

Annex A



**CITY OF NORTH PORT
FLOODPLAIN MANAGEMENT PLAN (FMP)
Updated
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TABLE OF CONTENTS

Page

PREFACE

[Background](#)

5

[Purpose of Floodplain Management Plan](#)

5

1. FLOODPLAIN MANAGEMENT COMMITTEE ORGANIZATION

6

[City Staff in CRS Committee](#)

[City Participation in Sarasota County LMS and CRS work Group Meetings](#)

2. PUBLIC INVOLVEMENT

7

[Public Sector Members](#)

3. COORDINATION WITH OTHER AGENCIES

8

[Unified Local Mitigation Strategy Work Group](#)

[Flood Map Update Coordination with FEMA, SWFWMD and Sarasota County](#)

[Coordination with Sarasota County on CRS Program and Development Review](#)

[Coordination with Charlotte Harbor National Estuary Program](#)

[Coordination with Myakka River Management Coordinating Council](#)

[Coordination with SWFWMD in the Environmental Resource Permit Program](#)

[Coordination with FDEP in the National Pollutant Discharge Elimination System Program](#)

[Permitting with U.S. Army Corp of Engineers](#)

[Permitting with US Fish and Wildlife Service and Florida Fish and Wildlife Conservation Commission](#)

4. HAZARD ASSESSMENT

10

[Storm Types and Flood Hazard](#)

[Map of Special Flood Hazard Areas](#)

[Original 1981 and 1984 FIRMs](#)

[Current Effective November 4, 2016 FIRMS](#)

[Preliminary December 31, 2019 Coastal Flood Risk FIRMS](#)

[Historic Flooding](#)

[Map of Known Flood Hazards](#)

[Recent Storms and Flooding](#)

[Assessment of Less Frequent Flood Hazards –](#)

[Water Control Structures Failure](#)

[Localized Flooding due to Pipe Failures and Conveyance System Blockages](#)

[Impact of Future Development on Flood Hazards](#)

[Hazards Other than Flood](#)

5. PROBLEM ASSESSMENT

14

[Vulnerability to Various Hazards](#)

[Life Safety Warnings and Evacuations](#)

[Public Health Hazards from Flood Waters](#)

[Protection of Critical Facilities and Infrastructure](#)

[Hazard effects on Community Economy and Major Employers](#)

[Buildings affected by Flood Hazard](#)

[Historic Damage to Buildings, Repetitive Loss and Insurance Claims](#)

[Natural and Beneficial Functions within the Floodplain](#)

[Development, Redevelopment and Population Trends Impact on the Watershed and Natural Resources](#)

[Future Flooding Impact on People, Property and Natural Floodplain Functions](#)

6. <u>FLOODPLAIN MANAGEMENT PROGRAM GOALS</u>	19
<ul style="list-style-type: none"> <u>1. Reduce Flooding of Roadways and Existing Properties</u> <u>2. Acquire Properties and Avoid Building in the SFHA</u> <u>3. Protect Public Lives and Health from Dangers of Natural Hazards</u> <u>4. Minimize Cost to The City and Property Owners.</u> <u>5. Protect our Environmental Resources</u> 	
7. <u>REVIEW OF POSSIBLE ACTIVITIES</u>	20
<ul style="list-style-type: none"> <u>Preventative activities through Zoning, and Development Regulations</u> <u>Floodplain Management Regulatory Standards</u> <u>Property Protection Activities</u> <u>Natural and Beneficial Function of Floodplain and Wetlands Protection</u> <u>Emergency Services Activities</u> <u>Structural projects</u> <u>Public Information Activities</u> 	
8. <u>ACTION PLAN AND REVIEW OF CURRENT ACTIVITIES</u>	22
<ul style="list-style-type: none"> <u>Preventative Activities</u> <u>Property Protection Activities</u> <u>Regulatory Activities</u> <u>Natural Resource Protection Activities</u> <u>Emergency Services Activities</u> <u>Structural Projects</u> <u>Public Outreach Activities</u> <u>Specific Action Plan Items</u> <ul style="list-style-type: none"> <u>8.1 Major Water Control Structures (WCS) Improvements</u> <ul style="list-style-type: none"> <u>8.1.1 Construction of WCS No. 106 Replacement</u> <u>8.1.2 Design of WCS No. 108 Replacement</u> <u>8.2 Minor Water Control Structure Repairs</u> <u>8.3 Retention (R) - Ditches and Major Canal Dredging</u> <u>8.4 Grid System for Stormwater Conveyance System, Rehabilitation</u> <u>8.5 Drainage Pipe Replacement</u> <u>8.6 Blockage Removal in Stormwater Conveyance</u> <ul style="list-style-type: none"> <u>8.6.1 Aquatic Vegetation Management</u> <u>8.6.2 Myakkahatchee Creek Blockage Removal</u> <u>8.7 FEMA Flood Map Updates</u> <ul style="list-style-type: none"> <u>8.7.1 Effective FEMA Flood Insurance Rate Maps Dated November 4, 2016</u> <u>8.7.2 Preliminary FEMA Coastal Flood Risk FIRMS Dated December 31, 2019</u> <u>8.8 Big Slough Flood Reduction Study</u> <u>8.9 Review and Implementation of Stormwater Regulations</u> <u>8.10 Incorporation of Low Impact Development (LID) Design in Developments</u> <u>8.11 Grant Funding of Projects</u> <u>8.12 Property Acquisition in the SFHA and Open Space Areas</u> <u>8.13 Public Outreach Meetings and Open Houses</u> <u>8.14 Presentations at Seminars and Workshops</u> <u>8.15 Brochure Handouts at Community Events</u> <u>8.16 Newsletters/New Releases, Television and Social Media Public Outreach</u> <u>8.17 City Website</u> <u>8.18 FIRMs Available to The Public</u> <u>8.19 Flood Warning, Response and Evacuation</u> <u>8.20 Participant in Sarasota County PPI Program</u> 	

9. PLAN ADOPTION	41
10. PLAN IMPLEMENTATION AND EVALUATION	41

[Five year FMP Update](#)

[Annual FMP Action Plan Update](#)

EXHIBITS

Exhibit 1-1 Resolution 2016-R-02 to Form CRS Committee
Exhibit 1-2 Invitees and Attendees List CRS Committee
Exhibit 1-3 City Staff Expertise in 6 Mitigation Measures
Exhibit 1-4 Floodplain Task Force Work Plan
Exhibit 3-1 LMS Project List as of 12-17-20
Exhibit 4-1 Parcels in SFHA 11-04-16 FIRMs
Exhibit 4-2 Structures in SFHA 11-04-16 FIRMs
Exhibit 4-3 Big Slough Watershed Boundary Map
Exhibit 4-4 Stormwater Conveyance Map
Exhibit 4-5 Historically Flooded Areas
Exhibit 4-6 Hurricane Irma Flooded Areas
Exhibit 4-7 Effect of Removing all WCSs
Exhibit 5-1 Hazard Analysis from 2019 CEMP
Exhibit 5-2 Flood Insurance Policies and Claims 09-10-20
Exhibit 5-3 Vulnerabilities and Property Loss
Exhibit 8-01 WCS Inspection, Replacement and Repairs
Exhibit 8-02 WCS 5-Year CIP Budget
Exhibit 8-03 2019 Maintenance Activities
Exhibit 8-04 Grid Map
Exhibit 8-05 Creek Blockage Removal Comparison
Exhibit 8-06 Preliminary Coastal Risk FIRMs Impacted Parcels
Exhibit 8-07 City Comments to FEMA on Prelim FIRMs
Exhibit 8-08 Nov 2019 Flood Reduction Study Conceptual Plan
Exhibit 8-09 Presentation on Flooded Property Acquisition
Exhibit 8-10 Financial Impact of Removal of Parcels from Tax Roll
Exhibit 8-11 Low Impact Developments as of Nov 2020
Exhibit 8-12 Tier 1 and Tier II Property Acquisition
Exhibit 8-13 Public Outreach All Events
Exhibit 8-14 Public Outreach News media, Social Media, YouTube Web Hits
Exhibit 8-15 Storm Ready Designation
Exhibit 8-16 Resolution 2019-R-06 to Join PPI

ATTACHMENTS

Attachment A 2019 CEMP Base Plan, Annexes and Appendices
Attachment B Stormwater Management Plan 2020-2030
Attachment C Sept 2014 Big Slough Watershed Final Report
Attachment D May 2019 Flood Reduction Study Plan

PREFACE

Background

The City of North Port City was incorporated in 1959 with only 23 residents and has grown over the last 60 years to become a vibrant community with a population of 77,561 as of April 2020. North Port has an incorporated area of approximately 104 square miles and is located in southeast Sarasota County.

The City is a participant in the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP) administered Community Rating System (CRS) program since 1992. CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from meeting FEMA's three goals of the Community Rating System:

- Reduce flood damage to insurable property
- Strengthen and support the insurance aspects of the National Flood Insurance Program
- Encourage a comprehensive approach to floodplain management

There are many community benefits to joining the CRS in addition to reduced flood insurance rates. CRS floodplain management activities provide enhanced public safety, a reduction in damage to property and public infrastructure, avoidance of economic disruption and losses, reduction of human suffering and the protection of the environment.

CRS Classification structure is based on credit points earned and is comprised of a Class rating scale of 10 to 1, with Class 10 being the worst and Class 1 being the best for flood insurance discount. A Class 10 will have 0% flood insurance reduction in the high risk flood zone AE, whereas a Class 1 rating will result a maximum of 45% flood insurance reduction in high risk flood zone AE.

The City of North Port has undergone several CRS audits to improve its CRS rating. The City's continual efforts in flood protection activities has resulted in improved CRS rating each audit. The most recent 2019 audit resulted in an improvement of the City's Class 6 rating to a Class 5 rating. The Class 5 rating became effective on May 1, 2020. The change from a Class 6 to the better Class 5 rating resulted in a change from 20% (Class 6) to 25% (Class 5) flood insurance discount for high risk flood zone AE areas. The flood insurance discount will be 10% in low risk flood zone X areas.

CRS Class	% Insurance Discount for Flood Zone AE	% Insurance Discount for Flood Zone X	Total Savings to North Port Residents as of September 10, 2020
6	20%	10%	\$34,870
5	25 %	10%	\$42,635

Purpose of Floodplain Management Plan

A requirement in the CRS program is the preparation and annual update of the Floodplain Management Plan (FMP) to address the following:

- Identify existing and future flood-related hazards and their causes;
- Ensure a comprehensive review of all possible activities and mitigation measures are conducted so that the most appropriate solutions will be implemented to address the hazard;
- Ensure the recommended activities meet the goals and objectives of the City, are in coordination with land use and comprehensive planning, do not create conflicts with other activities and are coordinated so the costs of implementing individual activities are reduced;
- Ensure the criteria used in community land use and development programs account for the hazards faced by existing and new development;

- Educate residents and property owners about the hazards, loss reduction measures and the natural and beneficial functions of floodplains;
- Build public and political support for activities and projects that prevent new problems, reduce losses and protect the natural and beneficial functions of floodplains;
- Build a constituency that wants to see the plan's recommendations implemented.

The FMP summarizes flood control projects, stormwater management activities, flood map revision, floodplain management ordinance revisions and public outreach conducted. The Plan also proposes future continuation of flood preventative activities. The FMP shall be used in conjunction with the latest edition of the City's Comprehensive Emergency Management Plan (CEMP) Base Plan and Hazard Specific Annexes included as Attachment A. The FMP is incorporated as an annex to Sarasota County's multi-jurisdictional Unified Local Mitigation Strategy (LMS) Plan. This FMP is organized into the ten (10) planning steps as given in the 2017 CRS Manual.

1. FLOODPLAIN MANAGEMENT COMMITTEE ORGANIZATION

The City of North Port's CRS Committee is formed by City Resolution 2016-R-02 (Exhibit 1-1) to review the FMP to meet the above mentioned purposes of the FMP. The FMP Committee will meet sufficient number of times to involve the members in the FMP plan steps 4 through 8. The FMP Committee is comprised of the City of North Port Staff listed below. Public sector representatives on this committee will be discussed in the next section. All meetings are publicly noticed and posted on the City website and social media to encourage public participation. During the year 2020 Covid-19 pandemic, these meetings were held virtually. Input from the CRS committee was received at the beginning of the planning process in a publicly advertised meeting and again in another publicly advertised meeting when the updated draft FMP was prepared.

A meeting was held on September 17, 2020 at the beginning of the FMP update process and another meeting was held on December 3, 2020 to discuss the updated draft FMP. A list of invitees, their roles and attendees to the CRS Committee meetings and meeting minutes are all included in Exhibit 1-2. Exhibit 1-3 lists the expertise of the City Staff in implementing the following six categories of mitigation measures: 1. Preventative Activity, 2. Property Protection, 3. Natural Resource Protection, 4. Emergency Services, 5. Structure Projects, and 6. Public Information.

The Stormwater Manager coordinates the CRS meetings, serves as the chairperson of the CRS Committee and prepares and updates the FMP. The Senior Planner from the Neighborhood Development Services (NDS) Planning Division will be the alternate.

City Staff in CRS Committee

1. Neighborhood Development Services (NDS) Planning Division – Senior Planner
NDS is the department responsible for the City's Land use and Comprehensive planning. The NDS Planner coordinates with the Stormwater Manager on the update of the City's Floodplain Management Ordinance.
2. NDS Building Division - Building and Code Enforcement staff
The Building staff oversees all building construction within the City to meet the Florida Building code and Floodplain Management Ordinance requirements to minimize impacts of flooding to structures. NDS formed a Floodplain Task force in early 2020. The primary mission of the Floodplain Task Force to support the City of North Port's CRS program through information, education and outreach activities. Exhibit 1-4 gives the Floodplain Task Force Work Plan. The Floodplain Task force is headed by the Building Official who is the City's designated Floodplain Administrator. Participants in the Floodplain Task force include NDS zoning staff, NDS planning Analysis and the Stormwater Manager. With the departure of the Building Official in August 2020, a Certified Floodplain Manager (CFM) from CAPGOV was retained to serve as the Building Official.

3. **Public Works Stormwater Manager**
The Stormwater Manager is the City's CRS coordinator and prepares the FMP and CRS program elements with input from City staff and the public. The Stormwater Manager assists with Public Works Operations/Maintenance projects that prevent or reduce flooding, coordinates flood map updates, provides Special Flood Hazard Area (SFHA) information to the public, performs development review to minimize adverse impacts to the floodplain, revises the City's stormwater regulations, provides input to the revision of the Floodplain Management Ordinance and performs public outreach activities to educate the public on flood protection, SFHA information and natural floodplain functions. The Stormwater Manager also oversees the environmental protection of wetlands and is a member of the LMS work group.
4. **Public Works Engineering Division – Engineering Manager (Project Engineer as alternate)**
The Public Works Engineering Manager and Project Engineer oversees engineering design and construction projects, coordinates all stormwater design and floodplain impact issues with the Stormwater Manager, and provides input to the revision of the Floodplain Management Plan.
5. **Public Works Administration Division – Community Outreach Coordinator**
The Community Outreach Coordinator assists in public outreach for the CRS program and updates the City's website and social media on flood information.
6. **City Manager Office – Grant Writer and Community Outreach Coordinator**
The Grants Writer coordinates the City's grant applications and is also a Certified Floodplain Manager (CFM) and has experience with the CRS program. The Community Outreach Coordinator coordinates all public outreach programs for the entire City and sends preparedness messages and alerts on approaching storm events.
7. **Finance Department – Management Analyst**
The Management Analysis coordinates the City's capital improvement program.
8. **Fire Rescue – Emergency Manager**
The Emergency Manager updates the City's Comprehensive Emergency Response Plan, coordinates the City's flood warning system, performs public outreach on flood protection information and is member of the LMS work group.
9. **Department of Parks and Recreation – Parks and Recreation Manager**
The Parks and Recreation Manager coordinates a diverse year-round recreational opportunity through the preservation of open space, park settings, recreational facilities, and programs that meet the physical, mental, cultural and social needs of our residents, while enhancing the overall quality of life. Parks and Recreation is a division within the Department of General Services.
10. **Utilities Department – Utilities Engineer**
The Utilities staff oversees the water and wastewater service to the City and monitors water quality.

City Participation in Sarasota County LMS and CRS work Group Meetings

The City of North Port has three representatives, the Stormwater Manager, the Emergency Manager and the Grant Writer, who participate in the Sarasota County LMS work group. This work group includes representatives from the Cities of Sarasota and Venice, Town of Longboat Key, Sarasota County, Sarasota County Schools and Sarasota Memorial Hospital. Each jurisdiction's FMP is included as an annex to the multi-jurisdictional LMS Plan. The LMS Work Group, which has met on a quarterly basis since December of 2007, participates in the five-year update to the LMS plan and annually revises the LMS projects list. The meeting is publicly noticed, and agendas, minutes and advertisement may be found in Appendix of Sarasota County Unified Local Mitigation Strategy. The City Stormwater Manager also attends and provide input in the Sarasota County CRS committee meetings.

2. PUBLIC INVOLVEMENT

The FMP Committee includes the below public sector members. All meetings are publicly noticed and posted on the City website and social media to encourage public participation. Representatives of various public sectors were invited to the CRS committee meetings as shown on Exhibit 1-2. Input from the CRS committee

was received at the beginning of the planning process in a publicly advertised meeting and again in another publicly advertised meeting when the updated draft FMP was prepared.

Public Sector Members

1. Chamber of Commerce Representative
2. North Port Librarian
3. HOA Representatives
4. Building Industry Association (BIA) Representative
5. Developers
6. Engineering Consultants
7. Flood Insurance Representatives
8. Realtor Representatives
9. Commercial facility Representatives
10. Lending Institute Representatives
11. Civic Association Representative
12. North Port Contractors Representative
13. Sarasota County CRS Coordinator

3. COORDINATION WITH OTHER AGENCIES

Unified Local Mitigation Strategy Work Group

The City of North Port Stormwater Manager, Emergency Manager and Grants Writer participate in the Sarasota County Local Mitigation Strategy (LMS) work group. Local hazard mitigation strategy planning is the process of organizing community resources, identifying and assessing hazard risks and determining how to best minimize or manage those risks. This process culminates in a hazard mitigation plan that identifies specific mitigation actions designed to achieve both short-term planning objectives and a long-term community vision. The City staff provides input into the multi-jurisdictional LMS plan including the five-year update. Annually City staff revises the LMS projects list (Exhibit 3-1).

Flood Map Update Coordination with FEMA, SWFWMD and Sarasota County

The City of North Port coordinated extensively with representatives from FEMA, Southwest Florida Water Management District (SWFWMD) and Sarasota County in updating the City's Flood Insurance Rate Maps (FIRMs) and Flood Insurance Study (FIS) which became effective on November 4, 2016. The City is currently coordinating with FEMA and providing comments in the release of the preliminary coastal risk FIRMs dated December 31, 2019. This map update effort is discussed more in later sections of the FMP. The interactions include preparation and comments on the flood maps, public outreach efforts, hosting of open houses and comments/appeals on the draft FIRMs.

Coordination with Sarasota County on CRS Program and Development Review

City of North Port staff closely coordinates the following activities with the County:

- Participate with Sarasota County CRS coordinator in general public outreach activities such as flood mitigation workshops and dissemination of flood information at the North Port Library staffed by Sarasota County.
- Participate in the Unified Program for Public Information (PPI) along with the City of Venice, City of Sarasota and Town of Longboat Key. The PPI allows participating communities to coordinate public outreach messages vital to floodplain management.
- As part of the PPI Committee, the City also participate in the development of the Flood Insurance Promotion Plan expected to be finalized early 2021.
- The Stormwater Manager coordinates with the Sarasota County Engineer in the review of development projects within the West Villages Improvement District (WVID) area that was annexed into North Port. WVID is within the Sarasota County's Lower Myakka River Watershed, and the coordinative effect is to

avoid adverse flooding effects to the County from any new projects proposed within that watershed. The Stormwater Manager reviews the development engineering consultant's update of the County's hydraulic model to evaluate the impact of the proposed development within the development and effects of the discharge into the surrounding County.

- The City's Emergency Manager participates closely with the Sarasota County's Emergency Operations Center staff in the event of oncoming Tropical Storms and Hurricanes.

Coordination with Charlotte Harbor National Estuary Program

The City of North Port Stormwater Manager is a member of the Charlotte Harbor National Estuary Program (CHNEP) Management Committee. A City Commissioner represents North Port on the CHNEP Policy Committee. The CHNEP addresses water quality and environmental benefits related to restoration of Charlotte Harbor and protection of the estuaries. The City also hosts a booth at the CHNEP Annual Environmental Festival and disseminates information to the public on water quality protection, flood information and low impact development (LID) methods.

Coordination with Myakka River Management Coordinating Council

The City of North Port Stormwater Manager is a member of the Myakka River Management Coordinating Council (MRMCC) which was established in 1985, by the Myakka River Wild and Scenic Designation and Preservation Act (Section 258.501, Florida Statutes) (Designation Act) to provide interagency and intergovernmental coordination in the management of the river. The Florida Department of Environmental Protection (Department) coordinates the MRMCC. The MRMCC holds three meetings per year to review and make recommendations on all proposals for amendments to the Designation Act, Myakka Wild and Scenic River Management Plan, Chapter 62D-15, Florida Administrative Code, Myakka River Wild and Scenic River Rule. They also review other matters that affect the water quality, quantity issues and wildlife in the protected areas along the Myakka River. The City of North Port Stormwater Manager provides input on new development projects with discharges to the Myakka River Protection Zone.

Coordination with SWFMWD in the Environmental Resource Permit Program

The City of North Port schedules Environmental Resource Permit (ERP) pre-application meetings with the SWFMWD to solicit input on the design of new/replacement flood control projects, new city developments, dredging vegetation control projects within the City's stormwater conveyance system. The City also obtains all required ERPs and performs the SWFMWD required stormwater system recertifications.

Coordination with FDEP in the National Pollutant Discharge Elimination System Program

The City of North Port is one of 6 co-permittees (North Port, Sarasota and Venice, Town of Longboat Key, Sarasota County, and Florida Department of Transportation) in the National Pollutant Discharge Elimination System (NPDES) permit. An annual NPDES permit is submitted that documents all NPDES permit requirements relating to stormwater system inventory inspection and maintenance, water quality monitoring and pollutant load modeling, flood control projects, development review and water quality treatment and attenuation requirements, construction inspection for proper best management practices, proactive and reactive inspections and public outreach. The City has been audited several times by FDEP and found to be compliant.

Permitting with U.S. Army Corp of Engineers

The City of North Port has contacted and obtained all needed permits for new construction projects from the U.S. Army Corp of Engineers (USACOE). An example is the permit obtained to replace water control structure No. 101 on the Myakkahatchee Creek. The concern over the impact this replacement structure on the small tooth sawfish was resolved in the permitting effort.

Permitting with the US Fish and Wildlife Service and Florida Fish and Wildlife Conservation Commission

The City of North Port has contacted and obtained all needed permits for the impact of new construction projects on protected species from both Fish and Wildlife Service (FWS) and Florida Fish and Wildlife

Conservation Commission (FWC) . An example is the permit obtained to replace water control structure No. 101 on the Myakkahatchee Creek. There were existing gopher tortoise burrows within the access easement to the structure. A gopher tortoise survey was done and a FWC relocation permit was obtained and the gopher tortoises relocated prior to start of construction.

4. HAZARD ASSESSMENT

Storm Types and Flood Hazard

Tropical storms and hurricanes are large cyclonic storms with counterclockwise winds of 39 mph or greater. They are often accompanied by heavy rains and storm surge that can cause flooding. In addition, fallen trees and debris can obstruct water flow, contributing to structure damage. Hurricanes are categorized according to the below Saffir-Simpson Hurricane Wind Scale which is based on estimates of potential property damage. Hurricanes rated Category 3 and higher are considered major hurricanes because of their potential for significant damage and loss of life. While less devastating, Category 1 and 2 hurricanes are still dangerous, and they too, require preventative measures.

Category	Sustained Winds	Potential Damage
Tropical Storm	39 – 73 mph	Some
1	74 – 95 mph	Some
2	96 – 110 mph	Extensive
3	111 – 130 mph	Devastating
4	131 – 155 mph	Catastrophic
5	156 mph or higher	Catastrophic

NOAA Damage Potential for Each Category:

- **Category 1:** Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding, and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last several days.
- **Category 2:** Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
- **Category 3:** Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
- **Category 4:** Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
- **Category 5:** Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas.

Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

A detailed description of the flood hazard assessment is given in the Sarasota County Unified LMS plan and the FEMA FIS Study number 12115CV001A. The LMS plan can be accessed on the Sarasota County Website at <https://www.scgov.net/government/emergency-services/local-mitigation-strategy>. The FEMA FIS study can be accessed on the FEMA website here: <https://hazards.fema.gov/femaportal/prelimdownload/>. The City's CEMP Base Plan and Hazard Specific Annex D (Attachment A) gives a detailed flood history and the City's emergency management response to flood events.

Map of Special Flood Hazard Areas

Original 1981 and 1984 FIRMS

The original FEMA FIRMS with Special Flood Hazard Areas (SFHA) are dated September 2, 1981 and available for only a portion of North Port east of the Myakka River. The FEMA FIRMS for the City's West Villages Improvement District (WVID) annexed area that is west of the Myakka River are dated May 1, 1984. These FIRM maps are available at the City of North Port Public Works Department, the NDS department and at the North Port Library. Pdfs of the maps are available on the City website at <https://www.cityofnorthport.com/government/city-services/public-works/flood-information/1981-1984-fema-flood-maps>. These 1981 and 1984 FIRMS are no longer effective.

Current Effective November 4, 2016 FIRMS

The 1992 and 2003 storm event are close to a 100-year storm event and the extent of flooding is much more expansive than the SFHA shown in the 1981 FEMA FIRMS. Consequently, a cooperatively funded project with SWFWMD named the Big Slough Watershed Study was initiated in 2003 and completed in 2014 (see Attachment C) to update the FIRMS and evaluate options to reduce flooding. This study is detailed in later sections of this FMP. Data is available from the study which shows the depth of flooding, velocities and peak times corresponding to peak flows. A Big Slough hydraulic model was used to evaluate the flood risk and update the SFHA. This model was calibrated with flood water elevation data determined from a video recording by North Port Fire Rescue during the June 2003 flood. Also, during public outreach efforts prior to the May 22, 2012 model approval, much input was obtained from the residents including documentation of localized highwater marks. The elevations corresponding to the high-water marks were surveyed and used to verify the hydraulic model.

The SWFWMD Governing Board approved the Big Slough hydraulic model used for preparing the FIRMS on May 22, 2012. The updated FIRMS became effective on November 4, 2016. As the FEMA FIRMS are just pdfs of the SFHA overlaid on old 2007 aerial, the City has made available on the City website a user-friendly searchable web application to view the effective FIRMS overlaid on the most current 2020 aerial with visible property lines and information links. This web application is available at the City's "FEMA Flood Map Updates Webpage" at <http://www.cityofnorthport.com/flood> provides instructions on how to assess this effective November 4, 2016 FIRMS. An overview map of the SFHA with affected parcels is given in Exhibit 4-1. An overview map of the SFHA with affected building structures is given in Exhibit 4-2.

Preliminary December 31, 2019 Coastal Flood Risk FIRMS

North Port has tidally influenced areas south of US 41 and east of the Myakka River. The West Villages annexed area west of the Myakka River is also tidally influenced. In the November 4, 2016 FIRMS, The SFHA in these tidally affected areas were prepared, by just remapping the 1981 and 1984 FIRM coastal Base Flood Elevations (BFEs) of 7ft NAVD88 on 2007 LiDAR topography. This effort resulted in major portions of North Port developments removed from the SFHA that was in 1981 and 1984 SFHA. The coastal BFE of 7ft NAVD88 was not reevaluated. Consequently, in February 2014, FEMA started an effort

to identify, assess, and update coastal flood hazard risk to incorporate storm surge, high tides, wave action in addition to freshwater flooding input. On December 31, 2019, FEMA released preliminary coastal risk maps for Sarasota County which included the City of North Port. The status of this current map update effort, impact of the SFHA changes, City's comments and timeline for adoption is discussed in later Section 8. The web application available at the City's "FEMA Flood Map Updates Webpage" at <http://www.cityofnorthport.com/flood> provides instructions on how to assess this interactive preliminary December 31, 2019 FIRMs.

Historic Flooding

The City of North Port is located on the southwest side of Florida in the southernmost part of Sarasota County, which is bordered on the south by Charlotte County, on the east by Desoto County and to the north by Sarasota County. The City is comprised of 104 square miles and is the third largest land area city in the state.

North Port started as a planned community in 1959 with 70,608 platted residential lots. An extensive stormwater infrastructure network was constructed by General Development Corporation (GDC) consisting of 132 miles of manmade retention ditches (R-Ditches), 1,613 miles of roadside swales and 79.1 miles of major wet waterways with 64 water control structures (WCS) and stormwater conveyance piping to support its residential, commercial and light industrial developments. The WCSs is used to control water flow in the interconnected system R-ditches, waterways and Myakkahatchee Creek (also known as the Big Slough Canal). Twenty-eight (28) of the WCSs are equipped with gates which are opened or closed to allow flood relief or release of water in a stepwise design to the downstream southerly section of Myakkahatchee Creek and the westerly end of the Cocoplum Waterway. The City's water plant is located at the confluence of the Myakkahatchee Creek with the west end of the Cocoplum Waterway and withdraws potable water source from both water bodies.

The portion of the City that is east of the Myakka River is located within the southernmost downstream end of the 196 square miles of the Big Slough/Myakkahatchee Creek watershed boundary (Exhibit 4-3) and consequently is inundated with surface water runoff from this extremely large watershed, even during the mean annual storm event. A map of the City stormwater conveyance systems is given in Exhibit 4-4.

The City has experienced severe flooding from unnamed storms, tropical depressions, tropical storms and hurricanes as follows.

Date	Inches of Rain	Storm Magnitude	Storm
March 23-31, 1987	5.4 to 9.1	10 to 25-year storm	Unnamed storm
September 5-9, 1988	8.2 to 8.9	25-year storm	Unnamed storm
June 23 - July 2, 1992	16.2 to 20.7	500-year storm	Tropical Depression One
September 14-23, 2000	4.7	5-year storm	Unnamed storm
July 20-26, 2001	4.6 to 6.9	10-year storm	Unnamed storm
September 6-14, 2001	10.0 to 11.0	100-year storm	Tropical Storm Gabrielle
June 17-22, 2003	13.6 to 14.3	100-year storm	Unnamed storm
August 12-19, 2004	3.0 to 4.5	5-year storm	Hurricane Charlie
September 10-15, 2017	9.8	25 to 100-year storm	Hurricane Irma
November 8-12, 2020	3.5	Mean annual storm	Hurricane Eta

Map of Known Flood Hazards

During the 1992, 2003 and 2004 storms, extensive street flooding was experienced in the North Port Estates area and in areas within about 1.5 miles reach near the I-75 corridor crossing of the Myakkahatchee Creek and within the Jockey Club area. A map of these historically flood prone areas is provided in Exhibit 4-5. The flooding is due to a mix of factors including:

- Watershed location and lack of topographic relief.

- Periodic excesses of rainfall associated with cyclic and seasonal storm events.
- The Community's infrastructure, constructed in the 1960s, is designed for a 10-year storm event of 5-day duration, which is before the definition of the 100-year floodplain and the State's stormwater management regulations.
- Construction of the I-75 corridor in 1977 which redirected natural drainage patterns.
- Population growth and corresponding residential and commercial land development.
- Long-term increases in peak stormwater discharge rates and runoff volumes in upstream areas of the watershed in Sarasota, Manatee and Desoto Counties.
- Silt and vegetative debris accumulated in the stormwater conveyance system.

Recent Storms and Flooding

Hurricane Irma

The September 2017 Hurricane Irma with 9.8 inches of rain brought widespread street flooding typically experienced in the North Port Estates area and in area near the I-75 corridor crossing of the Myakkahatchee Creek. Exhibit 4-6 gives a map of the flooded locations during site reconnaissance on two separate days. The depth of flooding is also shown on the map.

The Jockey Club area streets that are typically inundated during such as storm event, were not flooded during Hurricane Irma. This is due to the City's prior efforts on R-ditch rehabilitation, major conveyance pipe replacements and the installation of swale liners in the Jockey Club area.

However, extensive flooding occurred in the "Dorothy Avenue" area located west of the Myakkahatchee Creek and just north of US 41. This is caused by freshwater run-off coupled with storm surge into tidally affected canals at high tide conditions. This caused water to back up onto the streets. Street flood retreated quickly when high tide conditions receded, and rainfall ended.

Additionally, during Hurricane Irma, the streets in the Orlando Boulevard area in the south east end of North Port was flooded due to a downstream replacement of a weir water control structure constructed by Charlotte County. This weir was constructed with an opening that was too restrictive. After the 2017 Hurricane Irma, Charlotte County widened the weir opening and no major flooding in the Orlando area has been reported during the later November 2020 Hurricane Eta, but this was a much lesser storm event.

Hurricane Eta

The November 2020 Hurricane Eta was a lesser storm event with 3.5 inches of rainfall. Historically, such a rain event would have caused some street flooding along the creek and in the North Port Estates area. However, no street flooding occurred, and this can be attributed to the City's on-going efforts in road swale regrading, pipe cleaning/replacements and removing debris and blockages in the Myakkahatchee Creek and City R-ditches.

Assessment of Less Frequent Flood Hazards –

Water Control Structures Failure

The City has an inventory and map of the 64 water control structures (WCSs) which function as dams or levees to retain water in the Cities interconnected system canals with the Myakkahatchee Creek. Twenty-eight (28) of the structures are equipped with gates that can be opened to allow flood relief or release of water in a stepwise design to the downstream southerly section of Myakkahatchee Creek and the westerly end of the Cocoplum Waterway. The City's water plant is located at the confluence of the Myakkahatchee Creek with the west end of the Cocoplum Waterway and can withdraw potable water source from either water bodies. As part of the Big Slough Watershed Study completed in 2014 (Attachment C), a best management practice analysis was conducted to determine the extent of flooding if the WCSs failed, i.e., removed in the hydraulic model. The analysis showed reduction in flooding in some areas north of Price Boulevard and east of Toledo Blade Boulevard but increased flooding in the west boundary of the City,

areas along the Creek and widespread flooding of populated areas just north of Cocoplum Waterway and west of Toledo Blade Boulevard. In this area, building structures are constructed at lower elevations (Exhibit 4-7) and are flood prone. In some of these areas, building structures are built low due to the availability of central sewer and the finished floor elevation was not raised as in homes built higher to accommodate a septic system drain field.

Localized Flooding due to Pipe Failures and Conveyance System Blockages

A considerable portion of the City's stormwater infrastructure was constructed in the late 1960's to 1970's and needs replacement. Much of the work done in the past has been reactive, many times due to collapsed pipes or frequent complaints. In fiscal year 2018, Public Works began taking a comprehensive, vigorous proactive approach to scheduling and budgeting for the maintenance, rehabilitation and replacement of the stormwater system. Details of the below drainage program improvement elements are given in the Department of Public Works Stormwater Management Plan for Fiscal Years 2020-2030 (Attachment B).

- Neighborhood Rehabilitation by Grid
- Road Crossing Pipe Replacement
- Outfall Replacement
- Retention Ditch Rehabilitation
- Targeted Projects

Impact of Future Development on Flood Hazards

In the City's Site Development Review process (SDR), per the City's Unified Land Development Code Chapter 18 Stormwater Regulations, the Stormwater Manager reviews all developments, other than single family platted lots, for floodplain impacts and required floodplain compensation and to ensure the finished floor elevation is higher than the regulatory base flood elevation. Thus, these new developments are not anticipated to worsen the floodplain.

The NDS Building division reviews proposed structures for all single-family platted lots. If a building is proposed within the SFHA footprint of the existing effective FIRM, then an elevation certificate will be required to show the building lowest floor elevation is constructed above the based flood elevation. However, floodplain compensation is not required for fill brought into the SFHA within these single-family platted lots so cumulatively, the floodplain can increase in these areas.

Hazards Other than Flood

The City's CEMP Base Plan and Hazard Specific Annexes (Attachment A) the Sarasota County LMS plans both describes the severity, history and probability of future events for other natural hazards such as earthquakes, wildfires or tornados. The LMS plan is available on the Sarasota County Website at <https://www.scgov.net/government/emergency-services/local-mitigation-strategy>.

5. PROBLEM ASSESSMENT

Vulnerability to Various Hazards

A tabulation of "Hazard Analysis" summarizing the City's vulnerability to each hazard excerpted from the City's CEMP Base Plan (Attachment A) is given in Exhibit 5-1. The anticipated frequency of occurrence, the City's vulnerability, exposure and potential for loss are addressed for the following categories of hazards, Hazardous Materials Spills, Commercial Nuclear Power Plant Incidents, Civic Disturbance, Mass Immigration, Coastal Oil Spill, Extreme Temperatures, Brush, Wildfires and Forest Fires, Thunderstorms and Tornadoes, Drought, Sinkholes and Subsidence, Terrorism, Exotic Pests and Diseases, Diseases and Pandemic Outbreaks, Critical Infrastructure Disruption, Special Events and Dam Failure, Major Transportation Incidents.

Life Safety Warnings and Evacuations

The City has a responsibility to warn the public on impending floods and the need for evacuation when necessary. The City's CEMP Base Plan Section V addresses life safety issues and response activities including evacuations (Attachment A). The CEMP Hazard Annex D details the flood warning and response activities.

The City of North Port has an [Alert Sarasota County](#) Emergency Notification System to quickly notify residents and business of an emergency or urgent situation. Residents can sign up to receive [Alert Sarasota County](#) alerts on their phone or email.

The Department of Public Works shares the cost of available USGS gages on the Myakkahatchee Creek at intersections with Tropicair Boulevard, Price Boulevard and at Water Control Structure No. 101 at the downstream end of the Creek next to the City's Water Treatment Plant. The City's "Flood Warning" webpage at <https://www.cityofnorthport.com/government/city-services/public-works/flood-information/flood-warning> has a link to the USGS gage on the Myakkahatchee Creek at Tropicair Boulevard. The webpage also provides a correlation of the anticipated flooding on streets correlated with USGS gage water level readings.

Public Health Hazards from Flood Waters

Flood waters may not only cause physical structure damage to buildings but can also cause associated health risks in the following forms:

- Mold and mildew
- Contaminated drinking and washing water
- Mosquito borne diseases
- Poor sanitation from loss of water and sewer services, overflowing/plugged septic systems
- Loss of electricity, air conditioning, natural gas, phone and internet services
- Animal invasion of property, in particular, fire ants seeking higher ground, water snakes and alligators
- Mental stress and fatigue

Due to these associated hazards, residents should have a plan on how to deal with the aftermath of a flood and seek assistance from professional sources or the public safety officials.

Protection of Critical Facilities and Infrastructure

The City of North Port's Emergency Management maintains a Critical Facilities Inventory (CFI) for the City. Given the sensitive nature of the facilities, they are protected under Florida Statutes Chapter 119 and the locations of which are not included in this Plan. The City's Comprehensive Emergency Management Plan (CEMP) Annex D Section V.B describes the City's Fire Rescue response to Critical Facilities (see Attachment A page D20 on pdf page 142). Protection of Critical Facilities is described in detail in the CEMP Annex F Section IV.C (see Attachment A page F8 on pdf page 184). Protection efforts in the face of a threat of flooding, facilities may be protected by constructing dikes, sand-bagging, or using pumps to prevent water from entering the facility. Critical facilities that require back-up electrical power such as City Hall and Police Station, Public Work/Fleet Facilities, Utilities building, Fire Stations, Water and Wastewater Plants all have appropriate back up power generation equipment on site.

The proper operation of the wastewater lift stations is necessary to avoid sewage over flow. During power outages, portable generators are readily available to supply power to wastewater lift stations. Sewage bypass pumping at the lift stations is another method to keep the flow moving in the collection system. Portable generators are also available to operate the gates at the City's water control structures to lower the water levels in the waterways in anticipation of a large rain event and to close the gates after the passing of the storm in order to retain water in the waterways which is a source of potable water for the City.

Mitigation activities relating to the critical facilities can be found in the Sarasota County Unified Local Mitigation Strategy Plan. Maps of shelters and surge/evacuation zones and routes on the Sarasota County Emergency Management website are linked from the City of North Port's website. Most of the critical facilities are built to withstand hurricane category 3 storm events.

The City's Utilities Department has an inventory of the water and wastewater infrastructure and the Department of Public Works has an inventory of the road and drainage infrastructure. These infrastructure systems are carefully checked before and after a hazard event for proper functioning.

Hazard effects on Community Economy and Major Employers

The City's more than 77,561 population (Bureau of Economics & Business Research April 2020) boast a median age of 40 and is one of the youngest in the Southwest Florida region. Youth is found in more than just the nearly 10,000 school children who attend the 6 elementary, 3 middle and 2 high schools within North Port. The population provides a work force to Sarasota, Manatee, Charlotte, Lee and even as far as Collier and Pinellas Counties. The major private employers within North Port are mostly commercial establishments along the US 41, and the Toledo Blade Boulevard corridor, with light industrial employers situated within the industrial park area on the west side of Toledo Blade Boulevard and in the Pan American Boulevard/Trott Circle area.

The City has acquired Warm Mineral Springs which is a main tourist attraction. Other main employers are the Sarasota Memorial Hospital and King Plastics on Toledo Blade Boulevard, USF College at Pan American Boulevard just north of US 41 and State College of Florida in the WVID Thomas Ranch annexed area. Despite the young population, there is also a large population of retirees in several large residential developments in Island Walk and Gran Paradiso in the Wellen Park area where there are currently many homes under construction. Other developments include Heron Creek along Sumter Boulevard, Bobcat Trail and developments along Toledo Blade Boulevard. Flood and other hazard events will cause extensive property damage, negatively impact the work force in North Port by restricting access to job sites and by loss of economy from businesses and tourism.

Buildings affected by Flood Hazard

Exhibit 4-2 shows the parcels with structures affected by the SFHA in the November 4, 2016 effective FIRMs. Below is a comparison of how many properties or portions of the properties were moved into the higher-risk SFHA and how many were moved out.

Parcel Status	No. of Affected Parcels (as of 12/05/16)	No. of Affected Parcels with Insurable Structures* (as of 12/05/16)	No. of Parcels with Insurable Structures* touching the SFHA (Using 12/05/16 Sarasota County GIS Structures Layer)
<u>Parcels Added</u> Parcels not in the 1981 FIRM floodplain, but any portion(s) of the parcel are touching the November 4, 2016 FIRM SFHA	14325	5531	276
<u>Parcels Removed</u> Parcels that are in the 1981 FIRM SFHA and were removed from the November 4, 2016 FIRM SFHA	1828	921	
Parcels that are in the 1981 FIRM SFHA and are still in the November 4, 2016 FIRM SFHA	2630	720	211

* An insurable structure is a structure with at least two load-bearing walls and a roof. It must be affixed to land, and at least 51% of its value must be above ground. This definition includes almost all residential and commercial structures, as well as ancillary buildings such as garages and barns. Storage facilities such as silos and grain storage buildings are also covered. The rules do not cover structures such as gazebos, pavilions, pole barns, and storage tanks, as these buildings do not have at least two load-bearing walls and a roof. If they did not have roofs, then they would not qualify as insurable structures. Otherwise, flood insurance is required. The issue is not habitability.

Exhibit 5-2 shows a total of 2,901 flood insurance policies in North Port as of September 10, 2020 and include 211 properties in the SFHA. Exhibit 5-3 is excerpted from the City's CEMP (Attachment A) Base Plan describes the vulnerabilities to the population, and economic loss if a hurricane with sufficient storm surge or flooding in a FEMA Special Hazard Flood Area was to affect the City of North Port.

Historic Damage to Buildings, Repetitive Loss and Insurance Claims

The City of North, as of September 10, 2020, does not have Repetitive Loss properties. A Repetitive Loss property is any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978. Flood insurance data about private property, including repetitive loss properties, are protected under the Privacy Act. The locations of flood insurance claims within North Port were reviewed. A generalized map of these areas is provided in Exhibit 4-5. The claims are mostly single family residential homes (Exhibit 5-2) and mostly located in the following areas near the Myakkahatchee Creek:

1. North Port Estates area near the Myakkahatchee Creek
2. Areas near the Myakkahatchee Creek north and south of Interstate 75
3. Jockey Club area north of US 41 and west of the Myakkahatchee Creek
4. Area subject to tidal inundation south of US 41 near the Myakkahatchee Creek

The City has completed a detailed flood reduction study in fiscal year 2016 to evaluate methods to reduce flooding in the above first three areas. This is discussed in greater detail in Section 8. The data included in Exhibit 5-2 shows that of the 60 paid losses, only 28 are in the SFHA flood zone AE. The remaining paid losses are in the lower risk flood zone X. This shows the importance of flood insurance coverage as SFHA in flood maps do not always predict which homes will be flooded. The number and value of losses in pre-FIRM homes and post FIRM homes are also given in Exhibit 5-2.

Natural and Beneficial Functions within the Floodplain

Floodplain areas are recognized as having an intrinsic value of their own as a part of the interconnected ecosystem and an influential role in increasing a community's quality of life. The recognized benefits of a naturally functioning floodplain include the storage and conveyance of flood waters, the recharging of groundwater; the maintenance of surface water quality, and the provision of habitats for fish and wildlife. These areas also provide diverse recreational opportunities, scenic value, and a source of community identity and pride. The existing floodplain along the City's Myakkahatchee Creek, provides a habitat for all forms of fish and wildlife. The City has acquired and continues to acquire property in this floodplain to preserve the habitat and protect the watershed from pollutants entering the Myakkahatchee Creek, the City's primary drinking water supply.

Wetlands as defined in 373.019(27), Florida Statutes are "areas that are inundated or saturated by surface or groundwater at a frequency and a duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils". There is an abundance of wetlands in the City in particular in the North Port Estates area north of I-75, along the Myakkahatchee Creek slough system, northeast annexed quadrant north of Snover Waterway and east of Toledo Blade and the annexed WVID area. Wetlands are strictly protected, and during the City's Site Development Review (SDR) process, the proposed development must avoid destruction of the wetland and wetland 25 ft buffer to the maximum extent possible. Destruction of wetlands require proof of state (SWFWMD or FDEP) and federal (USACE) permit approvals. Wetland mitigation will be required through purchase of mitigation credits from a wetland mitigation bank or reconstruction of an equivalent wetland near the destroyed wetland site. Wetlands are

typically part of a floodplain and serve the aforementioned beneficial functions of a floodplain. Wetlands provide treatment for surface runoff pollutants such as turbidity through settlement. Nitrogen and phosphorus nutrients and organics can be assimilated by the vegetation in the wetlands.

Development, Redevelopment and Population Trends Impact on the Watershed and Natural Resources

The City of North is not built-out and has large amounts of undeveloped property particularly in the North Port Estates area and areas east of Toledo Blade, the northeast annexed quadrant area north of Snover Waterway and east of Toledo Blade, and the annexed WVID area. There is minimal redevelopment occurring in North Port as most new developments are on areas not previously developed. As mentioned in Section 4, all new major development and redevelopment (single family platted lots excluded) must be reviewed through the City's Site Development Review (SDR) process, for floodplain impacts and required floodplain compensation. Stormwater attenuation is required so the new development peak runoff flow rate does not exceed the pre-development peak runoff flow rate. The pre-development condition allows stormwater recharge of the groundwater over a large surface area. This will be greatly reduced with the new development due to increased impervious areas which will prevent ground water recharge. Single family platted lots building on property that has wetlands will need to provide mitigation for any destruction of wetland and its flood waters storage capacity.

The City has strict water quality treatment requirements in the Unified Land Development Code (ULDC). For example, in the design of dry retention stormwater ponds, the City's regulation requires 100% more treatment volume than SWFWMD. The ULDC requires the low impact development methods such as use of pervious pavements to be evaluated for all new developments, as the pervious nature will assist in the recharge of groundwater and reduce runoff volume. The City has an aggressive public outreach program that will be discussed in later sections to minimize the developmental impact of surface water quality and quantity on the watershed and natural resources. All these regulatory requirements and public outreach efforts should help minimize the effects of new developments on the watershed and the City's natural resources.

In the building boom years during 2006 to 2009, the population trend increased at a rapid rate in North Port. Increased population can generally affect the natural resources such as increase in pollutant generation, increase potable water supply needs and additional stormwater runoff from constructed impervious areas. The City of North Port has one of the lowest per-capita water use rates in the region. This can be attributed to an extensive conservation program which includes a tiered rate structure, reuse water program, irrigation enforcement, and a comprehensive public education and outreach program that promotes water conservation, protection of City and regional resources, and encourages public participation in flood control efforts. The City's water conservation efforts and other sustainable development activities earned North Port the Florida Green Building Coalition's "Gold" level local government certification in 2011 and a "Silver" level upon recertification in July 2017.

Future Flooding Impact on People, Property and Natural Floodplain Functions

Due to the City of North Port being located at the most downstream end of the Big Slough Watershed, a severe storm event over North Port and the upstream reaches of the Big Slough watershed with several inches of heavy rains over a prolonged period during the rainy summer months, when the ground is already saturated, can cause street flooding and possible property and infrastructure damage. Flooding will cause severe economic impact on the community.

The Public Works staff has gained experience on correlating rainfall predictions with rise of flood waters in the Myakkahatchee Creek. The existing USGS rain gages are constantly monitored even after normal work hours. Staff is on standby to open gates well in advance of pending storms to lower canal water levels to provide additional attenuation storage volume and reduce the chance of flooding. This has worked well during the rainy season in which minimal street flooding occurred. A localized event with heavy rains may only result in flooding in a limited area of the City and would have relatively little long-term economic impact.

Future catastrophic storms that last over several days can cause widespread flooding even with the above gate opening activities performed. Cost to repair property damages must be borne by the owner or the NFIP flood insurance if in place. Subsequently, widespread NFIP flood insurance rates may increase. Property values can decline severely following such a storm which not only affects the property owner but will reduce the City's property tax revenue.

The City reserve funds would need to be drawn upon to pay for damages to City infrastructure which can include storm pipe failures, severe bank erosion, road collapse, damage to City buildings and equipment, and damages to the City's Water and Wastewater Treatment Plant, pump stations and utilities infrastructure. The infrastructure downtime and inconveniences to the public will cost lost revenues to businesses and lost wages to workers.

Also, the extensive property damage can severely affect the City financially due to the recent conversion to being self-insured. Tourism can be expected to decline. The sales tax revenue generated from purchases of supplies and replacement goods may offset in part the loss of sales tax revenue from a drop in tourism and visitors to the City due to the storm.

6. FLOODPLAIN MANAGEMENT PROGRAM GOALS

1. Reduce Flooding of Roadways and Existing Properties

- Complete structural projects that can minimize flooding of roadways and properties
- Evaluate the feasibility of localized and regional projects to reduce flooding
- Adopt updated flood maps that reflect the SFHA more accurately

2. Acquire Properties and Avoid Building in the SFHA

- Increase publicly owned natural areas within flood prone areas and jointly creates recreational opportunities if possible.
- Protect buildings from flooding by raising lowest flood elevation above the base flood elevation, incorporate flood proofing techniques
- Continue to enforce regulatory measures that ensure that new development will not increase flood threats to existing properties
- Relocate flood-prone buildings where warranted

3. Protect Public Lives and Health from Dangers of Natural Hazards

- Educate the public on flood protection methods availability of flood insurance, and flood protection methods
- Provide warning system for rising flood waters and other natural disasters
- Have a flood response plan ready prior to flood threat and implement plan during floods events
- Minimize standing water to prevent mosquitoes breeding.
- Adopt updated flood map that reflect the SFHA more accurately so buildings can be built above an accurate base flood elevation

4. Minimize Cost to The City and Property Owners

- Prioritize mitigation projects, starting with those sites facing the greatest threat to life, health, and property.
- Maximize the use of outside sources of funding such grants from SWFMWD, FEMA, FDEP, EPA
- Educate the owner in mitigation efforts to protect their own properties.
- Encourage property owner to acquire flood insurance.

5. Protect our Environmental Resources

- Implement LID practices to the maximum practicable.
- Educate the public on the beneficial functions of the wetlands and floodplains
- Improve water quality and habitat.
- Maintain an attractive parks and other open spaces such as wetlands

7. REVIEW OF POSSIBLE ACTIVITIES

Preventative activities through Zoning, and Development Regulations

Preventive activities keep flood problems from getting worse. The current comprehensive planning, stormwater and floodplain regulations are effective in preventing an increase of SFHA areas. They are administered by Department of Public Works and NDS Building and Planning Divisions.

- The NDS Planning Division coordinates input from the various departments to update the existing Comprehensive Plan. Future Land use and Zoning is a key element in the Comprehensive Plan and NDS planning staff updates the land use and zoning as needed with consideration for environmental protection.
- The Florida Building Code (FBC) was adopted by the City of North Port per City Ordinance 2015-10 on April 13, 2015 which amends the North Port, Florida – Administrative Code Chapter 14 which can be viewed at https://library.municode.com/fl/north_port/codes/code_of_the_city?nodeId=PTIICOR_CH14BUCORE
- Per Section 14-20 (a) *“The Florida Building Code, as adopted by the Florida Building Commission, (excluding Chapter 1, Administration) including all appendices and/or amendments thereto, and all such revisions, recodification, appendices and/or amendments as may be hereafter promulgated by the Florida Building Commission, is hereby adopted as the North Port Building Code in and for the City of North Port and shall be construed to be an integral part hereto”.*
- The NDS Building Division reviews all building permits to be in compliance with the FBC. The NDS Building Division also offers information on building retrofitting for flood protection. Workshops on Building mitigation to withstand floods and hurricane are held for the public jointly with Sarasota County staff.
- Each City Department is represented in a Site Development Review (SDR) process to ensure all new developments meet the City’s Unified Land Development Code (ULDC) regulations and intent of the Comprehensive planning. The City’s ULDC is available on Municode website at https://library.municode.com/fl/north_port.
- The ULDC Chapter 18 – Stormwater Regulations was adopted by City Commission in 2010. These regulations give clear design criteria for water quality treatment and attenuation requirements, and floodplain compensation requirements for all new major developments. The City is currently working on the revision of the entire ULDC including Chapter 18. This effort is anticipated to be completed in 2021. Proposed revisions to stormwater regulations provide for permit fast track incentives to encourage Low Impact Development (LID) implementation in new developments. LIDs are stormwater management practices, non-structural techniques, and better site planning to mimic natural hydrologic runoff characteristics and minimize the impact of land development on water resources. In the proposed regulations, all proposed parking above the minimum City required amount is preferred to be constructed of pervious pavement. A lower coefficient of runoff or curve number can be allowed for the pervious pavement. The City have had much success with new developments incorporating LIDs. This is discussed further under Section 8.
- The ULDC Chapter 37 Section 37-14 and Chapter 53 Section 53-113 (B) give Open Space requirements for developments. Policy 1.5 of the Recreation and Open Space Element of the City's adopted Comprehensive Plan specifies minimum criteria for determining that adequate capacity exists for recreation/open space facilities impacted by a proposed development.
- Annually, the ULDC is evaluated on whether revisions are needed. The Comprehensive Plan is updated every 5 years.

Floodplain Management Regulatory Standards

- The NDS Planning Division, Public Works Stormwater Manager and Engineering Manager, City Attorney have revised the State model floodplain ordinance per comments from the State. This modified State Floodplain Ordinance has been adopted by the City in May 2016 and is currently the ULDC Chapter 17 Flood Damage Prevention Regulations.
- The ULDC Chapter 18 – Stormwater Regulations include requirements for floodplain compensation to be provided if a new major development impacts the floodplain. These regulations are effective at preventing new development from adversely affecting the floodplain and neighboring properties.
- The City is adhering to the latest edition of the Florida Building Code (FBC) which has minimum freeboard requirement for the finished flood elevation (FFE) for all types of structures. Freeboard is a margin of safety added to the base flood elevation to account for waves, debris, miscalculations, lack of data, or changes in climate. The FBC follows the requirements of ASCE 24 Standard which provides minimum requirements for flood-resistant design and construction of structures located in flood hazard areas. For residential homes, the FFE must be at least 1 ft higher than the BFE.
- For all commercial, industrial, institutional, residential subdivisions developments any filling impact of the SFHA will required floodplain compensation However, floodplain compensation is not required for fill brought into the SFHA within single family platted lots, so cumulatively; the floodplain can increase in these areas. The City is evaluating large regional projects to reduce flooding, so this issue may be addressed through those projects.
- City is currently working with FEMA on updating the coastal flood risk FIRMs with correct information and will adopt the updated FIRMs within six months of FEMA approval. Due to the large increase in affected properties, there will be a significant economic impact. The availability of more accurate FIRMS will help homeowners in their decision on whether to purchase flood insurance and to avoid the SFHA and build more responsibly.

Property Protection Activities

- Increasing publicly owned natural areas within flood prone areas is an extremely effective way to limit building in the SFHA. The City has already purchased much of the properties along both sides of the Myakkahatchee Creek and is in the process of acquiring more land by direct purchase or by land swapping.
- In the City's aggressive public outreach efforts in the public open houses and other community events to discuss the impacts of the new draft FIRMs on affected parcels; flood insurance experts are available to discuss the protection offer by flood insurance. The City website and the City's flood information flyer also encourage the purchase of flood insurance.

Natural and Beneficial Function of Floodplain and Wetlands Protection

- Wetland protection is required in ULDC Chapter 49. All new developments are reviewed through the SDR process and building permitting review to limit impacts to wetlands and if impacts are unavoidable, wetland mitigation are required together with the required State and Federal permits. Protecting wetlands not only protect the wildlife habitat but also preserves flood water storage capacity and provides water quality treatment for nitrogen and phosphorus nutrients and organics through assimilation by the vegetation in the wetlands.
- In the City's public outreach program, efforts are made to educate the public on the beneficial functions of a floodplain for water quantity storage to lessen the effects of flooding. Developers and residents are advised to not build within the floodplain.

Emergency Services Activities

- There is a need to provide a flood warning and hazards notification to the general public. The Emergency Manager provides emergency services to including activating the [Alert Sarasota County](#) Emergency Notification System warning system when needed. The [Alert Sarasota County](#) telephone system quickly

notifies residents and business of an emergency or urgent situation. The Emergency Manager also performs public outreach disseminating information on flood protection and flood warning.

Structural projects

- Flood reduction can be achieved by keeping the City's stormwater conveyance system clear of debris and restrictive vegetation and ensuring the 64 water control structures are operable. The City has an ongoing program of structural projects such as water control structure rehabilitation/replacement, clearing R-ditches and canals, swale regrading and pipe replacement. These efforts have already shown a reduction in the frequency and extent of flooded streets in the recent summer rains.
- The Big Slough Watershed hydraulic model can be used to evaluate large regional improvement projects such as diversion of flood waters, retention storage reservoirs, bypassing flood water around the City and staging up of flood waters north of the City boundaries. These types of project will require large amounts of funding and the permitting effort will be challenging. The City has plans in the next year to evaluate the feasibility of these types of projects.

Public Information Activities

- Increasing public awareness of known flood hazard areas and availability of draft FIRMs will reduce building in the SFHA both in the existing 1981/1984 FIRMs and in the draft FIRMS. This knowledge can encourage early purchase of flood insurance.
- A large number of the public is not aware of the beneficial functions of wetlands and floodplain and related regulations against destruction. Sharing this information with the Public will result in greater protection of the wetland and floodplains.

8. ACTION PLAN AND REVIEW OF CURRENT ACTIVITIES

Preventative Activities

- Public Works shall continue the program of major water control structure improvements and minor water control structure repairs for increased reliability.
- Public Works has improved and will continue to schedule proactive (rather than reactive) increased maintenance efforts such as retention ditch/swale regrading and culvert cleaning, aquatic vegetation management and failing drainage pipe replacement. This will eliminate or reduce localized street flooding.
- With the completion of the Big Slough watershed study in September 2014, the City had coordinated with FEMA on the updating of the FIRMs and adopt the new flood maps which became effective in November 4, 2016. These maps are available on the City website.
- Public Works has performed a subsequent Flood Reduction study which was completed in 2019. This study evaluated feasible projects to relieve localized and regional flooding.

Regulatory Activities

- Public Works and Neighborhood Development Services continue to coordinate the development review process per the City's ULDC, to minimize the amount of fill brought into a flood prone area. The Stormwater Manager shall continue reviewing new development project to make sure the design does not cause adverse on-site or off-site flooding. The ULCD Chapter 18 Stormwater Regulations shall be updated as needed, in addition to Stormwater elements in the City's Comprehensive Plan.
- Through active participation in the Site Development Review process, The City will continue to encourage developers and consulting engineers to provide site designs that will minimize impervious areas, and to evaluate implementing LIDs design to the maximum extent practicable such as use of pervious pavement, green roofs, rain cisterns, reuse of stormwater for irrigation, direct runoff to bioretention/biotreatment vegetated swale areas prior to discharge stormwater pond, Florida friendly native landscaping, and other surface water quality improvement controls and devices.

Property Protection Activities

The City Manager's office in cooperation with the Department Parks and Recreation is continuing the acquisition of parcels along the Myakkahatchee Creek Corridor to prevent building in the floodplain, creation of open space park land and protection of wetlands. The land on each side of the creek will also serve to protect the water quality of the creek as this is a major potable water supply for the City.

The ULDC regulations and NDS Building Division permitting process prevent new homes proposed at a higher elevation from flooding adjacent existing homes built at a lower elevation. Elevation certificates are required for houses built in the SFHA. NDS staff and Stormwater Manager provide advice to home builders to avoid building in SFHA and requirement to set lower floor elevations above the effective FIRMs BFEs and preferably also above new draft FIRMs base flood elevations even before the FIRMs are effective.

Natural Resource Protection Activities

The City shall continue to acquire properties along the Myakkahatchee Creek which will protect these environmentally sensitive flood prone lands from development. The public outreach program shall include educating the public on the beneficial functions of floodplains and wetlands.

Emergency Services Activities

The Emergency Manager shall coordinate public warning on impending floods and evacuation when necessary. The City's Comprehensive Emergency Management Plan (CEMP) Base Plan Section V (Attachment A) addresses life safety issues and response activities including evacuations. The City's CEMP Hazard Annex D details the flood warning and response activities.

The City of North Port has a [Alert Sarasota County](https://www.cityofnorthport.com/government/city-services/fire-rescue/emergency-management) telephone system to quickly notify residents and business of an emergency or urgent situation. Residents can register their phone number in the [Alert Sarasota County](https://www.cityofnorthport.com/government/city-services/fire-rescue/emergency-management) system at the City website link <https://www.cityofnorthport.com/government/city-services/fire-rescue/emergency-management>.

Structural Projects

Over the last several years the City has implemented a proactive program of water control structure (WCS) rehabilitation/replacement. The City has received several sources of grant funding such as the Community Budget Issue Requests (CBIRS) grant and SWFWMD Cooperative Funding Initiative (CFI). Grant applications to secure supplemental funding for WCS replacements are also submitted to funding sources such as FEMA's Hazard Mitigation Grant Program, (HMGP) and the Community Development Block Grant. The City plans to continue the program of performing at least one major water control structure rehabilitation/replacement each year. Minor repairs to remaining water control structures shall be implemented each year to prolong the life of the structure.

The Big Slough Watershed study has provided an extremely useful hydraulic model that can be used to determine effective flood reduction improvement projects. The following sections discuss upcoming flood reduction feasibility study to relieve regional flood and historic flooding in localized areas.

The Public Works Department has a program of drainage pipe replacements to avoid pipe failure. The adequacy of pipe conveyance capacity is checked and adjusted as needed.

Public Outreach Activities

The City shall continue participating in disseminating flood protection information through the various community events, civic organizations, newspaper and TV media, flyer mail outs and City website. The City shall continue to public outreach activities to disseminate information the new draft FIRMs.

Specific Action Plan Items

Following are description of action items and accomplishments that meets the City’s floodplain management goals. These action items are summarized in Table 8-1 and lists the Floodplain Management Activities 1 through 6 that are met by the action items.

Table 8-1 Action Items, Goals and Compliance with Floodplain Management Activities									
	Action Item	Priority	Goal 1. Reduce Flooding of Roadways and Existing Properties	Goal 2. Acquire Properties & Build Responsibly in the SFHA	Goal 3. Protect Public Lives and Health from Dangers of Natural Hazards	Goal 4. Minimize Cost to City and Property Owners	Goal 5. Protect our Environ. Resources	Flood- plain Mgt Activities met by Action *	Deadline
Administrative Action Items									
	Plan Adoption		X	X	X	X	X		Feb 2021
	Monitoring and Reporting		X	X	X	X	X		May 1 each year
	Community Rating System		X	X	X	X	X		CRS Verification. Visit
Program Action Items									
8.1	Major Water Control Structures Improvements	High	X		X			5	Ongoing
8.2	Minor Water Control Structure Repairs	Med	X		X			5	Ongoing
8.3	Retention (R) - Ditches and Major Canal Dredging	Med	X		X	X	X	1, 2, 3	Ongoing
8.4	Grid System for Stormwater Conveyance System, Rehabilitation	Med	X		X	X	X	1, 2, 3	Ongoing
8.5	Drainage Pipe Replacement	High	X		X	X	X	1, 2, 3	Ongoing
8.6	Blockage Removal in Stormwater Conveyance	High	X		X	X	X	1, 2, 3	
8.7	FEMA Flood Map Updates	Med		X	X			1, 2, 6	Ongoing
8.8	Big Slough Flood Reduction Study	Low	X	X	X	X		1, 2, 5	Completed 2019
8.9	Review and Implementation of Stormwater Regulations	Med	X		X		X	1, 3	Ongoing
8.10	Incorporation of Low Impact Development (LID) Design in Developments	High	X		X		X	1,3	Ongoing
8.11	Grant Funding of Projects	High				X		5	Ongoing
8.12	Property Acquisition in the SFHA & Open Space Areas	Med		X				1, 2, 3	Ongoing
Public Information Items									
8.13	Public Outreach Meetings and Open Houses	Med	X		X	X	X	1,2,3,4,6	Ongoing
8.14	Presentations at Seminars and Workshops	Med	X		X	X	X	1,2,3,4,6	Ongoing
8.15	Brochure Handouts at Community Events	Med	X		X	X	X	1,2,3,4,6	Ongoing
8.16	Newsletter/News Releases, Television and Social Media Public Outreach	High	X		X	X	X	1,2,3,4,6	Ongoing
8.17	City Website	High	X		X	X	X	1,2,3,4,6	Ongoing
8.18	FIRM Information Available to The Public	High	X		X	X	X	1,2,6	Ongoing
8.19	Flood Warning, Response and Evacuation	High	X		X	X	X	1,2,4,6	Ongoing
8.20	Participant in Sarasota County PPI Program	High	X		X	X	X	1,2,3,4,6	

8.1 Major Water Control Structures (WCS) Improvements

Responsible Department for Action: Public Works Department, Engineering Division

Schedule for Completion of Action: Ongoing

Funding Source: Road and Drainage District and Surtax

The City's waterway system is designed to accommodate several needs: a source for potable water supply, water quality treatment, and stormwater conveyance and attenuation. The waterways form a grid pattern and are interconnected with each other and with the Myakkahatchee Creek. There are 64 water control structures (WCS) of which 28 are gated.

Age, function and structural integrity conditions vary between WCSs and many are in dire need of rehabilitation or complete replacement. Delays in the rehabilitation/replacement schedule increase the possibility and risk for a potential massive failure of the deteriorated structures especially during a severe storm event. Water control structure failures could trigger other catastrophic mishaps such as downstream flooding and washout of roads and bridges.

All WCSs are inspected annually and prioritized for replacement. The priority is re-evaluated each year as rate of structure deterioration differs over time. A ranking system was developed based on condition of the key components of the structure and the location of the structure. In addition, the potential extent of flooding and population affected should a massive failure occurs, is also considered in the ranking system. The results of the 2020 inspection of WCS are given in Exhibit 8-1. The WCSs that received major rehabilitation or were replaced are listed on pdf page 7 of Exhibit 8-1. The proposed 5-year Capital Improvement Projects (CIP) budget for WCS replacement is in Exhibit 8-2. Depending on available funding, the annual plan each year is to design the replacement of one structure, while constructing the structure that was designed the previous year. Attachment B also give the 10-year Stormwater Management plan for rehabilitation and maintenance.

8.1.1 Construction of WCS No. 106 Replacement

WCS No. 106 is a gated weir structure on the Cocoplum Waterway just west of North Port Boulevard. The Cocoplum Waterway discharges to the Myakkahatchee Creek. The existing WCS is equipped with six gates, which in the closed position, allow storage of water like a reservoir. In anticipation of pending rainstorm events and as the water level rises, the gates are opened as needed to reduce the potential for flooding. The water in the Cocoplum Waterway and the Myakkahatchee Creek serves as a raw water supply for the City's Water Treatment Plant. Thus, the proper functioning of these gates and structure is critical to the City's ability to control water levels, minimize adverse impacts from a storm event, and supplement the City's potable water supply. WCS No. 106 was constructed in 1959. Over time, the concrete supports for the gates and catwalk have severely deteriorated and extensive corrosion has developed in the sheet metal weir, gates and catwalk.

A new replacement WCS No. 106 was proposed to be completed in fiscal year 2019-2020. The new WCS will include a coated sheet metal weir with reinforced concrete cap; catwalk; eight automated gates with the capability of manual or remote gate operation via telemetry control; cameras; a lighting system; and riprap for erosion control. Work will include dewatering, flow by-passing, and removal and disposal of all demolished material of the existing WCS. The upstream kayak portage will be relocated further east on the Cocoplum Waterway to accommodate the construction of the new WCS.

Summary of Accomplishments

Construction of the new replacement weir structure has been completed in August 2020 within budget and schedule.

Budget and Schedule for Completion

Activity	Costs	Time of Completion
Consultant for design, permitting and construction engineering services	\$168,000.00	Design Completed November 2018
Project Construction	\$2,304,436.58	August 11, 2020
Total	\$2,472,436.58	

8.1.2 Design of WCS No. 108 Replacement

WCS No. 108 is located on the Cocoplum canal just west of Collingswood Boulevard in the City of North Port. The structure is equipped with six gates which are operated in the closed position in order to allow storage of water similar to a reservoir. In anticipation of pending rainstorm events and as the water level rises, the gates are opened as needed to reduce flooding and discharge water into downstream segments of Cocoplum waterway which ultimately discharge into the Myakkahatchee Creek. The water in the Cocoplum canal serves as a raw water supply for the City's Water Treatment Plant. Thus, the proper functioning of these gates and structure is critical to the City's ability to control water levels, minimize adverse impacts from a storm event and supplement the City's potable water supply. This structure was constructed in the 1950's. Over time, extensive corrosion has developed in the sheet metal weir piling, concrete supports, gates and catwalk. Design of a new replacement WCS No. 108 was proposed to be completed in fiscal year 2020-2021.

Summary of Accomplishments

A Consultant was selected for design, permitting and construction engineering services for the WCS No. 108 replacement Structure. Four of the existing gates will be replaced with manually operated stainless steel pull-up type gates. The two center gates will be replaced with manually operated stainless steel push-down type gates. Design will include all hydraulic modeling needed to receive approved permits from the Southwest Florida Water Management District (SWFWMD) and the US Army Corps of Engineers (USACE).

Budget and Schedule for Completion

Activity	Costs	Time of Completion
Consultant for design, permitting and construction engineering services	\$142,006.12	FY 2020-2021
Project Construction	To be determined	FY 2021-2022

8.2 Minor Water Control Structure Repairs

Responsible Department for Action: Public Works Department, Operations and Maintenance Division

Schedule for Completion of Action: Ongoing

Funding Source: Road and Drainage District

During the annual inspection of all water control structures, a list of needed minor repairs is compiled to extend the life of the structure until it is completely replaced. Repairs consist of welding new sections or replacement of corroded horizontal and vertical I-beams, tie rods, repair or replacements of gates, gate tracks, catwalk, gear boxes and patching of corroded sections of weir sheet piling. Bank erosion near the structures is also inspected and repaired as needed.

Summary of Accomplishments

To be more cost efficient, a full time City Welder was hired to join the Public Works team. The welder will prioritize and perform the minor repairs described starting on pdf page 9 of Exhibit 8-1. All current and historic repairs for each structure are included in this exhibit.

8.3 Retention (R) - Ditches and Major Canal Dredging

Responsible Department for Action: Public Works Department, Operations and Maintenance Division

Schedule for Completion of Action: Ongoing

Funding Source: Road and Drainage District and Surtax

The City has an aggressive program of clearing R-ditches and canals of vegetation and silt deposits. Several segments of R-ditches and canals require annual maintenance dredging due to their location, surrounding development and need to restore flow conveyance capacity.

Summary of Accomplishments

Exhibit 8-3 provides a monthly reporting of length of R-ditches and canals which have been rehabilitated. The silt and vegetation removal effort will continue each year.

8.4 Grid System for Stormwater Conveyance System, Rehabilitation

Responsible Department for Action: Public Works Department, Operations and Maintenance Division

Schedule for Completion of Action: Ongoing

Funding Source: Road and Drainage District and Surtax

Silt debris and vegetation accumulation in roadside swales affect drainage flow. Most of the drainage pipes installed by General Development Corporation (GDC) in the 1970's were corrugated metal pipes which have corroded and deteriorated over time. Over the past several years, Public Works staff has vastly increased the maintenance activities on the roadside drainage system to include swale regrading, pipe replacement and roadside mowing.

A work management system (WMS) has also been implemented to efficiently track drainage issues reported by residents. The public can contact Public Works customer service at (941)240-8050 to report any drainage issues. The information received is then entered in the WMS and the issue is addressed.

With many different components making up the stormwater drainage system, it is difficult to effectively maintain the system by continually operating in a reactionary mode. A proactive approach that better utilizes resources is to rehabilitate an entire neighborhood system of swales, road crossing pipes, outfalls and retention ditches. Neighborhoods are divided into grids as shown in Exhibit 8-4. The prioritization of grids for rehabilitation is based on the following criteria: known flooding, impact on other infrastructure (roads, waterways, etc.), present condition of system, residential density and impact to community facilities (schools, parks, etc.).

Summary of Accomplishments

Within the last 12 months, Grid 205 rehabilitation was completed, and Grid 407 rehabilitation was started and on schedule to be completed in December 2020. Grid 307 rehabilitation has started and is anticipated to be completed by March 2021. Rehabilitation of the east section of Grid 204 is proposed for FY2021. The budget for Grid 407 rehabilitation is \$985,240 and the budget for Grid 307 rehabilitation is \$469,500, which covers pipes, catch basins, asphalt, rip rap, concrete, sod, hydroseed and surveying.

8.5 Drainage Pipe Replacement

Responsible Department for Action: Public Works Department, Engineering, and Operations and Maintenance Divisions

Schedule for Completion of Action: Ongoing

Funding Source: Road and Drainage District and Surtax

The quality of the City's roads was one of the largest issues facing North Port. Originally paved in the 1960s, many of North Port's neighborhood streets had fallen into severe disrepair. On November 6, 2012, nearly 60 percent of the voters approved a referendum authorizing the City to obtain a \$46 million bond to upgrade 266 miles of substandard roads in the City. The City began this road rehabilitation program in 2014 and completed the project in 2019. As with all roadwork done in the City, road related drainage improvements are included in the rehabilitation of the roadway. Corrugated metal pipe (CMP) was typically used by General Development Corporation in the 1960s for drainage pipes. Over time, many of these CMPs have corroded and the City's road rehabilitation program includes replacing failing drainage pipe with reinforced concrete pipe (RCP). RCP culvert pipes crossings are also installed to replace the "Texas swales" to allow stormwater to cross under the road instead of just sheet flowing over the asphalt and causing deterioration.

Summary of Accomplishments

Exhibit 8-3 includes the monthly reporting of pipes replaced. This effort will continue each year.

8.6 Blockage Removal in Stormwater Conveyance

Responsible Department for Action: Public Works Department, Engineer, and Operations and Maintenance Division

Schedule for Completion of Action: Ongoing

Funding Source: Road and Drainage District

8.6.1 Aquatic Vegetation Management

It is vital to control excessive growth of nuisance vegetation which impedes flow in the extensive system of R-ditches and canals in the City. A team of licensed and well-trained City staff perform aquatic vegetation control. Spraying herbicides for aquatic vegetation control is conducted only under calm weather conditions. Windy conditions are avoided to prevent over-spraying. Staff closely monitors the effects of spraying. Typically, the lower end of the manufacturer's recommended dose is used. The herbicide is reapplied only if needed. Record keeping of the date and time of spraying, licensed applicator, size of treatment area, type and amount of herbicide used, and application method is carefully documented.

Summary of Accomplishments

Operations has developed a systematic method of controlling the nuisance vegetation by applying herbicides to the young developing plants before maturity. This minimizes the number of mature plants reproducing at a rapid rate. A planned stretch of waterway is sprayed rather than scattered reactive treatment of vegetative blooms. This systematic method has reduced the number of herbicides used. Exhibit 8-3 includes the monthly reporting of the aquatic vegetation control performed. This maintenance effort will continue each year. Additionally, in 2019, an amphibious machine was acquired to remove vegetation and minimize the use of herbicide.

8.6.2 Myakkahatchee Creek Blockage Removal

Historic extensive flooding is experienced in the areas adjacent to the Myakkahatchee Creek (creek) near I-75. Debris in the creek can cause the following adverse effects:

- Debris blockages can restrict flow and contribute to upstream flooding.
- Debris can be washed down into the City's Water Control Structure No. 101 and can damage the gates and structure. Opening of the gates are critical to flood control and closing of the gates is vital for storage of potable water supply.

During the dry season in 2017 and 2018, Public Work staff conducted detailed inspections of the extent of debris blockages in the creek. In 2017, a 3,615 feet segment of the creek was inspected from Price Boulevard to the creek intersection with Snover Waterway. In 2018, a 5,500 ft segment of the creek was

inspected from the intersection with Snover Waterway to Sensation St. Exhibit 8-5 is a map of the creek segments. Severe blockages were found and include:

- Overgrown Brazilian Peppers trees that created an almost impenetrable barrier across the entire creek at multiple locations.
- Several huge fallen trees including root balls, lying in and across the entire creek channel.
- Branches and fallen trees trapping other debris including hot water heater, wooden planks, tires, truck bedliner, etc. These in turn trap and create sand bars which adds to the blockage.

The City had obtained a written approval of Permit Exemption #648689 from Southwest Florida Water Management District (SWFWMD) to remove blockages in the creek with the following conditions:

- All work within the creek shall be performed by manual labor utilizing chainsaws and other hand-held tools.
- Invasive Brazilian Pepper trees within or directly adjacent to the creek shall be cut no less than 12 inches above natural grade. Stumps shall remain in place to minimize erosion.
- All cutting and debris shall be removed from the creek with the assistance of machinery which must be located on uplands adjacent to the creek.
- The City of North Port shall implement effective erosion, sediment and turbidity control measures within the proposed work zones where applicable.

Summary of Accomplishments

Operations Staff cleared all creek blockages in the inspected sections during the 2017 and 2018 dry seasons, while adhering to the conditions of the SWFWMD approval. The success of creek blockage removal projects was evident in the subsequent rainy seasons by evaluating the data from the upstream United States Geological Society (USGS) water level gage that is located on the creek at the Tropicare Boulevard bridge, upstream of the creek blockage removal projects. The positive results are as follows:

- Before the 2017 and 2018 creek blockage removal projects, one inch of rainfall resulted in a 0.75ft rise in creek level. After the 2017 and 2018 creek blockage removal projects, one inch of rainfall resulted in a 0.4ft rise in creek level. This is a 47% improvement.
- Before the 2017 and 2018 creek blockage removal projects, a USGS gage water level reading of 21.35ft resulted in street flooding in areas near the Myakkahatchee Creek north of Kumquat Ave to just south of Tropicare Blvd. After the 2017 and 2018 creek blockage removal projects, there was no street flooding in the areas indicated above during the 2018 rainy season with USGS gage readings of over 21.35ft. Even during an unusually large rainstorm event in December 2018, when the USGS gage water level reading was 22.15ft, there was still no street flooding in the areas indicated above. Exhibit 8-5 includes a graph of the USGS gage readings for rain events after the 2018 creek clearing.

Based on the success of the 2017 and 2018 creek blockage removal projects, the City continued inspecting the creek for blockage in 2019 and 2020 and found several more blockages in the creek. These locations are shown in pdf page 2 of Exhibit 8-5. In preparation to clear these and future blockages, the following activities will include:

- A Cultural Resources Assessment Survey (CRAS) dated August 1, 2019, was conducted for the City of North Port, on a 4.92 mile corridor including Myakkahatchee Creek and extending 50 feet from the top of the creek banks on the east and west sides. The project corridor extends northward from Price Boulevard to the northern City boundary. The CRAS concluded that the City's ongoing maintenance efforts along the creek should have no adverse effects on sites eligible for the National Register of Historic Places and recommends no additional archaeological investigation within the project area.
- Access paths for maintenance vehicles and machinery access will be delineated from the nearest roadway so as to minimize the amount of land disturbance.
- A wetland and wildlife survey will be conducted along these access paths.

- Approvals will be obtained from Southwest Florida Water Management District (SWFWMD) for clearing these access path(s).

8.7 FEMA Flood Map Updates

Responsible Department for Action: Public Works Department, Engineering Division

Schedule for Completion of Action: Ongoing

Funding Source: Road and Drainage District

8.7.1 Effective FEMA Flood Insurance Rate Maps Dated November 4, 2016

The FEMA flood insurance rate maps (FIRMs) with an effective date of November 4, 2016, have been in use since the City Commission approved Ordinance 2016-21 on September 13, 2016 to adopt the FIRMs. These maps can be viewed on the City Web page at <http://www.cityofnorthport.com/flood>.

8.7.2 Preliminary FEMA Coastal Flood Risk FIRMS Dated December 31, 2019

In February 2014, FEMA started a new Coastal Risk Mapping, Assessment and Planning (Risk Map) effort to identify, assess, and update coastal flood hazard Risk Maps that incorporate storm surge, high tides, wave action in addition to freshwater inputs.

On December 31, 2019, FEMA released preliminary Coastal Risk Maps for Sarasota County which included the City of North Port. The maps can be viewed through the City interactive map application at <https://www.cityofnorthport.com/government/city-services/public-works/flood-information/fema-flood-map-updates>. These maps show major portions of North Port developments that were removed from the high-risk AE zone in the November 4, 2016 effective FIRMs, will again be in a high-risk flood zone AE if the maps become effective. In some areas, the base flood elevations increased from 7ft NAVD88 to as much as 9ft NAVD88. Exhibit 8-6 gives a tabulation of the number of parcels added ("1% increase") to the SFHA and number of parcels taken out ("1% decrease") of the SFHA for North Port and other municipalities within Sarasota County. In North Port, there are 3,601 affected parcels in which all or a portion of the parcel is impacted by the SFHA. Fifty (50) North Port parcels are removed from the SFHA. Following are general description of the North Port areas that are affected by the SFHA in these preliminary maps:

Areas West of Myakka River

- Portions of Gran Paradiso, The Preserve, Renaissance, Oasis, Lake Geraldine
- Village D, E and G in West Villages

Areas East of Myakka River

- Talon Bay
- Duck Key
- Residential and Commercial area South of US41
- Couple streets in Dorothy Ave. area

Summary of Accomplishments

Public outreach conducted by the City of North Port, Sarasota County and FEMA included three public open house events in early March 2020. Due to the 2020 Covid-19 pandemic, FEMA has delayed the 90-day period for Public comments and appeals. Meanwhile, the City has reviewed the preliminary Coastal Risk Maps and has sent FEMA a letter on September 15, 2020 with an extensive list of comments (Exhibit 8-7).

8.8 Big Slough Flood Reduction Study

Responsible Department for Action: Public Works Department, Engineering Division

Schedule for Completion of Action: Completed December 31, 2019

Funding Source: Road and Drainage District, Surtax and Southwest Florida Water Management District (SWFWMD) Cooperative Funding Initiative Grant

In October 2016, the City received a SWFWMD Cooperative Funding of up to \$125,000 of the \$300,000 budgeted for a flood reduction study. A Consultant was retained to evaluate alternatives to accomplish the following:

1. Reduce historic flooding in the following two localized areas in the City:
 - Area near the Myakkahatchee Creek just north and south of interstate I-75.
 - Area near Dorothy Avenue west of Biscayne Drive and north of US 41.
2. Complete a regional stormwater study to reduce the extensive floodplain that is delineated in the new FEMA FIRMs.

Existing site conditions were evaluated, and the Big Slough Watershed model used to model flood reduction projects also known as Best Management Practices (BMPs). A BMP implementation plan was developed with prioritized recommendations and probable costs for implementation of selected BMPs. The Consultant's recommended flood reduction plan had the following phased BMP components:

- Widen and deepen the existing retention ditch/conveyance system and upsizing road crossing culverts in the Dorothy Avenue area.
- Construction of a new bypass canal parallel to the Myakkahatchee Creek within a portion of the City's Tier I lots that are located north of Price Boulevard.
- Increasing the conveyance capacity through widening and upsizing pipe culverts in the R-36 retention ditch/conveyance system that runs along the northern and western boundaries of the City.
- Inflow Reduction Option - Restriction/reduction of high flow into Myakkahatchee Creek near the north City Boundary by constructing inflow reduction devices north of the City Boundary. This will cause additional storage of stormwater on the Carlton Tract which is jointly owned by the SWFWMD and Sarasota County

The draft Report, conceptual drawings and checklist were received in February 2019. A City Commission Workshop was held on March 4, 2019, to review the Study recommendations. City Commission consensus was received to submit the Consultant's recommended plan for SWFWMD Conceptual Environmental Resource Permit application with minor changes. Consensus was also received on the following staff recommendations:

- Continue Debris/Vegetation Blockage Removal Project.
- Evaluate localized drainage improvements in the Dorothy Avenue area upstream of the retention ditches.
- Do not proceed with researching grant fund to acquire flooded properties, but to schedule a future workshop with Commission on recommended flooded property acquisition.
- Continue reaching out to the SWFWMD and Sarasota County on viability of the Inflow Reduction Option.

Summary of Accomplishments

Final Flood Reduction Study Reports

The Consultant's recommended May 2019 flood reduction plan is provided in Attachment D. In an email on October 28, 2019, the SWFWMD Bureau Chief Environmental Resource Permit Bureau, Regulation Division indicated that SWFWMD *"does not support installation of improvements and/or resultant changes in hydrology on District property"*. In an email on November 14, 2019, the Interim Senior Manager of Sarasota County's Stormwater Environmental Utility, indicated the additional storage of stormwater on the Carlton Tract is *"inconsistent with the objective of the purchase and preservation"* of the land. As the inflow reduction option is no longer viable, the Consultant prepared an update to the plan in November 2019 to remove the inflow reduction option (Exhibit 8-8). The key elements of the final recommendation are:

- Improvements to the existing retention ditch/conveyance system and upsizing road crossing culverts in the Dorothy Avenue area.

- Construction of a new bypass canal parallel to the Myakkahatchee Creek within a portion of the City's Tier 1 lots from south of Tropicair Boulevard to north of Price Boulevard.
- Increasing conveyance capacity through canal widening and upsizing pipe culverts in the R-36 retention ditch/conveyance system along the northern and western boundary of the city.

Flooded Property Acquisition

A workshop was held on December 2, 2019 to present the recommended parcels for acquisition which are at least 50% or more inundated by a 10-year storm and parcels along flooded streets and the cost of the acquisition. Exhibit 8-9 is a presentation to City Commission. The City Commission request an estimate of the revenue that will be lost if these properties are acquired by the City. The financial impact of removal of parcels from tax roll is provided in a subsequent memo on September 4, 2020 to the City Commission (Exhibit 8-10).

SWFWMD Conceptual Environmental Resource Permit

As a result of the decisions by SWFWMD and Sarasota County, the inflow reduction option was removed from the application to SWFWMD for a Conceptual Environmental Resource Permit. The SWFWMD Conceptual Environmental Resource Permit No. 49044123.000 was approved on December 27, 2019 and includes the following future conceptual drainage system improvements:

1. Future widening and dredging of existing Channel R36 (approximately 43,000 LF) with bottom widths ranging from 30 to 66 feet.
2. Future modification of existing Water Control Structure WCS-162 including the addition of operable gates. Water Control Structure WCS-162 is located within existing Channel R36 just north of Tropicair Boulevard.
3. Addition of future dual 48" diameter culverts at the existing Channel R36 crossing of Interstate I-75.
4. Replacement/upsizing of the existing culverts with future quadruple 60" culverts at the existing Channel R36 crossing of Tropicair Boulevard.
5. Future widening and dredging of existing Channel R70 (approximately 2,800 LF) with bottom widths ranging from 10 to 20 feet.
6. Future widening and dredging of existing Channel R69 (approximately 2,500 LF) with bottom widths ranging from 10 to 20 feet.
7. Replacement/upsizing of the existing culverts with future triple 6'x4' box culverts at the existing Channels R69 and R70 crossings of Trionfo Avenue, Porto Bello Avenue, Herbison Avenue, Eager Street, Allen Road, and South Biscayne Drive.
8. Future removal of the existing Channel R69 weir structure (located at the downstream end of existing Channel R69).
9. Future creation of four (4) proposed trapezoidal bypass channels (approximately 13,500 LF in total length with bottoms approximately 50 feet wide) located parallel to Myakkahatchee Creek. The upstream and downstream ends of each of the four (4) future Bypass Channels will connect to Myakkahatchee Creek via broad-crested weirs at elevations approximately 2 feet above the Myakkahatchee Creek bottom.

8.9 Review and Implementation of Stormwater Regulations

Responsible Department for Action: Public Works Department, Engineering Division, in cooperation with Planning Division of the Neighborhood Development Services (NDS) Department

Schedule for Completion of Action: Ongoing

Funding Source: Road and Drainage District

All major site developments in North Port, whether on private or City property, must go through pre-application meeting in the City's Site Development Review (SDR) process. Key City staff members from all relevant departments provide site specific input, so that the development meets the City's Unified Land Development Code (ULDC) requirements in the formal submittal. During the mandatory SDR pre-

application process, the City Stormwater Manager reiterates the stormwater treatment, attenuation and floodplain mitigation requirements in the City's ULDC. A stormwater checklist is available on the City website to assist the developer's consultant with a complete submittal that meets all stormwater treatment, attenuation and floodplain analysis and compensation requirements. Specific attention is paid in the review to check that new developments do not adversely affect or cause flooding onto adjacent properties.

The Stormwater Manager also reviews and addresses all Environmental Wetland and Wildlife protection issues and all stormwater and environmental construction issues.

ULDC Chapter 17 Flood Damage Prevention Regulations

Responsible Department for Action: Public Works, Stormwater Manager, NDS Building Official

Schedule for Completion of Action: Complete

The City's ULDC Chapter 17 provides flood damage prevention regulations. The Florida Building Code (FBC), that was effective on March 2012, incorporates the flood provisions from the model International Code Series. Therefore, changes to floodplain management regulations were implemented to properly coordinate with the FBC and meet requirements of the National Flood Insurance Program (NFIP).

The City revised ULDC Chapter 17 flood damage prevention regulations using the State Model Floodplain Management Ordinance and obtained approval from the Florida Division of Emergency Management Contractor. The revised ULDC Chapter 17 flood damage prevention regulations were adopted by the City of North Port Commission on May 10, 2016.

Summary of Accomplishments

In the development review process, the City continues to implement the ULDC Chapter 17 Flood Damage Prevention Regulations.

ULDC Chapter 18 Stormwater Regulations and Chapter 49 Wetlands Protection Regulations

Responsible Department for Action: Public Works, Stormwater Manager

Schedule for Completion of Action: Ongoing

Funding Source: Road and Drainage District

On June 14, 2010, the City of North Port adopted a complete revision of the ULDC which included consolidating all stormwater regulations into one new Chapter 18. Chapter 49 Wetlands Protection Regulations were also revised to meet State regulations. In 2011, all City departments reviewed the ULDC code that was adopted on June 14, 2010 and proposed needed revisions. On January 30, 2012, ULDC Chapter 18 – Stormwater Regulations, Section 18-10 (C)(2) was amended to require the proposed length and material of the pipe to be submitted with the permit application. ULDC Chapter 33 – Minor and Major Site Development Regulations, Sections 33-6 and 33-8 were amended to provide additional requirements for survey, site and drainage design, driveway culverts and swale piping requirements. As the City's stormwater swales/ditch/canals/creek system serves not only as a stormwater conveyance system, stormwater also is the main raw water supply for the City's Water Treatment Plant, thus the need for greater water quality treatment and protection. The ULDC Chapter 18 – Stormwater Regulations was revised in June 2010 to incorporate additional water quality improvement requirements. These requirements exceed, or are in addition, to those required by SWFMWD.

Summary of Accomplishments

In November 2019, a draft list of proposed stormwater and environmental regulations changes to the ULDC was submitted. The changes include clarifications of regulations, need to evaluate and use of Low Impact Development methods, improvement to design of stormwater treatment and attenuation and

conveyance system to improve water quality, reduce flooding, reduce erosion and added protections for the environmental and protected wildlife species.

8.10 Incorporation of Low Impact Development (LID) Design in Developments

Responsible Department for Action: Public Works Department, Engineering Division

Schedule for Completion of Action: Ongoing

Funding Source: Road and Drainage District

In the Site Development Review (SDR) review process, developers are encouraged to implement Low Impact Development (LID) design to the maximum extent practicable such as minimization of impervious areas, use of pervious pavement, green roofs, rain cisterns, reuse of stormwater for irrigation, direct runoff to bioretention/biotreatment vegetated swale areas prior to discharge stormwater pond, Florida friendly native landscaping, and other surface water quality improvement controls and devices.

Summary of Accomplishments

Exhibit 8-11 provides a detailed list of LIDs implemented to date to reduce stormwater impact from new development for both City projects and Developer projects.

8.11 Grant Funding of Projects

Responsible Department for Action: Public Works Department, Engineering Division and City Manager's Office

Schedule for Completion of Action: Ongoing

Funding Source: Road and Drainage District

The City has pursued several sources of grant funding such as the Community Budget Issue Requests (CBIRS) grant and has received a total grant allocation of \$1,600,000. Southwest Florida Water Management District (SWFWMD) and the City have cooperatively funded the construction of the new replacement Water Control structure (WCS) No. 101 located on the Myakkahatchee Creek near the Water Treatment Plant. The City has received reimbursements from SWFWMD for \$658,630.75 of the \$1,317,261.50 spent on the replacement structure.

The City Public Work Department shall continue to apply for grant funding from agencies such as SWFWMD, Federal Emergency Management Agency, Environmental Protection Agency, Florida Department of Environmental Protection Agency, and CBIRS to offset the cost of the flood reduction projects to the City and its residents.

Summary of Accomplishments

- SWFWMD awarded the City a cooperative grant funding up to \$125,000 of the \$300,000 budgeted for the afore mentioned Big Slough Flood Reduction Study. As of December 2019, the study is completed, and the City received the maximum grant reimbursements totaling \$125,000.
- A request for FEMA Hazard Mitigation Grant Program (HMGP) funding for the design and construction of the replacement of WCS 113 has been submitted for \$3,118,500 in March 2020. A similar application of funding for this project has also been submitted for a Community Development Block Grant in August 2020. Status and timeline of grant award from these two sources is unknown as of this writing.

8.12 Property Acquisition in the SFHA and Open Space Areas

Responsible Department for Action: City Manager's Office and Parks and Recreation Department

Schedule for Completion of Action: Ongoing

Funding Source: General Fund

Over the last sixteen years, the City has applied for and received grant funding and with supplemental City funding, has acquired a significant portion of the lands immediately adjacent to Myakkahatchee Creek from Price Boulevard north to the City limits. The Tier I lots are the strip of lots immediately adjacent to on both sides of the creek and the Tier II are the next nearest strip of lots. Most of these properties are in the 100-year floodplain.

Summary of Accomplishments

Exhibit 8-12 provides a map of the Tier I and Tier II properties acquired. The City is currently continuing this effort of land acquisition.

8.13 Public Outreach Meetings and Open Houses

Responsible Department for Action: Public Works Department, Engineering Division and Neighborhood Development Services Department

Schedule for Completion of Action: Ongoing

Funding Source: Road and Drainage District

Extensive public outreach has been conducted in response to FEMA's December 31, 2019, release of the preliminary Coastal Flood Risk FIRMs for Sarasota County which included the City of North Port.

Summary of Accomplishments

FEMA, in coordination with the City of North Port and Sarasota County staff, conducted three public outreach open houses on the preliminary Coastal Flood Risk FIRMs. These meetings occurred on March 4-5, 2020, in Sarasota, Venice and North Port. FEMA will designate a 90-day public comment and appeal period after publishing a notice in two local newspapers and a notice in the Federal Register. The start of this 90-day period has not been established as of this writing.

In addition to the three FEMA public outreach open houses, the City of North Port had planned the following three additional City of North Port Public Open Houses:

- Morgan Family Center – March 26, 2020 5pm to 8pm
- Talon Bay HOA meeting – March 18, 2020 4pm to 6pm (only for Talon Bay Residents)
- Gran Paradiso HOA meeting – March 19, 2020 5pm to 8pm (only for Gran Paradiso Residents)

The additional three public outreach open houses scheduled by the City of North Port to be held in March 2020 had to be cancelled due to the Covid-19 pandemic.

Following are other forms of public outreach implemented by the City of North Port on the preliminary Coastal Flood Risk FIRMs:

- Posted City News Releases
- Updated City web page "FEMA Map Updates" at <https://www.cityofnorthport.com/government/city-services/public-works/flood-information/fema-flood-map-updates>
- Created a user friendly, searchable interactive online [City Flood web application](#) with a link from the FEMA Map Updates web page.
- Created of a user friendly, searchable [side by side comparison](#) of the new preliminary FEMA Dec 31st, 2019, flood maps with the current FEMA Nov 4, 2016, flood map, with a link from the FEMA Map Updates web page.
- Sent mailer invitations to affected properties to attend public open houses.
- Sent Facebook and Twitter notices of the Public Open House events
- Established new telephone hotline (941-429-1052) to handle resident's inquiries
- Communicated information with the Homeowners Associations (HOA) representatives at the City's HOA meeting.

- Gave presentation at a local Peace River Engineering Society meeting.
- Sent email correspondence with the design Engineering Consultants, developers and HOA representatives.

8.14 Presentations at Seminars and Workshops

Responsible Department for Action: Public Works Department, Engineering Division

Schedule for Completion of Action: Ongoing

Funding Source: Road and Drainage District

Public Works staff spoke at many seminars and workshops on topics that included flood map updates and flood prevention, stormwater issues, environmental protection, green development, fertilizer use, and pollution prevention. Annually, the Fire Rescue Emergency Manager also conducts multiple public outreach activities on Hurricane preparedness with Homeowners' Associations and civic groups. A list of these activities is included in Exhibit 8-13, Items highlighted in yellow are directly related to flood protection.

8.15 Brochure Handouts at Community Events

Responsible Department for Action: Public Works Department, Engineering and Administration Divisions

Schedule for Completion of Action: Ongoing

Funding Source: Road and Drainage District

City staff volunteers at many community events and host booths with displays of the City's stormwater system, flood maps and offers an array of free brochures and education material. The City 10 CRS Topics flyer on Flood Information produced in-house by the City staff is distributed at these public events and at the afore mentioned seminars and workshops. This brochure is also available in kiosks at the three floors on City Hall and at Public Works building. Examples of community events are included in Exhibit 8-13.

8.16 Newsletters/New Releases, Television and Social Media Public Outreach

Responsible Department for Action: Public Works Department, Engineering and Administration Divisions

Schedule for Completion of Action: Ongoing

Funding Source: Road and Drainage District

Flood Information is disseminated through various forms of news media and social media. Exhibit 8-14 provides a listing and range of distribution. Items highlighted in yellow are directly related to flood protection and includes:

- North RePort Newsletter mailed to every home in North Port
- Facebook and Twitter message releases
- North Port Sun and Herald Tribune Newspapers articles
- City Website News Releases
- Flood Awareness Week Social Media Postings
- Utility bill message
- Youtube Videos

8.17 City Website

Responsible Department for Action: Public Works Department, Engineering and Administration Divisions

Schedule for Completion of Action: Ongoing

Funding Source: Road and Drainage District

The City of North Port posts the most current information concerning stormwater and flooding potential on the City's website. The City has added a Flood Information page that provides information on FEMA

flood map Updates, flood warning, CRS program and available flood elevation certificates at <http://www.cityofnorthport.com/flood>.

The City provides a link to a searchable user-friendly web application to view flood zones and obtain base flood elevations on the new FEMA FIRMs through the City's FEMA Flood Map Updates webpage at <https://www.cityofnorthport.com/government/city-services/public-works/flood-information/fema-flood-map-updates>.

Elevation Certificates are also available on the City webpage at:

<http://www.cityofnorthport.com/government/city-services/public-works/flood-information/elevation-certificates-3188>

The City's Emergency Management webpage "Hazards We Face" provides useful information on storm preparation and dealing with hazards:

<http://www.cityofnorthport.com/government/city-services/fire-rescue/emergency-management/hazards-we-face>

Links are provided to related websites such as National Flood Insurance Program, Floodsmart, Florida Disaster, Sarasota County Library Catalog on Flood information, Sarasota CRS webpage and FEMA site on FIRM maps.

8.18 FIRMs Available to The Public

Responsible Department for Action: Public Works Department, Engineering Division and Neighborhood Development Services Department

Schedule for Completion of Action: Ongoing

Funding Source: Road and Drainage District

The November 4, 2016, FEMA FIRMs panels are available on the FEMA website, but these map panels are not currently searchable with an address and the underlying aerial is from early 2007. Homes built after the aerial date are not be visible. The pdfs of the new preliminary FIRMS panels are available from the FEMA website at: <https://hazards.fema.gov/femaportal/prelimdownload/>.

The City has subsequently released a user-friendly web map application that allows searching the new FIRMS by Address, Parcel Identification Number, or Name. The map is also overlaid on the 2018 aerial to allow easy location of houses. Flood zones, property lines and base flood elevations are easily visible on this web application which can be accessed from the City's FEMA Flood Map Updates webpage at: <https://www.cityofnorthport.com/government/city-services/public-works/flood-information/fema-flood-map-updates>.

Since the release of the December 31, 2019, preliminary Coastal Flood Risk FIRMs the City Stormwater Manager and Neighborhood Development Services Department staff have responded to multiple requests for flood information. Anyone who desires a written determination of the existing and proposed flood zones, can submit a Flood Information Request form to the City's Stormwater Manager. The request form can be downloaded from the City's website at:

<https://www.cityofnorthport.com/home/showdocument?id=15195>

Annually, the City mails letters offering flood protection and mapping information services to Insurance Companies, Realtors, Financial Institutions, and Abstract and Title companies that are registered with the City of North Port. The letter is also mailed to the President of North Port Realtors Board and to President of the North Port Chamber of Commerce.

8.19 Flood Warning, Response and Evacuation

Responsible Department for Action: Public Works Department, Operations Division and Fire Rescue Department

Schedule for Completion of Action: Ongoing

Funding Source: Road and Drainage District and Fire and Rescue District

The City has funded two United States Geological Survey (USGS) gages, in the Myakkahatchee Creek, one at Tropicair Boulevard and the other at WCS 101 located further south near the City's Water Treatment Plant. These USGS gages monitor the water level in the creek and precipitation and provide real time data. The City has correlated the levels in the Creek at the Tropicair gage with known areas of flooding and this information, together with a link to the USGS gage, is available on the City website at: <https://www.cityofnorthport.com/government/city-services/public-works/flood-information/flood-warning>.

The Emergency Manager (EM) and Public Works Operations staff monitors weather conditions and the Myakkahatchee Creek USGS gages during rain events. Public Works Operations staff will raise/lower gates at water control structures to move, retain, or redirect water flow to avoid flooding. Once water levels have reached an action stage, warnings are provided to the public through door-to-door contact, advisories through the City web site, advisories through local and cable broadcast media, and/or National Oceanic and Atmospheric Administration weather alert radios. If the situation is severe, the City has the ability to release a geographically targeted telephonic and text message to affected individuals through the new Mass Notification software system provided through the Florida Dept of Emergency Management. The alert is known as "Alert Sarasota County" and will utilize geo-fencing technology to distribute flooding, flash flooding, and evacuation notices to residents. In 2019, the City of North Port was fortunate not to experience a storm event that required Alert Sarasota County Community Emergency Notification System.

The City of North Port has worked with the Peace River/Manasota Regional Water Supply Authority (PRMRWSA) in the development of the Emergency Action Plan (EAP) for the new Peace River Reservoir #2. Computer modeling has shown that failure of the reservoir embankment can affect the City of North Port, particularly in the eastern areas of the City. The City has participated in the Statewide Hurricane exercise in a tabletop exercise on August 27, 2019, as part of a simulation of a breach at the PRMRWSA reservoir. Notification was received from PRMRWSA and maps were reviewed to determine impacts to City. The City receives an updated hard copy of (PRMRWSA) EAP each year near the beginning of the year. The updated January 2020 EAP is available from the Emergency Manager.

The City was recognized on July 28, 2014, by the National Weather Service as the third municipality in the State of Florida to achieve the designation of Storm Ready. This designation is reserved for locations which go above and beyond to protect their citizens from the impacts of hazardous weather. This program helps citizens feel safer knowing that our Emergency Management and the National Weather Service are working together through enhanced planning, education and awareness programs. The Storm Ready designation that was renewed on November 18, 2019, is valid until July 8, 2023 (Exhibit 8-15).

The City has become in 2019 a Weather-Ready Nation (WRN) Ambassador. The Weather-Ready Nation Ambassador initiative is the National Oceanic and Atmospheric Administration's (NOAA) effort to formally recognize NOAA partners who are improving the nation's readiness, responsiveness, and overall resilience against extreme weather, water, and climate events. As a WRN Ambassador, partners commit to working with NOAA and other Ambassadors to strengthen national resilience against extreme weather. In effect, the WRN Ambassador initiative helps unify the efforts across government, non-profits, academia, and private industry toward making the nation more ready, responsive, and resilient against extreme environmental hazards. The hyperlink to the WRN Ambassador initiative site can be assessed from the

North Port Fire Rescue web page <https://www.cityofnorthport.com/government/city-services/fire-rescue>
This program is accessible to the public and helps to warn and educate residents on developing flood conditions and hazards.

The City of North Port Emergency Management Division of the Fire Rescue Department has installed four-inch, reflective vinyl collars (traffic-grade reflective yellow tape with zone labels) on street-sign posts to mark hurricane evacuation zones A and B. The zones represent a storm surge threat to a neighborhood. The “A” zone (including manufactured housing communities) is at most risk and will be advised to evacuate first, while zones marked by other letters (B through E) are less likely to see floodwaters from the Gulf of Mexico or the Myakka River.

8.20 Participant in Sarasota County PPI Program

Responsible Department for Action: Public Works Department, Operations Division and Fire Rescue Department

Schedule for Completion of Action: Ongoing

Funding Source: Road and Drainage District and Fire and Rescue District

The City has adopted on July 23, 2019 a Resolution 2019-R-06 (Exhibit 8-16) to join the Sarasota County Program for Public Information (PPI) Committee formed under the Sarasota County’s CRS program. The PPI is a FEMA planning tool, to effectively coordinate public outreach. The PPI Committee is comprised of a cross-section of employees and community stakeholder members from Sarasota County Government, the City of Sarasota, the City of Venice, the City of North Port, the Town of Longboat Key, the Sarasota Bay Estuary Program, Mote Marine, and local business representatives such as Realtors, Insurance Agents, and Mortgage Lenders, is open for participation by all interested parties including private citizens, and is chaired by the Sarasota County Stormwater Department Director or designee.

The City’s Stormwater Manager is the City’s coordinate on the PPI committee and the North Port stakeholders to the committee include the City Senior Planner, Insurance agents, surveyor and volunteer from the North Port Canal Watch Group and previous Environmental Advisory Board member.

Post Disaster Mitigation Policies and Procedures

Post-disaster actions, mitigation policies and procedures are intended to help guide redevelopment in a pre-planned and more sustainable manner. The City’s post-disaster recovery plan is given in CEMP Annex A (given in Attachment A pdf pages 97 -108). Per CEMP Annex A Section I. A (Attachment page A1, pdf page 97), the North Port Emergency Manager is part of the Sarasota County’s team in post-disaster recovery efforts. Sarasota County’s has a Post-Disaster Redevelopment Plan (PDRP) which can be assessed from the Sarasota County’s website at:

https://www.scgov.net/government/planning-and-development-services/planning-and-zoning/-folder-225#docan7171_11681_7055

The City reviews and provides feedback to on Sarasota County’s PDRP which is currently being updated. After a disaster has occurred, Staff will establish or revise post-disaster redevelopment and mitigation policies and procedures as needed. The anticipated worst hit areas of damage by floods are most likely the same areas described in earlier Section 4 - Historic flooding.

Policies are established in Annex A Section III.B (Attachment page A8, pdf page 104) to determine whether structures will be rebuilt if substantially damaged. Annex A Section III.B specifies *“Once the damage assessment process is complete, the City of North Port Neighborhood Development Services Department conducts the post-disaster habitability inspections. The purpose of these inspections is to ensure that all structures are safe for entry and that water, electric, and gas services may be reconnected to the structure. These inspections are not conducted until the damage assessment process has been completed. All buildings*

damaged must be permitted for rebuilding or restoration and all new work must be up to current codes. Condemnation of severely damaged buildings and structures will be accomplished when they become public safety issues. Annex A provides responsibilities for public information, code enforcement, planning, and other efforts that encourage, mandate, and/or fund loss reduction activities. "

Action Items to Mitigate other Hazards

The above Sections 8.1 through 8.19 includes action items other than public information activities, to mitigate the effects of natural hazards which are mostly from flooding and storm damage. Additional action items will be developed as needed in coordination with the City's post-disaster recovery plan given in CEMP Annex A Section (given in Attachment A pdf pages 97 -108). Staff will review the policies and procedures of this Annex, as well as mitigation activities, for other hazards listed in Exhibit 5-1 that was excerpted from the CEMP Base Plan.

9. PLAN ADOPTION

The multi-jurisdictional Unified Local Mitigation Strategy (LMS) Plan is prepared by Sarasota County with input from the various jurisdictions including Cities of North Port, Sarasota and Venice, Town of Longboat Key, Sarasota County, Sarasota County Schools and Sarasota Memorial Hospital. The FMPs from the various jurisdictions are incorporated as annexes to the LMS Plan. After the Board of Sarasota County Commission adopts the LMS and associated FMPs in Spring 2021, the City of North Port Commission will adopt the LMS Plan and associated North Port FMP.

10. PLAN IMPLEMENTATION AND EVALUATION

Five year FMP Update

No plan is perfect. As FMP implementation proceeds, flaws will be discovered, and changes may be needed. Hazard conditions, goals and objectives may change. Implementation, evaluation and updates of the City's FMP will be coordinated by the Department of Public Works Stormwater Manager with input from the CRS committee which include members from various City Departments and public sectors as described in earlier Section 1. Input from the CRS committee will be solicited at the beginning of the planning process in a publicly advertised meeting and again in another publicly advertised meeting when the updated draft FMP was prepared. The previous November 2015 FMP together with the 2016 Sarasota Unified Local Mitigation Strategy (LMS) was adopted by City Resolution 2016-R-02 (Exhibit 1-1) on February 9, 2016. The FMP will be updated every 5 years and will be attached as annex to the Sarasota County 2021 LMS. The 2021 LMS with the updated FMP annex, is anticipated to be adopted by City of North Port Commission by resolution in Spring 2021.

Annual FMP Action Plan Update

The department(s) listed in the Section 8 Action Plan shall be responsible for overseeing implementation of the Action Plan. The FMP and Section 8 Action Plan items shall be evaluated annually by the City Department representatives in the CRS Committee and recommendations for changes will be included in the CRS Section 510 FMP progress report required as part of the annual CRS recertification. The Action Plan accomplishments over the previous 12 months will be included. The report will be submitted to the City Manager for approval and copied to City Commission prior to May 1 each year. The FMP will be made available to the public at the North Port Library, on the City of North Port Website and will be released to the media.



City of North Port

RESOLUTION NO. 2016-R-02

A RESOLUTION OF THE CITY OF NORTH PORT, FLORIDA, ADOPTING THE 2016 SARASOTA COUNTY UNIFIED LOCAL MITIGATION STRATEGY, WITH THE NORTH PORT FLOODPLAIN MANAGEMENT PLAN ANNEX, AS THE FORMAL GUIDE FOR THE CITY OF NORTH PORT'S HAZARD MITIGATION AND FLOODPLAIN MANAGEMENT ACTIVITIES IN ACCORDANCE WITH PUBLIC LAW 106-390, THE FEDERAL DISASTER MITIGATION ACT 2000 (44 CFR §201.6), AND THE FLORIDA ADMINISTRATIVE CODE RULE 9-G22; PROVIDING FOR CONFLICTS; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, City of North Port is subject to hazards including, severe weather, hurricanes, tornadoes, floods and wildfires and the City faces potential damage to life, property, natural resources and the local economy; and

WHEREAS, the Sarasota County Unified Local Mitigation Strategy Work Group is comprised of staff of Sarasota County Government; the Cities of North Port, Sarasota, and Venice; the Town of Longboat Key; Sarasota County School Board; and Sarasota Memorial Hospital, and community members is open for participation to any and all interested parties; and

WHEREAS, a City of North Port Community Rating System Work Group has also been formed to review and update the Floodplain Management Plan and is comprised of key City Department and community representatives, with the City's Stormwater Manager as the work group coordinator (City planner as an alternate) and those meetings are open for participation to any and all interested parties; and

WHEREAS, the Work Groups have identified these local hazards and have assessed County- and City-wide vulnerability and risk to these hazards, ultimately identifying and prioritizing mitigation initiatives that would reduce local vulnerability; and

WHEREAS, The Sarasota County Unified Local Mitigation Strategy and the North Port Floodplain Management Plan annex represents the City of North Port's commitment to reduce vulnerability and risks from all hazards, while it serves as a policy guide as resources are committed toward reducing the effects of all hazards, and is required of all communities

participating in the Community Rating System program through which provides flood insurance discounts through the National Flood Insurance Program; and

WHEREAS, initiatives identified, based upon established and accepted criteria, on the Unified Local Mitigation Strategy Project Lists are given greater consideration by State-managed funding programs, including but not limited to the Hazard Mitigation Grant program, the Flood Mitigation Assistance Program, the Pre-Disaster Mitigation Competitive Grant Program, Communities Trust, Community Development Block Grant, Coastal Partnerships Initiative; and

NOW THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF NORTH PORT, FLORIDA, THAT:

SECTION 1

- 1.01 The foregoing "WHEREAS" clauses above are hereby ratified as true and correct, and incorporated herein by reference.
- 1.02 The Sarasota County Unified Local Mitigation Strategy, with the North Port Floodplain Management Plan Annex, is adopted as the formal guide for the City of North Port's hazard mitigation and floodplain management activities.
- 1.03 The City Manager or his designee is authorized to apply for funding to support these activities.

SECTION 2 CONFLICTS

- 2.01 If there is any conflict between this Resolution and any other Resolution or Ordinance, or portions thereof, the provisions of this Resolution shall prevail to the extent of such conflict.

SECTION 3 SEVERABILITY

- 3.01 If any section, subsection, sentence, clause, phrase or portion of this Resolution is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining portions.

SECTION 4 EFFECTIVE DATE

4.01 This Resolution shall take effect immediately upon execution by the Chair.

PASSED AND DULY ADOPTED by the City Commission of the City of North Port, Florida this
9th day of February, 2016

CITY OF NORTH PORT

By: Jacqueline Moore

Jacqueline Moore
Mayor

ATTEST:

By: Helen M. Raimbeau

Helen Raimbeau, MMC
City Clerk

Approved as to form and legal sufficiency:

By: Mark Moriarty

Mark Moriarty
City Attorney

CRS Committee Meeting Invitees List

Full Name	Organization	Title	Dept	Division
Valerie Malingowski	City of North Port	Grant Writer	City Manager Office	Administration
Josh Taylor	City of North Port	Community Outreach Coordinator	City Manager Office	Community Outreach
Michael Fear	City of North Port	Alternate Community Outreach Coordinator	City Manager Office and Public Works	Administration
Angela Hollister	City of North Port	Accountant III	Finance	Accounting Services
Eric Tiefenthaler	City of North Port	Div Chief -Emergency Manager	Fire Rescue	Administration
Peter Marietti III	City of North Port	Fire Marshall	Fire Rescue	Administration
Alexander Bahorski	City of North Port	Planning Analyst	Neighborhood Development Services (NDS)	Planning and Zoning
Savannah White	City of North Port	Environmental Tech	NDS and PW	Planning and Zoning, Engineering
Josh Thurmer	City of North Port	Chief Plans Examiner	NDS	Building
Tommy Lasprogato	City of North Port	Building Division Manager	NDS	Building
Kevin Raducci	City of North Port	Code Enforcement Manager	NDS	Building Code Enforcement
Alison Christie	City of North Port	Senior Planner	NDS	Planning and Zoning
Rhea Lopes	City of North Port	Senior Planner	NDS	Planning and Zoning
Sherry Willette	City of North Port	Planner	NDS	Planning and Zoning
Sandy Pfundheller	City of North Port	Director	Parks and Recreation	Administration
Monica Bramble	City of North Port	Acting Public Works Director	Public Works	Administration
Benjamin E. Newman	City of North Port	Project Engineer	Public Works	PW Engineering
Elizabeth Wong	City of North Port	Stormwater Manager	Public Works	PW Engineering
Colleen Hibbitts	City of North Port	Community Outreach Coordinator	Utilities	Community Outreach
Jennifer Fehrs	City of North Port	Utilities Engineer	Utilities	Utilities Engineering
Michael Acosta	City of North Port	Engineering Manager	Utilities	Utilities Engineering
Justin Box	Allstate Insurance	insurance Company Owner		
Bobbi Claybrooke	AM Engineering	Consultant Engineer		
Kimberley Quigley	BB&T	Lending Institution		
Todd Mathes	Benderson	Developer		
Kevin Feuser	Brightway insurance	insurance Company Owner		
Jon Mast	Building Industria Assoc.	Builder		
Bridget Spence	Casey Management	Developer		
Matthew Dill	Chamber of Commerce	Commerce		
Manager	Charlotte Desoto Building Industria Assoc.	Building Industria Rep		
Deborah Snowden	Coldwell Banker Sunstar Realty	Realtor		
Fred Koenig	Duck Key	HOA member		
Terrence Kirschner	Gran Paradiso - Lennar Homes	Developer		
Matthew Koratich	Gran Paradiso Development	HOA Manager		
Grant Gorski	Gran Paradiso Management	HOA Manager		
Strickland Smith	Heidt Engineering	Consultant Engineer		
Bruce Henry	Keller Williams Realty	Broker Associate/Realtor		
Peter Van Buskirk	Kimley-Horn Associates	Consultant Engineer		
Ty Gremaux	Kimley-Horn Associates	Consultant Engineer		
Matther Koratich	Lennar Homes - Gran Paradiso	Developer		
Brad Soule	Matty Corporation	Developer		
Bill Murray	MQ Partners	Developer		
Paul Morgan	NP Contractor Association and Past PZAB Member	Contractor		
Mellisa Ginn	Presto Air	Contractor		
Linda Pizzaro	Realtor Association	Realtor		
Lex van Brero	Resident of Gran Paradiso	Resident		
Donna Bailey	Sarasota County	CRS Coordinator	Public Works	Stormwater
Janita Wisch	Sarasota County	Librarian for City of North Port		
Doug Brauer	Stantec Engineering	Consultant Engineer		
Markowitz, Rachel	Stantec Engineering	Consultant Engineer		
Dean McConville	State Farm insurance	insurance Company Owner		
Mary Foster	State Farm Insurance	Insurance agent		
John Shope	Suncoast Credit Union	Lending Institution		
Ralph Bienne	Suncoast Credit Union	Lending Institution		
Darryl Denson	Sundance Builder	Builder		
Richard Ives	Talon Bay HOA	HOA member		
Ron Carroll	Talon Bay HOA	HOA member		
Alan Fish	VBF Surveying	Surveyor		
Lisa Haseley	Wells Fargo	Lending Institution		
Clint Cuffie	WRA Egnineering, LLC	Consultant Engineer		
Clint Cuffie	WRA Engineering	Consultant Engineer		

Attendees List at CRS Committee Meetings

Full Name	Organization	Title	Dept	Division	FMP Review Meeting Attendance	
					9/17/2020	12/3/2020
Valerie Malingowski	City of North Port	Grant Writer	City Manager Office	Administration	x	
Michael Fear	City of North Port	Community Outreach Coordinator	City Manager Office and Public Works	Administration	x	x
Angela Hollister	City of North Port	Accountant III	Finance	Accounting Services	x	x
Eric Tiefenthaler	City of North Port	Div Chief -Emergency Manager	Fire Rescue	Administration	x	x
Peter Marietti III	City of North Port	Fire Marshall	Fire Rescue	Administration	x	x
Kevin Raducci	City of North Port	Code Enforcement Manager	Neighborhood Development Services (NDS)	Building Code Enforcement	x	
Alexander Bahorski	City of North Port	Planning Analyst	NDS	Planning and Zoning		x
Alison Christie	City of North Port	Senior Planner	NDS	Planning and Zoning	x	x
Rhea Lopes	City of North Port	Senior Planner	NDS	Planning and Zoning	x	x
Savannah White	City of North Port	Environmental Tech	NDS and PW	Planning and Zoning, Engineering	x	
Sandy Pfundheller	City of North Port	Director	Parks and Recreation	Administration	x	
Elizabeth Wong	City of North Port	Stormwater Manager	Public Works	PW Engineering	x	x
Benjamin E. Newman	City of North Port	Project Engineer	Public Works	PW Engineering	x	x
Jennifer Fehrs	City of North Port	Utilities Engineer	Utilities	Utilities Engineering	x	x
Michael Acosta	City of North Port	Engineering Manager	Utilities	Utilities Engineering	x	x
Donna Bailey	Sarasota County	CRS Coordinator	Public Works	Stormwater	x	x
Bruce Henry	Keller Williams Realty	Broker Associate/Realtor			x	x
Clint Cuffle	WRA Egnineering, LLC	Engineer , Vice President			x	
Grant Gorski	Gran Paradiso Development	General Manager			x	
Justin Box	Allstate Insurance	insurance Company Owner			x	x
Kevin Feuser	Brightway insurance	insurance Company Owner			x	x
Lex van Brero	Resident of Gran Paradiso	Resident			x	
Markowitz, Rachel	Stantec Engineering	Civil Engineer			x	x
Mary Foster	State Farm insurance	Insurance agent			x	x
Matthew Koratich	Gran Paradiso Development	HOA Operations Manager			x	x
Ronnie Carroll	Talon Bay Development	HOA Representative			x	
Terrence Kirschner	Gran Paradiso - Lennar Homes	Developer			x	
Bobbi Claybrooke	AM Engineering	Civil Engineer				x
Gremaux, Ty	Kimley-Horn and Assoc	Civil Engineer				x
Strackbein, Trenton	Kimley-Horn and Assoc	Civil Engineer				x

Noth Port Staff Role in 6 Mitigation Measures

Full Name	Title	Dept	Division	Role in 6 Mitigation Measure *					
				1. Preventative	2. Property Protection	3. Natural Resource Protection	4. Emergency Services	5. Structural Projects	6. Public Information
Alison Christie Rhea Lopes Alexander Bahorski	Senior Planner Planning Analyst	Neighborhood Development Services (NDS)	Planning	<ul style="list-style-type: none"> Floodplain mapping and data Planning and zoning Open space preservation Building codes 	<ul style="list-style-type: none"> Building elevation Insurance 				<ul style="list-style-type: none"> Map information Real estate disclosure
Angela Hollister	Accountant III	Finance	Accounting Services		<ul style="list-style-type: none"> Property Acquisition 				
Benjamin E. Newman	Project Engineer	Public Works	Engineering	<ul style="list-style-type: none"> Building codes Planning and zoning 		<ul style="list-style-type: none"> Wetlands protection 	<ul style="list-style-type: none"> Post-disaster mitigation actions 	<ul style="list-style-type: none"> Storm drain improvements 	<ul style="list-style-type: none"> Outreach projects
Elizabeth Wong	Stormwater Manager	Public Works	Engineering	<ul style="list-style-type: none"> Floodplain mapping and data Planning and zoning Open space preservation Stormwater management Floodplain regulations Drainage system maintenance Erosion setbacks Building codes 	<ul style="list-style-type: none"> Property Acquisition Building elevation Insurance 	<ul style="list-style-type: none"> Wetlands protection Water quality improvement Erosion and sediment control Natural area preservation Environmental corridors Natural area restoration Natural functions protection 	<ul style="list-style-type: none"> Hazard warning Health and safety maintenance Post-disaster mitigation actions 	<ul style="list-style-type: none"> Reservoirs Channel modifications Levees/floodwalls Storm drain improvements Diversions 	<ul style="list-style-type: none"> Map information Library Outreach projects Technical assistance Real estate disclosure Environmental education
Eric Tiefenthaler Peter Marietti III	Div Chief - Emergency Manager, Fire Marshall	Fire Rescue	Administration				<ul style="list-style-type: none"> Hazard threat recognition Critical facilities protection Hazard warning Health and safety maintenance Hazard response operations Post-disaster mitigation actions 		<ul style="list-style-type: none"> Outreach projects
Michael Acosta Jennifer Fehrs	Engineering Manager Utilities Engineer	Utilities	Engineering		<ul style="list-style-type: none"> Sewer backup protection 		<ul style="list-style-type: none"> Critical facilities protection Health and safety maintenance Hazard response operations Post-disaster mitigation actions 	<ul style="list-style-type: none"> Reservoirs Levees/floodwalls 	<ul style="list-style-type: none"> Outreach projects
Kevin Raducci Tommy Lasprogato Josh Thurmer	Code Enforcement Manager, Building Division Manager, Chief Plans Examiner	Neighborhood Development Services (NDS)	Building	<ul style="list-style-type: none"> Planning and zoning Erosion setbacks Building codes 	<ul style="list-style-type: none"> Building elevation 	<ul style="list-style-type: none"> Wetlands protection 			<ul style="list-style-type: none"> Map information Real estate disclosure
Michael Fear	Alternate Community Outreach Coordinator	City Manager Office and Public Works	Administration						<ul style="list-style-type: none"> Outreach projects
Sandy Pfundheller	Director	Parks and Recreation	Administration			<ul style="list-style-type: none"> Natural area preservation Environmental corridors Natural area restoration Natural functions protection 			
Savannah White	Environmental Tech	NDS and PW	Planning, Operations	<ul style="list-style-type: none"> Floodplain mapping and data 		<ul style="list-style-type: none"> Wetlands protection Water quality improvement Erosion and sediment control Natural area preservation Environmental corridors Natural area restoration Natural functions protection 			<ul style="list-style-type: none"> Map information Outreach projects Real estate disclosure Environmental education
Valerie Malingowski	Grant Writer	City Manager Office	Administration		<ul style="list-style-type: none"> Property Acquisition 				<ul style="list-style-type: none"> Map information Outreach projects

* 6 mitigation Measures as defined in CRS 2017 Manual page 510-20



Neighborhood Development Services

Floodplain "Task Force" Work Plan

1. Overview

The primary mission of the Floodplain Task Force to support the City of North Port's Community Rating System (CRS) through information, education and outreach activities to develop multiple knowledgeable Certified Floodplain Managers. Historically, the City's CRS Coordinator has provided significant input on the CRS Program and flood insurance rules and guidelines propagated by FEMA. The Task Force will also be very active in ASFPM membership and Florida Floodplain Mangers membership to stay informed of upcoming changes to the NFIP and potential effects these changes could have.

The committee will be headed by the Building Official who is designated the Floodplain Administrator listed below.

Anthony Warren CBO, CFM, Building Official/Floodplain Administrator

The membership is composed of interested employees within Neighborhood Development Services. The Floodplain Administrator will use an initial selected group of members who are interested in continuing education, on the job work experience and essential personnel that are already involved in different aspects of Floodplain Management. The CRS Coordinator will serve as an outside source but will work in a collective effort.

Initial Members are listed below.

Melissa McThenia, Zoning Plans Examiner

Kyla Guilbault, Development Tech II

Justin Bryde, GIS Analyst Addressing Specialist

Outside Source

Elizabeth Wong P.E., Stormwater Manager/CRS Coordinator



Achieve Anything

www.cityofnorthport.com

Neighborhood Development Services: 941.429.7044, 4970 City Hall Boulevard, North Port, FL 34286

2. Task Outline

2020 – Initial Work Items

Task Name	Task Leader	Task Duration	Task Description
Self-Studies	Floodplain Administrator	Ongoing Until Complete	Complete EMI Self Studies as assigned by Floodplain Administrator
Annual Conference	Floodplain Administrator	4 days Annually	(2-3) Members should be prepared to attend for networking, continuing education and new industry standards
Elevation Certificates	Zoning/Permit Supervisor	Ongoing/As Needed	Verify Elevation Certificates for completeness prior to submitting to CRS Coordinator
Prepare assigned CRS sections	Floodplain Administrator/CRS Coordinator	Prior to Annual Renewal and Prior to 5 Year Cycle	Each member will be selected for preparing information to submit to the CRS Coordinator.
Information Log(s)	Floodplain Administrator	Ongoing/As Needed	Documenting phone calls, emails and walk ins for any items related to floodplain management.
Public Outreach	Floodplain Administrator/Outreach Personnel	Ongoing	Provide Public Outreach through social media, pamphlets, utility bill mailouts, onsite speaking engagements
ASFPM/FLFLOODS Committees	Floodplain Administrator	Ongoing	Actively participate in the Florida and National Floodplain Committees

3. Floodplain Courses

A. FEMA EMI Independent Self Study (introductory courses)*Free Online

IS-1100 Increased Cost of Compliance, IS-1102 Theory of Elevation Rating, IS-1103 Elevation Certificate for Surveyors, IS-1105a Elevation Certificate Made Easy, IS-1106a FEMA Mapping, IS-1113 Coastal Barrier Resources Act

B. One Day Class (Face To Face and more in depth) *Fee

Fundamentals In Floodplain Management, Elevation Certificate Basics

C. CFM Courses (4 day classes followed my CFM Test. Only 1 is needed) *Fee

E-0273, L-0273, G-0273

D. FEMA EMI Independent Self Study (follow up courses)*Free Online

IS-162 Hazard Mitigation Floodplain Management, IS-279a Introduction to Retrofitting, IS-280 Engineering Principles, IS-321 Hurricane Mitigation, IS-322 Flood Mitigation, IS-727 Floodplain Management and Protecting Wetlands

Primary	Description of Project	Agency Responsible for Implementation	Priority	Estimated Cost	Funding Source	Hazard Mitigation Strategy	Hazards Mitigated	Jurisdiction Project #	Jurisdiction Project Owner	Jurisdiction Project Benefit	Mitigation Goals Achieved	Timeframe for Project Completion	Project Status (COMPLETED)	Project Status (DEFERRED)	Project Status (DELETED)	Project Status (IN PROGRESS)	Project Status (NEW)	If Deferred; Why?	Mitigate New or Existing	Comments
Purchase lots along the Myakkahatchee Creek	Purchase lots to reduce flood vulnerability	CM, NDS, PW	High	\$3.5M	FDEP Grants	1	All	N/A	NP	1	2, 4	As funding is available		TRUE				Funding	E (Existing)	
Deer Prairie Creek Bridge	Install bridge in order to decrease response time	Fire Rescue	High	\$1M	CIP Grants Infrastructure Surtax III	5	All	N/A	NP	1 5	5	2024		TRUE				Funding	E (Existing)	
City EOC/Fire Rescue HQ/Data Center/PD 911 Dispatch/Property Evidence Building	Build a new facility to accommodate emergency operations center to include showers, and back-up emergency power to entire bldg	Public Works, FM	High	\$6M	Grants HMGP Other City Funds	2	All	N/A	NP	ALL	5	As funding is available		TRUE				Funding	E (Existing)	100% of Plans received, Plans in NP SDR review, and moving into the permitting phase. Pegasus filed a PoP extension that has been approved but is still in processing with the state. The state also requested a SOW environmental review, but we anticipate no issues with approval. A cost increase was also submitted to the state and is currently going through a CBA.
North Port Utilities Admin/Field Operations	Replace buildings with hardened structures	Utilities	High	\$13.2M	Revenue Bonds User Rates	2 3	All	N/A	NP	ALL	5	2023				TRUE			E (Existing)	Planning started.
North Port Utilities construction of additional source for R/O	To add additional wells to the current wellfield to increase drought tolerance and protect the existing system	Utilities	Medium	\$4.5M	Capacity Fees	5	4	N/A	NP	ALL	1 4 5					TRUE			E (Existing)	
Hardening of water & sewer utility structures	Upgrade utility structures at bridge crossings, etc.	Utilities	Medium	\$600K	User Rates	5	All	N/A	NP	ALL	5	2020				TRUE			E (Existing)	
Additional emergency water interconnect	12" Potable water emergency inter-connect between Sarasota and NP	Utilities	Medium	\$32K	County User Rates	5	All	N/A	NP	1 4	5	2021		TRUE					E (Existing)	
Replacement of shallow depth water and wastewater lines at Lazy River		Utilities	High	\$150K	User Rates	5	4	N/A	NP	1 2 4	1 2 5		TRUE						E (Existing)	
Inflow & Infiltration in identified areas of the City		Utilities	High	\$300K	User Rates	2 5	10	N/A	NP	1 5	1 4 5					TRUE			E (Existing)	
Vault style master pumping lift station #12 rehabilitation to ground level		Utilities	High	\$370K	User Rates	2 5 7	All	N/A	NP	1	1 2 4 5	2021				TRUE			E (Existing)	
Phase 1 Water Treatment Plant rehabilitation of Flocculation #1		Utilities	High	\$575K	User Rates	2 5	All	N/A	NP	1 5	2 4 5	2021	TRUE						E (Existing)	
Distribution line installation to serve the Western reaches of the City based on hydraulic modeling		Utilities	High	\$3.5M	Capacity Fees	5	4	N/A	NP	1 4 5	1 4	2021				TRUE			N (New)	
Rehabilitation of lift stations that are 30 plus years old that have been identified in need		Utilities	High	\$150K	User Rates	2 5 7	All	N/A	NP	1 5	1 2 5	2021				TRUE			E (Existing)	
VFDs installed on current raw water intake structures at the Water Treatment Plant		Utilities	High	\$30K	User Rates	2 5	All	N/A	NP	1 4 5	1 4	2021				TRUE			E (Existing)	
Installation of additional analyzers and integration to SCADA to achieve 24 hour operations at the Water Treatment Plant		Utilities	High	\$48K	User Rates	2	All	N/A	NP	1 4 5	1 2 4	2021				TRUE			E (Existing)	
Upgrade the 14 year old control panel at the Wastewater Treatment Plant to improve operational efficiency		Utilities	High	\$35K	User Rates	2	All	N/A	NP	1 4 5	1 2 5		TRUE						E (Existing)	
Public Works Administration Building	Replace buildings with hardened structures	Public Works	Medium	\$6.28M	RDA	2 3	All	N/A	NP	ALL	5	As funding is available		TRUE				Funding	N (New)	
Pipe Lining on major outfalls	CMP pipes that are difficult to replace can be lined. Only those that are deemed structurally sufficient can be lined. All others will need to be replaced.	Public Works	High	\$1M	RDA	2 5 6 7	All	N/A	NP	1 4	1 2 5	As funding is available		TRUE				Funding	E (Existing)	
Design 4 Lane Price Blvd Sumter to Toledo Blade	Four-lane and elevate roadway.	Public Works	NA	\$2.2M	Surtax III	5	All	N/A	NP	ALL	5	2020			TRUE				E (Existing)	
Construct 4 Lane Price Blvd Sumter to Toledo Blade	Four-lane and elevate roadway.	Public Works	NA	\$43M	Grants Other City Funds Surtax III	5	All	N/A	NP	ALL	5	2022				TRUE			E (Existing)	
Design 4 Lane Price Blvd Sumter to West of North Port High School	Four-lane and elevate roadway.	Public Works	High	\$7M	Grants Other City Funds Surtax III	5	All	N/A	NP	ALL	5	As funding is available		TRUE				Funding	E (Existing)	
Construct 4 Lane Price Blvd Sumter to West of North Port High School	Four-lane and elevate roadway.	Public Works	High	\$33M	Grants Other City Funds Surtax III	5	All	N/A	NP	ALL	5	As funding is available		TRUE				Funding	E (Existing)	
Design 4 Lane Price Blvd Toledo Blade to Haberland	Four-lane and elevate roadway.	Public Works	High	\$5.6M	Surtax III	5	All	N/A	NP	ALL	5	As funding is available		TRUE				Level of Service	E (Existing)	

Primary	Description of Project	Agency Responsible for Implementation	Priority	Estimated Cost	Funding Source	Hazard Mitigation Strategy	Hazards Mitigated	Jurisdiction Project #	Jurisdiction Project Owner	Jurisdiction Project Benefit	Mitigation Goals Achieved	Timeframe for Project Completion	Project Status (COMPLETED)	Project Status (DEFERRED)	Project Status (DELETED)	Project Status (IN PROGRESS)	Project Status (NEW)	If Deferred; Why?	Mitigate New or Existing	Comments
Construct 4 Lane Price Blvd Toledo Blade to Haberland	Four-lane and elevate roadway.	Public Works	High	\$30.7M	Surtax III	5	All	N/A	NP	ALL	5	As funding is available		TRUE				Level of Service	E (Existing)	
Design 4 Lane Price Blvd Haberland to Veterans	Four-lane and elevate roadway.	Public Works	High	\$6.7M	Surtax III	5	All	N/A	NP	ALL	5	As funding is available		TRUE				Level of Service	E (Existing)	
Construct 4 Lane Price Blvd Haberland to Veterans	Four-lane and elevate roadway.	Public Works	High	\$34M	Surtax III	5	All	N/A	NP	ALL	5	As funding is available		TRUE				Level of Service	E (Existing)	
Toledo Blade Blvd Extension, Tropicair Blvd to SR72	Roadway extension	Public Works	High	\$16M	Revenue Bonds	2	9	N/A	NP 4	1	1	As funding is available				TRUE		N (New)		
Big Slough Flood Reduction Study	Consultant to recommend solutions to reduce flooding in 2 areas	Public Works	High	\$300K	RDA	2 5 6 7	2 7	N/A	NP	1 4	1 2 5	2020	TRUE						E (Existing)	Funded by SWFWMD
Design replacement for flood control structure #115	Corroded Structure Need to rehab. replace for flood protection	Public Works	High	\$109K	RDA	2 5 6 7	2 3 6 7 9 11	N/A	NP	1 4	1 2 5	2017	TRUE						E (Existing)	
Construct replacement for flood control structure #115	Corroded Structure Need to rehab. replace for flood protection	Public Works	High	\$165K	RDA	2 5 6 7	2 3 6 7 9 10	N/A	NP	1 4	1 2 5	2018	TRUE						E (Existing)	
Design replacement for flood control structure #106	Corroded Structure Need to rehab. replace for flood protection	Public Works	High	\$168K	RDA	2 5 6 7	2 3 6 7 9 10	N/A	NP	1 4	1 2 5	2018	TRUE						E (Existing)	
Construct replacement for flood control structure #106	Corroded Structure Need to rehab. replace for flood protection	Public Works	High	\$2.274M	RDA	2 5 6 7	2 3 6 7 9 10	N/A	NP	1 4	1 2 5	2020	TRUE						E (Existing)	
Design replacement for flood control structure #108	Corroded Structure Need to rehab. replace for flood protection	Public Works	High	\$192K	RDA	2 5 6 7	2 3 6 7 9 10	N/A	NP	1 4	1 2 5	2020			TRUE				E (Existing)	
Construct replacement for flood control structure #108	Corroded Structure Need to rehab. replace for flood protection	Public Works	High	2.48M	RDA	2 5 6 7	2 3 6 7 9 10	N/A	NP	1 4	1 2 5	2021		TRUE				Funding	E (Existing)	
Design replacement for flood control structure #113	Corroded Structure Need to rehab. replace for flood protection	Public Works	High	\$308K	HMGP RDA Surtax III	2 5 6 7	2 3 6 7 9 10	N/A	NP	1 4	1 2 5	As funding is available		TRUE				Funding	E (Existing)	
Construct replacement for flood control structure #113	Corroded Structure Need to rehab. replace for flood protection	Public Works	High	\$3.85M	HMGP RDA Surtax III	2 5 6 7	2 3 6 7 9 10	N/A	NP	1 4	1 2 5	As funding is available		TRUE				Funding	E (Existing)	
Design replacement for flood control structure #114	Corroded Structure Need to rehab. replace for flood protection	Public Works	High	\$300K	RDA	2 5 6 7	2 3 6 7 9 10	N/A	NP	1 4	1 2 5	As funding is available		TRUE				Funding	E (Existing)	
Construct replacement for flood control structure #114	Corroded Structure Need to rehab. replace for flood protection	Public Works	High	\$3.6M	RDA	2 5 6 7	2 3 6 7 9 10	N/A	NP	1 4	1 2 5	As funding is available		TRUE				Funding	E (Existing)	
Design replacement for flood control structure #157	Corroded structure. Needs rehabilitated and replaced for flood protection.	Public Works	High	\$175K	Grants RDA Surtax III	2 5 6 7	2 3 6 7 9 10	N/A	NP	1 4	1 2 5									
Construct replacement for flood control structure #157	Corroded structure. Needs rehabilitated and replaced for flood protection.	Public Works	High	\$1.8M	Grants RDA Surtax III	2 5 6 7	2 3 6 7 9 10	N/A	NP	1 4	1 2 5									
Design replacement for other flood control structures	Corroded Structure Need to rehab. replace for flood protection	Public Works	Medium	\$500K	RDA	2 5 6 7	2 3 6 7 9 10	N/A	NP	1 4	1 2 5	As funding is available		TRUE				Funding	E (Existing)	









Primary	Description of Project	Agency Responsible for Implementation	Priority	Estimated Cost	Funding Source	Hazard Mitigation Strategy	Hazards Mitigated	Jurisdiction Project #	Jurisdiction Project Owner	Jurisdiction Project Benefit	Mitigation Goals Achieved	Timeframe for Project Completion	Project Status (COMPLETED)	Project Status (DEFERRED)	Project Status (DELETED)	Project Status (IN PROGRESS)	Project Status (NEW)	If Deferred; Why?	Mitigate New or Existing	Comments
Construct replacement for other flood control structures	Corroded Structure Need to rehab, replace for flood protection	Public Works	Medium	\$3M	RDA	2 5 6 7	2 3 6 7 9 10	N/A	NP	1 4	1 2 5	As funding is available		TRUE				Funding	E (Existing)	
Drainage System Improvements	Rehab and replacement of swales, ditches, pipes, outfalls and canals	Public Works	Medium	\$1.5M	RDA Surtax III	5 6 7	2 7 9 11	N/A	NP	1	1 2	As funding is available					TRUE		E (Existing)	
Bridge Rehabilitation and Repairs	Repairs to evacuation route bridges	Public Works	Medium	\$1.5M	RDA Surtax III	3	2 9	N/A	NP	1 4	1	As funding is available					TRUE		E (Existing)	
Big Slough Flood Reduction Projects	Implementatono of projects to reduce flooding	Public Works	Medium	\$43M	RDA	2 5 6 7	2 3 6 7 9 10	N/A	NP	1 4	1 2 5	As funding is available		TRUE				Funding	E (Existing)	
Property Maintenance Yard	Replace buildings with hardened structures	Parks and Rec	High	\$7M	CIP HMGP	2 3	All	N/A	NP	ALL	5	As funding is available		TRUE			TRUE	Funding	E (Existing)	
Generator for City Hall	Add emergency power to entire building	Public Works FM	High	\$1M	CIP HMGP	2 3	All	N/A	NP	ALL	5					TRUE			E (Existing)	
Lift station bypass pump project	Upgrade existing lift stations to include bypass pumps at all major stations.	Utilities	High	\$5M	User Rates	2 3 5	All	N/A	NP	1	All	2029					TRUE		E (Existing)	
North Port THIRA Update	Update to the THIRA Plan	Fire	Medium	\$30K	General Revenues Grants	All	All	N/A	NP	1	All						TRUE			
Public Outreach	Public outreach programs for all jurisdictions	LMS Work Group	High	\$10K	NA	All	All	NA	LBK NP Sarasota County Sarasota Hospital Board SRQ Venice	ALL	3	Continuous				TRUE			E (Existing)	

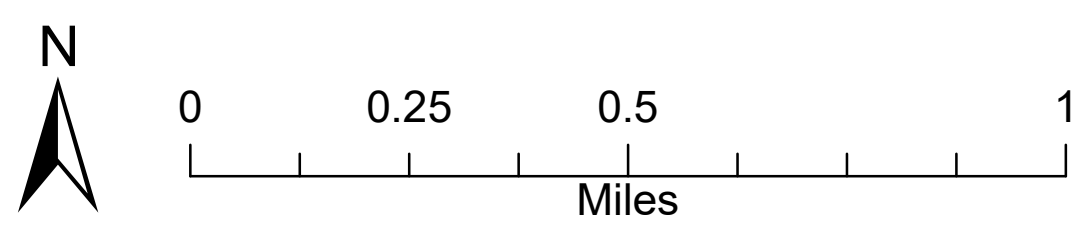


Parcel Status	No. of Affected Parcels (as of 12/05/16)	No. of Affected Parcels with Insurable Structures (as of 12/05/16)	No. of Parcels with Insurable Structures* touching the SFHA (Using 12/05/16 Sarasota County GIS Structure Layer)
Parcels Added			
Parcels not in the 1981 FIRM floodplain, but any portion(s) of the parcel are touching the November 4, 2016 FIRM SFHA	14325	5531	276
Parcels Removed			
Parcels that are in the 1981 FIRM SFHA and were removed from the November 4, 2016 FIRM SFHA	1828	921	
Parcels that are in the 1981 FIRM SFHA and are still in the November 4, 2016 FIRM SFHA	2630	720	211

* An insurable structure is a structure with at least two load-bearing walls and a roof. It must be affixed to land, and at least 51% of its value must be above ground. This definition includes almost all residential and commercial structures, as well as ancillary buildings such as garages and barns. Storage facilities such as silos and grain storage buildings are also covered. The rules do not cover structures such as gazebos, pavilions, pole barns, and storage tanks, as these buildings do not have at least two load-bearing walls and a roof. If they did not have roofs, then they would not qualify as insurable structures. Otherwise, flood insurance is required. The issue is not habitability.

Legend

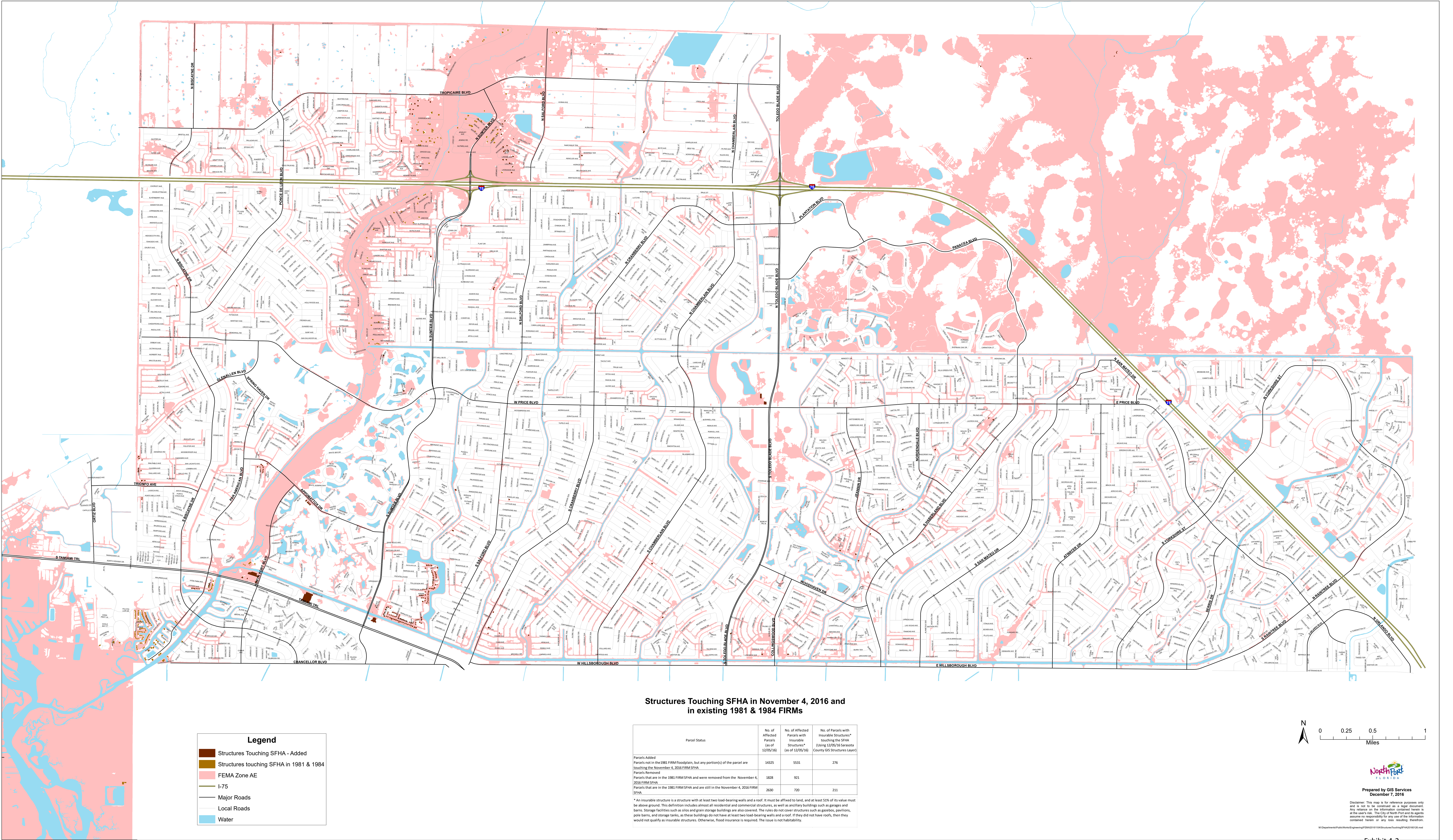
-  Parcels in SFHA with Structures
-  Parcels in SFHA in 1981 & 1984 maps with Structures
-  Parcels with Structures Removed from SFHA in 1981 & 1984
-  FEMA Zone AE
-  I-75
-  Major Roads
-  Local Roads
-  Water

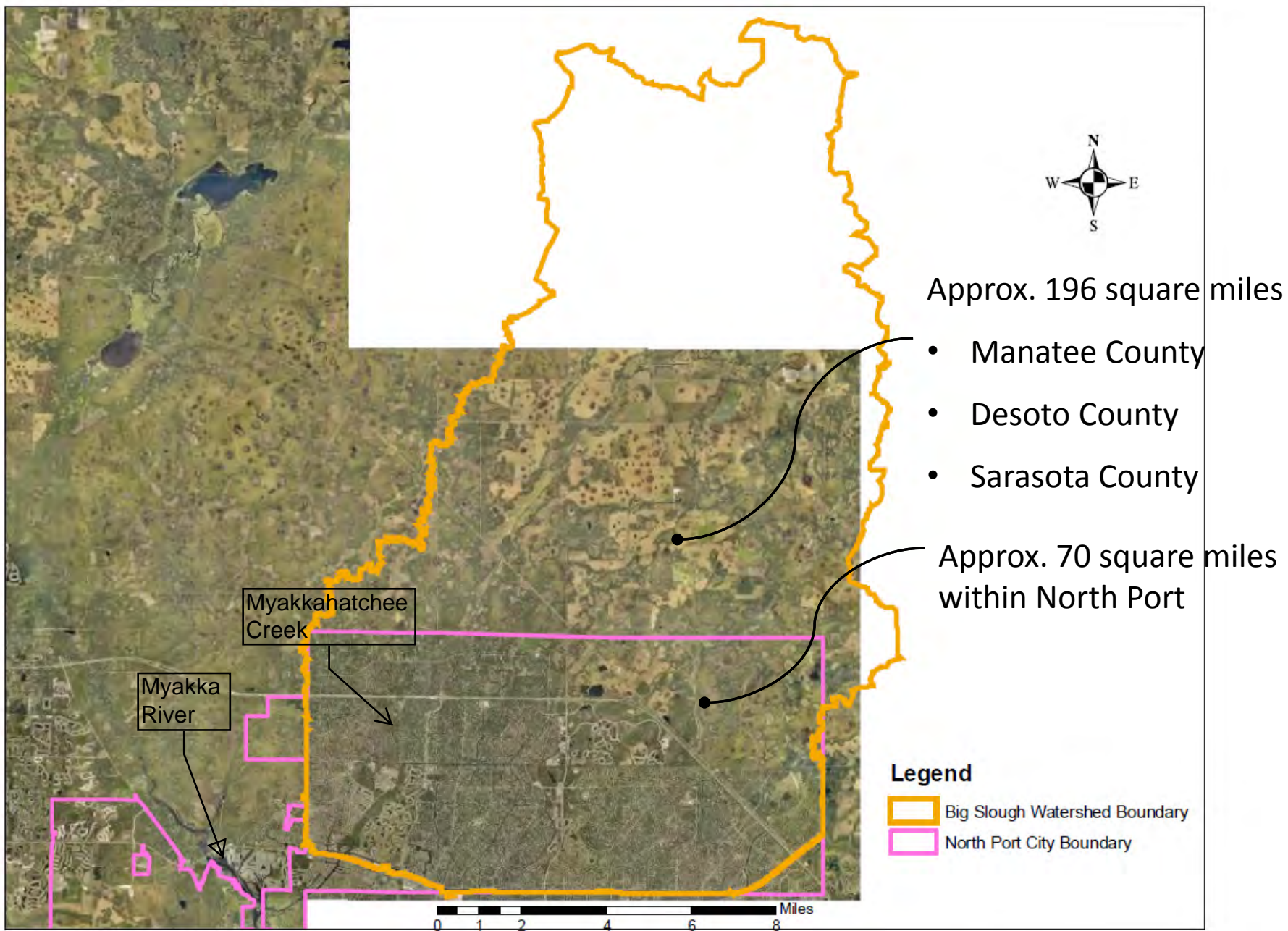


Prepared by GIS Services
December 7, 2016

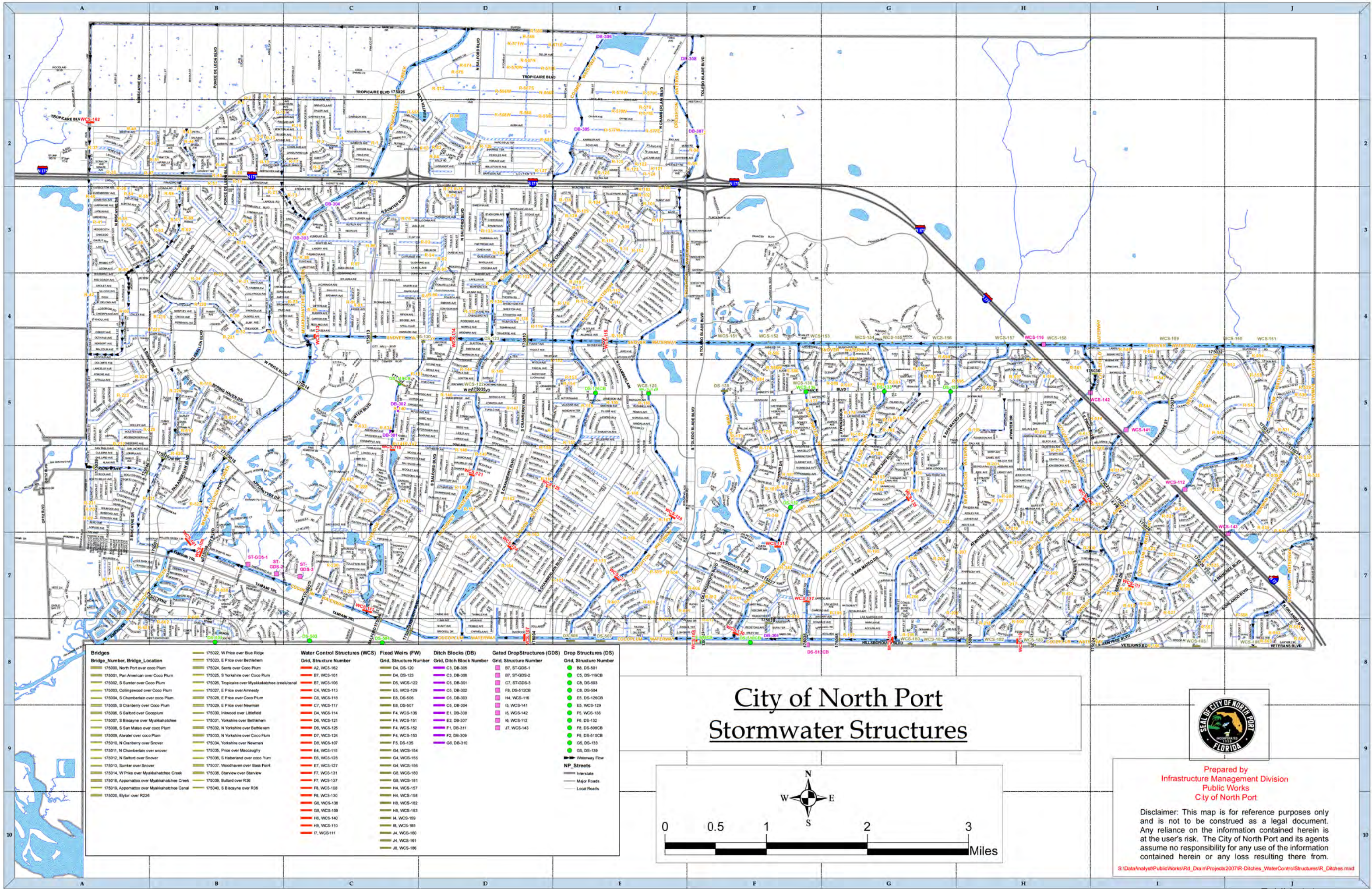
Disclaimer: This map is for reference purposes only and is not to be construed as a legal document. Any reliance on the information contained herein is at the user's risk. The City of North Port and its agents assume no responsibility for any use of the information contained herein or any loss resulting therefrom.

M:\Departments\Public Works\Engineering\FEMA2016\1104\Parcels Touching SPHWB Structures\20160126.mxd





Big Slough Watershed Boundary (196 square miles)



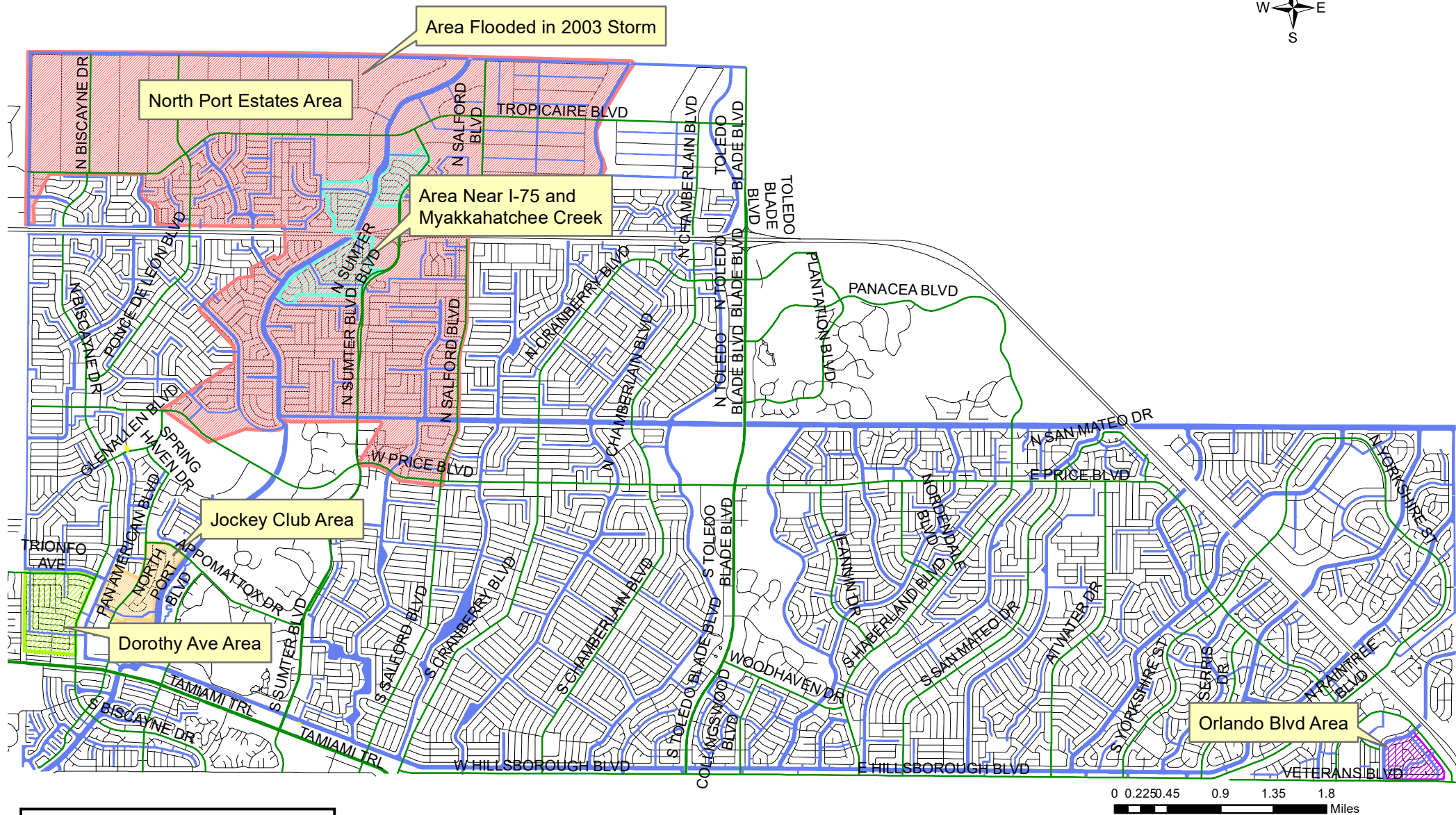
City of North Port Stormwater Structures



Prepared by
Infrastructure Management Division
Public Works
City of North Port

Disclaimer: This map is for reference purposes only and is not to be construed as a legal document. Any reliance on the information contained herein is at the user's risk. The City of North Port and its agents assume no responsibility for any use of the information contained herein or any loss resulting there from.

S:\Data\Analysis\PublicWorks\Road_Drain\Projects\2007\Road_Drain\WaterControlStructures\Road_Drain.mxd



Legend

- Waterways and R-Ditches
- Jockey_Club
- Area Near I-75 and Myakkahatchee Creek
- North Port Estates Area Flooded in Storm 2003
- Orlando Blvd Area
- Dorothy Ave Area

City of North Port Flood Prone Areas

North Port Estates Area -
Flooding due to back up from
Myakkahatchee Creek

Area near
Myakkahatchee
Creek prone to
flooding

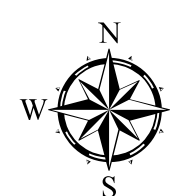
Orlando Area - Flooding due
to back up from new Water
Control Structure in Charlotte
County sized too restrictive

Dorothy Area - Flooding
due to back up from high
tide conditions in tidal R-
Ditch R-69

City of North Port Flooded Areas

Legend

 Flood Water



Day after
Hurricane Irma
Surveyed 9/11/17 am

*Areas are still being assessed for
flood water.

North Port Estates Area -
Flooding due to back up from
Myakkahatchee Creek

Area near
Myakkahatchee
Creek prone to
flooding

Day after Hurricane
Irma Passed North Port
Surveyed 9/11/17 am

Orlando Area - Flooding due
to back up from new Water
Control Structure in Charlotte
County sized too restrictive

City of North Port

Flooded Areas

Legend

Depth

> 1FT

< 1FT

N

E

S

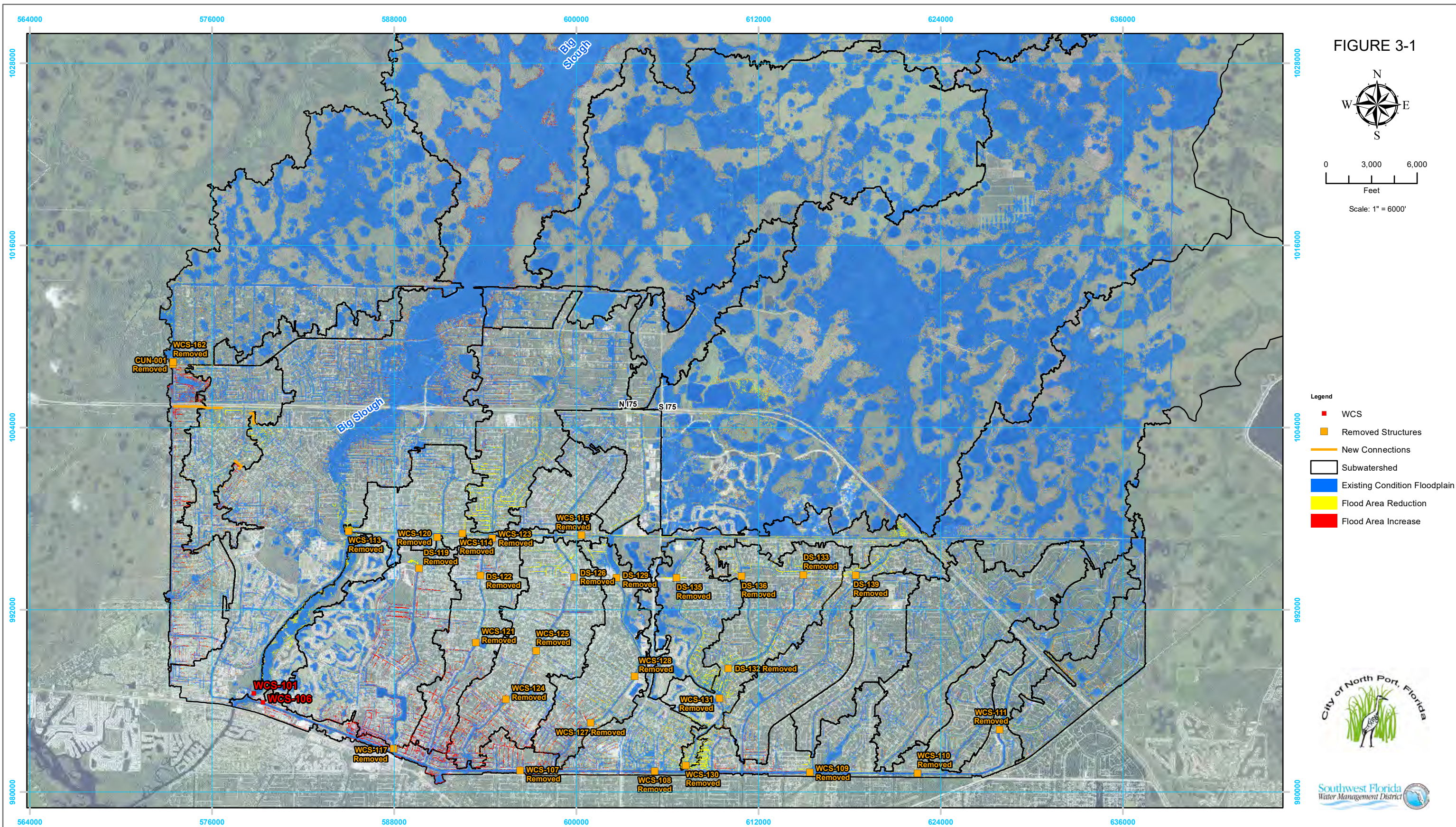
W

4 Days after
Hurricane Irma
Surveyed 9/14/17

*Updates reflect 9-14-17 @ 9:00 am.

*Areas are still being assessed for
flood water.

Exhibit 4-6 Page 2



Project: 03-065	Projection: Florida East West	
Prepared: 10-11-07	Horizontal Datum: NAD83	Vertical Datum: N/A
Prepared by: CGG	Modified by:	Modified:
File: \\03-065\ArcGIS\ArcLayouts\20140909 - Final BMP Figures\BMP1.mxd		

NORTH PORT / BIG SLOUGH WMP

BMP ALTERNATIVE 1 - 1 DAY 100 YEAR EVALUATION

Ardaman & Associates, Inc.
 Geotechnical, Environmental and
 Materials Consultants

Phone: 407-855-3860 Fax: 407-859-8121
 8008 South Orange Avenue
 Orlando, Florida 32809

II. SITUATION

A. Hazard Analysis

The City of North Port has exposure to numerous and diverse types of hazards. This Section will attempt to identify the threat posed by each to assist planners in anticipating future needs. The hazards are listed in the sequence identified by the Florida Division of Emergency Management (FDEM) CEMP Review Criteria.

Table 1: Hazard Analysis

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
High Winds from Tropical Cyclone Events	The City of North Port has only been indirectly affected by a tropical cyclone event. However, The City of North Port (Port Charlotte statistical area) has been exposed to 54 hurricanes/tropical storms since 1871 ¹ . The hurricanes of the 2004 and 2005 seasons had some minimal to moderate impact on the City. The City was included in the Presidential Declarations for Hurricanes Charley, Frances, Ivan, Jeanne (2004) and Wilma (2005); and Tropical Storm Gabrielle (2001). In 2008, the City activated for TS Fay, but quickly demobilized when the storm turned in a southerly direction missing the City. A comparable situation occurred in 2012 with Tropical Storm Isaac.	Injured and/or entrapped persons and the loss of life. Mass traffic congestion and other evacuation-related issues. Temporary and long-term sheltering needs. Private property loss. Damage to City infrastructure. Lost business revenue, with accompanying unemployment and loss of tax revenue. Fire, hazardous materials releases, search and rescue operations related to storm activity. Looting and increased crime due to economic conditions created by long-term recovery. Potential loss of water and/or sewer service.	A Gulf Coast landfall is one of the three most likely Florida hurricane tracks based on planning models. Among the hazards analyzed in this section, hurricane activities pose the greatest threat to the broadest population in North Port.	Frequency	Low to Moderate
				Vulnerability	Low to Moderate
				Exposure	Moderate
				Risk	Moderate

¹ <http://www.hurricanecity.com/city/portcharlotte.htm>.

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
	In September 2017, the City experienced minor disruptions because of Hurricane Irma. Power outages, localized flooding and vegetative debris were among the key impacts.				
Storm Surge from Tropical Cyclone Events (See Figure 1 Hurricane Evacuation Level, which are built from SLOSH models)	The City of North Port has never been affected by storm surge from a tropical cyclone; however, areas adjacent to the tributaries of the Myakka River are subject to tidal influences, which themselves are affected by storm surge.	Injured and/or entrapped persons and the loss of life. Mass traffic congestion and other evacuation-related issues. Temporary and long-term sheltering needs. Private property loss. Damage to City infrastructure. Lost business revenue, with accompanying unemployment and loss of tax revenue. Fire, hazardous materials releases, search and rescue operations related to storm activity. Looting and increased crime due to economic conditions created by long-term recovery. Potential loss of water and/or sewer service.	<p>Since the updated storm surge maps in 2017, all North Port is still in at least one storm surge zone. Areas west of I-75 are most susceptible; and the risk of storm zone increases in proximity to the Myakka River, and to the Gulf of Mexico.</p> <p>The Holiday Park Mobile Home community is in Evacuation Level B.</p> <p>Several City-owned critical infrastructures are also located in the storm surge areas:</p> <p><u>B Zone</u> - Utilities' Water Treatment Plant, Utilities' Wastewater Treatment Plant, Fire Station 82 and Police Department's District 2 substation, Family Service Center, Property Maintenance Yard (fueling station)</p> <p><u>C Zone</u> - Utilities' Hillsborough and Southwest water booster stations.</p> <p><u>D Zone</u> - Municipal Complex (City Hall, Fire Station 81, Police Department and Mullen's Center), Fire Stations 83, 84 and 85, Utilities' central office, Utilities' Northeast water booster station, Public Works Complex (fueling station)</p>	Frequency	Low to Moderate
				Vulnerability	Low to High
				Exposure	Moderate
				Risk	Moderate
Floods (See Figure 2)	At least 750 residences were affected for more than a week in the City due to continued major flooding on the Myakka River and Myakkahatchee Creek from the Spring Flooding Event of 2003.	Possible evacuation of residents. Temporary sheltering and congregate feeding. Evacuation traffic and traffic related to road closures. Property and infrastructure damage. Loss of business revenue. Possible search and rescue operations. Possible shutdown of water treatment facilities. Possible contamination of water systems. Possible waste water system overload.	Seasonal flooding is a re-occurring issue in Florida, most specifically for those areas which are near the Florida coast, adjacent to bays or inlets, or which contain river systems. Per the risk analysis of the Sarasota County Emergency Management, increased development causes an increase in flooding risk due to the interruption of the natural swamp	Frequency	Moderate to High
				Vulnerability	Low to High
				Exposure	Moderate
				Risk	Moderate

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
			<p>and marsh systems ability to mitigate the excess water. The City of North Port fits all the criteria of a flood prone area.</p> <p>The Community Rating System (CRS) is a set of flood mitigation initiatives set forth by the National Flood Insurance Program (NFIP), which allows participating communities to participate in and initiate programs which reduce the flood hazard in the community. For each initiative, there are points that can be awarded, which equate to a Class when enough points are gained by the community. The City of North Port is an active member of the Community Rating System under the National Flood Insurance Program. At this writing, the City of North Port stands at a Class 6 in the Community Rating System under the National Flood Insurance Program. This equates to a 15% saving on flood insurance for policy holders in the Special Flood Hazard Area (SFHA) in both the City and the County.</p>		
Hazardous Material Spills	<p>On February 2, 2004, a gasoline tanker traveling on I-75 exploded over the Myakkahatchee Creek bridge. An unknown amount of gasoline and diesel fuel entered the creek but was contained prior to reaching the main drinking water intake at the Water Treatment Plant.</p> <p>Two nearly identical gasoline tanker accidents occurred in 2016 on I75. Contamination was limited to the local area, however a threat to the City's drinking supply resulted in closure of the Water Treatment Plant and purchase of water from the Peace River system.</p>	<p>Area evacuation and related traffic issues. The possibility of significant numbers of people being injured or becoming ill due to the hazardous materials release. Temporary sheltering of evacuated residents. Adequate equipment and trained personnel for hazardous materials containment and disposal. Adequate disposal facilities. Possible contamination of surface water, and source water for the water treatment plant.</p>	<p>There are few end users of large amounts of industrial or agricultural chemicals and other hazardous materials in North Port. The only fixed facilities using Extremely Hazardous Substances (EHS), as defined by the US Environmental Protection Agency (EPA), are owned and operated by the City of North Port Utilities Department. Other fixed facilities subject to federal reporting have been identified and maintained in Fire Rescue's records' management system. Significant amounts of a wide variety of hazardous materials are transported on I-75. It is considered the leading risk area for hazardous materials incidents in the County. Significant amounts of hazardous materials transit through North Port on US 41.</p> <p>The Sarasota County Fire Department is first responding to hazardous materials incidents in the City of North Port.</p>	Frequency	Low
				Vulnerability	Moderate
				Exposure	Moderate
				Risk	Moderate
Commercial Nuclear Power Plant Incidents	<p>North Port is not within the Emergency Planning Zone or Ingestion Pathway Zone of a</p>	<p>North Port may receive a request to assist in furnishing mutual aid under provisions of the Florida Statewide Mutual Aid Agreement. Should an incident be of such magnitude as to require the evacuation of Tampa Bay,</p>	<p>Evacuees from a mishap at Florida Power Corporation nuclear generating facility at Crystal River, might arrive in Sarasota County seeking shelter.</p>	Frequency	Low
				Vulnerability	Low
				Exposure	Low

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
	nuclear generating facility, thus is not considered at risk.	traffic control could be an issue.		Risk	Low
Civil Disturbance	The City of North Port has no history of civil disturbance.	The vulnerability of businesses on US 41 to looting. The possibility that North Port might be requested to furnish mutual aid.	The City does not face some of the challenges present in other Florida communities where conflict exists between cultural groups. Similarly, Sarasota County has had no recent incident of civil disorder of any significance.	Frequency	Low
				Vulnerability	Low
				Exposure	Low
				Risk	Low
Mass Immigration	<p>There is no evidence that concerns caused by mass immigration has impacted the City of North Port. However, recent events along the Southwest coast of Florida indicate the potential for an event.</p> <p>In July 2007, 30 refugees from Cuba landed on Little Gasparilla Island; June 2007, 33 migrants from Cuba arrived on Sanibel Island; and in December 2006, 25 Cuban refugees landed on Longboat Key.</p>	<p>The City of North Port does not have a coastline for landings. However, if the refugees boated up the Myakka River or Myakkahatchee Creek, the City would be directly impacted.</p> <p>Otherwise, the City may provide mutual aid support to Charlotte and/or Sarasota counties for medical and/or law enforcement assistance.</p>	While mass immigration to Florida from the Caribbean, Central America and South America has increased dramatically since 1980, the City is too far north and inland to directly receive arriving "boat people," and is not a likely settlement site.	Frequency	Low
				Vulnerability	Low
				Exposure	Low
				Risk	Low
Coastal Oil Spill	<p>The City of North Port does not include any portion of the Gulf of Mexico's coast. However, given the tidal influence on the Myakka River, if a spill were to occur in the Gulf, there exists a potential for product to flow up the Myakka River towards the City.</p> <p>The City of North Port was not impacted by the Deepwater Horizon oil spill in 2010 which affected numerous interests to the north of Sarasota County in the Gulf of Mexico.</p>	<p>Economic impact due to temporary loss of recreational activities in Charlotte Harbor. Furnishing mutual aid support to communities on Charlotte Harbor.</p> <p>Regarding proposed drilling off the Gulf coast of Florida, the US Department of the Interior's Minerals Management Service (MMS) states "[f]or the foreseeable future any proposed development operations within 100 miles of the coast of Florida would be only for the development of natural gas fields. Even if a blowout were to occur, no oil would be released. Any pipelines proposed would carry only dry natural gas." They do indicate one potential for a worse case situation would be if the supply vessel carrying diesel oil to the drilling rig lost all its diesel during transfer operations - this could result in a spill of about 1,800 bbl. The MMS can and has required mitigation</p>	Traffic exists along Florida's Gulf Coast which could allow for a mishap to occur. The hazardous materials release could enter parts of Charlotte Harbor, but it is more likely that existing currents would move the release past the Harbor. A hazardous materials release in the Gulf would be responded to by Federal and State authorities. Public Works may receive mutual aid requests or be involved in environmental damage response to properties located on the Charlotte Harbor shoreline, City of Venice or unincorporated Sarasota and/or Charlotte counties.	Frequency	Low
				Vulnerability	Low
				Exposure	Low
				Risk	Low

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
		during past drilling operations to minimize this remote possibility.			
Extreme Temperatures	<p>Freeze conditions in Florida are seasonal and relatively predictable.</p> <p>Florida Severe Freeze 2000 for which Sarasota County was included in the declared counties.</p> <p>The last significant winter storm to occur in Sarasota County was the "no name" storm in March 1993.</p>	<p>Temporary sheltering of lower income persons whose homes may lack adequate heating capability. Increased utility costs to the City of North Port in maintaining City facilities with adequate heating for workers and the public.</p> <p>In 2012, a coalition of services for the homeless began to establish freezing weather shelters at local churches. These facilities open when the National Weather Service posts a freeze watch for our area.</p>	<p>There are few agriculture interests within the City which might suffer economic loss. Some temporary shortages of utility resources might take place. Potable water lines have frozen in past years causing a water service disruption to some houses.</p>	Frequency	Low
				Vulnerability	Low
				Exposure	Low
				Risk	Low
Brush, Wildfires and Forest Fires	<p>Brush or forest fires are generally seasonable during late winter to spring and predictable based on weather conditions.</p> <p>Sarasota County was included in the declared counties for the Florida Extreme Fire Hazard in 1998.</p> <p>The largest wildfire in the City was experienced in May 2017 during which more than 1000 acres with the City's boundaries were burned and an additional 4000 acres just outside the City limits.</p>	<p>Wildland-Urban interface fuel loading is high, as compared to normal. Area evacuation and traffic control. Temporary sheltering of evacuees. Mutual aid support to other impacted communities, or requests for assistance to North Port.</p> <p>See Tables 3 and 4 Seasonal KBDI Values for Florida Forest Service's South Region and Sarasota County as a measure that conditions are favorable for the occurrence and spread of wildfires.</p>	<p>As the population density increases, the probability factor will decrease, but the impact factor will increase. The scattered development within the City, and the lack of land clearance, creates an environment in which many residences are grouped in relatively isolated areas surrounded by forested land. There is a history of arsonist activity in South Sarasota County. The possibility of an accidental fire caused by construction equipment, or controlled burning by contracts is a possibility.</p> <p>The City of North Port Fire Rescue participates in the Firewise program to mitigate the effects of wildfires. Four communities Harbor Isles, La Casa, Riverwalk Mobile Home Village, and Woodland Estates have met the requirements of the program.</p>	Frequency	Moderate to High
				Vulnerability	Moderate to High
				Exposure	Moderate to High
				Risk	Moderate to High
Thunder Storms and Tornadoes	<p>Heavy rains, winds and storm action are common in Florida.</p> <p>On May 24, 2012, an EF-0 tornado affected residences in the Highland Ridge Community of North Port. No injuries were</p>	<p>Possible area evacuation. Road blockage from debris. Temporary sheltering of small numbers of persons whose residences became significantly damaged by the storm or winds. The possible loss of water and/or sewer service.</p>	<p>North Port is not located in an area with a high incident of tornado activity. Tornadoes are common occurrences with thunderstorms. Florida has the second highest record of tornadoes in the United States.</p>	Frequency	Low
				Vulnerability	Low to Moderate
				Exposure	Moderate

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
	<p>reported, but an estimated \$50,000 in damages was recorded.</p> <p>In January 2015, a Myakka State Forest Ranger reported tornado damage to a ranger station and a mobile home trailer at around 3:50 a.m. A subsequent NWS storm survey classified the tornado as an EF-0.</p>		Given the number of mobile homes in the City and adjoining areas, there exists significant exposure should a tornado move through the region.	Risk	Low to Moderate
Drought	<p>Droughts are occurring with frequency in Southwest Florida.</p> <p>The Keetch-Byram drought index typically indicates a severe value during the spring season.</p> <p>The US Drought Monitor indicates the State ranges from Abnormally to Exceptionally Dry, with Sarasota County on the upper scale of drought conditions.</p>	<p>Necessary slow-down in planned city projects due to water restrictions. Assistance to residents on well-water supply systems. Increased responses to wildfire events. Potential damage to residential and commercial structures, and City infrastructure.</p>	<p>Droughts generally impact the most on agricultural-based communities. Water restrictions and enforcement might be required. Droughts have an impact on wildfires.</p> <p>The Florida Forest Service has analyzed weather data over a 35-year period was examined to determine average Keetch-Byram drought index (KBDI) values for each region of Florida on a seasonal basis. These average KBDI values are given in the following table as the "NORMAL" classification. Departures from this average value were related to fire activity to determine the breakpoints for the other classes. (See tables 2 and 3).</p>	Frequency	Moderate to High
				Vulnerability	Moderate to High
				Exposure	Moderate to High
				Risk	Moderate to High
Sinkholes and Subsidence	<p>Sinkholes of a significant magnitude are an infrequent occurrence.</p> <p>Since July of 1981, Sarasota County and the jurisdictions within have recorded seven sinkhole events, all less than ten feet in diameter, and each was centered on a specific property. Of the seven Subsidence Incident Reports in Sarasota County, only one occurred in the last seven years. Reported on July 7, 2013 several small holes were reported after heavy rainfall. The</p>	<p>Property loss. Damage to the infrastructure. Area evacuation, closure, traffic control and security.</p>	<p>Allowing for the vastness of the City limits, the probability of a sinkhole development threatening property is very significant. Sinkhole development could require area security to prevent members of the public from risk.</p>	Frequency	Low
				Vulnerability	Low to Moderate
				Exposure	Low
				Risk	Low

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
	maximum dimensions were 2-8' wide with no property damage.				
Terrorism	There is no specific reason to believe that a terrorist type of occurrence is anticipated.	Potential mass casualties. Public panic. Environmental concerns.	One tactic of terrorists is to target "innocent" person rather than a specific group for which hostility exists. The news media would inundate the City should it be the focal point of an incident. The City does not possess targets of interest to an international terrorist; however, an individual with a hatred of local government, or a disgruntled employee may pose a greater risk to the security of City facilities, staff and visitors.	Frequency	Low
				Vulnerability	Moderate to High
				Exposure	Low
				Risk	Low
Exotic Pests and Diseases	The City of North Port has not had any known reports of such diseases or pests, but the threat exists on a consistent basis.	Infectious disease control. Quarantine for livestock or people. Need for many treatment agents. Disposal of deceased animals.	Exotic threats and diseases are a pervasive threat to the agricultural interests in the City. This biological hazard is associated with any insect, animal, or pathogen that could pose an economic or health threat. The Mediterranean fruit fly and citrus canker are two examples of this threat. There is also a possibility for the importation of pathogens that could have a negative effect on the livestock industry.	Frequency	Low
				Vulnerability	Low
				Exposure	Low
				Risk	Low
Disease and Pandemic Outbreaks	The City of North Port has not had any known reports of such diseases or outbreaks, but the threat exists on a consistent basis. The City of North Port was not significantly impacted by the H1N1 Pandemic in 2009 or the Ebola event of 2014.	Economic loss. Mass casualty/fatality. Infectious disease control. Disproportionate effects on elderly and children. Disposal of diseased livestock/agricultural stock. Need for mass feeding. Mass care. Quarantine of people and/or livestock. Large number of treatment agents	The City is vulnerable to epidemic on a constant basis. Although the threat is minimal, an epidemic is still possible. With tourists coming in from all over the world during the months of October through April, there is an increased vulnerability during this time. The environment is regularly monitored for diseases and pathogens by local and state agencies.	Frequency	Low
				Vulnerability	Moderate
				Exposure	Low
				Risk	Low
Critical Infrastructure Disruption	Utility disruptions are an infrequent event, typically arising from a severe weather event, an accidental cutting through of a transmission line by a contractor or nesting bird. On January 12, 2015 components of an osprey nest contacted high voltage wires which started a fire at the top of an electrical pole on Greenwood Avenue between	Evacuation. Sheltering. Mass feeding. Mass casualty. Large scale contamination. Contamination of water supply. Decontamination. Economic loss. Agricultural loss. Inability of public safety officials to communicate. Civil unrest. Inability to provide critical support functions at medical facilities.	This technological hazard is a consistent threat in the City. This hazard may become present through an accident, sabotage, or terrorism. This hazard includes, but is not limited to, utility disruptions and communications system failures. This hazard can cause other hazardous incidents to occur. These may include, but are not limited to, hazardous material spills, delay of medical operations, and loss of ability to provide power or communications, and loss of ability to provide utility services.	Frequency	Low
				Vulnerability	Moderate
				Exposure	Low
				Risk	Low

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
	Greenway Drive and S. Sumter Boulevard in North Port. The fire caused damage to the feeder lines resulting in a secondary emergency – that of a power outage impacting 3,510 FPL customers including traffic lights at several intersections and the City of North Port municipal complex. Telephone lines to Sarasota County 9-1-1 were overwhelmed and callers were unable to reach the North Port Police dispatch center.				
Special Events	The City of North Port has no history of dignitary visits, cultural events, or a significant impact from spring break.	Public safety resources overwhelmed. Potential for terrorism, mass casualty, civil unrest.	<p>With Special Events, the need for additional logistics and manpower to handle the possibility of large crowds increases significantly. The possibility for acts of terrorism or civil disobedience in these events also increase.</p> <p>The North Port High School's Performing Arts Center is the second largest theater in Sarasota County. With 1,023 seats, it presents unique challenges during an emergency.</p> <p>The City-sponsored July 4th celebration attracts more than 5,000 attendees.</p> <p>A spring training complex for the Atlanta Braves will be situated in the West Villages-section of the City. The stadium will have 6,200 fixed seats and 2,200 berm seating along with suites.</p>	Frequency	Low
				Vulnerability	Low
				Exposure	Low
				Risk	Low
Dam Failure	The Peace River Manasota Regional Water Supply Authority has constructed a 6-billion-gallon reservoir adjacent to their water treatment plant on US 17 in Desoto County. As this is a relatively new facility, there is no history of incidents; however,	Possible evacuation of residents. Temporary sheltering and congregate feeding. Evacuation traffic and traffic related to road closures. Property and infrastructure damage. Loss of business revenue. Possible search and rescue operations. Possible shutdown of water treatment facilities. Possible contamination of water systems. Possible waste water system overload.	Based on the construction of the retention walls and the distance from the reservoir, the effects on the City of North Port may be minimal.	Frequency	Low
				Vulnerability	Low
				Exposure	Low
				Risk	Low

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
	similar type reservoirs have experienced retention wall cracks, but no failures.				
Major Transportation Incidents	Motor vehicle accidents are a frequent occurrence on the roadways in North Port. However, most which are minor in nature, and have minimal impact on the City.	Traffic rerouting issues. Environmental impacts from release of hazardous materials.	In the City of North Port, I-75 extends from mile marker 171 (Charlotte County line) to 185 in an east to west direction. Exits are at mile marker 179 (Toledo Blade Blvd.), and mile marker 182 (Sumter Blvd.). This is a two-lane roadway in each direction, with a posted speed limit of 70 mph. US 41 extends from Cranberry Blvd. (Charlotte County line) to Ortiz Blvd. This is a two-lane roadway, with a posted speed limit of 45 mph. Significant amounts of a wide variety of hazardous materials are transported on I-75. It is considered the leading risk area for hazardous materials incidents in the County. Significant amounts of hazardous materials transit through North Port on US 41.	Frequency	Moderate
				Vulnerability	Moderate
				Exposure	Moderate
				Risk	Low to Moderate

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CRS What-If

Application	CRS Coord.	2ndPOC	Activity Points	Chronology	Comments	What If	GTA
Community:	NORTH PORT, CITY OF			State:	FLORIDA		
County:	SARASOTA COUNTY ▼			CID:	120279		

Current CRS Class = 5

[\[Printable Version\]](#)

		TOTAL	SFHA *	X-STD/AR/A99 **	PRP ***
CRS Class	PIF	2,901	211	66	2,624
	PREMIUM	\$1,122,810	\$116,486	\$34,258	\$972,066
	AVERAGE PREMIUM	\$387	\$552	\$519	\$370
09	Per Policy	\$3	\$37	\$29	\$0
	Per Community	\$9,669	\$7,766	\$1,903	\$0
08	Per Policy	\$6	\$74	\$29	\$0
	Per Community	\$17,435	\$15,531	\$1,903	\$0
07	Per Policy	\$9	\$110	\$29	\$0
	Per Community	\$25,201	\$23,297	\$1,903	\$0
06	Per Policy	\$12	\$147	\$58	\$0
	Per Community	\$34,870	\$31,063	\$3,806	\$0
05	Per Policy	\$15	\$184	\$58	\$0
	Per Community	\$42,635	\$38,829	\$3,806	\$0
04	Per Policy	\$17	\$221	\$58	\$0
	Per Community	\$50,401	\$46,595	\$3,806	\$0
03	Per Policy	\$20	\$258	\$58	\$0
	Per Community	\$58,167	\$54,361	\$3,806	\$0
02	Per Policy	\$23	\$294	\$58	\$0
	Per Community	\$65,933	\$62,126	\$3,806	\$0
01	Per Policy	\$25	\$331	\$58	\$0
	Per Community	\$73,698	\$69,892	\$3,806	\$0

* SHFA (Zones A, AE, A1-A30, V, V1-V30, AO, and AH): Discount varies depending on class.

** SFHA (Zones A99, AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO): 10% discount for Classes 1-6; 5% discount for Classes 7-9.

*** Preferred Risk Policies are not eligible for CRS Premium Discounts.

Insurance Occupancy**As of 09/02/2020**

Community:	NORTH PORT, CITY OF	State:	FLORIDA
County:	SARASOTA COUNTY	CID:	120279

Overview	Occupancy	Zone	Pre/Post FIRM			
	Policies in Force	Premium	Insurance in Force	Number of Closed Paid Losses	\$ of Closed Paid Losses	Adjustment Expense
Single Family	2,826	\$1,077,149	\$866,308,900	87	\$992,284.74	\$46,011.85
2-4 Family	45	\$16,837	\$11,580,000	0	\$0.00	\$0.00
All Other Residential	17	\$5,414	\$4,638,000	1	\$0.00	\$95.00
Non Residential	13	\$23,410	\$5,225,000	0	\$0.00	\$0.00
Total	2,901	\$1,122,810	\$887,751,900	88	\$992,284.74	\$46,106.85

	Policies in Force	Premium	Insurance in Force	Number of Closed Paid Losses	\$ of Closed Paid Losses	Adjustment Expense
Condo	40	\$13,488	\$7,435,000	1	\$0.00	\$95.00
Non Condo	2,861	\$1,109,322	\$880,316,900	87	\$992,284.74	\$46,011.85
Total	2,901	\$1,122,810	\$887,751,900	88	\$992,284.74	\$46,106.85

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Insurance Zone**As of 09/02/2020**

Community:	NORTH PORT, CITY OF	State:	FLORIDA
County:	SARASOTA COUNTY	CID:	120279

Overview	Occupancy	Zone	Pre/Post FIRM			
	Policies in Force	Premium	Insurance in Force	Number of Closed Paid Losses	\$ of Closed Paid Losses	Adjustment Expense
A01-30 & AE Zones	165	\$99,720	\$39,746,400	24	\$88,191.55	\$6,860.00
A Zones	1	\$531	\$350,000	0	\$0.00	\$0.00
AO Zones	5	\$4,652	\$992,300	4	\$3,881.50	\$1,915.00
AH Zones	0	\$0	\$0	0	\$0.00	\$0.00
AR Zones	0	\$0	\$0	0	\$0.00	\$0.00
A99 Zones	0	\$0	\$0	0	\$0.00	\$0.00
V01-30 & VE Zones	0	\$0	\$0	0	\$0.00	\$0.00
V Zones	0	\$0	\$0	0	\$0.00	\$0.00
D Zones	0	\$0	\$0	0	\$0.00	\$0.00
B, C & X Zone						
Standard	66	\$34,258	\$17,198,800	7	\$31,883.44	\$2,175.00
Preferred	2,624	\$972,066	\$818,600,000	25	\$147,952.69	\$12,365.00
Total	2,861	\$1,111,227	\$876,887,500	60	\$271,909.18	\$23,315.00

Insurance Pre/Post FIRM**As of 09/02/2020**

Community:	NORTH PORT, CITY OF	State:	FLORIDA
County:	SARASOTA COUNTY	CID:	120279

Overview	Occupancy	Zone	Pre/Post FIRM
-----------------	------------------	-------------	----------------------

Pre-FIRM

	Policies in Force	Premium	Insurance in Force	Number of Closed Paid Losses	\$ of Closed Paid Losses	Adjustment Expense
A01-30 & AE Zones	61	\$56,393	\$12,354,600	23	\$88,191.55	\$6,735.00
A Zones	0	\$0	\$0	0	\$0.00	\$0.00
AO Zones	1	\$1,042	\$350,000	0	\$0.00	\$0.00
AH Zones	0	\$0	\$0	0	\$0.00	\$0.00
AR Zones	0	\$0	\$0	0	\$0.00	\$0.00
A99 Zones	0	\$0	\$0	0	\$0.00	\$0.00
V01-30 & VE Zones	0	\$0	\$0	0	\$0.00	\$0.00
V Zones	0	\$0	\$0	0	\$0.00	\$0.00
D Zones	0	\$0	\$0	0	\$0.00	\$0.00
B, C & X Zone	236	\$86,083	\$60,221,000	19	\$39,660.41	\$4,965.00
Standard	32	\$15,268	\$8,292,000	7	\$31,883.44	\$2,175.00
Preferred	204	\$70,815	\$51,929,000	12	\$7,776.97	\$2,790.00
Grand Total	298	\$143,518	\$72,925,600	42	\$127,851.96	\$11,700.00

Post-FIRM

	Policies in Force	Premium	Insurance in Force	Number of Closed Paid Losses	\$ of Closed Paid Losses	Adjustment Expense
A01-30 & AE Zones	104	\$43,327	\$27,391,800	1	\$0.00	\$125.00

A Zones	1	\$531	\$350,000	0	\$0.00	\$0.00
AO Zones	4	\$3,610	\$642,300	4	\$3,881.50	\$1,915.00
AH Zones	0	\$0	\$0	0	\$0.00	\$0.00
AR Zones	0	\$0	\$0	0	\$0.00	\$0.00
A99 Zones	0	\$0	\$0	0	\$0.00	\$0.00
V01-30 & VE Zones	0	\$0	\$0	0	\$0.00	\$0.00
V Zones	0	\$0	\$0	0	\$0.00	\$0.00
D Zones	0	\$0	\$0	0	\$0.00	\$0.00
B, C & X Zone	2,454	\$920,241	\$775,577,800	13	\$140,175.72	\$9,575.00
Standard	34	\$18,990	\$8,906,800	0	\$0.00	\$0.00
Preferred	2,420	\$901,251	\$766,671,000	13	\$140,175.72	\$9,575.00
Grand Total	2,563	\$967,709	\$803,961,900	18	\$144,057.22	\$11,615.00

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Insurance Overview

As of 09/02/2020

Community:		NORTH PORT, CITY OF		State:		FLORIDA	
County:		SARASOTA COUNTY		CID:		120279	
Overview		Occupancy		Zone		Pre/Post FIRM	
Total by Community				Group Flood Insurance			
Total Number of Policies:				2,901			
Total Premiums:				\$1,122,810			
Insurance in Force:				\$887,751,900			
Total Number of Closed Paid Losses:				88			
\$ of Closed Paid Losses:				\$992,285			
Post Firm Minus Rated Policies				Manufactured Homes			
Total Number of Minus Rated Policies:				0			
A Zone Minus Rated Policies:				0			
V Zone Minus Rated Policies:				0			
ICC				1316			
Total Number of ICC Closed Paid Losses:				0			
\$ of ICC Closed Paid Losses:				\$0			
Substantial Damage Losses							
Number of Substantial Damage Closed Paid Losses:				7			

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Community Overview

Community:	NORTH PORT, CITY OF		State:	FLORIDA
County:	SARASOTA COUNTY		CID:	120279

Program:	Regular	Emergency Entry:	08/27/1974	Regular Entry:	09/02/1981
Status:	PARTICIPATING			Status Effective:	09/02/1981
Current Map:	11/04/2016	Study Underway:	NO	Level of Regs:	D
FIRM Status:	ORIGINAL			Initial FIRM:	09/02/1981
FHBM Status:	SUPERCEDED BY FIRM			Initial FHBM:	06/10/1977
Probation Status:					
Probation Effective:		Probation Ended:			
Suspension Effective:		Reinstated Effective:			
Withdrawal Effective:		Reinstated Effective:			

CRS Class / Discount:	05 / 25%	Policies in Force:	2,901
Effective Date:	05/01/2020	Insurance in Force:	\$887,751,900.00
CAV Date:	12/13/2018	No. of Paid Losses:	88
Workshop Date:	03/04/2020	Total Losses Paid:	\$992,284.74
CAV Date:	11/07/2017	Sub. Damage Claims Since 1978:	7
GTA Date:	07/20/2020		
Community Website: http://www.cityofnorthport.com			
<input type="checkbox"/> Tribal <input type="checkbox"/> Upton Jones Claims <input type="checkbox"/> ICC Claims		<input type="checkbox"/> HMGP Projects <input type="checkbox"/> FMA Projects	

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Table 10: Vulnerabilities by Population and Property Loss

Residential Non-Residential / Population / Valuation Information in Storm Evacuation Zones and FEMA Hazardous Zones

Evacuation Zones	Non-Residential	Residential		Total Units		Total Potential Property Value Loss	Residential Population (Units *2.65)
	Units	Potential Property Value Loss	Units	Potential Property Value Loss			
A	4	\$2,800,300	289	\$47,415,800	293	\$50,216,100	766
B	209	\$245,514,000	4,394	\$364,506,800	4,603	\$610,020,800	11,644
C	11	\$12,962,000	8,777	\$1,277,681,000	8,788	\$1,290,643,000	23,259
D	95	\$269,482,000	12,693	\$1,948,933,600	12,788	\$2,218,415,600	33,636
E	137	\$74,981,300	2,629	\$482,517,900	2,766	\$557,499,200	6,967
Grand Total	456	\$605,739,600	28,782	\$4,121,055,100	29,238	\$4,726,794,700	76,272

FEMA Zone	Non-Residential	Residential		Total Units		Total Potential Property Value Loss	Residential Population (Units *2.65)
	Units	Potential Property Value Loss	Units	Potential Property Value Loss			
FEMA AE Zone	92	\$384,014,800	6,122	\$968,199,400	6,214	\$1,352,214,200	16,223

Notes:

Known units not currently on 2017 taxroll is estimated values and included in unit counts.

Residential Units include individual Condo Units.

Residential Units only count one per apartment complex.

Total Value Loss includes total value of apartment complex.

Non-Residential includes individual Business Condo Units.

Centers under one ownership is counted as one unit and includes total value complex.

All data is based on GIS Data (August 2017): Surge Zones, FEMA A / AE Zone, Sarasota County Property Appraiser Parcels and Attribute tables.

The 2.65 multiplier is the average household size.

The valuation is from the JUST value from the Property Appraisers Office data (2017 Tax Role).

D. Economic Characteristics**1. Economic Profile**

- a. Employment by Major Sector. Most residents are employed in the service sector or government – 32% are retired.
- b. Unemployment Rate. Per the US Bureau of Labor Statistics, the unemployment rate for the North Port-Bradenton-Sarasota Metropolitan Statistical Area (MSA) in the spring of 2018 was 3.6%.
- c. Average Property Value. \$192,800
- d. Median Income. \$49,465

Exhibit 8-1

2020 Water Control Structures Inspection

Metal, Gates, Pipes and Risers: 1 = No Corrosion, 2 = Surface Rust, 3 = Some Rot, 4 = Major Corrosion

Overall: 1 = Good, 2 = Fair, 3 = Poor, 4 = Bac

Concrete: 1 = Good, 2 = Few chips/cracks, 3 = Some Spalling, 4 = Major Chips/Cracks Deterioration

Bank Condition: 1 = Good, 2 = Fair, 3 = Poor, 4 = Bac

Structure Location: Replaced or Rehabilitated = 0, Structure located in undeveloped areas (1), east of Toledo Blade (2), west of Toledo Blade (3), developed areas Snover & Cocoplum (4)

Structure #	Waterway	Date	Metal			Gates				Pipes	Risers	Concrete		Bank Condition	Overall	Structure Location	Replacement Priority Score	Other Observations	Previous Repairs Completed
			Sheet Piling	I - Beams	Cat walk	# of Gates	Gate	Hardware	Operational (yes, no, list#)			Columns	Cap						
WCS 108	Cocoplum	3/18/20	4	3	1	6	1.5	1.5	No			4		2.5	4	4	14	Holes in sheet pile, concrete pillars bad shape, gates do not open all of the way. Needs replacement.	4/2011 - Replaced 3 Gates Nos. 1, 2 and 5 9/7/12 - Replace corroded horizontal I-beams and corroded sections of vertical I-beams, and repair holes in sheet metal pile. 12/17/15 - Replaced 3 more Gates (including the existing electric gate). Use an existing actuator (from the old WCS 101). Needed two new left hand threaded rods, fabricate 3 new gates #3, 4, and 6 and tracks, minor concrete and sheet pile repair. 1/30/19 PO #047665 - Fixed catwalk gate rusted through in one location.
WCS 113	Snover	3/16/20	3	2	2	4	2	2	Yes			4		2.5	3	4	12	Hole in sheet pile by I beam on walkway, top of sheet pile is rotted out, needs more rip rap, rebar is showing in concrete pillar 3.	7/28/14 - Repaired erosion below existing concrete slab on the northwest side of WCS No. 113 by injecting flowable fill (cementitious grout) to fill all voids
WCS 114	Snover	3/16/20	2	2	2	4	2	2	Yes			4		2	3	4	10.5	Holes in catwalk I beam, concrete columns chipped.	5/12 - Replaced all 4 gates with new steel gates epoxy coated, replace all gate supports, gate slide frameworks, both horizontal I-beams and replaced corroded section of vertical I-beams, rebuilt corroded sections of all 4 lift rods 9/30/15 - Troubleshoot why gates nos. 1 and 2 not opening easily, replace corroded or bent sections of lift rods as needed; if needed, remove and replace 1 gear box with existing gear box at the public works facility; remove corroded first 14 feet long sections of two-strand horizontal and vertical catwalk railing(both sides of railing) and weld on new galvanized steel two-strand horizontal and vertical railing and paint. 12/2016 - Repaired damage to gate, tracks and gear 1/30/19 Fixed PO #047665 - Fixed hole in S. side sheet piling. Repaired Gate #2 as it does not close all the way down, need to physically hammer gate down
FW 157	Snover	3/24/20	4	4									4	2	4	2	8	Needs to be dug out and replaced.	
FW 158	Snover	3/25/20	1	1									1.5	2	4	2	8	Washout high side, concrete separated from sheet pile.	
WCS 121	MacCaughey	3/16/20	2	4	2	4	3	3	1&4 Yes 2&3 No			3	2	2	2.5	3	7.5	Washout on low side, I beams rotted out on low side, concrete slab is chipped, support bars rotted at water level.	
WCS 128	Creighton	3/17/20	2.5	1.5	1	2	3	2	Gate 1 No Gate 2 yes			2		1	2	3	6	Hole in gate 1, chips in concrete, hole in sheet pile by support bar.	9/14/12 - Replace corroded horizontal cap and corroded sections of vertical I-beams
WCS 127	Creighton	3/17/20	2.5	1	2	2	2	2	Yes			2		2	2	3	6	Washouts on low side, concrete pillars chipped and cracked, some hardware rusted.	1/30/19 PO#047665 - Repaired hole in Vertical beams and repaired hole in sheet piling by support bar

2020 Water Control Structures Inspection

Metal, Gates, Pipes and Risers: 1 = No Corrosion, 2 = Surface Rust, 3 = Some Rot, 4 = Major Corrosion

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Bank Condition: 1 = Good, 2 = Fair, 3 = Poor, 4 = Bad

Structure Location: Replaced or Rehabilitated = 0, Structure located in undeveloped areas (1), east of Toledo Blade (2), west of Toledo Blade (3), developed areas Snover & Cocoplum (4)

Structure #	Waterway	Date	Metal			Gates				Pipes	Risers	Concrete		Bank Condition	Overall	Structure Location	Replacement Priority Score	Other Observations	Previous Repairs Completed
			Sheet Piling	I - Beams	Cat walk	# of Gates	Gate	Hardware	Operational (yes, no, list#)			Columns	Cap						
WCS 124	Lagoon	3/16/20	2	2	3	4	2	2	1 No 2,3,4 Yes			3		2	2	3	6	Washout on low side, walkway I beam rotting out, gate 1 needs track and door.	6/13/12 - Remove gate sill bottoms as these are corroded and prevent gate from closing and replace angles welded to gate bottoms 11/6/15 - Replace track guide systems for 3 gates and change anchors in track guide systems; clean and lubricate all 3 lift rods for gates; for all 3 tie rods, weld new equivalent 3 ft sections; replace 3 ft corroded sections of weir vertical I-beams at both side banks and encase new sections of I-beam in concrete; repair hole in sheet piling, install 3 new gates. 1/30/19 PO #047665 - Repaired holes in east side sheet piling and repaired vertical I-Beam. Retrofit surplus actuator in place of non-working actuator
WCS 118	Blueridge	3/16/20	2	4	2	2	2	2	Yes			2		1	2	3	6	Both I beams rotted out, gate 1 needs door and track.	9/12/13 - Replace corroded sections of horizontal and vertical railing 6/4/18 - Replaced I Beam, inspect gear box, clean rod, maintain tracks, maintain gate 1/30/19 PO #047588 - Replaced both horizontal I-beam webs that had holes. Repaired tracks for Gate #2 as it does not close all the way down. Maintained gear box and rod.
WCS 117	Blueridge	3/16/20	2	3	2	2	2	2	Yes			2		1	2	3	6	Missing 2 nuts on track.	
WCS 138	New Castle	3/19/20	3	1.5	1	2	1.5	1.5	Yes			2.5		1.5	3	2	6	Sheet pile rotted out all along top, concrete slab broken from washout, support bars are bent.	8/07 - Replace gates and corroded members. Washout by walkway fixed
WCS 110	Cocoplum	3/20/20	3	3	1	6	2.5	2.5	Yes			1.5		2	3	2	6	Hole in sheet pile.	1/30/19 PO #047665 Fixed top bars in gate frames very corroded, one hole behind I-beam
FW 160	Snover	3/25/20	2	1									4	2	3	2	6	Concrete separated from sheet pile, cement cracked.	
FW 155	Snover	3/24/20	2	4									2	2	3	2	6	Cracks in concrete, concrete slab broken, I beam rusted and rotted, needs to be cleared of vegetation	
FW 159	Snover	3/25/20	1	2									2	1	3	2	6	Washout, concreted separated from sheet pile.	

2020 Water Control Structures Inspection

Metal, Gates, Pipes and Risers: 1 = No Corrosion, 2 = Surface Rust, 3 = Some Rot, 4 = Major Corrosion

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Bank Condition: 1 = Good, 2 = Fair, 3 = Poor, 4 = Bad

Structure Location: Replaced or Rehabilitated = 0, Structure located in undeveloped areas (1), east of Toledo Blade (2), west of Toledo Blade (3), developed areas Snover & Cocoplum (4)

Structure #	Waterway	Date	Metal			Gates				Pipes	Risers	Concrete		Bank Condi- tion	Overall	Struct- ure Locati- on	Replace- ment Priority Score	Other Observations	Previous Repairs Completed
			Sheet Pilings	I - Beams	Cat walk	# of Gates	Gate	Hard- ware	Operational (yes, no, list#)			Columns	Cap						
WCS 130	Bass Point	3/19/20	3	1.5	1	2	2	2	Yes			2		4	2.5	2	5	Washout on low side	8/07 - Replaced gates and corroded horizontal channels. 6/4/18 - Replaced I-Beam, inspect gear box, clean rod, maintain tracks, maintain gate 1/30/19 PO #047588 - Replaced I-beam webs that had holes. Repaired tracks. Maintained gear box and rod.
WCS 131	Bass Point	3/19/20	2.5	1	1	2	4	4	1 No 2 Yes			3		1	2.5	2	5	Ok besides gate 2 not working.	9/25/13 Replaced corroded horizontal support beams and corroded sections of tie rods and vertical I-beams on both west and east sides of the structure, patched a small leak in the sheet metal piling and welded new boxes for both gate stems. 8/07 - Weld boxes on gate stems on each gate.
WCS 137	New Castle	3/19/20	2.5	1	1	2	1	1	Yes			2		2	2.5	2	5	All good	8/07 - Replace gates and corroded members. 6/4/18 - Replace I Beam, Inspect Rod, clean and repair any bad threads, Gear box- open, replace any bad bearings, check key ways in gear drives. Check brass lifting bushing. Tracks, replace spacer bars as needed or tracks as needed. Adjust, clean and inspect door for proper operation. 1/30/19 PO #047588 - Replaced both horizontal I-beams which have rotted off.
WCS 111	Cocoplum	3/26/20	2.5	2	1	4	2	2	Yes			1.5		4	2.5	2	5		9/12/12 - Replaced corroded horizontal I-beam and corroded sections of vertical support for "cat walk" 1/30/19 PO #047665 - Fixed top bars in gate frames that was corroded
FW 122	MacCaughey	3/17/20	2										1	1	1.5	3	4.5	Cracked concrete	1/30/19 - Fixed W. downstream bank minor erosion.
FW 506	Crestwood	3/20/20	2							1			1	2	1.5	3	4.5	All good	
FW 507	Flamingo	3/20/20	2							2			1	1	1.5	3	4.5	All good	
FW 123	MacCaughey	3/17/20	1.5										1	1.5	1.5	3	4.5	Broke off concrete due to washout.	
FW 120	Blueridge	3/17/20	1.5	1.5										1.5	1.5	3	4.5	2 washouts 1 each high and low side, no concrete cap, sheet pile rusted, I beam rotted.	

2020 Water Control Structures Inspection

Metal, Gates, Pipes and Risers: 1 = No Corrosion, 2 = Surface Rust, 3 = Some Rot, 4 = Major Corrosion Overall: 1 = Good, 2 = Fair, 3 = Poor, 4 = Bad

Concrete: 1 = Good, 2 = Few chips/cracks, 3 = Some Spalling, 4 = Major Chips/Cracks Deterioration Bank Condition: 1 = Good, 2 = Fair, 3 = Poor, 4 = Bad

Structure Location: Replaced or Rehabilitated = 0, Structure located in undeveloped areas (1), east of Toledo Blade (2), west of Toledo Blade (3), developed areas Snover & Cocoplum (4)

Structure #	Waterway	Date	Metal			Gates				Pipes	Risers	Concrete		Bank Condition	Overall	Structure Location	Replacement Priority Score	Other Observations	Previous Repairs Completed
			Sheet Piling	I-Beams	Catwalk	# of Gates	Gate	Hardware	Operational (yes, no, list#)			Columns	Cap						
DS 119	Blueridge	3/25/20								1	1.5	1.5	1.5	1	1.5	3	4.5	Pipe downstream rotted.	1/30/19 - Fixed sidewalk washing out.
DS 126	Lagoon	3/17/20								1	1	1	1	2	1.5	3	4.5	Guardrail damaged, starting to washout.	1/30/19 - Fixed erosion of rip rap bank near guardrail
WCS 106	Cocoplum		1	1	1	8	1	1				1	1	1	1	4	4		Replacement under construction April 2019 to May 2020
FW 154	Snover	3/24/20	2	4									2	2	2	2	4	Cracks in concrete, I beam rotted out, needs to be cleared of vegetation.	
FW 161	Snover	3/25/20	1	1									3	1	2	2	4	Concrete separated from sheet pile, cement cracked.	4-16-19 - Dead cabbage palm removed
DS 508	Auburn	3/18/20								1		1	1	1	2	2	4	Needs new grate	4/5/19 Uretek chemical foam grout seal used to repair wash out under fabricform and hole near roadway guardrail
GDS 116	Snover	3/25/20			2	1	4	4	No	4	4			4	4	1	4	Need replaced, gate rotted, holes in pipe.	
GDS 141	Bethlehem	3/23/20			1	1	1	4	No	4	4			1	4	1	4	Holes in pipe, grate in the mud.	
GDS 142	Littlefield	3/23/20			1	1	4	4	No	4	4			4	4	1	4	Needs replaced, walkway good.	1/30/19 - Removed massive amount of dead willows and debris clogging structure. Repaired bank erosion. Remove toy car in upstream
GDS 143	Newman	3/25/20			2	1	1	2	Yes	4	4			1	4	1	4	Holes in pipes, handrail corroded, washout on bank.	
WCS 125	Lagoon	3/16/20	2	2	3	4	2	2	1&4 Yes 2&3 No			2		3	1	3	3	Washout on low side, I beam on walkway rusted out.	6/13/12 - Remove gate sill bottoms as these are corroded and prevent gate from closing and replace angles welded to gate bottoms
FW 129	Creighton	3/18/20	1							3.5		1	1	1	1	3	3	Pipes corroded and sheet pile rusted	1/30/19 Fixed - Remove fabric and debris over downstream pipes
WCS 162	R - 36	3/16/20	1		1	1	1	1	Yes	1		1	1	2	1	3	3	Washout far side of structure and beside pipe	6/4/15 Repaired erosion below existing concrete slab on the northwest side of WCS No. 113 by injecting flowable fill (cementitious grout) to fill all voids 1/20/10 - Removed willows in R 36 and fixed rip
FW 136	Blue Waters	3/18/20	1.5							2		1	1	1	1.5	2	3	Downstream pipes corroded, need to be replaced.	
WCS 140	Bethlehem	3/23/20	3.5	1	1	2	1	1	Yes			1.5		1	3	1	3	Hole in sheet pile, washout on low side.	12/2017 - Repair one horizontal I beam, Repair one Vertical I beam, Replace gate #1, Replace gate #2 1/30/19 - Fixed Horizontal I-beam that has fallen

2020 Water Control Structures Inspection

Metal, Gates, Pipes and Risers: 1 = No Corrosion, 2 = Surface Rust, 3 = Some Rot, 4 = Major Corrosion

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Structure #	Waterway	Date	Metal			Gates				Pipes	Risers	Concrete		Bank Condi- tion	Overall	Struct- ure Locati- on	Replace- ment Priority Score	Other Observations	Previous Repairs Completed
			Sheet Pilings	I - Beams	Cat walk	# of Gates	Gate	Hard- ware	Operational (yes, no, list#)			Columns	Cap						
FW 151	Snover	3/24/20	1	1									1	1	1	2	2	Minor crack in concrete upstream	
FW 152	Snover	3/24/20	1	1									1	1	1	2	2	Crack in concrete, concrete separating from sheet pile, needs to be cleared of heavy vegetation and trees.	
FW 153	Snover	3/24/20	1	1									1	1	1	2	2	Concrete separated for sheet piling, sheet pile rusted in the middle of structure, needs to be cleared of vegetation.	
FW 156	Snover	3/24/20	1	1									1	1	1	2	2	Cracks in concrete, 1 beam rotted out, needs to be cleared of vegetation.	
DS 510	Courtland	3/18/20								1		1	1	1	1	2	2	All good	1/30/19 - Small "island" downstream in Charlotte County removed.
GDS 512	Pellam	3/18/20			1	2	1	1	Yes			1		2	1	2	2	All good	
FW 180	Lion Heart	3/20/20	2							1.5		1	1	2	1.5	1	1.5	Sheet pile rusted, pipes are good, island on Charlotte County side.	
FW 181	Sunset	3/20/20	2							1		1	1	1	1.5	1	1.5	Island on Charlotte County side.	
FW 183	Morning Star	3/20/20	1.5							2.5			1	1	1.5	1	1.5	Pinhole in sheet pile	
FW 182	Dorchester	3/20/20	1.5							1		1	1	1.5	1	1	1	Sheet pile rusting	
FW 185	Elkcam	3/24/20	1							1			1	1	1	1	1	All good	
FW 186	Fordham	3/25/20	1							1			1	1	1	1	1	All good	
WCS 101	Myakkahatchee	3/16/20	1	1	1	6	1	1	Yes			1	1	1	1	0	0	Hydraulic leak on gate 2	5/9/14 - Completed replacement of existing structure with new structure, two additional gates for a total of 6 gates, gate automation and telemetry
WCS 107	Cocoplum	3/17/20	1	1	1	6	1	1	Yes			1	1	1	1	0	0	All good	Jan 2011 - Retrofitted with concrete weir wall, 6 new stainless steel gates, concrete spillway and large revetment.
WCS 109	Cocoplum	3/18/20	1	1	1	6	1	1	Yes			1	1	1	1	0	0	All good	12/17/2015

2020 Water Control Structures Inspection

Metal, Gates, Pipes and Risers: 1 = No Corrosion, 2 = Surface Rust, 3 = Some Rot, 4 = Major Corrosion Overall: 1 = Good, 2 = Fair, 3 = Poor, 4 = Bac
Concrete: 1 = Good, 2 = Few chips/cracks, 3 = Some Spalling, 4 = Major Chips/Cracks Deterioration Bank Condition: 1 = Good, 2 = Fair, 3 = Poor, 4 = Bac
Structure Location: Replaced or Rehabilitated = 0, Structure located in undeveloped areas (1), east of Toledo Blade (2), west of Toledo Blade (3), developed areas Snover & Cocoplum (4)

Structure #	Waterway	Date	Metal			Gates				Pipes	Risers	Concrete		Bank Condition	Overall	Structure Location	Replacement Priority Score	Other Observations	Previous Repairs Completed
			Sheet Piling	I - Beams	Cat walk	# of Gates	Gate	Hard ware	Operational (yes, no, list#)			Columns	Cap						
WCS 115	Snover	3/16/20	1	1	1	4	1	1	Yes			1	1	1	1	0	0	Missing Light.	8/31/18 - Completed replacement of existing structure with new structure, 4 automated gates with remote telemetry control
FW 132	Bass Point	3/19/20	1							1		1	1	1	1	0	0	All good	5/2011 - Severely corroded corrugated metal pipes CMP, erosion and undermining of side banks. Replace with open concrete weir and RCP culvert pipes.
FW 133	Bass Point	3/19/20	1							1		1	1	1	1	0	0	All good	11/2014 - Severely corroded corrugated metal pipes CMP, erosion and undermining of side banks. Replace with open concrete weir and RCP culvert pipes.
FW 135	Twin Lakes	3/17/20	1							1			1	1	1	0	0	All good	8/2009 Replaced concrete drop structure with concrete open weir replaced as part of the Toledo Blade widening project
FW 139	New Castle	3/19/20	1							1			1	1	1	0	0	Washout by structure, pipe separated from other pipe.	4/2012 Severely corroded corrugated metal pipes CMP, erosion and undermining of side banks. Replaced with open concrete weir and RCP culvert pipes.
DS 503	Apollo	3/17/20								2		1	1	1	1	0	0	All good	9/2009 Corroded Triple 72" Diameter CMP drop pipes structure and culvert replacement with concrete box structure with fiberglass skimmer and triple 72" concrete RCP and headwall.
DS 504	Jupiter	3/17/20								2		1	1	1	1	0	0	Skimmer down, needs to be placed back up.	8/2009 Corroded Triple 72" Diameter CMP drop pipes structure and culvert replacement with concrete box structure with fiberglass skimmer
DS 501	Cheshire	3/17/20								1					1	0	0	All good	7/2009 Rebuilt covered concrete structure and replaced corroded 60" diameter CMP pipe with 60" RCP.

GDS 112	Cocoplum	3/25/20			none	none	none	none	No	none	none			4	4	1		No catwalk, no gate.	Drop structure with 1 gate destroyed in storm in 9/13/16 and removed in 2017. Only horizontal culvert pipes left in place. Will need perform hydraulic modeling and obtain approval from SWFWMD not to replace structure.
CRE 5.09		3/18/20	None							1		1	1	1	4	2		2 box Culverts with deteriorated weir connecting Cocoplum with Charlotte County Crestville Waterway. No work	Was weir replacement done? Not fixed.

Structure priority for replacement is based on the following in order with the largest score:

- Column R - Replacement Priority Score
- Column Q - Structure Location
- Column D - Sheet Piling condition
- Column M - Concrete Column condition
- Column N - Concrete Cap condition
- Column E - I-Beams condition
- Column A - Structure No.

Water Control Structures (WCS) Completely Rehabilitated or Replaced
As of 11/30/20

Item	Water Control Structures	Waterway	Location	Rehab Issues	Project Start Date	Engineering / Permitting/Other non-Construction Costs	Actual Construction Costs Includes Contingency Spent	Total Final Design and Construction Cost Spent	Engineering Consultant / P.E.	Contractor / Supervisor	Project Status	City Project Manager	Comments
1	WCS 109	Cocoplum	East of San Mateo	Severe metal sheet piling corrosions, gates, two gates will not open. Retrofit with concrete weir wall and 6 new stainless steel gates and concrete spillway and large revetment.	Started Design in 2007	\$49,594.36	\$311,650.00	\$361,244.36	KHA / Nathan Lee Seth Schmid	Keesling Construction Inc. / Klint Keesling	Completed Sept 2009	Elizabeth Wong	
2	DS 501	Cheshire	Chancellor Between Sumter and North Port Blvd	Rebuilt covered concrete structure and replaced corroded 60" diameter CMP pipe with 60" RCP.	Started Design in 2006	\$16,622.67	\$77,488.37	\$94,111.04	DRMP / Scott Garth	Southwest Utilities Systems Inc / Rick Mauch	Completed July 2009	Elizabeth Wong	Charlotte County and City of North Port split cost 50/50. John elias is Charlotte County Project manager
3	DS 504	Jupiter	Chancellor Just east of Salford	Corroded Triple 72" Diameter CMP drop pipes structure and culvert replacement with concrete box structure with fiberglass skimmer and triple 72" concrete RCP and headwall.	Started Design in 2006	\$16,622.67	\$203,833.09	\$220,455.76	DRMP / Scott Garth	Armadillo / Keith Richmond	Completed August 2009	Elizabeth Wong	
4	DS 503	Apollo	Chancellor Just east of Sumter	Corroded Triple 72" Diameter CMP drop pipes structure and culvert replacement with concrete box structure with fiberglass skimmer and triple 72" concrete RCP and headwall.	Started Design in 2006	\$16,622.67	\$193,938.85	\$210,561.52	DRMP / Scott Garth	Dave Foote Environmental / George Foote	Completed Sept 2009	Elizabeth Wong	
5	WCS 135	Twin Lakes	Price East of Toledo Blade	Replace concrete drop structure with concrete open weir replaced as part of the Toledo Blade widening project	2009	Included in umbrella project of Toledo Blade Widening	\$134,860.00	\$134,860.00	Wilson Miller Prime	Apac is prime, Lovin Construction built structure	Completed August 2009	Ben Newman	Design Cost unknown as it was included in the Toledo Blade Widening contract
6	WCS 107	Cocoplum	Just west of Chamberlain	Severe metal sheet piling corrosions, gates, two gate will not open. Retrofit with concrete weir wall and 6 new stainless steel gates and concrete spillway and large revetment.	Start Design in 9/30/09	\$43,783.16	\$545,267.26	\$589,050.42	KHA / Nathan Lee Seth Schmid	Coral Sands	Completed January 2011	A. Carrasquillo	Costs include a large Emergency Change Order of \$125,000 due to unforeseen concrete in canal bottom downstream of structure.
7	DS 132 and culverts	Bass Point	At Jeannin Dr	Severely corroded corrugated metal pipes CMP, erosion and undermining of side banks. Replace with open concrete weir and RCP culvert pipes.	Design Start 10/09	\$40,987.22	\$436,615.82	\$477,603.04	DMK / Mary Ann Lind	Thomas Marine/Mark Mabee	Completed May 2011	Angel Carrasquillo	
8	DS 139 and culverts	Snover	East of Haberland	Severely corroded corrugated metal pipes CMP, erosion and undermining of side banks. Replace with open concrete weir and RCP culvert pipes.	Design Start 10/09, construction start 1/4/12	\$40,987.22	\$488,104.70	\$529,091.92	DMK / Mary Ann Lind	GCS/John Matz	Completed April 2012	A. Carrasquillo (design & permitting) E. Wong (construction)	
9	WCS 101	Cocoplum	Myakkahatchee Creek near WTP	Design, permitting and construction services for the replacement of WCS 101	5/29/2012	\$127,754.00		\$1,317,261.50	AIM Engineering / Lee Flynn and Tim Denger		Design 3/26/13 (USACOE Permit), construction 4/18/14	Elizabeth Wong	This is a SWFWMD cooperatively funded project. Engineering/Permitting cost include land and easement purchase and Gopher Tortoise relocation
				Gopher Tortoise Relocation	5/2/2013	\$4,400.00			Ian Vincent & Associates		Completed 5/22/13		
				Land/Easement Acquisition	8/9/2012	\$13,860.00			American Acquisition Group		Complete 4/6/13		
					8/9/2012	\$21,776.50			American Government Services		Complete 4/6/13		
				Complete replacement of existing structure with new structure, two additional gates for a total of 6 gates, gate automation and telemetry	Started construction May 28, 2013		\$1,149,471.00			Shoreline Foundation Inc/Charles Diveto/Neil Davis	Completed 5/9/14		
10	DS 133 and culverts	Snover	West of Haberland	Severely corroded corrugated metal pipes CMP, erosion and undermining of side banks. Replace with open concrete weir and RCP culvert pipes.	Design start 10/09, construction start 5/20/14	\$49,355.60	\$549,796.80	\$599,152.40	DMK / Mary Ann Lind and Kreg Maheu	Olympus Painting Contractors Inc. Ed Freeman	Completed 11/20/14	A. Carrasquillo (design & permitting) Elizabeth Wong (construction)	
11	WCS 115	Snover	East of Chamberlain Blvd	Severe corrosion of metal sheet piling corrosions and gates. Water level could not be retained upstream by structure. Will either replace or rehabilitate entire structure.	Start design in FY 2016	\$108,081.00	\$1,064,496.00	\$1,172,577.00	AIM Engineering / Lee Flynn	V & H Construction, Inc. (Rade Vujaklija and Joe Martin)	Completed 8/31/18	Elizabeth Wong	

**Water Control Structures (WCS) Completely Rehabilitated or Replaced
As of 11/30/20**

Item	Water Control Structures	Waterway	Location	Rehab Issues	Project Start Date	Engineering / Permitting/Other non-Construction Costs	Actual Construction Costs Includes Contingency Spent	Total Final Design and Construction Cost Spent	Engineering Consultant / P.E.	Contractor / Supervisor	Project Status	City Project Manager	Comments
12	WCS 106	Cocoplum	West of North Port Blvd Near WTP	Severe deterioration of concrete columns that support the gates and catwalk. Corrosion of sheet pilings	Start design in 8/8/17 Construction start 4/7/19	\$168,000.00	\$2,304,436.58	\$2,472,436.58	KHA / Peter Vanbuskirk, Seth Schmid	ZEP Construction, Inc (Jamie Booth, Kirk Scribner)	Completed 8/11/20	Elizabeth Wong	
13	WCS 108	Cocoplum	West of Collingswood	Severe deterioration of entire structure	Start design in 11/2/20	\$143,006.12			KHA / Peter Vanbuskirk, Ty Gremaux		Ongoing		
	Total					\$861,453.19	\$7,459,958.47	\$8,178,405.54					

Minor Repairs to Water Control Structures

As of 11/30/20

Item	Water Control Structures	Waterway	Location	Rehab Issues	Project Start Date	Engineering / Permitting/Other non-Construction Costs	Actual Construction Costs Includes Contingency Spent	Engineering Consultant / P.E.	Contractor / Supervisor	Project Status	City Project Manager	Comments
1	WCS137	Newcastle	Between Diamond Ave and Napa Ln	Replace gates and corroded members.	May-07	None	\$55,500	PBSJ / Tony Russo	Pittsfield Construction Inc. / Sam Matthews	Completed August 2007	Elizabeth Wong	Due to inoperable gates, obtained an emergency order and award the contract to Pittsfield
2	WCS138	Newcastle	At Monterey Ln	Replace gates and corroded members.	May-07	None	\$55,500	PBSJ / Tony Russo	Pittsfield Construction Inc. / Sam Matthews	Completed August 2007	Elizabeth Wong	
3	WCS 130	Bass Point	Near Cocoplum	Replace gates and corroded horizontal channels.	May-07	In house	\$77,500	PBSJ / Tony Russo	Pittsfield Construction Inc. / Sam Matthews	Completed August 2007	Elizabeth Wong	
4	WCS 131	Bass Point	Just downstream of the Twin Lakes intersection	Weld boxes on gate stems on each gate.	May-07	In house		PBSJ / Tony Russo	Pittsfield Construction Inc. / Sam Matthews	Completed August 2007	Elizabeth Wong	
5	WCS 108	Cocoplum	Just west of Collingwood	Replaced 3 Gates Nos. 1, 2 and 5	Apr-11	In house	\$9,350.00	PW staff	MS Welding. Mark Spalding	Completed April 2011	Angel Carrasquillo	Gates were so deteriorated, could not wait until future complete WCS replacement.
6	WCS 101	Cocoplum	Myakkahatchee Creek near WTP	Replaced 3 Gates	Sep-11	In house	\$13,245.00	PW staff	MS Welding. Mark Spalding	Completed Sept 2011	Angel Carrasquillo	Gates were so deteriorated, could not wait until future complete WCS replacement.
7	WCS 124	Lagoon	North of Cocoplum Near Parlay Ln	Remove gate sill bottoms as these are corroded and prevent gate from closing and replace angles welded to gate bottoms	May-12	In house	\$2,000.00	PW staff	MS Welding. Mark Spalding	Completed 6/13/12	Elizabeth Wong/Rick St Louis	These are minor repairs. Angles on gate bottoms found in good condition and not replaced
8	WCS 125	Lagoon	South of Price near Thomas Ln	Remove gate sill bottoms as these are corroded and prevent gate from closing and replace angles welded to gate bottoms	May-12	In house	\$2,000.00	PW staff	MS Welding. Mark Spalding	Completed 6/13/12	Elizabeth Wong/Rick St Louis	These are minor repairs. Angles on gate bottoms found in good condition and not replaced
9	WCS 114	Snover	Just west of Salford Blvd	Replace all 4 gates with new steel gates epoxy coated, replace all gate supports, gate slide frameworks, both horizontal I-beams and replaced corroded section of vertical I-beams, rebuilt corroded sections of all 4 lift rods	May-12	In house	\$18,000.00	PW staff	MS Welding. Mark Spalding	Completed 7/17/12	Elizabeth Wong/Rick St Louis	These are minor repairs
10	WCS 108	Cocoplum	Just west of Collingwood	Replace corroded horizontal I-beams and corroded sections of vertical I-beams, and repair holes in sheet metal pile	Aug-12	In house	\$18,400.00	PW staff	MS Welding. Mark Spalding	Completed 9/7/12	Elizabeth Wong/Rick St Louis	These are minor repairs
11	WCS 128	Newcastle	South of Price Blvd, near Oregon Ln	Replace corroded horizontal cap and corroded sections of vertical I-beams	Aug-12	In house	\$9,500.00	PW staff	MS Welding. Mark Spalding	Completed 9/14/12	Elizabeth Wong/Rick St Louis	These are minor repairs
12	WCS 111	Cocoplum	South of Price Blvd, near Newmand Dr.	Replace corroded horizontal I-beam and corroded sections of vertical support for "cat walk"	Aug-12	In house	\$6,600.00	PW staff	MS Welding. Mark Spalding	Completed 9/12/12	Elizabeth Wong/Rick St Louis	These are minor repairs
13	WCS 106	Cocoplum	Near WTP	Disassemble Gear box at one gate to evaluate repairs needed	11/5/2012	In house	\$300.00	PW staff	MS Welding. Mark Spalding	Completed 12/11/12	Elizabeth Wong/Rick St Louis	Gear box defective
14		Cocoplum	Near WTP	Provide a reconditioned gear box and all necessary parts and labor with 1 year warranty on one gate	3/1/2013	In house	\$4,550.00	PW staff	MS Welding. Mark Spalding	Completed 3/12/13	Elizabeth Wong/Rick St Louis	
15	WCS 118	Blueridge	Cuthbert Ave	Replace corroded sections of horizontal and vertical railing	9/1/13	In house	\$2,457.00	PW staff	Raber Industries Inc.	Completed 9/12/13	Elizabeth Wong/Rick St Louis	
16	WCS 131	Bass Point	Johannesberg Rd	Replaced corroded horizontal support beams and corroded sections of tie rods and vertical I-beams on both west and east sides of the structure, patched a small leak in the sheet metal piling and welded new boxes for both gate stems.	9/1/13	In house	\$8,557.00	PW staff	Raber Industries Inc.	Completed 9/25/13	Elizabeth Wong/Rick St Louis	
17	WCS 113	Snover	Just East of Myakkahatchee Creek	Repaired erosion below existing concrete slab on the northwest side of WCS No. 113 by injecting flowable fill (cementitious grout) to fill all voids	7/25/14	In house	\$14,000.00	PW staff	Thomas Marine Construction, Inc.	Completed 7/28/2014	Elizabeth Wong/Rick St Louis	
18	WCS 162	Snover	Van Camp/Tropicaire	Repaired erosion between weir and MES. Demo concrete adjacent to MES, install filter fabric, install morrow over fabric and install 12-inch diameter rip rap.	5/21/15	In house	\$7,000.00	PW staff	Genesis Construction Group sub'd to Charlotte County Seawalls Zac Futrell	Completed 6/4/15	Elizabeth Wong/Rick St Louis	Ed Freeman of Genesis subcontractor entire job to Charlotte County Seawalls

Minor Repairs to Water Control Structures

As of 11/30/20

Item	Water Control Structures	Waterway	Location	Rehab Issues	Project Start Date	Engineering / Permitting/Other non-Construction Costs	Actual Construction Costs Includes Contingency Spent	Engineering Consultant / P.E.	Contractor / Supervisor	Project Status	City Project Manager	Comments
19	WCS 124	Lagoon	South of Coldwater Ln	Replace track guide systems for 3 gates and change anchors in track guide systems as needed for workable gates; clean and lubricate all 3 lift rods for gates; for all 3 tie rods to dead men, weld new equivalent 3 ft sections of tie rods to reinforce corroded sections near water surface; replace 3 ft corroded sections of weir vertical I-beams at both side banks, chip concrete to existing solid metal beam, cut out corroded section of the I-beams and re-weld new vertical sections of I-beams onto solid metal, repair chipped concrete and encase new sections of I-beam in concrete; repair hole in sheet piling by welding or applying two-part epoxy grout, an 18" x 18" patch comprising a minimum 3/16" steel plate onto existing cleaned solid sheet metal piling; all dewatering costs as needed. Emergency procurement fabrication and installation of 3 new gates. PO# 046481	9/30/15	In house	\$23,500.00	PW staff	MS Welding. Mark Spalding	Completed 11/6/15	Elizabeth Wong/Rick St Louis	
20	WCS 125	Lagoon	North of Thomas Lane	Replace track guide systems for 2 gates and change anchors in track guide systems as needed for workable gates; clean and lubricate 2 lift rods for gates; for all 3 tie rods to dead men, weld new equivalent 3 ft sections of tie rods to reinforce corroded sections near water surface; replace 3 ft corroded sections of weir vertical I-beams at both side banks, chip concrete to existing solid metal beam, cut out corroded section of the I-beams and re-weld new vertical sections of I-beams onto solid metal; repair chipped concrete and encase new sections of I-beam in concrete; all dewatering costs needed. PO# 046481	9/30/15	In house	\$7,000.00	PW staff	MS Welding. Mark Spalding	Completed 9/28/15	Elizabeth Wong/Rick St Louis	
21	WCS 114	Snover		Troubleshoot why gates nos. 1 and 2 not opening easily, replace corroded or bent sections of lift rods as needed; if needed, remove and replace 1 gear box with existing gear box at the public works facility (contractor to pick up and transport equipment from public works to work site); remove corroded first 14 feet long sections of two-strand horizontal and vertical catwalk railing(both sides of railing) and weld on new galvanized steel two-strand horizontal and vertical railing to match the diameter of the rest of the adjacent catwalk railing; ensure all new welded joints are smooth; on all welded joints and new railing, apply zinc chromate primer and paint the replacement railing with at least two coats of 2-part epoxy Sherwin Williams marine grade green paint to match adjacent catwalk railing color. PO# 046481	9/30/15	In house	\$5,200.00	PW staff	MS Welding. Mark Spalding	Completed 9-30-15	Elizabeth Wong/Rick St Louis	Cost less than anticipated once Mark got into project
22	WCS 108	Cocoplum	Just west of Collingwood	Replaced 3 more Gates (including the existing electric gate). Use an existing actuator (from the old WCS 101). Needed two new left hand threaded rods, fabricate 3 new gates #3, 4, and 6 and tracks, flat bars and spacers as needed, minor concrete and sheet pile repair. This was an emergency order job. PO #046626	12/1/15	In house	\$34,900.00	PW staff	MS Welding. Mark Spalding	Completed 12-17-15	Elizabeth Wong/Rick St Louis	Gates were so deteriorated, could not wait until future complete WCS replacement.
23	WCS 106	Cocoplum	Near WTP	Replaced all six Gates. This was an emergency order job as 3 of the 6 gates were not working and the other three are the same age. Replaced corroded sections of all tie rods. The existing concrete sill at the bottom of the gates are in bad condition. The structure is planned for complete replacement in 2018. PO# 046747	4/4/16	In house	\$68,000.00	PW staff	MS Welding. Mark Spalding	Completed 4/8/2016	Elizabeth Wong/Rick St Louis	Gates were so deteriorated, could not wait until future complete WCS replacement.
24	WCS 101	Myakkahatchee Creek		Excessive rains and debris cause sand bar formation on upstream side of WCS 101 blocking push-down gate operation and bent two rods. MS removed bend section of rod, pumped out sand and welded new rod so gate remains functional until permanent repair can be made. Meanwhile Tom McCluin of Golden Harverst gates provided 2 new stainless steel rods (free) as he had determined that the clutch on the actuator was not set correctly to shut off the motor if there is too much torque on the stems. SS rods are on the floor in the RO building.	11/8/16	In house	\$7,500.00	PW staff	MS Welding. Mark Spalding	Completed End of 2016	Rick St Louis	Emergency Procurement
25	WCS 114	Snover		Excessive rains and debris caused damage to gate, tracks and gear. Emergency repairs make to make gates functional until a permanent repair can be made	11/8/16	In house	\$5,500.00	PW staff	MS Welding. Mark Spalding	Completed End of 2016	Rick St Louis	Emergency Procurement

Minor Repairs to Water Control Structures

As of 11/30/20

Item	Water Control Structures	Waterway	Location	Rehab Issues	Project Start Date	Engineering / Permitting/Other non-Construction Costs	Actual Construction Costs Includes Contingency Spent	Engineering Consultant / P.E.	Contractor / Supervisor	Project Status	City Project Manager	Comments
26	GDS 112			2016 storm broke off riser, gate and portion of catwalk and eroded bank. All broken parts removed in March 2017. Only horizontal pipes left in place and part of catwalk, banks stabilized. Need to get SWFWMD approval to not replace structure in kind.	March 2018	In house						
27	WCS 140	Bethlehem		Repair one horizontal I beam, Repair one Vertical I beam, Replace gate #1, Replace gate #2. PO# 047293	Last week in Sept 2017	In house	\$25,000.00	PW staff	MS Welding. Mark Spalding	Completed End of 2017	Chuck Speake	
28	WCS 137	New Castle	Near Laredo Ave	Replace I Beam- with painted with 2 part epoxy coating Inspect Rod, clean and repair any bad threads Gear box- open, replace any bad bearings, check key ways in gear drives. Check brass lifting bushing. Tracks, replace spacer bars as needed or tracks as needed. Adjust, clean and inspect door for proper operation. Minor repairs if needed. Inspect concrete and base of structure (under water) PO# 047588	3/23/2018	In house	\$9,000.00	PW staff	MS Welding. Mark Spalding	Completed 6/4/18	Chuck Speake	
29	WCS130	Bass Point	Just north of Cocoplum	Replace I Beam -with painted with 2 part epoxy coating Inspect Rod, clean and repair any bad threads Gear box- open, replace any bad bearings, check key ways in gear drives. Check brass lifting bushing. Tracks, replace spacer bars as needed or tracks as needed. Adjust, clean and inspect door for proper operation. Minor repairs if needed Inspect concrete and base of structure (under water)	3/23/2018	In house	\$8,000.00	PW staff	MS Welding. Mark Spalding	Completed 6/4/18	Chuck Speake	
30	WCS 118	Blueridge	at Ridgewood Dr	Replace I Beam- with painted with 2 part epoxy coating Inspect Rod, clean and repair any bad threads Gear box- open, replace any bad bearings, check key ways in gear drives. Check brass lifting bushing. Tracks, replace spacer bars as needed or tracks as needed. Adjust, clean and inspect door for proper operation. Minor repairs if needed. Inspect concrete and base of structure (under water)	3/23/2018	In house	\$8,000.00	PW staff	MS Welding. Mark Spalding	Completed 6/4/18	Chuck Speake	
31	WCS 108	Cocoplum	West of Collingswood Blvd	Fixed catwalk grate rusted through in one location	6/27/2018	In house	\$7,500.00	PW staff	MS Welding. Mark Spalding	Completed 1/30/19	John Hodge	
32	WCS 110	Cocoplum	West of Yorkshire St	Fixed top bars in gate frames very corroded, one hole behind I-beam	6/27/2018	In house	\$8,000.00	PW staff	MS Welding. Mark Spalding	Completed 1/30/19	John Hodge	
33	WCS 111	Cocoplum	Near Newman Dr.	Fixed top bars in gate frames that was corroded	6/27/2018	In house	\$8,500.00	PW staff	MS Welding. Mark Spalding	Completed 1/30/19	John Hodge	
34	WCS 114	Snover	West of Salford Blvd	Fixed hole in S. side sheet piling. Repaired Gate #2 as it does not close all the way down	6/27/2018	In house	\$9,000.00	PW staff	MS Welding. Mark Spalding	Completed 1/30/19	John Hodge	
35	WCS 124	Lagoon	North of Cocoplum Near Parlay Ln	Repaired holes in east side sheet piling and repaired vertical I-Beam. Retrofit surplus actuator in place of non-working actuator	6/27/2018	In house	\$8,000.00	PW staff	MS Welding. Mark Spalding	Completed 1/30/19	John Hodge	
36	WCS 127	Creighton	Near Alabelle Ln	Repaired hole in Vertical I-beams and repaired hole in sheet piling by support bar	6/27/2018	In house	\$8,500.00	PW staff	MS Welding. Mark Spalding	Completed 1/30/19	John Hodge	
37	WCS 101	Myakkahatchee Creek	At WTP	Telemetry malfunction, replace part no, NL120 CSI Ethernet Interface	9/5/2018	In house	\$446.00	PW staff	Locher Environmental Technology (mike Vega)	9/5/2018	Chuck Speake	
38	WCS 143	Newman	Fielders Rd	Washout on the bank of the Gated Drop Structure. WO# 20-005616	8/27/2020	In house	\$879.00	PW staff	PW Operations	Completed 8/27/20	Menelik Roberts	
39	WCS 158	Snover	Joewood Cir	Washout on the highside. WO# 20-005607	8/27/2020	In house	\$879.00	PW staff	PW Operations	Completed 8/27/20	Menelik Roberts	
40	WCS 130	Bass Point	Hightower Rd	Washout on Low side. WO# 20-005614	8/28/2020	In house	\$1,640.00	PW staff	PW Operations	Completed 8/28/20	Menelik Roberts	
41	DS 120	Blueridge	Tripoli St	Washout on both the High and Low side. Erosion repair. WO#20-005615	8/31/2020	In house	\$901.00	PW staff	PW Operations	Completed 8/31/20	Menelik Roberts	
42	DS 139	New Castle	E Price Blvd & Brewster Rd	Washout by structure. Erosion repair. WO# 20-005620	8/31/2020	In house	\$401.00	PW staff	PW Operations	Completed 8/31/20	Menelik Roberts	
43	WCS 125	Blueridge	Petunia Ter	Washout on Low side. Erosion repair. WO# 20-005619	8/31/2020	In house	\$707.00	PW staff	PW Operations	Completed 8/31/20	Menelik Roberts	
44	WCS 127	Blueridge	Malinda Ter	Washout on both the High and Low side. WO# 20-005612	8/31/2020	In house	\$901.00	PW staff	PW Operations	Completed 8/31/20	Menelik Roberts	

Minor Repairs to Water Control Structures

As of 11/30/20

Item	Water Control Structures	Waterway	Location	Rehab Issues	Project Start Date	Engineering / Permitting/Other non-Construction Costs	Actual Construction Costs Includes Contingency Spent	Engineering Consultant / P.E.	Contractor / Supervisor	Project Status	City Project Manager	Comments
45	WCS 121	Mac Caughey	Nimbus Dr	Washout on the low side. Erosion repair. WO#20-005609	9/3/2020	In house	\$1,970.00	PW staff	PW Operations	Completed 9/3/20	Menelik Roberts	
46	WCS 124	Lagoon	Parade Ter	Washout on Low side. Erosion repair. WO# 20-005613	9/4/2020	In house	\$881.00	PW staff	PW Operations	Completed 9/4/20	Menelik Roberts	
	Total						\$565,164.00					

WCS Replacement Plan

The priority for the replacement of the major WCS's is updated annually (Figure 3-2). Since 2006, 11 major WCS's have been completely replaced or rehabilitated, one is in construction, and one is being designed (Attachment C). The current Public Works plan is to annually design and permit one WCS replacement while constructing a previously designed and permitted WCS.

The rehabilitation of WCS 106 on the Cocoplum Waterway just west of North Port Boulevard is underway with completion expected in Spring of 2020. Design for WCS 108 on the Cocoplum Waterway west of Collingswood Boulevard is anticipated to be completed in Fall of 2020 and will be followed by construction budgeted for fiscal year 2021.

Beyond the 5-year budget projections shown, WCS 124, WCS 127, WCS 138, WCS 118, WCS 121 and WCS 125, are anticipated to be constructed in years 2025, 2026, 2027, 2028, 2029 and 2030 respectively. Budget amounts will be proposed when the structure is within the 5-year replacement window.

WCS Repair Plan

Preventative maintenance and minor repairs prolong the life of the WCS's and keep them in good working order. Minor repairs include repair or replacement of: gates, gate actuators, gate stems, gate tracks, tie backs, catwalk deck/railing, vertical and horizontal I-beams, weir sheet metal erosion, and adjacent bank erosion.

The WCS's that have not been replaced are at a vulnerable age when unforeseen component failures can occur. Due to the significant expense and time needed to design, permit and construct replacement WCS's, significant repairs may need to be done on a WCS that is scheduled to be replaced in the near future. Generally, components such as gates, actuators and stems that are in good condition can be salvaged and become spares for use in other failing WCS's.

Public Works Operations staff perform annual inspection of all structures and prioritize major and minor WCS repairs or replacements (Attachment B). Figure 3-3 reflects the fiscal year 2020 repair budget for WCS's.

Figure 3-2
5-year WCS Replacement Budget Plan

	2020	2021	2022	2023	2024
Design	WCS 108	WCS 113	WCS 114	FW 157	WCS 124
Costs	\$199,000	\$308,000	\$203,000	\$234,000	\$241,000
Construction	WCS 106	WCS 108	WCS 113	WCS 114	FW 157
Costs	\$2,500,000	\$2,480,000	\$3,850,000	\$2,540,000	\$2,920,000
Total Costs	2,668,000	\$2,679,000	\$4,158,000	\$2,743,000	\$3,154,000



Figure 3-3
Fiscal Year 2020 WCS Repair Budget Plan

Structure	Description	Budget Estimate
WCS 108	Repair holes in sheet piling	\$10,000
WCS 113	Repair holes in sheet piling, repair gate stem attachment points, evaluate for gate replacement	\$15,000-\$30,000
WCS 118	Replace #1 gate and track, evaluate for gate replacement	\$15,000-\$20,000
WCS 124	Replace #1 gate and track, evaluate for gate replacement	\$15,000-\$20,000
WCS 125	Replace actuator	\$20,000

Water Control Structure Locations

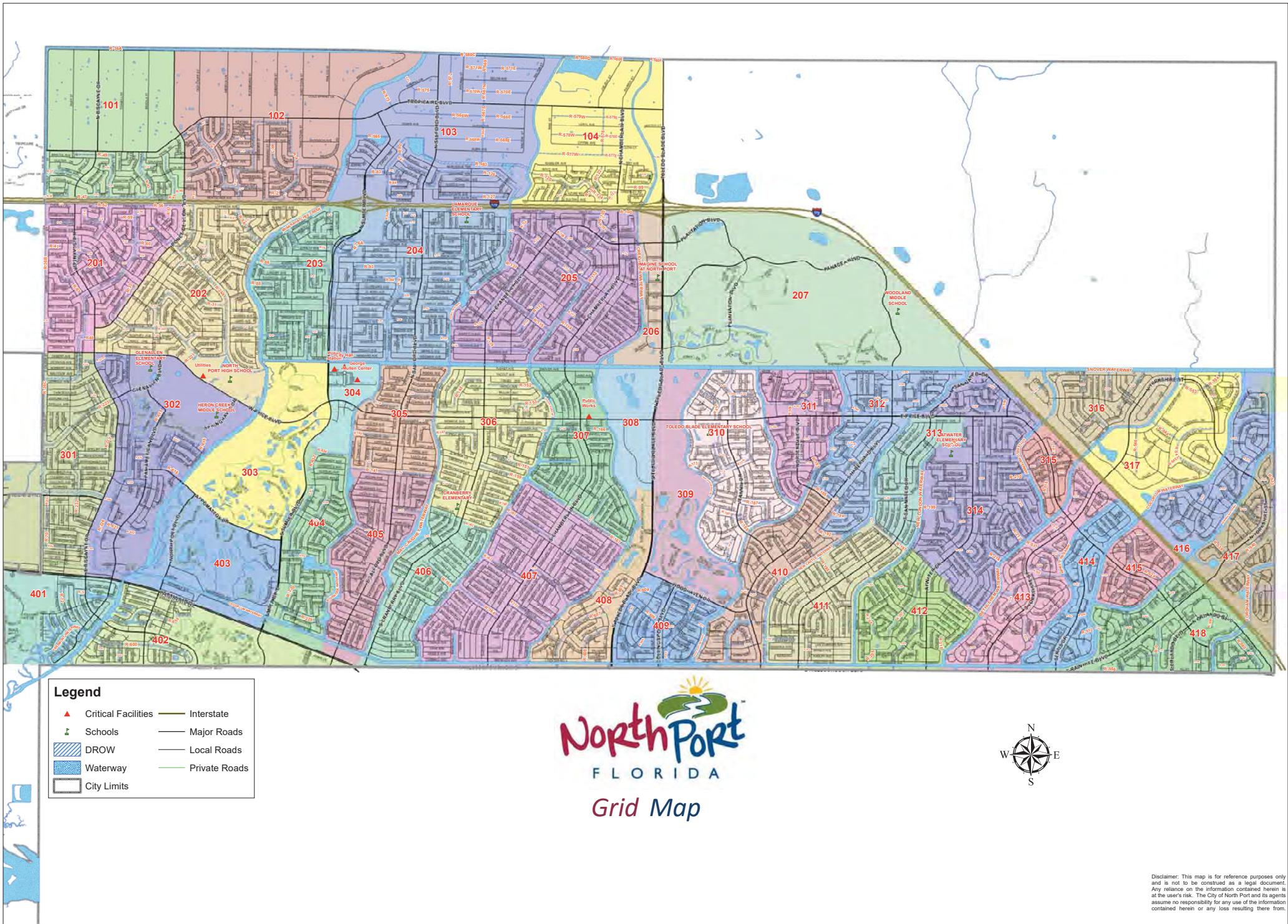
WCS 106	North Port Blvd and Cocoplum Waterway
WCS 108	Collingswood Blvd and Cocoplum Waterway
WCS 113	Snover Waterway and Myakkahatchee Creek
WCS 114	N Salford Blvd and Snover Waterway

WCS 118	Abbotsford St and Blueridge Waterway
WCS 124	Parade Terrace and Lagoon Waterway
WCS 125	Parkmount Terrace and Lagoon Waterway
FW 157	Panacea Blvd and Snover Waterway

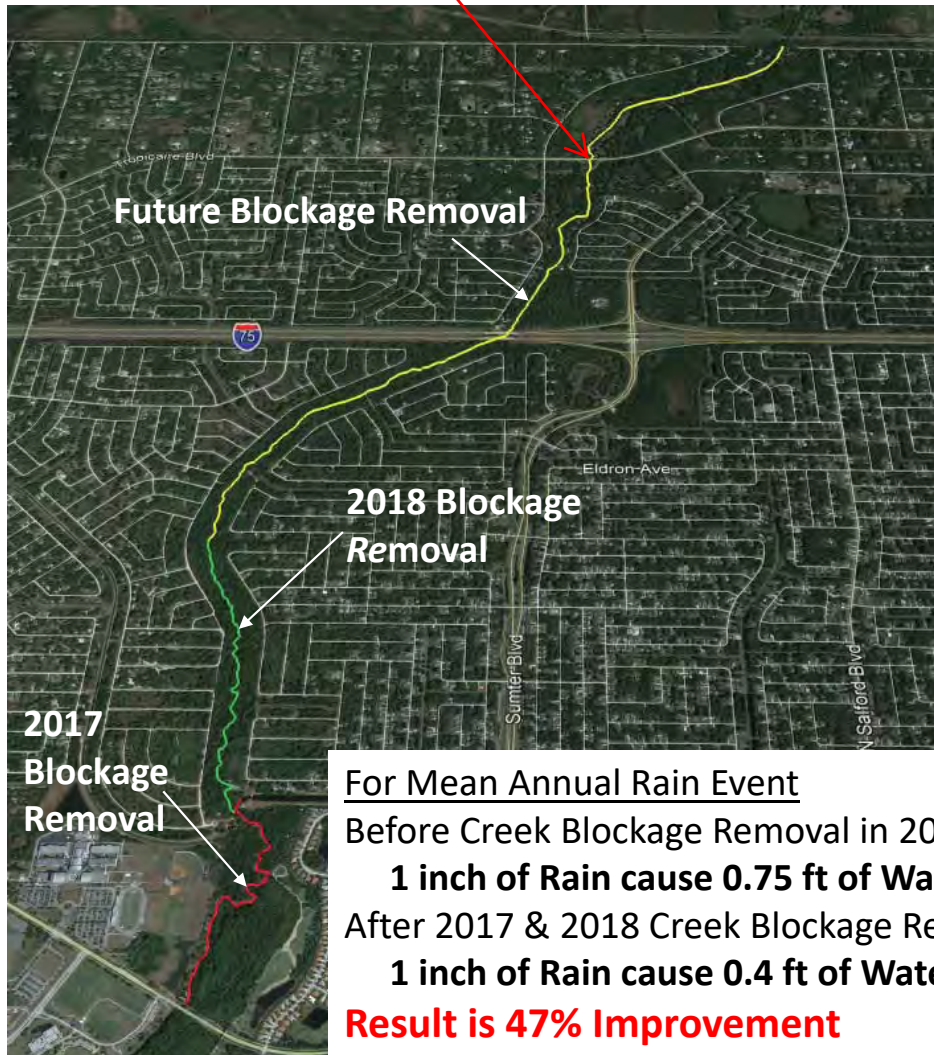
2019 Activities

2019 Maintenance Activities in Monthly Reports to Commission

TYPE	January	February	March	April	May	June	July	August	September	October	November	December	Total
Retention (R) Ditches and Canals Rehabilitated (<i>linear miles</i>)	2.509	2.278	2.569	2.420	1.503	2.658	1.900	2.662	2.447	2.911	1.026	1.688	26.57
Swales Rehabilitated (<i>linear miles</i>)	5.407	5.244	5.714	5.898	6.195	5.890	5.386	5.506	5.359	6.613	5.506	4.826	67.544
Asphalt Placed – Pothole Repairs (<i>tons</i>)	19	12	16	12	15	16	18	22	15	8	4.71	10.25	168
Roadside Mowing (<i>acres</i>)	1283	447	1336	2187	2878	2243	2000	2400	2000	1800	2435	800	21,809
Drainage Right of Way (ROW) Mowing (<i>acres</i>)	0	167	0	251	230	195	0	20	80	65	70	0	1,078
Aquatic Spraying (<i>acres</i>)	49	42	65	55	32	40	46	26	22	22	22	16	437
Boom Mowing R-Ditch Bottoms (<i>linear miles</i>)	4.87	1.34	19	25.8	14.5	10.8	9.5	11	13.7	9.36	14	6.4	140
Pipes Installed (<i>linear miles</i>)	0.215	0.118	0.199	0.205	0.207	0.121	0.176	0.094	0.164	0.157	0.147	0.130	1.932
Catch Basins/Culvert Boxes Installed	2	12	8	11	9	8	6	3	1	9	5	7	81
Drainage pipe cleaning (each)	73	91	151	182	174	113	101	61	64	78	114	165	1,367



USGS Rain Gage
at Tropicaire Blvd

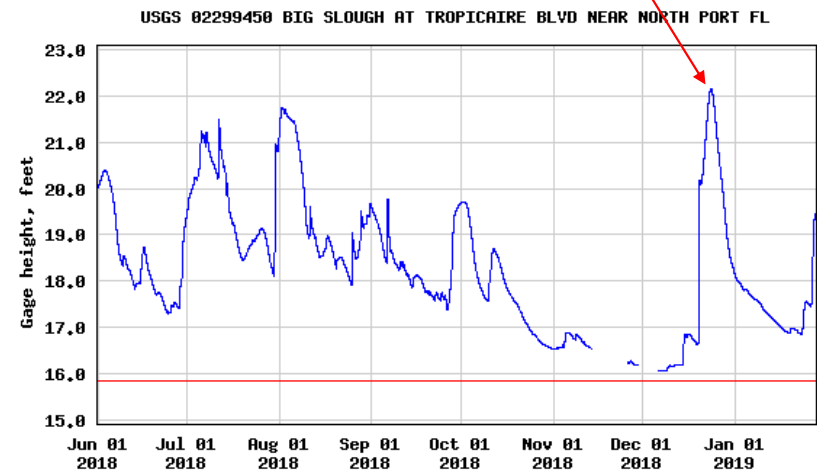


After 2017 - 2018 Creek Blockage Removal

**No street flooding after
2017 - 2018 project
Tropicaire Blvd USGS gage at 22.15'**

Gage height, feet

Most recent instantaneous value: 19.45 01-28-2019 12:00 EST



● Future Blockages to Remove



City of North Port Myakkahatchee Creek Blockages



Disclaimer: This map is for reference purposes only and is not to be interpreted as a legal document. Any reliance on the information contained herein is at the user's risk. The City of North Port and its agents assume no responsibility for any use of the information contained herein or any loss resulting therefrom.

Document Path: W:\Information\2022\Draw\8_CreekBlockages\CreekBlockages.mxd

Changes Between the FEMA Preliminary Coastal Flood Risk FIRMS Dated 12/31/19 and Existing Effective FIRMs dated 11/4/16

Address List Parcels (Centroids)	1% Increase	1 % Decrease	1% Increase Exclusively	1 % Decrease Exclusively	Share Both	TOTAL
<u>Countywide Total</u>	<u>27,284</u>	<u>20,891</u>	<u>25,087</u>	<u>18,694</u>	<u>2,197</u>	<u>45,978</u>
Town of Longboat Key		373	0	373	0	373
City of Sarasota	672	1,697	640	1,665	32	2,337
City of Venice	47	1,231	17	1,201	30	1,248
City of North Port	3,601	50	3,588	37	13	3,638
Unincorporated	22,964	17,540	20,842	15,418	2,122	38,382
<u>BBC Districts Total (Centroids)</u>	<u>27,284</u>	<u>20,891</u>	<u>25,087</u>	<u>18,694</u>	<u>2,197</u>	<u>45,978</u>
Michael A. Moran - 1	7,704	3,128	7,068	2,492	636	10,196
Christian Ziegler - 2	1,806	2,760	1,630	2,584	176	4,390
Nancy C. Detert - 3	5,652	4,501	4,709	3,558	943	9,210
Alan Maio - 4	6,722	5,211	6,526	5,015	196	11,737
Charles D. Hines - 5	5,400	5,291	5,154	5,045	246	10,445
Buildings (Intersected)	1% Increase	1 % Decrease	1% Increase Exclusively	1 % Decrease Exclusively	Share Both	TOTAL
<u>Countywide Total</u>	<u>7,750</u>	<u>16,360</u>	<u>7,619</u>	<u>16,229</u>	<u>131</u>	<u>23,979</u>
Town of Longboat Key	0	376	0	376	0	376
City of Sarasota	206	1,396	201	1,391	5	1,597
City of Venice	7	1,152	6	1,151	1	1,158
City of North Port	1,495	3	1,495	3	0	1,498
Unincorporated	6,042	13,433	5,917	13,308	125	19,350

"Exclusively" means parcels that only have one type of change. Some parcels include both areas added to the one-percent annual chance flood and areas removed from the one-percent annual chance flood.

"Share Both" means a parcel crossed both the increase and decrease layers of the CSLF layer from FEMA. The floodplain was essentially reshaped on those parcels



City of North Port

Office of the City Manager

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September 15, 2020

Mark A. Vieira, P.E.
Senior Civil Engineer
FEMA Region IV
Mitigation Division, RA Branch
US Department of Homeland Security
770-220-5450

Re: City of North Port Review of the December 31, 2019, Preliminary Coastal Risk Flood Insurance Rate Maps and Flood Insurance Study

Dear Mr. Vierra:

The City of North Port appreciates the cooperative efforts by the Federal Emergency Management Agency (FEMA) to revise the City's November 4, 2016, Flood Insurance Rate Maps (FIRMs) for the coastal area. Attached are the City's concerns and recommendations on the December 31, 2019, Preliminary Coastal Risk FIRMs and Flood Insurance Study (FIS). The City would appreciate a response to these comments prior to FEMA finalizing the FIRMs and FIS. Any questions or comments should be directed to Elizabeth Wong, P.E., City of North Port Stormwater Manager via email to ewong@cityofnorthport.com or by phone at (941) 240-8321 or (941) 628-1475.

Sincerely,

Jason Yarborough, ICMA-CM
Acting City Manager

c. by email

Cari Branco, Assistance City Manager
Juliana B. Bellia, Director, Department of Public Works
Rick Newkirk, Utilities Director
Scott Titus, Fire Chief
Eric Tiefenthaler, Emergency Manager
Monica Bramble, Assistant Director, Department of Public Works
Gerardo Traverso, P.E., PMP, Engineering Manager, Department of Public Works
Elizabeth Wong, P.E. Stormwater Manager, Department of Public Works
Mike Taylor, P.E. Project Manager, AECOM

**CITY OF NORTH PORT COMMENTS ON
PRELIMINARY RISK FIRMS DATED DECEMBER 31, 2019**

1. 2007 LiDAR Topographic Data Should be Updated to Prepare the Preliminary Risk FIRMs –

Concern: In a 2/13/20 email response from Mark Vierra, he indicated *“The coastal portion of Sarasota County is using LiDAR flown in 2015. However, for inland areas of Sarasota County including the City of North Port, 2007 LiDAR is the most current that we have.”* The 2007 LiDAR topography done over 13 years ago, is very outdated. Most of Florida has experienced a huge building boom after 2007 and many structures are built higher than the elevations in 2007. These higher elevations are not reflected in the new flood maps as they are based on outdated 2007 topography.

Proposed Solution:

- a. It is recommended that FEMA acquire up to date LiDAR data before revising the flood maps.

2. Properties already Built higher than the proposed BFEs –

Concern: The City and FEMA’s consultant AECOM, have received much input from many property owners in areas west of the Myakka River in the West Villages area (Gran Paradiso, The Preserve, Renaissance, Oasis) and in Talon Bay east of the Myakka River. A large portion of these properties were in flood zone AE per the 1981 and 1984 FIRMs, then remapped as flood zone X in the 2016 FIRMs, and now remapped back into flood zone AE in the December 31, 2019 preliminary Risk FIRMs.

Many of these properties were built higher than the proposed BFE, but the lower elevations corresponding to undeveloped conditions in the 2007 LiDAR data were used for the December 31, 2019 preliminary Risk FIRMs. The 2007 LiDAR data show these properties remapped into Flood zone AE. Mark Vierra had indicated that these properties cannot qualify for a no-fee letter of map amendment (LOMA) as the very first 1984 FIRM shows them to be in AE. Consequently, they will have to pay FEMA to file for a letter of map revision based on fill (LOMR-F). Many properties were built after the flood zone changed from Zone AE in 1984, to Zone X in the 11/4/16 FIRMs. Thus, these properties were not required to obtain Elevation Certificates. Now to file for a LOMR-F they will have to pay for both an elevation certificate (about \$300) and the FEMA LOMR-F filing fee (\$425 per lot or \$800 for multiple lots).

Proposed Solution:

- a. A list of these developments is provided in Attachment A. The corresponding Southwest Florida Water Management District (SWFMWD) permitted plans, record drawings and several elevations certificates are available. Due to the large file sizes, pdfs of these documents are sent separately in an email to the FEMA’s Project Manager and FEMA’s Consultant AECOM to access files through “One Drive “.

- b. It is recommended that FEMA download and review this data. Properties that are already built higher than the new BFEs should be removed out of the zone AE before finalizing the FIRMs.
- c. For properties already built higher than the revised BFEs before the new FIRMs effective date, FEMA should consider waiving the LOMR-F filing fee for MT-1 applications and process application as a no-fee LOMA.
- d. Property owners that sent FEMA's consultant as-built surveys and elevation certificates before and during or the 90-day Public Comment period should also have their properties removed out of the zone AE before FEMA finalizes of the new FIRMs.

3. Three Myakka River Bridge Effects –

Concern: FEMA's consultant AECOM indicated that the modeling used to prepare the Preliminary Risk FIRMs did not include the storm surge and wave action dampening effects of the following three (3) parallel bridges that spans the mouth of the Myakka River near El Jobean. Only the bridge approaches were in the model.

- I. Old railroad trestle bridge that is a fishing pier
- II. North-bound State Road 776 Bridge
- III. South-bound State Road 776 Bridge

On a typical windy day with winds that frequently come out of the southeast, there is a huge visible difference in wave action heights and between the upstream and downstream sides of these bridges. The very tightly spaced railroad trestle pilings, the deck stringers (elevation 8ft NAVD88) and the hand railing (elevation 11.5ft NAVD88) will likely dampen the storm surge and wave action and may lower the BFE of 11 ft NAVD88 in the preliminary Risk Maps.

Proposed Solution:

The three bridges need to be incorporated into the modeling used to prepare the Preliminary Risk FIRMs

- A pdf copy of the old railroad trestle bridge plans named "*EL JOBEAN BRIDGE REHAB 6-9-15*" is available. These plans correspond with the current day condition of the north half of the old railroad trestle bridge that is now a fishing pier, and shows elevation of the deck, stringers and railing. The south half of the old railroad trestle bridge is similar to the north.
- Florida Department of Transportation provided plans for the north and south bound concrete bridges. All available plans, photos and videos of these three bridges are sent separately in an email to the FEMA's Project Manager and FEMA's Consultant AECOM to access files through "One Drive".

4. **Model Validation in North Port area** - In the model validation report file name "R4_SWFL_IDS2_Feb2017.pdf", please clarify what is used to validate the proposed flood elevations in the Myakka River that affects North Port.

5. 500-Year Model Results

- a. There are many areas where the 0.2% risk is increased. Was the 500-year storm (0.2% risk) modeled? Where can the 500-year storm flood elevations be found?

6. Other comments on Flood Insurance Study

- a. Flood Insurance Study FIS Vol 2 Pdf page 29 - Table 22 Topo Elev - the year the topographic elevation is used to prepare the maps needs to be specified.

7. Other comments on Preliminary Risk Firms Dated December 31, 2019

- a. The notes on all the FIRM panels referenced year 2017 for the ortho imagery aerial. This is misleading flood data as flood data does not match the 2007 LiDAR topography used in risk mapping. Suggest either using a corresponding 2007 ortho imagery aerial for the FIRM panels or adding another note that indicates 2007 topography was used in the special flood hazard area mapping.
- b. Wrong street name Panel 12115C0362G –Road south of US 41 on the west side of the State College of Florida, is misnamed “*S. Tamiami Trl*”. This should be “*West Villages Parkway South*”.

► MEMORANDUM

To: Elizabeth Wong, P.E. (City of North Port)
From: Dave DeLoach, P.E.; Trillian Baldassari, P.E.

File: 16-00400-00

Subject: Update to Conceptual Plan

November 13, 2019

Update to Conceptual Plan

On October 29, 2019, the City of North Port directed DeLoach Engineering Science, PLLC (DES) to remove the Inflow Reduction element of the conceptual design from the set of planned improvements. The conceptual-level design drawings and corresponding models were updated to reflect this change, and the conceptual plan now includes the following major project components:

- Improvements to the existing retention ditch/conveyance system and upsizing road crossing culverts in the Dorothy Avenue area.
- Construction of a new bypass canal parallel to the Myakkahatchee Creek within a portion of the City's Tier 1 lots from south of Tropicaine Boulevard to north of Price Boulevard.
- Increasing conveyance capacity through canal widening and upsizing pipe culverts in the R-36 retention ditch/conveyance system along the northern and western boundary of the city.

Engineer's Opinion of Probable Cost

Estimated project costs were updated to reflect the removal of the inflow reduction element of the conceptual plan. As discussed in the Stormwater Management Plan Report (May 2019), estimated costs, including engineering design, permitting, and construction, are based on RS Means 2017 Heavy Construction Costs with national average values adjusted to the Ft Myers/Sarasota County area. Estimates include a 30% contingency and were projected to future years (up to 2035) assuming 4% inflation. Combined costs for each of those projections were annualized over 50 years at 7%.

Engineer's Opinion of Probable Construction Cost					
	2017	2020	2025	2030	2035
Dorothy (Triple Box Culvert)	\$ 5,628,495	\$ 6,331,291	\$ 7,702,984	\$ 9,371,858	\$ 11,402,298
R-36 Improvements	\$ 15,379,020	\$ 17,299,306	\$ 21,047,251	\$ 25,607,199	\$ 31,155,073
Bypass	\$ 17,121,876	\$ 19,259,782	\$ 23,432,470	\$ 28,509,182	\$ 34,685,779
Estimated Combined Cost	\$ 38,129,391	\$ 42,890,379	\$ 52,182,704	\$ 63,488,239	\$ 77,243,150
Estimated Annualized Cost*	\$ 2,762,850	\$ 3,107,830	\$ 3,781,151	\$ 4,600,348	\$ 5,597,027

* Combined cost annualized over 50 years at 7%, 13.8 PV Annuity Factor (capital cost only, excludes O&M)

Benefits and Benefit to Cost Ratio (BCR)

Benefits are based upon flood reduction achieved across a range of simulated storm events compared to the existing condition. For roadway removed from floodplain, benefits reflect avoidance of repair costs at a rate of \$50,000 per mile. For parcels removed from the floodplain, benefits reflect avoidance of \$6,300 per occurrence, based on historical NFIP claims statistics reduced by 85 percent to account for lot vacancy.

	With Inflow Reduction Element			Without Inflow Reduction Element		
	Flood Reduction (acres)	Road Flood Reduction (miles)	Parcels Reduction (centroid*)	Flood Reduction (acres)	Road Flood Reduction (miles)	Parcels Reduction (centroid*)
2.33-year	244	8	234	223	8	234
5-year	359	13	405	333	12	402
10-year	460	18	538	427	17	515
25-year	495	21	542	448	18	515
50-year	518	21	562	466	18	509
100-year	557	24	558	489	22	505

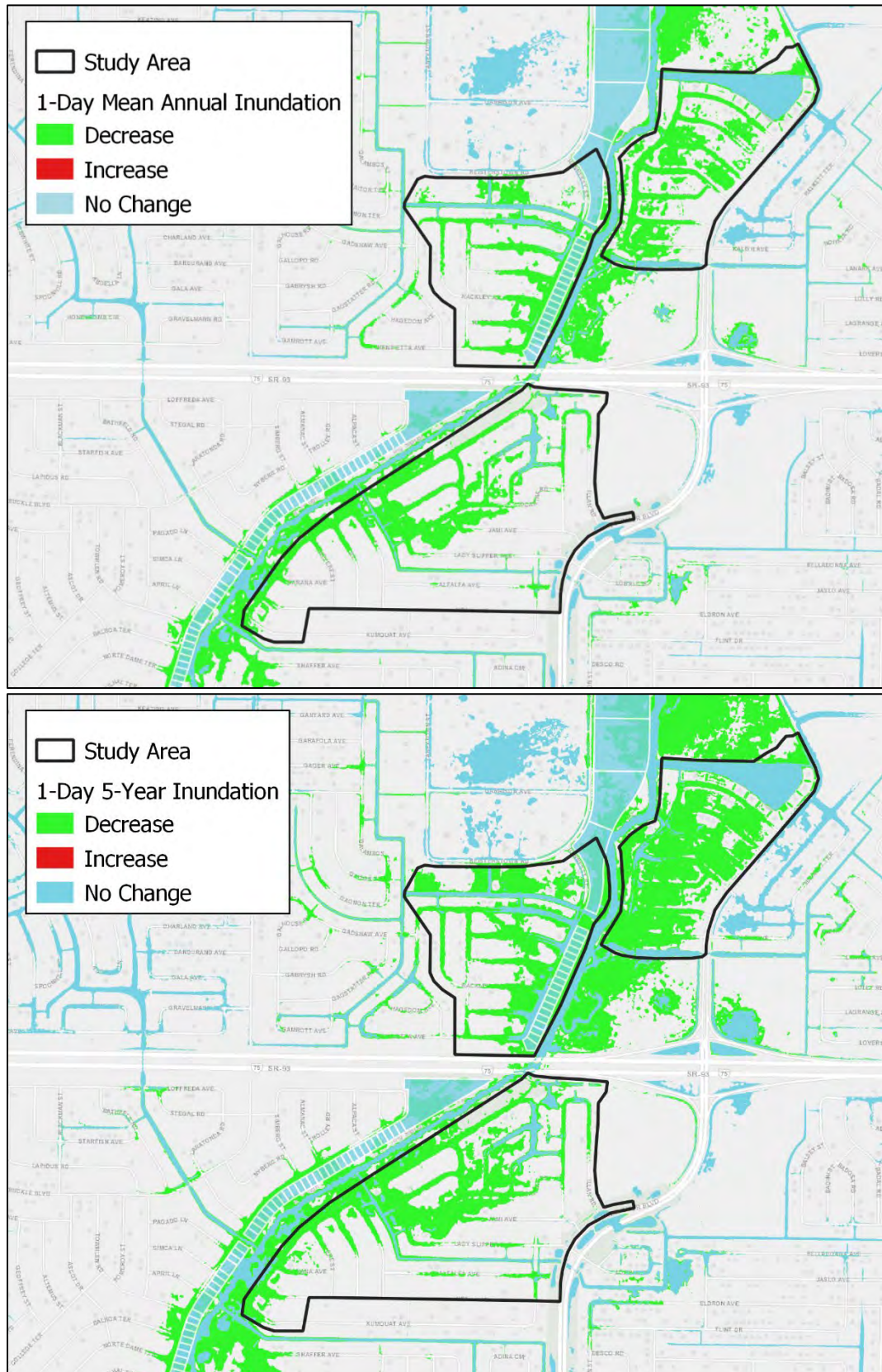
* number of parcels where the center of the parcel is no longer inundated

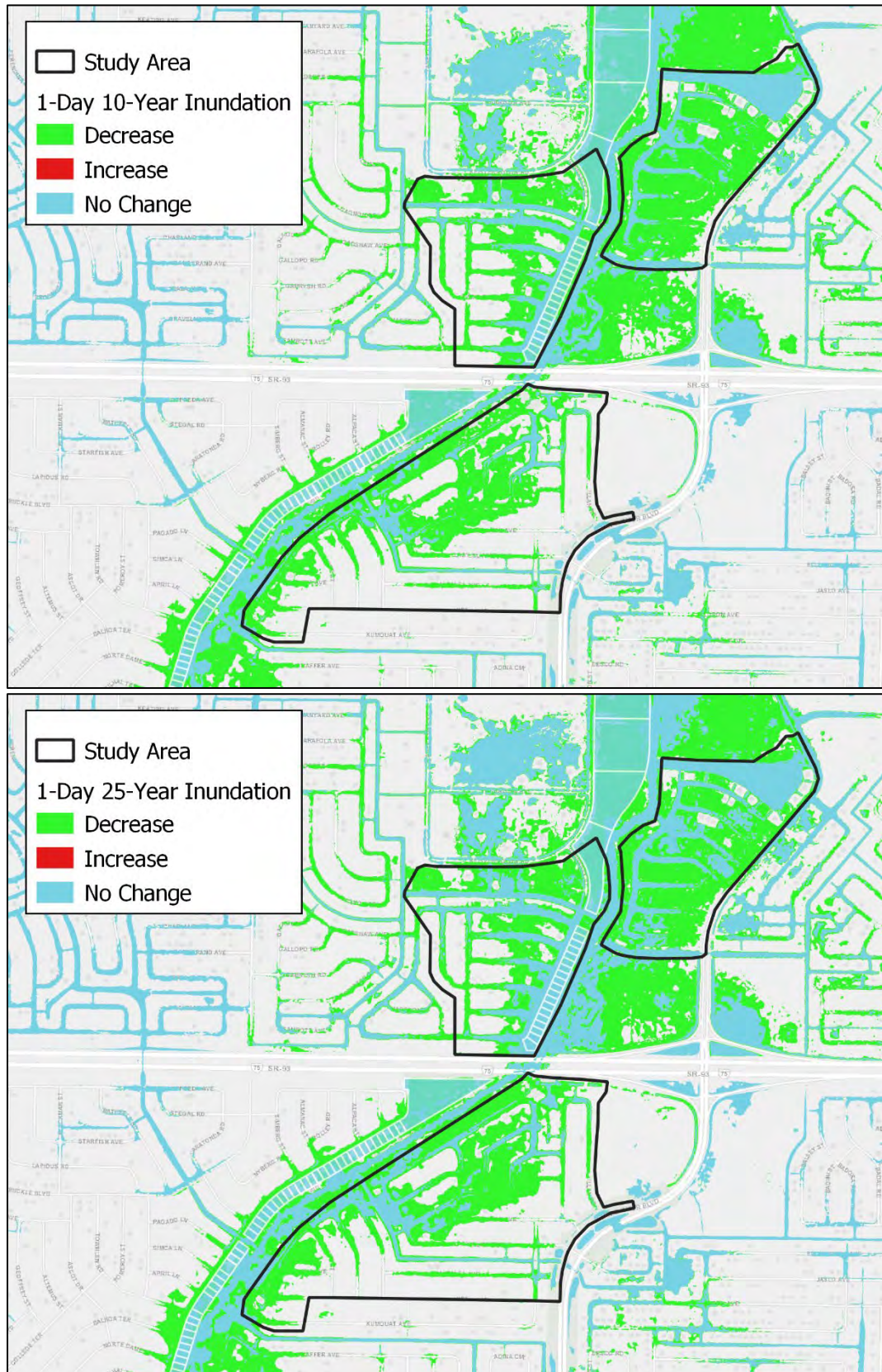
Annual benefit is calculated by multiplying total project benefits for a storm event simulation by the event probability then summing across events simulated. In the case of the revised stormwater management plan, annualized benefits accrue to \$1,909,295 with a BCR of 69 percent (calculations included in Appendix A).

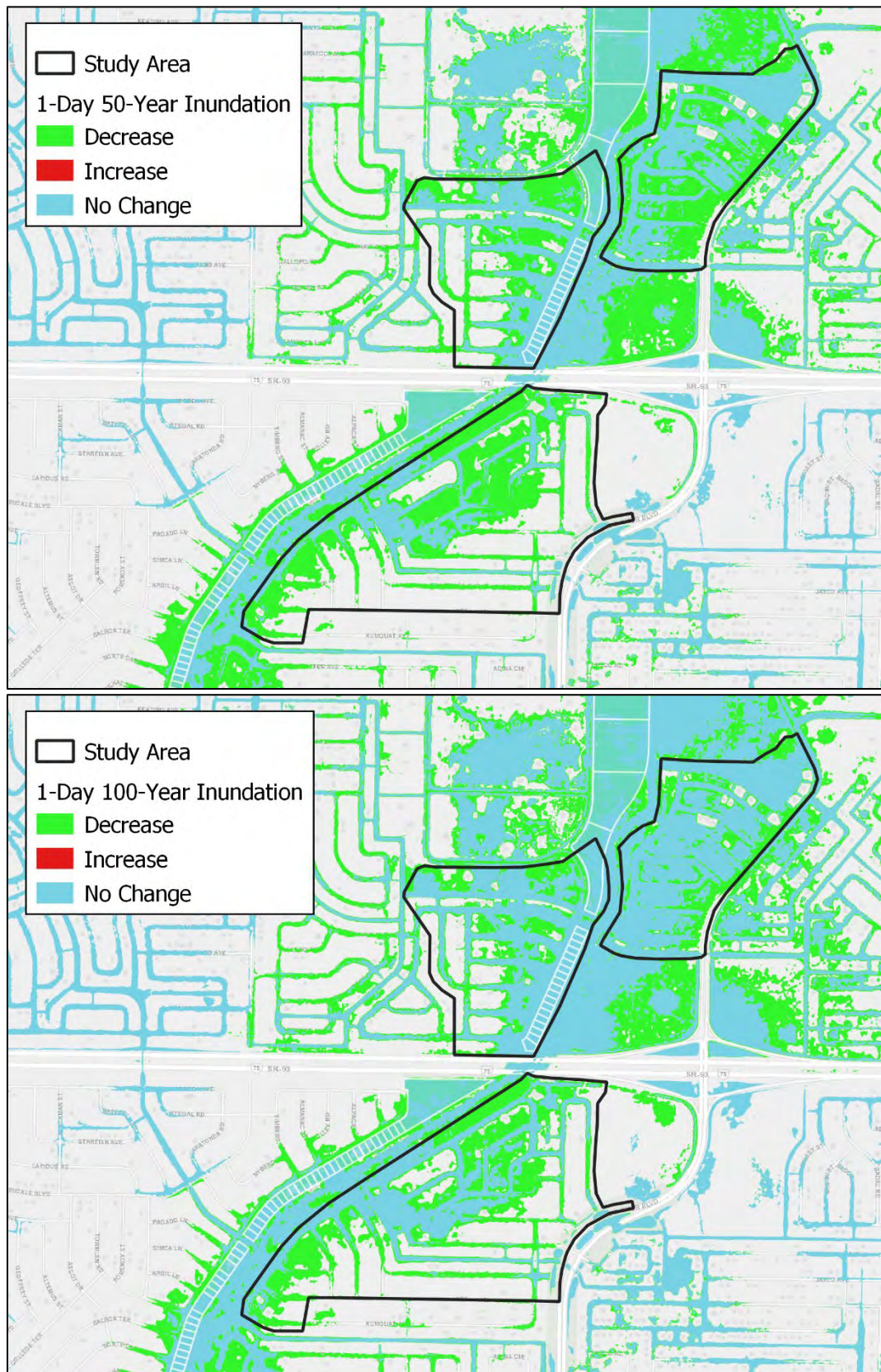
Flood Area Reduction in the I-75 Study Area

The following figures illustrate the reduced extent of inundation in the I-75 study area for Mean Annual through 100-year storm events for the updated stormwater management master plan model, excluding the inflow reduction option.

The conceptual plan focuses on improvements to primary components of the stormwater management system to reduce large-scale regional flooding in the City of North Port. Adjacent areas where minor increases may result from primary system improvements have been identified. Appurtenant facilities may be required to eliminate local increases in some isolated areas. It is understood that design of additional facilities (not yet specified) may be included in future applications for phased construction, including, but not limited to, addition of flap gates, local collection system modifications, and/or construction of storage areas to eliminate local impacts from small stage increase in the primary system, if any.



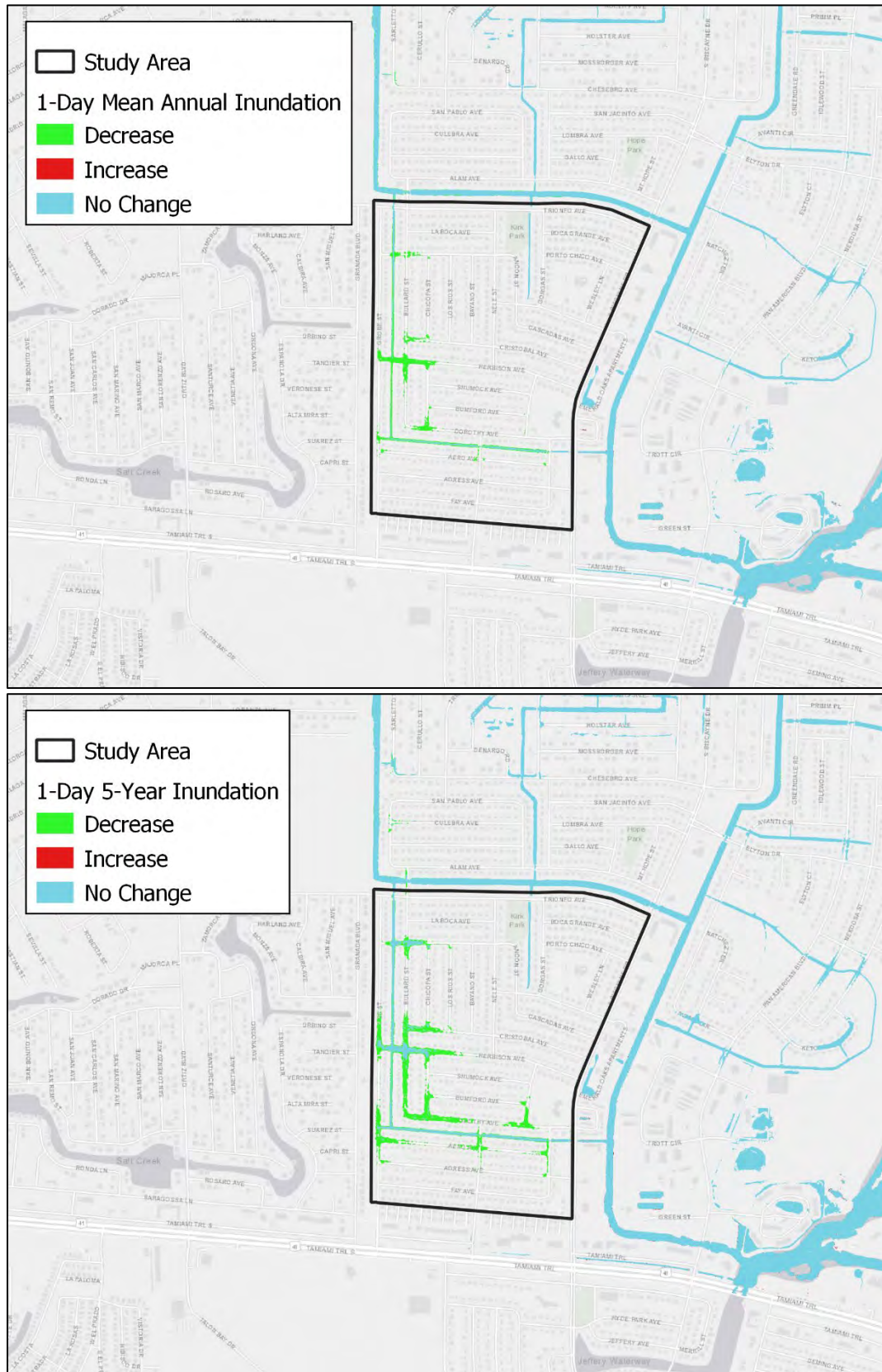




Flood Area Reduction in the Dorothy Avenue Study Area

The following figures illustrate the reduced extent of inundation in the Dorothy Avenue study area for Mean Annual through 100-year storm events for the updated stormwater management master plan model, excluding the inflow reduction option.

The conceptual plan focuses on improvements to primary components of the stormwater management system to reduce large-scale regional flooding in the City of North Port. Adjacent areas where minor increases may result from primary system improvements have been identified. Appurtenant facilities may be required to eliminate local increases in some isolated areas. It is understood that design of additional facilities (not yet specified) may be included in future applications for phased construction, including, but not limited to, addition of flap gates, local collection system modifications, and/or construction of storage areas to eliminate local impacts from small stage increase in the primary system, if any.







Appendix A
Benefit Cost Ratio Calculations

Drainage Improvement Components and Probable Construction Costs

Project Components	Existing	Full Plan
	101	104B
Existing Condition*	x	x
Dorothy (Single Box Culvert)	-	-
Dorothy (Triple Box Culvert)	-	x
R-36 Improvements	-	x
Bypass (flowway, n = 0.040)	-	x
Bypass (wetland, n = 0.150)	-	-
Reduce Northern Inflows	-	-
Other Planned Improvements	-	-
Estimated Combined Cost	\$ -	\$ 38,129,391
Estimated Annualized Cost		\$ 2,762,850

Engineer's Estimate of Probable Construction Cost (by Component)	
Existing Condition	\$ -
Dorothy (Single Box Culvert)	\$ 1,299,000
Dorothy (Triple Box Culvert)	\$ 5,628,495
R-36 Improvements	\$ 15,379,020
Bypass (flowway, n = 0.040)	\$ 17,121,876
Bypass (wetland, n = 0.150)	\$ 20,546,251
Other Planned Improvements	\$ 2,000,000

1.2 = multiplier on Bypass cost to create wetland

7% Interest Rate	13.800746 Present Value Annuity Factor
50 Number of Years	(Considers capital cost only, no annual maint., etc.)

Flood Area Reduction and Cost (\$1000 per acre removed)

Flood Area (acres)	2.33-year	7891	7668
	5-year	9076	8744
	10-year	10342	9915
	25-year	11094	10647
	50-year	11898	11432
Flood Reduction (acres)	100-year	13366	12877
	2.33-year	-	223
	5-year	-	332
	10-year	-	427
	25-year	-	447
Cost \$1000/ac removed	50-year	-	466
	100-year	-	489
	2.33-year	-	\$171
	5-year	-	\$115
	10-year	-	\$89
	25-year	-	\$85
	50-year	-	\$82
	100-year	-	\$78

Estimates of Benefits and BCR - Road Flood Reduction

Flooded Road (feet)	2.33-year	83668	43056
	5-year	196065	131741
	10-year	417032	326657
	25-year	597989	501959
	50-year	828185	730820
Road Flood Reduction (miles)	100-year	1246274	1130254
	2.33-year	-	7.7
	5-year	-	12.2
	10-year	-	17.1
	25-year	-	18.2
Cost \$1000/mi removed	50-year	-	18.4
	100-year	-	22.0
	2.33-year	-	\$4,957
	5-year	-	\$3,130
	10-year	-	\$2,228
	25-year	-	\$2,096
	50-year	-	\$2,068
	100-year	-	\$1,735

Est. Annualized Benefit (A) \$ 364,339
Est Benefit/Cost Ratio (BCR) 0.13

Estimates of Benefits and BCR - Parcels Flooded Reduction (touch)

Flooded Parcels (touch)	2.33-year	7780	6960
	5-year	12373	11303
	10-year	18134	17073
	25-year	21844	20817
	50-year	25887	24788
Parcels Reduction (touch)	100-year	32011	30836
	2.33-year	-	820
	5-year	-	1070
	10-year	-	1061
	25-year	-	1027
Cost \$1000/parcel removed	50-year	-	1099
	100-year	-	1175
	2.33-year	-	\$46
	5-year	-	\$36
	10-year	-	\$36
	25-year	-	\$37
	50-year	-	\$35
	100-year	-	\$32

Est. Annualized Benefit (B) \$ 148,337
Est Benefit/Cost Ratio (BCR) 0.05

Estimates of Benefits and BCR - Parcels Flooded Reduction (centroid)

Flooded Parcels (centroid)	2.33-year	783	549
	5-year	1091	689
	10-year	1399	884
	25-year	1580	1065
	50-year	1799	1290
Parcels Reduction (centroid)	100-year	2408	1903
	2.33-year	-	234
	5-year	-	402
	10-year	-	515
	25-year	-	515
Cost \$1000/parcel removed	50-year	-	509
	100-year	-	505
	2.33-year	-	\$163
	5-year	-	\$95
	10-year	-	\$74
	25-year	-	\$74
	50-year	-	\$75
	100-year	-	\$76

Est. Annualized Benefit (C) \$ 1,396,620
Est. Benefit/Cost Ratio (BCR) 0.51

Estimated Annualized Benefit \$ 1,909,295
Est. Benefit/Cost Ratio (BCR) 0.69

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Assume: \$50,000 Roadway Benefit per mile per Flood Avoided

Estimates of Benefits and BCR - Parcels Flooded Reduction (touch)

Flooded Parcels (touch)	2.33-year	7780	6960
	5-year	12373	11303
	10-year	18134	17073
	25-year	21844	20817
	50-year	25887	24788
Parcels Reduction (touch)	100-year	32011	30836
	2.33-year	-	820
	5-year	-	1070
	10-year	-	1061
	25-year	-	1027
Cost \$1000/parcel removed	50-year	-	1099
	100-year	-	1175
	2.33-year	-	\$46
	5-year	-	\$36
	10-year	-	\$36
	25-year	-	\$37
	50-year	-	\$35
	100-year	-	\$32

Est. Annualized Benefit (B) \$ 148,337
Est Benefit/Cost Ratio (BCR) 0.05

Estimates of Benefits and BCR - Parcels Flooded Reduction (centroid)

Flooded Parcels (centroid)	2.33-year	783	549
	5-year	1091	689
	10-year	1399	884
	25-year	1580	1065
	50-year	1799	1290
Parcels Reduction (centroid)	100-year	2408	1903
	2.33-year	-	234
	5-year	-	402
	10-year	-	515
	25-year	-	515
Cost \$1000/parcel removed	50-year	-	509
	100-year	-	505
	2.33-year	-	\$163
	5-year	-	\$95
	10-year	-	\$74
	25-year	-	\$74
	50-year	-	\$75
	100-year	-	\$76

Est. Annualized Benefit (C) \$ 1,396,620
Est. Benefit/Cost Ratio (BCR) 0.51

Estimated Annualized Benefit \$ 1,909,295
Est. Benefit/Cost Ratio (BCR) 0.69

Assume:	(For partially impacted lots)	250 Average benefit (or damages averted) per parcel per event
\$ 250.00	Per Parcel Benefit per Flood Avoided	0 Est TAX revenue generated by change in property's flood frequency status

		42000 Ave Flood Claim 2008-2012 (FEMA, 2017)	15% Adj down from Ave Flood Claim
		Adjust down to account for vacant lots	
Assume:	(For fully inundated lots)	6300 Add'l average benefit (or damages averted) per parcel per event for Centroid Inundated	
\$	6,300.00	Average Per Parcel Benefit per Flood Avoided	
		0 Est tax revenue revenue generated by change in property's flood frequency status	
		Typ Home Value:	0 > 0 assumes conversion to occupied lot
		Millage:	15.4017 Total (0 or \$150,000)
			11.9947 Countywide NPT
			3.407 NPT
			0 est. non-ad velorem (0 or\$ 540)

	Flood Reduction (acres)	Road Flood Reduction (miles)	Parcels Reduction (centroid)
2.33-year	223	7.7	234
5-year	333	12.2	402
10-year	427	17.1	515
25-year	448	18.2	515
50-year	466	18.4	509
100-year	489	22.0	505

4.0% 13.800746

Engineer's Estimate of Probable Construction Cost (Based on RS Means 2017, with costs projected at 4% inflation)					
	2017	2020	2025	2030	2035
Dorothy (Triple Box Culvert)	\$ 5,628,495	\$ 6,331,291	\$ 7,702,984	\$ 9,371,858	\$ 11,402,298
R-36 Improvements	\$ 15,379,020	\$ 17,299,306	\$ 21,047,251	\$ 25,607,199	\$ 31,155,073
Bypass (flowway, n = 0.040)	\$ 17,121,876	\$ 19,259,782	\$ 23,432,470	\$ 28,509,182	\$ 34,685,779
Estimated Combined Cost	\$ 38,129,391	\$ 42,890,379	\$ 52,182,704	\$ 63,488,239	\$ 77,243,150
Estimated Annualized Cost*	\$ 2,762,850	\$ 3,107,830	\$ 3,781,151	\$ 4,600,348	\$ 5,597,027

* Combined construction cost annualized over 50 years at 7%, 13.8 PV Annuity Factor (capital cost only, excludes O&M)

Preliminary Estimate of Acquisition Cost					
	2019	2020	2025	2030	2035
Estimated Property Value*	\$ 4,325,200	\$ 4,498,208	\$ 5,472,758	\$ 6,658,447	\$ 8,101,018
Estimated Annualized Cost**	\$ 313,403	\$ 325,939	\$ 396,555	\$ 482,470	\$ 586,999

* Combined "Just Value" of properties inundated 50% or more by flooding from the 10-year 24-Hour Storm Event



ACQUISITION OF FLOODED PROPERTIES IN BIG SLOUGH FLOOD STUDY AREA

**City of North Port
Commission
Workshop
December 2, 2019**

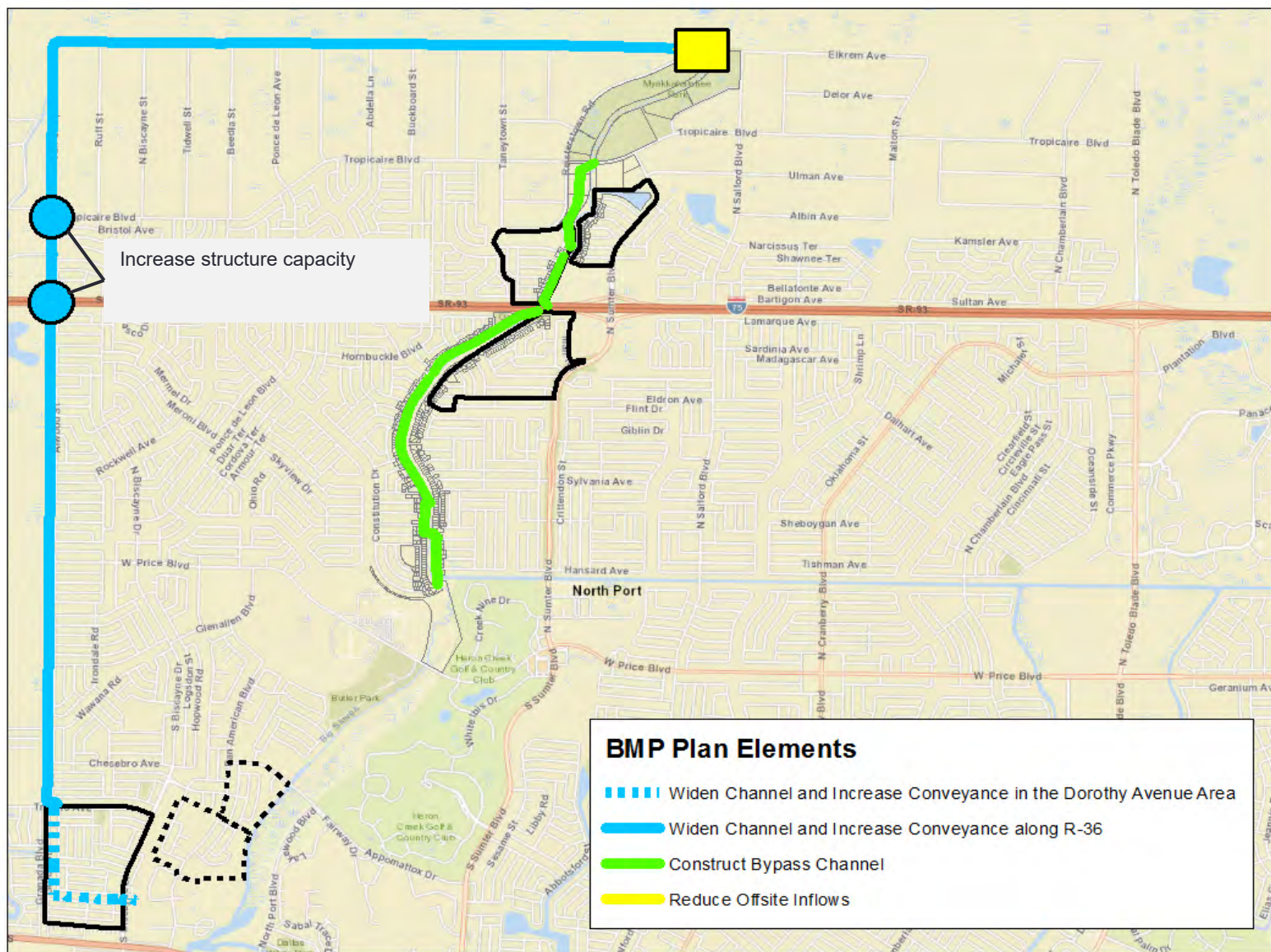


Slide 1

Purpose of Workshop

- Review Commission direction from the March 4, 2019, Commission Workshop on Big Slough Flood Reduction Study.
- Discuss acquisition of flooded properties.
- Discuss available grant funding.
- Discuss priorities of property acquisition.

Recap of Consultant's Recommended Plan Components in March 4, 2019, Workshop

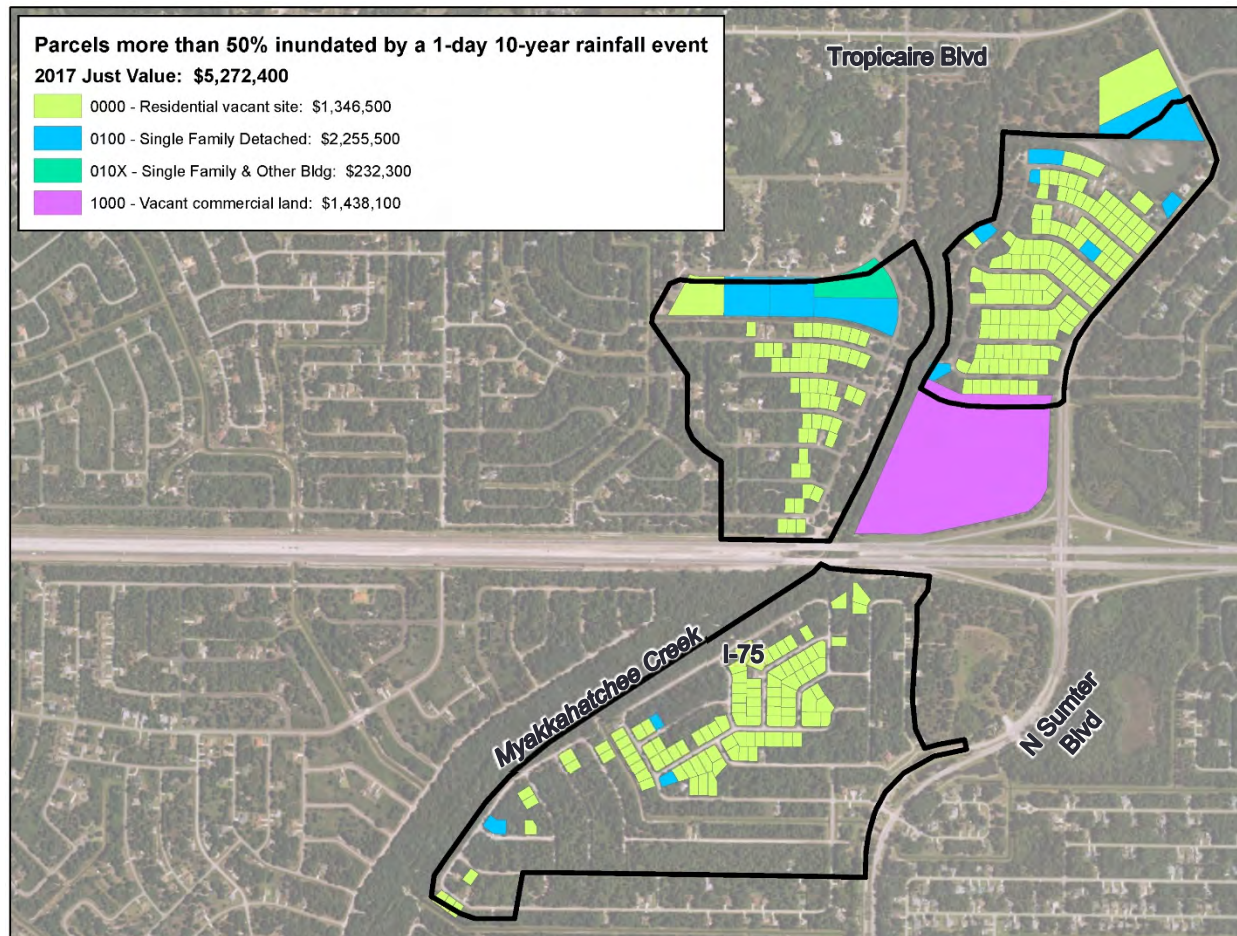


Recap of Consultant's Engineer's Opinion of Probable Cost in March 4, 2019, Workshop

	Engineer's Estimate of Probable Construction Cost (Based on RS Means 2017, with costs projected at 4% inflation)				
	<u>2017</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>	<u>2035</u>
Dorothy (Triple Box Culvert)	\$ 5,628,495	\$ 6,331,291	\$ 7,702,984	\$ 9,371,858	\$ 11,402,298
R-36 Improvements	\$ 15,379,020	\$ 17,299,306	\$ 21,047,251	\$ 25,607,199	\$ 31,155,073
Bypass (flowway, n = 0.040)	\$ 17,121,876	\$ 19,259,782	\$ 23,432,470	\$ 28,509,182	\$ 34,685,779
Reduce Northern Inflows	\$ 2,575,105	\$ 2,896,643	\$ 3,524,209	\$ 4,287,739	\$ 5,216,690
Estimated Combined Cost	\$ 40,704,496	\$ 45,787,022	\$ 55,706,913	\$ 67,775,978	\$ 82,459,840
Estimated Annualized Cost*	\$ 2,949,442	\$ 3,317,721	\$ 4,036,515	\$ 4,911,037	\$ 5,975,028
* Combined construction cost annualized over 50 years at 7%, 13.8 PV Annuity Factor (capital cost only, excludes O&M)					

RS Means Heavy Construction Costs, adjusted to Ft Myers/Sarasota County area, for engineering design, permitting and construction with 30% contingency.

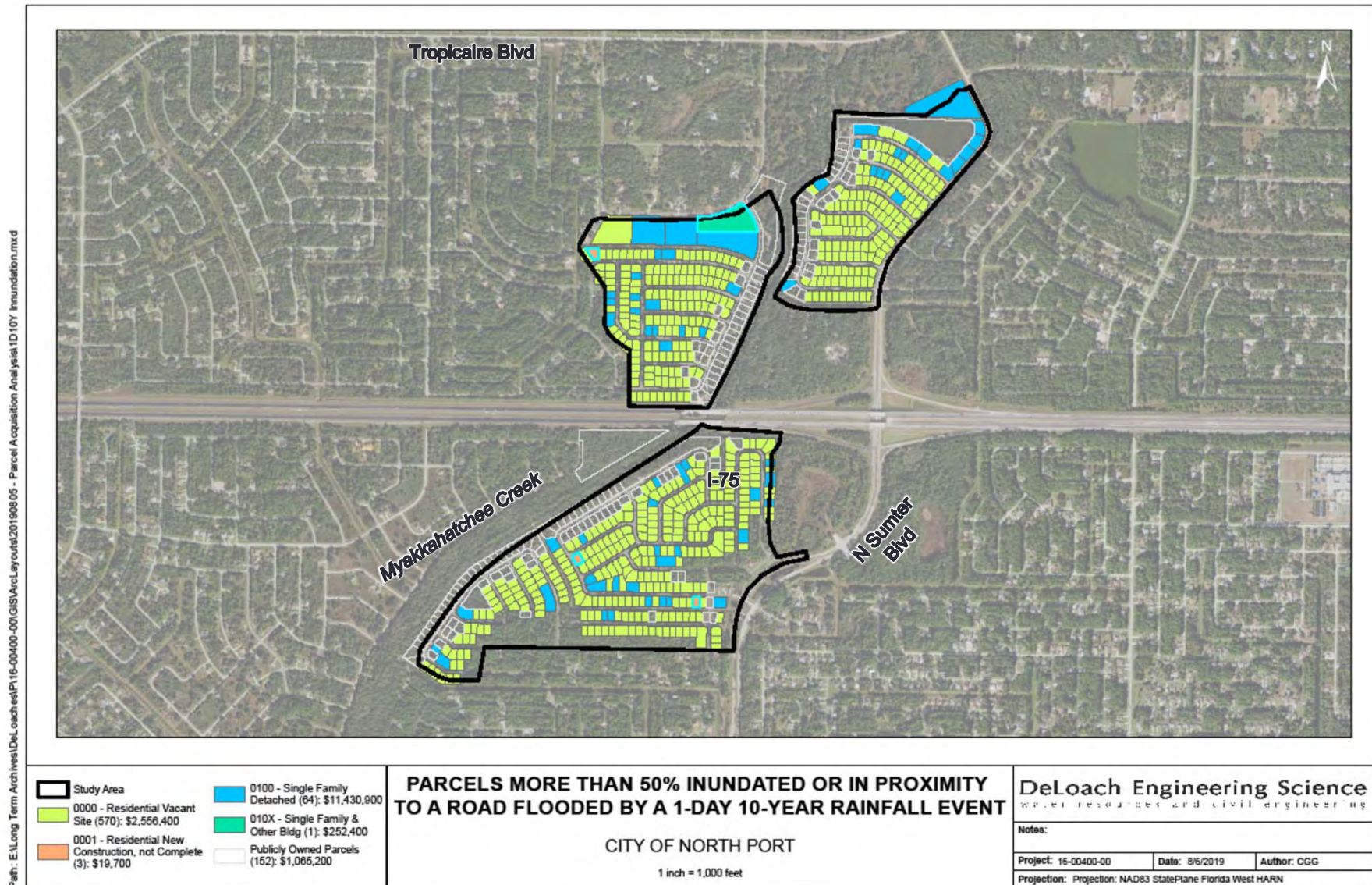
March 4, 2019, Workshop – Flooded Properties Based on 50% Inundated by a 1-day 10-year Rainfall



Preliminary Estimate of Acquisition Cost (Based on Sarasota County Property Appraiser 2017, projected at 4% inflation)					
	2017	2020	2025	2030	2035
Estimated Property Value*	\$ 5,272,400	\$ 5,930,733	\$ 7,215,643	\$ 8,778,934	\$ 10,680,915
Estimated Annualized Cost**	\$ 382,037	\$ 429,740	\$ 522,844	\$ 636,120	\$ 773,937

* Combined "Just Value" of properties inundated 50% or more by flooding from the 10-year 24-Hour Storm Event
 ** Cost annualized over 50 years at 7%, 13.8 PV Annuity Factor (estimated acquisition cost only)





Update Based on Flood Properties 50% Inundated by a 1-day 10-year Rainfall and Include Parcels Along Flooded Streets



Flooded Properties Acquisition Costs

April 4, 2019 - Just Values of Properties

- 50% flooded in a 1-day 10-year Storm Event.
- Along flooded roadway.

Legend	Parcel Type	No. of Parcels	April 4, 2019 Just Value
	Residential Vacant	570	\$2,556,400
	Residential Single Family Home	64	\$11,430,900
	Residential New Construction, Not Complete	3	\$19,700
	Single Family & Other Building	1	\$252,400
	Total	638	\$14,259,400

Consultant Cost for Acquisition

- Include property information reports (title searches) and appraisals for the single family homes.
- Does not include eminent domain condemnation efforts.

Consultant Activity	Cost Estimate August 2019
Property Information Reports (Title Searches)	\$319,000
Land Acquisition Negotiations	\$2,552,000
Appraisal	\$100,000
Closings	\$200,000
Total	\$3,171,000

Slide 7

Grant Funding

- Florida Communities Trust (FCT)

<https://floridadep.gov/lands/land-and-recreation-grants/content/fct-florida-communities-trust-home>

- FDEP administered program with funding from Florida Forever proceeds.
- Provides funding to local governments and eligible nonprofit organizations to acquire land for parks, open space, greenways.

- Trust for Public Lands (TPL)

<https://www.tpl.org/>

- TPL helps structure, negotiate, and complete land transactions that create parks, playgrounds, and protected natural areas.
- TPL buy land from willing landowners and then transfers it to public agencies, land trusts, or other groups for permanent protection.

- Federal Emergency Management Agency Hazard Mitigation Grant Program (HMGP)

<https://www.fema.gov/hazard-mitigation-grant-program>

- Following Presidential Major Disaster Declaration, HMGP grants may be available to individuals, businesses and private nonprofits via local governments to purchase property that has been subject to or is in danger of repetitive damage.

Discussion / Recommendations

- Continue with the Myakkahatchee Creek blockage removal efforts.
- After completing creek blockage removal project, re-evaluate the need to acquire properties after two or three rainy seasons.
- Continue flow channel maintenance efforts of creek, canals, retention ditches and roadside swales.
- Install “**Road Subject to Flooding**” signs at key locations.
- Prioritize acquisition of vacant lots within Study area.
 1. Vacant parcels nearest to Myakkahatchee Creek along flooded streets. Negotiate first with willing sellers.
 2. Vacant parcels 50% inundated in 1-day 10-year storm.
- Same priority as above except add acquisition of parcels with constructed homes ?
- Pursue grant funding for property acquisition.




City of North Port
DEPARTMENT OF PUBLIC WORKS
Office: 941.240.8050
Fax: 941.240.8063



MEMORANDUM

TO: Jason Yarborough, ICMA-CM, Acting City Manager

THROUGH: Cari Branco, Assistant City Manager

FROM: Juliana B. Bellia, Director 

SUBJECT: Item No. 246: Financial Impact of Removing Suggested Purchase Properties with the Big Slough Flood Study Area from Tax Roll

DATE: September 4, 2020

During the City Commission Workshop held on December 2, 2019, staff was directed to provide the financial impact of removing suggested purchased properties within Big Slough Flood Study area from tax roll, provide map of locations along creek where our Operations personnel will be removing creek blocks, and investigate available property for possible "property swap."

FINANCIAL IMPACT TO THE TAX ROLL OF REMOVED LOTS

The Big Slough Flood Reduction Study identified a total of 647 properties/lots within the Study area near the Myakkahatchee Creek and I-75 bridge that will be subject to flooding for the 10-year, 25-year and 100-year storm events. The following provides a breakdown of the 647 affected properties:

- Vacant single-family lots: 579
- Lots developed with single family residences: 65
- Lots in the construction process for single-family residences: 3

The financial impact of removing these lots from the tax roll was determined utilizing 2019 data from the websites of the Sarasota County Tax Collector and the Sarasota County Property Appraiser. The financial impacts only include the City of North Port mileage portion and the Non-Ad Valorem Assessments for the Fire Rescue District, Road and Drainage District, Solid Waste District and Capital Road Bond.

Jason Yarborough, ICMA-CM, Acting City Manager
September 4, 2020
Page Two

Based on the 2019 data included in the Sarasota County Tax Collector's website, the financial impact of removing all the lots subject to flooding and highlighted by the Big Slough Flood Reduction Study will total approximately \$272,500.00 per year. *(See Attachment 1).*

MAP DELINEATING MYAKKAHATCHEE CREEK BLOCKAGES

The Myakkahatchee Creek Blockage Removal Project typically takes place in the dry season between the months of December and May. The blockages have been identified and are delineated on a map. *(See Attachment 2).*

The direct pathway to each blockage has not yet been determined and therefore are not delineated on the attached map. Staff is currently evaluating potential pathways/access points to determine the alternatives that will have the least environmental impact.

Prior to the start of the Myakkahatchee Creek Blockage Removal Project, environmental surveys of the selected pathways/access points will be completed, and the entire Project Plan will be presented to the Commission.

AVAILABLE CITY-OWNED PROPERTY FOR POTENTIAL "PROPERTY SWAP"

The City of North Port currently owns a total of 554 single family residential lots within the City limits that can be considered for a property swap with the vacant single family lots included in the Big Slough Flood Reduction Study.

Should you have any questions, or desire any additional information, please do not hesitate to contact me.

JBB/jbb

Attachments:

- 1) Spreadsheets for Breakdown of Taxes and Assessments
- 2) Map Delineating Myakkahatchee Creek Blockages

Cc: PW Electronic File
Gerardo Traverso, P.E., P.M.P., Engineering Manager
Chuck Speake, Operations and Maintenance Manager
Frank Miles, MPA, Director, Department of Neighborhood Development Services

Attachment 1

RESIDENTIAL LOTS CONSTRUCTION STARTED BUT NOT COMPLETED TO DATE

	Account	Owner Name	2019 Ad-Valorem			2019 Non Ad-Valorem				Total
			Ass/Tax Value	Millage Rate-City	Total Tax	Fire & Rescue	Road & Drainage	Capital Road Bond	Solid Waste	
1	954142463	MAKSIMCHUK VASILYI	\$4,246.00	3.8735	\$16.45	\$85.66	\$171.56	\$46.00	\$245.00	\$564.67
2	953152605	HOMES MADE POSSIBLE HOMES LLC	\$3,171.00	3.8735	\$12.28	\$85.66	\$171.56	\$46.00	\$0.00	\$315.50
3	954142701	TERRA CORAL LLC	\$4,392.00	3.8735	\$17.01	\$85.66	\$171.56	\$46.00	\$245.00	\$565.23

\$45.74 \$256.98 \$514.68 \$138.00 \$490.00

Totals \$1,445.40 \$1,445.40

Total all Properties. **\$265,635.69**

SINGLE DETACHED HOMES

	Account	Owner Name	2019 Ad-Valorem			2019 Non Ad-Valorem				Totals
			Ass/Tax Value	Millage Rate-City	Total Tax	Fire & Rescue	Road & Drainage	Capital Road Bond	Solid Waste	
1	942153204	FOLLMER RAYMOND	\$175,299.00	3.8735	\$679.02	\$310.28	\$171.56	\$46.00	\$245.00	\$1,451.86
2	942080003	PARFENCHUK RUTH A	\$188,691.38	3.8735	\$730.90	\$333.98	\$171.56	\$46.00	\$245.00	\$1,527.44
3	954142913	SCHIAU SERGHEI	\$173,787.77	3.8735	\$673.17	\$307.60	\$171.56	\$46.00	\$245.00	\$1,443.33
4	942080002	HARRIS DEWEY R	\$211,473.86	3.8735	\$819.14	\$374.31	\$171.56	\$46.00	\$245.00	\$1,656.01
5	954142926	HAYES CORY ALLEN	\$118,662.30	3.8735	\$459.64	\$210.03	\$171.56	\$46.00	\$245.00	\$1,132.23
6	942153307	NEW VISTA RESIDENCES INC	\$153,768.96	3.8735	\$595.62	\$272.17	\$171.56	\$46.00	\$245.00	\$1,330.36
7	954141738	KING BOBBY G	\$135,655.44	3.8735	\$525.46	\$240.11	\$171.56	\$46.00	\$245.00	\$1,228.13
8	954143217	ANGOTTI SONDR A CHARISLE	\$168,909.00	3.8735	\$654.27	\$298.97	\$171.56	\$46.00	\$245.00	\$1,415.80
9	954142459	HOWETT RICHARD R	\$43,997.28	3.8735	\$170.42	\$267.16	\$171.56	\$46.00	\$245.00	\$900.14
10	953151931	FITZNER KENNETH ROBERT	\$0.00	3.8735	\$0.00	\$223.16	\$171.56	\$46.00	\$245.00	\$685.72
11	954143221	YORK JOSHUA	\$210,422.70	3.8735	\$815.07	\$372.45	\$171.56	\$46.00	\$245.00	\$1,650.08
12	954142437	COMPERDA MICHAEL G	\$133,965.29	3.8735	\$518.91	\$237.12	\$171.56	\$46.00	\$245.00	\$1,218.59
13	955153218	DE CLERCQ JEFFREY	\$118,438.65	3.8735	\$458.77	\$232.70	\$171.56	\$46.00	\$245.00	\$1,154.03
14	954142522	CHAPMAN BYRON JAMES	\$34,055.51	3.8735	\$131.91	\$235.00	\$171.56	\$46.00	\$245.00	\$829.47
15	954142467	IAFRATE JOSEPH C	\$148,485.50	3.8735	\$575.16	\$262.82	\$171.56	\$46.00	\$245.00	\$1,300.54
16	954142930	FORREST CHRISTOPHER D	\$173,748.36	3.8735	\$673.01	\$307.53	\$171.56	\$46.00	\$245.00	\$1,443.11
17	942080008	WAGNER ANA C	\$137,444.64	3.8735	\$532.39	\$243.28	\$171.56	\$46.00	\$245.00	\$1,238.23
18	954143329	KELLEY TRACY L	\$92,587.91	3.8735	\$358.64	\$238.95	\$171.56	\$46.00	\$245.00	\$1,060.15
19	954142128	ANDERSON DEBBIE A	\$191,983.29	3.8735	\$743.65	\$339.81	\$171.56	\$46.00	\$245.00	\$1,546.02
20	942080004	BORER ELIZABETH	\$277,853.18	3.8735	\$1,076.26	\$491.80	\$171.56	\$46.00	\$245.00	\$2,030.62
21	942080001	WIERSMA VERNON L	\$191,130.23	3.8735	\$740.34	\$338.30	\$171.56	\$46.00	\$245.00	\$1,541.20
22	954142456	MAKSIMCHUK DMITRY	\$102,600.00	3.8735	\$397.42	\$239.66	\$171.56	\$46.00	\$245.00	\$1,099.64
23	942080011	PORTER SHARON F	\$202,626.90	3.8735	\$784.88	\$358.65	\$171.56	\$46.00	\$245.00	\$1,606.08
24	954142925	PAUL ALAN & PAMELA JUNE LUTZ REVOCABLE TRUST	\$165,707.61	3.8735	\$641.87	\$293.30	\$171.56	\$46.00	\$245.00	\$1,397.73
25	942080007	LA CROIX FREDERICK R	\$130,189.86	3.8735	\$504.29	\$230.44	\$171.56	\$46.00	\$245.00	\$1,197.29
26	953152217	BRENTWOOD NP LLC	\$169,628.94	3.8735	\$657.06	\$300.24	\$171.56	\$46.00	\$245.00	\$1,419.86
27	954141810	OSBORNE JOHN R	\$50,397.93	3.8735	\$195.22	\$267.16	\$171.56	\$46.00	\$245.00	\$924.94
28	953151934	KOSZ MONIKA	\$90,768.89	3.8735	\$351.59	\$223.00	\$171.56	\$46.00	\$245.00	\$1,037.15
29	942153205	HINGER RICHARD	\$80,060.31	3.8735	\$310.11	\$254.00	\$171.56	\$46.00	\$245.00	\$1,026.67
30	954142518	POLOVICH PHILIP	\$132,805.50	3.8735	\$514.42	\$235.07	\$171.56	\$46.00	\$245.00	\$1,212.05
31	954142605	FORTH CHARLES A	\$62,128.91	3.8735	\$240.66	\$238.00	\$171.56	\$46.00	\$245.00	\$941.22
32	953152214	GLENRIDGE ESTATES LLC	\$131,128.13	3.8735	\$507.92	\$232.10	\$171.56	\$46.00	\$245.00	\$1,202.58
33	942153301	ATKINSON CURTIS M	\$55,979.60	3.8735	\$216.84	\$278.00	\$171.56	\$46.00	\$245.00	\$957.40
34	953141113	MORNINGSTAR JOSEPH H	\$235,078.52	3.8735	\$910.58	\$416.09	\$171.56	\$46.00	\$245.00	\$1,789.23
35	953152103	MATHIEU PAUL	\$292,555.50	3.8735	\$1,133.21	\$517.82	\$171.56	\$46.00	\$245.00	\$2,113.60
36	942080005	NEWHALL SUSAN RAE	\$258,688.50	3.8735	\$1,002.03	\$457.88	\$171.56	\$46.00	\$245.00	\$1,922.47
37	944152728	KAPPELMANN KEITH D	\$26,625.00	3.8735	\$103.13	\$215.00	\$171.56	\$46.00	\$245.00	\$780.69
38	953152222	TILLMAN DAVID S	\$164,968.50	3.8735	\$639.01	\$291.99	\$171.56	\$46.00	\$245.00	\$1,393.56
39	954143311	EDWARDS LENA E	\$86,487.59	3.8735	\$335.01	\$256.00	\$171.56	\$46.00	\$245.00	\$1,053.57

SINGLE DETACHED HOMES

40	954142520	THOMPSON DAVID L (CO-TTEE)	\$238,879.50	3.8735	\$925.30	\$422.82	\$171.56	\$46.00	\$245.00	\$1,810.68
41	954143215	RIVERA LEONARDO JR	\$61,695.45	3.8735	\$238.98	\$243.00	\$171.56	\$46.00	\$245.00	\$944.54
42	953152324	WINTER MARTIN D	\$26,092.50	3.8735	\$101.07	\$217.89	\$171.56	\$46.00	\$245.00	\$781.52
43	953152614	MAIGRET STEPHEN	\$101,481.72	3.8735	\$393.09	\$223.00	\$171.56	\$46.00	\$245.00	\$1,078.65
44	942153206	MANNING LAWRENCE W	\$54,960.39	3.8735	\$212.89	\$239.76	\$171.56	\$46.00	\$245.00	\$915.21
45	942153308	NEW VISTA RESIDENCES INC	\$131,504.07	3.8735	\$509.38	\$232.76	\$171.56	\$46.00	\$245.00	\$1,204.70
46	954142458	WILLIAMS ANNIE M	\$186,481.50	3.8735	\$722.34	\$330.07	\$171.56	\$46.00	\$245.00	\$1,514.97
47	953152628	ABAJIAN ANN	\$75,010.08	3.8735	\$290.55	\$234.00	\$171.56	\$46.00	\$245.00	\$987.11
48	967060743	MERRING AUSTIN	\$159,111.00	3.8735	\$616.32	\$281.63	\$171.56	\$46.00	\$245.00	\$1,360.50
49	953152515	KLEIN ANNA	\$161,880.00	3.8735	\$627.04	\$286.53	\$171.56	\$46.00	\$245.00	\$1,376.13
50	953152518	HOWETT KRISTIN	\$68,909.76	3.8735	\$266.92	\$265.90	\$171.56	\$46.00	\$245.00	\$995.38
51	954141739	ADORNA TOM	\$86,689.94	3.8735	\$335.79	\$254.80	\$171.56	\$46.00	\$245.00	\$1,053.15
52	953141110	THURSTON JEFFREY M	\$115,047.69	3.8735	\$445.64	\$203.63	\$171.56	\$46.00	\$245.00	\$1,111.83
53	954142627	WJHFL LLC	\$131,600.00	3.8735	\$509.75	\$232.93	\$171.56	\$46.00	\$245.00	\$1,205.24
54	954142515	CSMA FT LLC	\$113,422.50	3.8735	\$439.34	\$200.76	\$171.56	\$46.00	\$245.00	\$1,102.66
55	954142630	SUTTER JOHN	\$149,600.00	3.8735	\$579.48	\$264.79	\$171.56	\$46.00	\$245.00	\$1,306.83
56	967060701	MULLEN MARK F	\$194,469.00	3.8735	\$753.28	\$344.21	\$171.56	\$46.00	\$245.00	\$1,560.05
57	942041904	SCOTT JOSEPH W	\$111,701.46	3.8735	\$432.68	\$243.00	\$171.56	\$46.00	\$245.00	\$1,138.24
58	953152415	MC MILLAN MICHAEL	\$143,624.84	3.8735	\$556.33	\$254.22	\$171.56	\$46.00	\$245.00	\$1,273.11
59	953152221	LONG JR DAVID L	\$26,625.00	3.8735	\$103.13	\$254.67	\$171.56	\$46.00	\$245.00	\$820.36
60	953152513	CABRERA ROLANDO	\$130,462.50	3.8735	\$505.35	\$230.92	\$171.56	\$46.00	\$245.00	\$1,198.83
61	953151933	MINA CYNTHIA G	\$81,642.90	3.8735	\$316.24	\$256.00	\$171.56	\$46.00	\$245.00	\$1,034.80
62	954142803	GAILLARD CHELSEA	\$142,446.95	3.8735	\$551.77	\$252.13	\$171.56	\$46.00	\$245.00	\$1,266.46
63	953152713	DE CLERQ JR DONALD H	\$26,625.00	3.8735	\$103.13	\$247.98	\$171.56	\$46.00	\$245.00	\$813.67
64	953141111	TRUST AGREEMENT DATED 02/09/1999	\$230,892.00	3.8735	\$894.36	\$408.68	\$171.56	\$46.00	\$245.00	\$1,765.60
65	953141112	UTT KEITH V	\$111,656.73	3.8735	\$432.50	\$265.00	\$425.26	\$46.00	\$245.00	\$1,413.76

\$33,239.66 \$18,333.01 \$11,405.10 \$2,990.00 \$15,925.00

Totals \$81,892.77 \$81,892.77

VACANT LOTS

	Account	Owner Name	2019 Ad-Valorem			2019 Non Ad-Valorem				Total
			Ass/Tax Value	Millage Rate-City	Total Tax	Fire & Rescue	Road & Drainage	Capital Road Bond	Solid Waste	
1	942153207	RE & C INVESTMENT LLC	\$3,800.00	3.8735	\$14.72	\$85.66	\$171.56	\$46.00	\$0.00	\$317.94
2	942153326	NEW VISTA PROPERTIES INC	\$3,400.00	3.8735	\$13.17	\$85.66	\$171.56	\$46.00	\$0.00	\$316.39
3	942080009	NORMAN WILLIAM	\$18,041.10	3.8735	\$69.88	\$85.66	\$171.56	\$46.00	\$0.00	\$373.10
4	942153324	ABREU VICTOR A	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
5	954142808	RIVERSIDE LAND HOLDINGS LLC	\$4,252.55	3.8735	\$16.47	\$85.66	\$171.56	\$46.00	\$0.00	\$319.69
6	955153007	GMINDER RUSSELL	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
7	954142717	IVANENKO PETER	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
8	942153208	SILVER FROND INVESTMENTS LLC	\$3,727.50	3.8735	\$14.44	\$85.66	\$171.56	\$46.00	\$0.00	\$317.66
9	953152011	AIEL INVESTMENT LLC	\$3,969.26	3.8735	\$15.37	\$85.66	\$171.56	\$46.00	\$0.00	\$318.59
10	942153323	CRONKEY JOSEPH E	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
11	953152117	CAMPBELL CARL G	\$3,969.26	3.8735	\$15.37	\$85.66	\$171.56	\$46.00	\$0.00	\$318.59
12	942153310	NEW VISTA PROPERTIES INC	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
13	954141727	PHAM DUC M	\$4,252.55	3.8735	\$16.47	\$85.66	\$171.56	\$46.00	\$0.00	\$319.69
14	955152912	WILLIAMS WALTER E JR	\$3,301.50	3.8735	\$12.79	\$85.66	\$171.56	\$46.00	\$0.00	\$316.01
15	954142528	MONTALVO EDUARDO R	\$4,961.84	3.8735	\$19.22	\$85.66	\$171.56	\$46.00	\$0.00	\$322.44
16	954142233	JIMENEZ HERBERT	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
17	954142221	PHILLIPS ANDREW	\$14,458.44	3.8735	\$56.00	\$85.66	\$171.56	\$46.00	\$0.00	\$359.22
18	954142457	NEVIS FOUR LLC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
19	953152322	HALE ROBERT D	\$3,621.00	3.8735	\$14.03	\$85.66	\$171.56	\$46.00	\$0.00	\$317.25
20	953152201	BURKE DARCI L	\$3,969.26	3.8735	\$15.37	\$85.66	\$171.56	\$46.00	\$0.00	\$318.59
21	955153128	PROVIDENT TRUST GROUP LLC	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
22	955153214	MC GRATH JOSEPH P	\$3,301.50	3.8735	\$12.79	\$85.66	\$171.56	\$46.00	\$0.00	\$316.01
23	954142224	PURFEERST JOSEPH E (TTEE)	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
24	954142236	CHEN QIAN	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
25	954142625	HEIVA HOLDINGS USA LLC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
26	954142403	EQUITY TRUST COMPANY CUST	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
27	953152316	NEW VISTA PROPERTIES INC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
28	954143216	FICHTENBERG RONALD	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
29	955153107	CHADWICK REI6 LLC	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
30	955153010	PLANAS TEOBALDO	\$3,621.00	3.8735	\$14.03	\$85.66	\$171.56	\$46.00	\$0.00	\$317.25
31	954141804	OVERSEAS INVESTMENT LLC	\$4,899.00	3.8735	\$18.98	\$85.66	\$171.56	\$46.00	\$0.00	\$322.20
32	954142602	SMITH WILLARD J	\$4,394.19	3.8735	\$17.02	\$85.66	\$171.56	\$46.00	\$0.00	\$320.24
33	954143114	MOORE EDWARD M JR	\$5,670.06	3.8735	\$21.96	\$85.66	\$171.56	\$46.00	\$0.00	\$325.18
34	954143115	LOY WILLIAM M	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
35	954142811	PAJUNAR AMOR G (TTEE)	\$4,819.13	3.8735	\$18.67	\$85.66	\$171.56	\$46.00	\$0.00	\$321.89
36	954142920	DAGUE RICK JOSEPH	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
37	953152302	DELVILLAR ANGELO R	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
38	954143318	NORTH PORT LOTS AND REAL PROPERTY LLC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
39	954143205	HAUBER EDWARD R (TTEE)	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14

VACANT LOTS

40	955153115	SYNERGIC INVESTMENTS INC	\$3,195.00	3.8735	\$12.38	\$85.66	\$171.56	\$46.00	\$0.00	\$315.60
41	955153110	EPPS MONTE (TTEE)	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
42	955153003	BURKE CHRISTOPHER P	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
43	954142804	ANTOSH WAYNE	\$4,252.55	3.8735	\$16.47	\$85.66	\$171.56	\$46.00	\$0.00	\$319.69
44	954141729	SHABURA VLADIMIR	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
45	955153004	NEW VISTA PROPERTIES INC	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
46	954142801	PERCIAL MARTHA A	\$4,899.00	3.8735	\$18.98	\$85.66	\$171.56	\$46.00	\$0.00	\$322.20
47	954142917	VEREMCHUK ALEKSANDR	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
48	954143214	PICKETT KENNETH	\$4,639.14	3.8735	\$17.97	\$85.66	\$171.56	\$46.00	\$0.00	\$321.19
49	954142120	KRACHKO ANDREY	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
50	954142526	NOLAND JASON	\$5,245.13	3.8735	\$20.32	\$85.66	\$171.56	\$46.00	\$0.00	\$323.54
51	954142439	ZEIS ERNEST	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
52	954143317	AMBURGEY TOMMY W	\$3,827.61	3.8735	\$14.83	\$85.66	\$171.56	\$46.00	\$0.00	\$318.05
53	954141736	HERCHENHAHN JEAN	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
54	953152107	SUNBELT SALES & DEVELOPMENT CORP	\$3,827.61	3.8735	\$14.83	\$85.66	\$171.56	\$46.00	\$0.00	\$318.05
55	954143110	ADAMS GERALD (TTEE)	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
56	954143314	HOER CHRISTOPHER F	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
57	953151932	SUSAN CAROL FITZPATRICK REVOC LIVING TRUST	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
58	953152401	RAZZAQUE ANJUMAN J	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
59	953152313	DENIS SILVIA M	\$3,969.26	3.8735	\$15.37	\$85.66	\$171.56	\$46.00	\$0.00	\$318.59
60	942153306	Q SMITH HOMES LLC	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
61	955152707	PRIVATE EQUITY SOLUTIONS LLC	\$3,727.50	3.8735	\$14.44	\$85.66	\$171.56	\$46.00	\$0.00	\$317.66
62	955152704	NANDIGAM KOUSHALYA	\$3,727.50	3.8735	\$14.44	\$85.66	\$171.56	\$46.00	\$0.00	\$317.66
63	955152811	NORTH PORT LOTS AND REAL PROPERTY LLC	\$2,875.50	3.8735	\$11.14	\$85.66	\$171.56	\$46.00	\$0.00	\$314.36
64	955153108	MARINA LUPYAN TRUST	\$3,301.50	3.8735	\$12.79	\$85.66	\$171.56	\$46.00	\$0.00	\$316.01
65	955153111	LANGE BARBARA	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
66	954141748	PORCO DOMENICO	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
67	954142228	RODRIGUEZ WAYNE	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
68	954143202	POWELL MICHAEL J	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
69	954141723	DE LEON OSCAR	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
70	954142902	SMITH DAN	\$4,677.48	3.8735	\$18.12	\$85.66	\$171.56	\$46.00	\$0.00	\$321.34
71	955152916	NORTH PORT LOTS AND REAL PROPERTY LLC	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
72	954142907	COGOLLOS ANGELA	\$4,252.55	3.8735	\$16.47	\$85.66	\$171.56	\$46.00	\$0.00	\$319.69
73	954141751	LOURO PHILIP	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
74	954142910	CHU WANG LING	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
75	955152706	MYERS DAVID C	\$3,727.50	3.8735	\$14.44	\$85.66	\$171.56	\$46.00	\$0.00	\$317.66
76	953151638	PAUYO CASSANDRA	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
77	954143011	OVERSEAS INVESTMENT LLC	\$4,579.50	3.8735	\$17.74	\$85.66	\$171.56	\$46.00	\$0.00	\$320.96
78	955153113	GROZA DELIA M	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
79	954142443	BALIUS GENE	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
80	955153013	VIRNAN NADIA	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
81	955153212	VINNIK IGOR	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
82	955153127	PROVIDENT TRUST GROUP LLC	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83

VACANT LOTS

83	954142517	QUEEN VIRGINIA P	\$5,528.42	3.8735	\$21.41	\$85.66	\$171.56	\$46.00	\$0.00	\$324.63
84	954141744	BURNS JOHN J	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
85	954142802	MORGAN JEFFREY C	\$4,252.55	3.8735	\$16.47	\$85.66	\$171.56	\$46.00	\$0.00	\$319.69
86	955153125	SUSAN CAROL FITZPATRICK REVOC LIVING TRUST	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
87	955152908	SLABAUGH GLEN	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
88	954142906	HOMA GINA L	\$4,252.55	3.8735	\$16.47	\$85.66	\$171.56	\$46.00	\$0.00	\$319.69
89	955153124	NEW VISTA PROPERTIES INC	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
90	953151639	NORTH PORT LOTS AND REAL PROPERTY LLC	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
91	954142601	SMITH WILLARD J	\$4,394.19	3.8735	\$17.02	\$85.66	\$171.56	\$46.00	\$0.00	\$320.24
92	954142122	KRACHKO ANDREY	\$4,394.19	3.8735	\$17.02	\$85.66	\$171.56	\$46.00	\$0.00	\$320.24
93	955153216	MAGGIO RONALD J	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
94	955152806	KOBEL KATHRYN	\$3,727.50	3.8735	\$14.44	\$85.66	\$171.56	\$46.00	\$0.00	\$317.66
95	955152701	UB PROPERTIES LLC	\$2,343.00	3.8735	\$9.08	\$85.66	\$171.56	\$46.00	\$0.00	\$312.30
96	955153105	SNYDER DEVELOPMENT CORP	\$4,047.00	3.8735	\$15.68	\$85.66	\$171.56	\$46.00	\$0.00	\$318.90
97	955153112	GOGREEN PROPERTY MGMT LLC	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
98	954142511	CHUNG WINIFRED C	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
99	954142301	BARNETT JERRY A	\$4,677.48	3.8735	\$18.12	\$85.66	\$171.56	\$46.00	\$0.00	\$321.34
100	955152921	KOSTESKI SIMON	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
101	954142805	PAIK SON K	\$4,252.55	3.8735	\$16.47	\$85.66	\$171.56	\$46.00	\$0.00	\$319.69
102	954143010	ALEXSOFF DEAN	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
103	954143009	KOSTESKI SIMON	\$4,677.48	3.8735	\$18.12	\$85.66	\$171.56	\$46.00	\$0.00	\$321.34
104	942153311	MANNELL ROBERT A	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
105	953152208	SERFOZO STEVE	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
106	954142530	KARR MARTIN PALMER	\$5,005.50	3.8735	\$19.39	\$85.66	\$171.56	\$46.00	\$0.00	\$322.61
107	954142451	VERENCHUK IGOR	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
108	954142461	ESTANDA FIDEL	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
109	954142464	GMINDER RUSSELL	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
110	954142444	BALIUS GENE	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
111	955152812	PEDRIQUEZ VIRGILIO V	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
112	942153304	MOLTER GREGORY	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
113	955152805	GULF COAST CONSULTING LLC	\$3,727.50	3.8735	\$14.44	\$85.66	\$171.56	\$46.00	\$0.00	\$317.66
114	953152113	BERRYHILL TIMOTHY	\$3,969.26	3.8735	\$15.37	\$85.66	\$171.56	\$46.00	\$0.00	\$318.59
115	954142523	BARJUCA OCTAVIAN	\$4,535.84	3.8735	\$17.57	\$85.66	\$171.56	\$46.00	\$0.00	\$320.79
116	954142524	BEACHY FREEMAN	\$4,961.84	3.8735	\$19.22	\$85.66	\$171.56	\$46.00	\$0.00	\$322.44
117	953151633	DOWDEN SR CURLL C	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
118	954142237	DAVIS LEWIN	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
119	954143320	KOLANEK IRENA (E LIFE EST)	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
120	954143204	MAKSIMCHUK VLADISLAV	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
121	954143313	HOFFER CHRISTOPHER F	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
122	953152205	BRISSETT BERYL M	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
123	942153314	NORTH PORT LOTS AND REAL PROPERTY LLC	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
124	953152102	FLORIDA RESERVE HOMES LLC	\$4,047.00	3.8735	\$15.68	\$85.66	\$171.56	\$46.00	\$0.00	\$318.90
125	955152702	NICHOLS MEGAN	\$3,727.50	3.8735	\$14.44	\$85.66	\$171.56	\$46.00	\$0.00	\$317.66

VACANT LOTS

126	955152817	CANINO JOHN A JR	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
127	953152114	CAMPBELL CARL G	\$3,969.26	3.8735	\$15.37	\$85.66	\$171.56	\$46.00	\$0.00	\$318.59
128	954142021	BRIAN W BRANCH AND DEBORAH A HUNT TRUST	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
129	954143321	SANJEF ENTERPRISES LLC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
130	954142404	ILLSLEY RICHARD R	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
131	955152705	DIANGSON TEODORO M	\$3,727.50	3.8735	\$14.44	\$85.66	\$171.56	\$46.00	\$0.00	\$317.66
132	954143103	MACKE JOHN E	\$3,827.61	3.8735	\$14.83	\$85.66	\$171.56	\$46.00	\$0.00	\$318.05
133	953151635	NEW VISTA PROPERTIES INC	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
134	954142904	ROMANS REMODELING LLC	\$4,899.00	3.8735	\$18.98	\$85.66	\$171.56	\$46.00	\$0.00	\$322.20
135	953141109	KINNARD ALAN F	\$74,277.36	3.8735	\$287.71	\$85.66	\$171.56	\$46.00	\$0.00	\$590.93
136	954141747	HEIVA HOLDINGS USA LLC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
137	954142514	PARKHILL GARY	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
138	954142624	EVANS JOAN	\$4,899.00	3.8735	\$18.98	\$85.66	\$171.56	\$46.00	\$0.00	\$322.20
139	955153126	AGMA INTERNATIONAL LLC	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
140	954141904	LAMKIN DOLORES	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
141	954142007	Q SMITH HOMES LLC	\$4,252.55	3.8735	\$16.47	\$85.66	\$171.56	\$46.00	\$0.00	\$319.69
142	954143325	SANFORD STANLEY	\$4,899.00	3.8735	\$18.98	\$85.66	\$171.56	\$46.00	\$0.00	\$322.20
143	954142448	MAO ALICE	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
144	942153320	LI-CHUAN CHUANG	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
145	953152105	CHRISTOPHER ALEXANDER	\$4,047.00	3.8735	\$15.68	\$85.66	\$171.56	\$46.00	\$0.00	\$318.90
146	942153222	WERNER FAMILY TRUST	\$3,940.50	3.8735	\$15.26	\$85.66	\$171.56	\$46.00	\$0.00	\$318.48
147	942153305	CILLEY KATHERINE E	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
148	955153219	KARELLA ANTHONY H	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
149	954141914	HUMMEL DAVID M	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
150	954143220	HILAIRE JEAN MICHEL	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
151	942153318	AMERICAN ESTATE AND TRUST	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
152	954142447	Q SMITH HOMES LLC	\$4,961.84	3.8735	\$19.22	\$85.66	\$171.56	\$46.00	\$0.00	\$322.44
153	954142004	BACCHUS ALBAN	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
154	954141746	GRAY JASON	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
155	954141737	HORIZON TRUST COMPANY	\$5,857.50	3.8735	\$22.69	\$85.66	\$171.56	\$46.00	\$0.00	\$325.91
156	954142709	MARTIN FAMILY TRUST	\$4,535.84	3.8735	\$17.57	\$85.66	\$171.56	\$46.00	\$0.00	\$320.79
157	954142525	HEIVA HOLDINGS USA LLC	\$4,961.84	3.8735	\$19.22	\$85.66	\$171.56	\$46.00	\$0.00	\$322.44
158	954142705	LEWIS MIKE	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
159	954141807	MILLS ERIC M	\$4,535.84	3.8735	\$17.57	\$85.66	\$171.56	\$46.00	\$0.00	\$320.79
160	954142702	ADAMS GERALD	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
161	954141903	LAMKIN DOLORES	\$4,252.55	3.8735	\$16.47	\$85.66	\$171.56	\$46.00	\$0.00	\$319.69
162	954141725	RAMSUBHAG OMA A	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
163	954142631	AGUAMARINA OF FLORIDA LLC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
164	954141724	RAMSUBHAG OMA A	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
165	955153109	EPPS MONTE (TTEE)	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
166	954141808	OSBORNE JOHN	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
167	954141915	SALAZAR J OCTAVIO	\$4,819.13	3.8735	\$18.67	\$85.66	\$171.56	\$46.00	\$0.00	\$321.89
168	954143222	LYNCH MICHAEL	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14

VACANT LOTS

169	954143309	BALIUS GENE	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
170	954143330	NGUYEN THUYLINH N	\$4,252.55	3.8735	\$16.47	\$85.66	\$171.56	\$46.00	\$0.00	\$319.69
171	954142103	PROTOS INC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
172	953152402	MC LAIN KURT	\$3,621.00	3.8735	\$14.03	\$85.66	\$171.56	\$46.00	\$0.00	\$317.25
173	954142617	FARRELL KEVIN M	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
174	942153202	SUN PROPERTY VENTURES LLC	\$3,940.50	3.8735	\$15.26	\$85.66	\$171.56	\$46.00	\$0.00	\$318.48
175	954143003	BEACHY FREEMAN	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
176	954143106	PHAM DUC M	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
177	954142718	HOWARD ANNA V	\$4,394.19	3.8735	\$17.02	\$85.66	\$171.56	\$46.00	\$0.00	\$320.24
178	954143211	NELSON MARVIN D	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
179	953152005	BOUNDS BARBARA A	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
180	954143312	HOFER CHRISTOPHER F	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
181	954143319	DAWSON PETERGAY	\$4,579.50	3.8735	\$17.74	\$85.66	\$171.56	\$46.00	\$0.00	\$320.96
182	954141802	JACOB MANOJ	\$4,252.55	3.8735	\$16.47	\$85.66	\$171.56	\$46.00	\$0.00	\$319.69
183	953152010	CHANG TE CHUAN	\$3,401.61	3.8735	\$13.18	\$85.66	\$171.56	\$46.00	\$0.00	\$316.40
184	942153317	LORUSSO JOSEPH J	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
185	953151920	SWIFT CLEAR INVESTMENT LLC	\$3,544.32	3.8735	\$13.73	\$85.66	\$171.56	\$46.00	\$0.00	\$316.95
186	954142408	BERKHOFF-HORNIG JURGEN	\$6,603.00	3.8735	\$25.58	\$85.66	\$171.56	\$46.00	\$0.00	\$328.80
187	954143308	CHU WANG LING	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
188	953152215	NORTH PORT LOTS AND REAL PROPERTY LLC	\$3,962.87	3.8735	\$15.35	\$85.66	\$171.56	\$46.00	\$0.00	\$318.57
189	953152116	CAMPBELL CARL G	\$3,969.26	3.8735	\$15.37	\$85.66	\$171.56	\$46.00	\$0.00	\$318.59
190	953152203	MIRRIONE JAMES	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
191	953152101	MALDONADO RADAMES	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
192	954142706	HARRIS INA P TTEE	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
193	954142512	THE KINGDOM TRUST COMPANY (CUST)	\$4,899.00	3.8735	\$18.98	\$85.66	\$171.56	\$46.00	\$0.00	\$322.20
194	954142708	COGOLLOS ANGELA	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
195	953152820	ANDERS JEFFREY L	\$3,301.50	3.8735	\$12.79	\$85.66	\$171.56	\$46.00	\$0.00	\$316.01
196	954143111	ADAMS GERALD (TTEE)	\$4,535.84	3.8735	\$17.57	\$85.66	\$171.56	\$46.00	\$0.00	\$320.79
197	954143213	ZORO PROPERTIES LLC	\$5,927.79	3.8735	\$22.96	\$85.66	\$171.56	\$46.00	\$0.00	\$326.18
198	954143109	BROWN A EARL	\$3,969.26	3.8735	\$15.37	\$85.66	\$171.56	\$46.00	\$0.00	\$318.59
199	954142932	MUYOT JOSEFINO F	\$4,535.84	3.8735	\$17.57	\$85.66	\$171.56	\$46.00	\$0.00	\$320.79
200	954143113	MOORE EDWARD M JR	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
201	955153014	HUNT CHRISTOPHER	\$10,224.00	3.8735	\$39.60	\$85.66	\$171.56	\$46.00	\$0.00	\$342.82
202	954143207	CHELNOKOV VLADIMIR	\$4,381.41	3.8735	\$16.97	\$85.66	\$171.56	\$46.00	\$0.00	\$320.19
203	953152323	THOMPSON TIMOTHY A	\$3,621.00	3.8735	\$14.03	\$85.66	\$171.56	\$46.00	\$0.00	\$317.25
204	953152003	FELIX MILHOUSE	\$3,401.61	3.8735	\$13.18	\$85.66	\$171.56	\$46.00	\$0.00	\$316.40
205	954143019	JOHANNSEN LINDA K	\$4,252.55	3.8735	\$16.47	\$85.66	\$171.56	\$46.00	\$0.00	\$319.69
206	953152312	KOWLESSAR DEOMATTIE	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
207	953152209	MALLEY JOSEPH A	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
208	954143006	HEIVA HOLDINGS USA LLC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
209	953151937	GUTIERREZ REYNALDO D	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
210	955152907	ANDREWS ELIZABETH	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
211	953151634	ATCHISON THOMAS J	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50

VACANT LOTS

212	955153114	WOODS ISAAC H	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
213	955153118	RESTREPO JULIANA	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
214	953151640	COMIAN X TAX LIEN FUND LLC	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
215	954143002	CID DEMETRIO	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
216	954142908	HEIVA HOLDINGS USA LLC	\$3,969.26	3.8735	\$15.37	\$85.66	\$171.56	\$46.00	\$0.00	\$318.59
217	954142931	WALLS DIANE R	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
218	954143112	CRUM CATHY	\$4,961.84	3.8735	\$19.22	\$85.66	\$171.56	\$46.00	\$0.00	\$322.44
219	954142022	WRIGHT GREGORY P	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
220	954142006	LEWIS MIKE	\$4,252.55	3.8735	\$16.47	\$85.66	\$171.56	\$46.00	\$0.00	\$319.69
221	954142020	HUNT-BRANCH AARON	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
222	955152703	HERNANDEZ JIMMY	\$3,727.50	3.8735	\$14.44	\$85.66	\$171.56	\$46.00	\$0.00	\$317.66
223	954143315	L I CHOICE INC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
224	955152917	SANDEEP GO LLC	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
225	954142922	HEIVA HOLDINGS USA LLC	\$3,827.61	3.8735	\$14.83	\$85.66	\$171.56	\$46.00	\$0.00	\$318.05
226	954143102	QUEEN GALEN K S	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
227	954143017	DE ANGELIS ELENA M	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
228	954142806	DONN THUY VAN	\$4,252.55	3.8735	\$16.47	\$85.66	\$171.56	\$46.00	\$0.00	\$319.69
229	953151938	ABONADO CARLITO	\$3,827.61	3.8735	\$14.83	\$85.66	\$171.56	\$46.00	\$0.00	\$318.05
230	942153328	CHARLETTA RICHARD J	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
231	942153312	ZACZEK ELIZABETH J	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
232	953152014	GILBERT THOMAS J	\$3,827.61	3.8735	\$14.83	\$85.66	\$171.56	\$46.00	\$0.00	\$318.05
233	954143203	POWELL MICHAEL J	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
234	955152804	DILENDICK BRIAN	\$3,727.50	3.8735	\$14.44	\$85.66	\$171.56	\$46.00	\$0.00	\$317.66
235	953152220	MARTIN URSULA	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
236	955153008	JOVE JOSE I	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
237	955152815	WEXLER DONNA	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
238	953152308	HAGGERTY DENICE	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
239	953152115	CAMPBELL CARL G	\$3,969.26	3.8735	\$15.37	\$85.66	\$171.56	\$46.00	\$0.00	\$318.59
240	953152006	BOUNDS BARBARA A	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
241	955152918	HENDRICKS JR BERNARD D	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
242	954142713	LANGSTON LEROY	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
243	955152920	WRIGHT ROBERT PHILIP	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
244	954143201	COGOLLOS ANGELA	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
245	954142914	RUSSELL RICHARD	\$4,896.87	3.8735	\$18.97	\$85.66	\$171.56	\$46.00	\$0.00	\$322.19
246	942153325	WOLFE CLAUDINE	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
247	954143008	EDGERTON FAMILY LIVING TRUST	\$4,677.48	3.8735	\$18.12	\$85.66	\$171.56	\$46.00	\$0.00	\$321.34
248	954143107	NORTH PORT LOTS AND REAL PROPERTY LLC	\$4,579.50	3.8735	\$17.74	\$85.66	\$171.56	\$46.00	\$0.00	\$320.96
249	953152503	GREEN JR MICHAEL B	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
250	954143208	MAYFIELD CAMELLIA	\$5,541.20	3.8735	\$21.46	\$85.66	\$171.56	\$46.00	\$0.00	\$324.68
251	954142714	REALIZA BONG	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
252	954143016	GADEN ROGER C	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
253	954142401	TORRANCE BARBARA J	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
254	954142238	DEWAR EDWARD W	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14

VACANT LOTS

255	954142513	DABANDAN EDGARDO	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
256	954142240	EIGHT HOLDINGS LLC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
257	954143212	NORTH PORT LOTS AND REAL PROPERTY LLC	\$4,768.01	3.8735	\$18.47	\$85.66	\$171.56	\$46.00	\$0.00	\$321.69
258	954143206	WATT MONTE	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
259	954142232	CHUNG WINIFRED C	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
260	954142127	CHALMERS GEOFFREY T	\$4,394.19	3.8735	\$17.02	\$85.66	\$171.56	\$46.00	\$0.00	\$320.24
261	955152913	JEVRIC VERA	\$3,195.00	3.8735	\$12.38	\$85.66	\$171.56	\$46.00	\$0.00	\$315.60
262	954143013	NORTH PORT LOTS AND REAL PROPERTY LLC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
263	954143108	JOSEPH MARJORIE NELSON	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
264	954142453	SURAPANENI SRINIVAS	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
265	954142225	JOSEPH E PURFEERST REVOCABLE TRUST	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
266	953152218	SARASOTA CAPITAL LLC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
267	953152321	ADAMS GERALD I	\$3,621.00	3.8735	\$14.03	\$85.66	\$171.56	\$46.00	\$0.00	\$317.25
268	942153302	DE HAVEN MARY C B	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
269	954142510	HEIVA HOLDINGS USA LLC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
270	954142507	CLEARE DELONE Y	\$8,930.03	3.8735	\$34.59	\$85.66	\$171.56	\$46.00	\$0.00	\$337.81
271	953152310	GOETZE LORALEE J	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
272	954142126	CHALMERS GEOFFREY T	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
273	955153117	GEIST JAMES S (TTEE)	\$3,195.00	3.8735	\$12.38	\$85.66	\$171.56	\$46.00	\$0.00	\$315.60
274	954142227	PURFEERST JAMES M	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
275	954142531	HEIVA HOLDINGS USA LLC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
276	954142519	BUSER CHRISTOPHE	\$5,103.48	3.8735	\$19.77	\$85.66	\$171.56	\$46.00	\$0.00	\$322.99
277	955153211	ROTH GUENTER (TTEE)	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
278	955153009	HABITAT FOR HUMANITY SOUTH SARASOTA COUNTY INC	\$3,195.00	3.8735	\$12.38	\$85.66	\$171.56	\$46.00	\$0.00	\$315.60
279	954142239	DEWAR EDWARD W	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
280	955152904	LOPEZ MONICA	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
281	953152802	GEORGIEV ZORNITSA	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
282	953152106	CHRISTOPHER ALEXANDER	\$4,047.00	3.8735	\$15.68	\$85.66	\$171.56	\$46.00	\$0.00	\$318.90
283	953152004	BOUNDS BARBARA A	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
284	954142455	VEMULAPALLI SUSHMA	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
285	954142450	FIRST CHOICE HOME BUILDERS LLC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
286	954142460	FALNESS DAVID E	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
287	954143322	HEIVA HOLDINGS USA LLC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
288	953152118	NP 11 LLC	\$3,969.26	3.8735	\$15.37	\$85.66	\$171.56	\$46.00	\$0.00	\$318.59
289	953153001	NARDINI-CALLAHAN DAWN	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
290	954142618	FARRELL BRIAN J	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
291	953151936	MILLER DARRELL J	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
292	954142302	BARNETT JERRY A	\$5,005.50	3.8735	\$19.39	\$85.66	\$171.56	\$46.00	\$0.00	\$322.61
293	955152911	WHITEHOUSE JOHN F	\$3,301.50	3.8735	\$12.79	\$85.66	\$171.56	\$46.00	\$0.00	\$316.01
294	954142912	MEANS RICHARD T	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
295	942080010	NORMAN WILLIAM	\$25,453.50	3.8735	\$98.59	\$85.66	\$171.56	\$46.00	\$0.00	\$401.81
296	942153203	OVERSEAS INVESTMENT LLC	\$3,834.00	3.8735	\$14.85	\$85.66	\$171.56	\$46.00	\$0.00	\$318.07
297	967060946	LAWRENCE STEVE	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14

VACANT LOTS

298	955152903	NEW VISTA PROPERTIES INC	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
299	953152002	BOUNDS BARBARA A	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
300	953152404	SANIXAY CHANSAMONE	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
301	954141752	SHERMAN OFELIA TTEE	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
302	953152210	DASCZYNSKI WARREN	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
303	955153005	AMERICAN ESTATE AND TRUST	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
304	953152607	BIRA HOLDINGS LLC	\$3,940.50	3.8735	\$15.26	\$85.66	\$171.56	\$46.00	\$0.00	\$318.48
305	955152922	VAZIRI HOSHMAND	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
306	954143101	PEREIRA JOSE C J	\$3,969.26	3.8735	\$15.37	\$85.66	\$171.56	\$46.00	\$0.00	\$318.59
307	954142905	DEMONTEVERDE MARIE H	\$4,252.55	3.8735	\$16.47	\$85.66	\$171.56	\$46.00	\$0.00	\$319.69
308	954143018	BEACHY FREEMAN	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
309	954141755	LANG WILLIE L	\$4,394.19	3.8735	\$17.02	\$85.66	\$171.56	\$46.00	\$0.00	\$320.24
310	954143007	I DREAMS ESTATES LLC	\$4,639.14	3.8735	\$17.97	\$85.66	\$171.56	\$46.00	\$0.00	\$321.19
311	953152609	NGUYEN THU	\$3,940.50	3.8735	\$15.26	\$85.66	\$171.56	\$46.00	\$0.00	\$318.48
312	953152508	NEW VISTA PROPERTIES INC	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
313	944152727	KAPPELMANN KEITH	\$4,366.50	3.8735	\$16.91	\$85.66	\$171.56	\$46.00	\$0.00	\$320.13
314	954142807	VERO ATLANTIC 2 LLC	\$4,899.00	3.8735	\$18.98	\$85.66	\$171.56	\$46.00	\$0.00	\$322.20
315	954141809	HENRY MARIE C	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
316	942153223	COLONIAL RESTORATION LLC	\$3,727.50	3.8735	\$14.44	\$85.66	\$171.56	\$46.00	\$0.00	\$317.66
317	955152919	WOOD PETER	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
318	955152807	BOWSER WILLIAM T	\$3,727.50	3.8735	\$14.44	\$85.66	\$171.56	\$46.00	\$0.00	\$317.66
319	954142509	HEIVA HOLDINGS USA LLC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
320	953152623	SPRINGCROFT PROPERTIES LLC	\$3,940.50	3.8735	\$15.26	\$85.66	\$171.56	\$46.00	\$0.00	\$318.48
321	953152216	OLIVIERI WILLIAM M	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
322	955153104	SNYDER DEVELOPMENT CORP	\$3,301.50	3.8735	\$12.79	\$85.66	\$171.56	\$46.00	\$0.00	\$316.01
323	955152906	GEORGIOU TASOS	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
324	954142440	BOUNDS RAYMOND	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
325	954142303	OVERSEAS INVESTMENT LLC	\$5,005.50	3.8735	\$19.39	\$85.66	\$171.56	\$46.00	\$0.00	\$322.61
326	954142445	NORTH PORT LOTS AND REAL PROPERTY LLC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
327	942153220	CARLOS DOMINGOS	\$3,727.50	3.8735	\$14.44	\$85.66	\$171.56	\$46.00	\$0.00	\$317.66
328	953151926	BINGLE CHRIS	\$4,792.50	3.8735	\$18.56	\$85.66	\$171.56	\$46.00	\$0.00	\$321.78
329	953152317	BRANCH ADINA M	\$3,827.61	3.8735	\$14.83	\$85.66	\$171.56	\$46.00	\$0.00	\$318.05
330	967060947	CATENA JENNIFER	\$4,252.55	3.8735	\$16.47	\$85.66	\$171.56	\$46.00	\$0.00	\$319.69
331	954142441	COMPERDA FRANK M	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
332	954142119	CHUNG WINIFRED C	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
333	954142452	SURAPANENI SRINIVAS	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
334	955153123	HENDERSHOT BRUCE D	\$3,621.00	3.8735	\$14.03	\$85.66	\$171.56	\$46.00	\$0.00	\$317.25
335	955153210	SILVER FROND INVESTMENTS LLC	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
336	954143105	HEIVA HOLDINGS USA LLC	\$5,103.48	3.8735	\$19.77	\$85.66	\$171.56	\$46.00	\$0.00	\$322.99
337	954142918	HASTINGS KENNETH R	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
338	953152013	FLUBACHER RONALD	\$3,827.61	3.8735	\$14.83	\$85.66	\$171.56	\$46.00	\$0.00	\$318.05
339	954142234	ADORNA THOMAS M	\$8,930.03	3.8735	\$34.59	\$85.66	\$171.56	\$46.00	\$0.00	\$337.81
340	954142712	LANGSTON LEROY	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14

VACANT LOTS

341	953152408	OVERSEAS INVESTMENT LLC	\$3,940.50	3.8735	\$15.26	\$85.66	\$171.56	\$46.00	\$0.00	\$318.48
342	953152307	BELLS REALTY INVESTMENTS	\$4,047.00	3.8735	\$15.68	\$85.66	\$171.56	\$46.00	\$0.00	\$318.90
343	954142230	LOURO ALEX T	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
344	954142229	VOGT JORGE	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
345	953152819	NEW VISTA PROPERTIES INC	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
346	955153106	AMERICAN ESTATE AND TRUST	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
347	953152511	LAU CHI-HO A	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
348	955153011	BECERRA ELPIDIO L	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
349	953152710	WESTON MICHAEL	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
350	953152419	SILVA ROBERT L	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
351	967060740	MULLEN MARK F	\$5,154.60	3.8735	\$19.97	\$85.66	\$171.56	\$46.00	\$0.00	\$323.19
352	953152622	SPRINGCROFT PROPERTIES LLC	\$3,940.50	3.8735	\$15.26	\$85.66	\$171.56	\$46.00	\$0.00	\$318.48
353	953152510	LAU CHI-HO A	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
354	954142018	GIFFONE MICHAEL F	\$4,677.48	3.8735	\$18.12	\$85.66	\$171.56	\$46.00	\$0.00	\$321.34
355	953152624	K & N PROPERTY INVESTMENTS LLC	\$3,940.50	3.8735	\$15.26	\$85.66	\$171.56	\$46.00	\$0.00	\$318.48
356	942153321	OVERSEAS INVESTMENT LLC	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
357	954142454	GUGLIELMO MATTHEW	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
358	954143326	PAPE EDWARD	\$4,899.00	3.8735	\$18.98	\$85.66	\$171.56	\$46.00	\$0.00	\$322.20
359	953152407	CONNELL JERRY L	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
360	953152219	KORELL LINDSEY ROTH IRA F/B/O	\$3,834.00	3.8735	\$14.85	\$85.66	\$171.56	\$46.00	\$0.00	\$318.07
361	942153319	LI-CHUAN CHUANG	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
362	953152119	GRECO KATHLENE	\$3,827.61	3.8735	\$14.83	\$85.66	\$171.56	\$46.00	\$0.00	\$318.05
363	955152909	TYNDALE RICARDO ANTHONY	\$4,047.00	3.8735	\$15.68	\$85.66	\$171.56	\$46.00	\$0.00	\$318.90
364	953151901	VAN TRUONG JIMMY L	\$3,969.26	3.8735	\$15.37	\$85.66	\$171.56	\$46.00	\$0.00	\$318.59
365	953152509	PIZZARIELLO VITO	\$3,969.26	3.8735	\$15.37	\$85.66	\$171.56	\$46.00	\$0.00	\$318.59
366	967060945	BASTANTE JOSEPH	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
367	953151636	NELIGAN DEAN A	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
368	953152504	ERWIN DAVID	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
369	942153313	GOGREEN PROPERTY MGMT LLC	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
370	954141749	LOURO MARCELLO	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
371	953152403	TAYLOR DUANE	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
372	954142019	KARAM ROSE	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
373	954141913	PEDERSON KAREN	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
374	954142506	THOMAS GERHARDT A TTEE	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
375	955152810	CABRERA VIRGILIO D	\$3,195.00	3.8735	\$12.38	\$85.66	\$171.56	\$46.00	\$0.00	\$315.60
376	954142231	WEISS JOSEPH G	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
377	953152007	BOUNDS BARBARA A	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
378	942153209	SILVER FROND INVESTMENTS LLC	\$3,834.00	3.8735	\$14.85	\$85.66	\$171.56	\$46.00	\$0.00	\$318.07
379	953152619	KUBACKA JOLANTA	\$3,834.00	3.8735	\$14.85	\$85.66	\$171.56	\$46.00	\$0.00	\$318.07
380	954141735	CHOUDHURI SANTANU	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
381	955152910	ALEXSOFF NAUMCE	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
382	953151902	MADISON ANNA C	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
383	954141750	LOURO MICHAEL	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14

VACANT LOTS

384	953152015	CORNERSTONE PROPERTIES OF SARASOTA INC	\$3,827.61	3.8735	\$14.83	\$85.66	\$171.56	\$46.00	\$0.00	\$318.05
385	953152512	HEINKE STEPHAN	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
386	954142916	HEIVA HOLDINGS USA LLC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
387	953152309	GOETZE LORALEE J	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
388	953151641	NEW VISTA PROPERTIES INC	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
389	954143219	GOODWIN DAVID	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
390	954142921	JEANNINE ELIZABETH BELL REVOCABLE TRUST	\$3,969.26	3.8735	\$15.37	\$85.66	\$171.56	\$46.00	\$0.00	\$318.59
391	954143210	KRACKOVIC DANNE	\$4,252.55	3.8735	\$16.47	\$85.66	\$171.56	\$46.00	\$0.00	\$319.69
392	954142704	ADAMS GERALD	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
393	953152610	ETTLIN DOMINIK	\$3,940.50	3.8735	\$15.26	\$85.66	\$171.56	\$46.00	\$0.00	\$318.48
394	954142005	ZANCA HEDWIG I	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
395	953152202	AEG INVESTMENTS LP	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
396	954142707	PRIVATE EQUITY SOLUTIONS LLC	\$4,899.00	3.8735	\$18.98	\$85.66	\$171.56	\$46.00	\$0.00	\$322.20
397	967060738	RIBEIRO ANTONIO A	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
398	955153213	OVERHOLSER MERLE W	\$3,301.50	3.8735	\$12.79	\$85.66	\$171.56	\$46.00	\$0.00	\$316.01
399	954142534	JOHNSON SCOTT	\$4,899.00	3.8735	\$18.98	\$85.66	\$171.56	\$46.00	\$0.00	\$322.20
400	954142105	HEIVA HOLDINGS USA LLC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
401	954143104	FIRST REALTY CONSULTING LLC	\$5,927.79	3.8735	\$22.96	\$85.66	\$171.56	\$46.00	\$0.00	\$326.18
402	954142810	CADIENTE SAMSON S	\$4,819.13	3.8735	\$18.67	\$85.66	\$171.56	\$46.00	\$0.00	\$321.89
403	954141742	BROUSSARD JR LAWLESS	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
404	955153121	FITZPATRICK CHRISTINA	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
405	955153116	STOJAK BARBARA	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
406	953152620	ALPHA FLORIDA REAL ESTATE LLC	\$3,940.50	3.8735	\$15.26	\$85.66	\$171.56	\$46.00	\$0.00	\$318.48
407	954143316	NORTH PORT LOTS AND REAL PROPERTY LLC	\$3,544.32	3.8735	\$13.73	\$85.66	\$171.56	\$46.00	\$0.00	\$316.95
408	953152409	BURGOS IRIS	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
409	954141741	Q SMITH HOMES LLC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
410	953152426	EL SHADDAI BIBLE MINISTRIES	\$3,621.00	3.8735	\$14.03	\$85.66	\$171.56	\$46.00	\$0.00	\$317.25
411	954143012	COMPARETTO ANTONIO J	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
412	955153012	VIRNAN NADIA	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
413	954141803	OVERSEAS INVESTMENT LLC	\$4,899.00	3.8735	\$18.98	\$85.66	\$171.56	\$46.00	\$0.00	\$322.20
414	953152301	GRAY WALTER	\$3,544.32	3.8735	\$13.73	\$85.66	\$171.56	\$46.00	\$0.00	\$316.95
415	955153120	CHAMBERLAIN ALFRED C	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
416	954143001	HEIVA HOLDINGS USA LLC	\$3,969.26	3.8735	\$15.37	\$85.66	\$171.56	\$46.00	\$0.00	\$318.59
417	954141743	SHABURA VLADIMIR	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
418	955153122	UNDERWOOD PAT	\$3,727.50	3.8735	\$14.44	\$85.66	\$171.56	\$46.00	\$0.00	\$317.66
419	953152204	DAVIS AUDREY H V M	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
420	942153309	OVERSEAS INVESTMENT LLC	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
421	953151637	NEW VISTA PROPERTIES INC	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
422	953152501	HEARN ANASTASIA	\$3,544.32	3.8735	\$13.73	\$85.66	\$171.56	\$46.00	\$0.00	\$316.95
423	953152428	AMERICAN ESTATE AND TRUST	\$3,727.50	3.8735	\$14.44	\$85.66	\$171.56	\$46.00	\$0.00	\$317.66
424	953152613	YAREMCHUK VOLODYMYR	\$3,940.50	3.8735	\$15.26	\$85.66	\$171.56	\$46.00	\$0.00	\$318.48
425	954142125	CHALMERS GEOFFREY T	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
426	954142462	BALIUS GENE	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14

VACANT LOTS

427	953152608	NGUYEN PROPERTY MANAGEMENT LLC	\$3,940.50	3.8735	\$15.26	\$85.66	\$171.56	\$46.00	\$0.00	\$318.48
428	953152606	BIRA HOLDINGS LLC	\$3,940.50	3.8735	\$15.26	\$85.66	\$171.56	\$46.00	\$0.00	\$318.48
429	953152618	MALLOY SHARON (TTEE)	\$3,834.00	3.8735	\$14.85	\$85.66	\$171.56	\$46.00	\$0.00	\$318.07
430	953152818	HERNANDEZ JIMMY	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
431	953152420	SALAM ELIZABETH C	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
432	953152621	MUNZ MIKE	\$3,940.50	3.8735	\$15.26	\$85.66	\$171.56	\$46.00	\$0.00	\$318.48
433	953152626	ASKEW ASHLEY LYNN	\$3,621.00	3.8735	\$14.03	\$85.66	\$171.56	\$46.00	\$0.00	\$317.25
434	954141728	HEIVA HOLDINGS USA LLC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
435	954143015	JAEN RUBEN	\$4,677.48	3.8735	\$18.12	\$85.66	\$171.56	\$46.00	\$0.00	\$321.34
436	954142924	BROWN JOE W	\$4,381.41	3.8735	\$16.97	\$85.66	\$171.56	\$46.00	\$0.00	\$320.19
437	954142532	ALAVERDYAN SUREN	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
438	954142505	MAYS RONALD L	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
439	953152405	MASTRATI JOHN A	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
440	954141740	Q SMITH HOMES LLC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
441	953152412	CABRERA EDELMIRA	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
442	953152617	ATINA ENTERPRISES LLC	\$3,834.00	3.8735	\$14.85	\$85.66	\$171.56	\$46.00	\$0.00	\$318.07
443	953151923	WORMER LESLIE A	\$3,969.26	3.8735	\$15.37	\$85.66	\$171.56	\$46.00	\$0.00	\$318.59
444	953152612	YAREMCHUK VOLODYMYR	\$3,940.50	3.8735	\$15.26	\$85.66	\$171.56	\$46.00	\$0.00	\$318.48
445	953152902	PORTER ROBERT C	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
446	953152517	AMERICAN ESTATE AND TRUST	\$4,260.00	3.8735	\$16.50	\$85.66	\$171.56	\$46.00	\$0.00	\$319.72
447	955152915	ADAMS GERALD	\$2,662.50	3.8735	\$10.31	\$85.66	\$171.56	\$46.00	\$0.00	\$313.53
448	953152709	NEW VISTA PROPERTIES INC	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
449	953152505	ROSELAND LEO J	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
450	955152809	SHAW PATRICIA A	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
451	954142529	KARR MARTIN PALMER	\$5,740.35	3.8735	\$22.24	\$85.66	\$171.56	\$46.00	\$0.00	\$325.46
452	954142623	OVERSEAS INVESTMENT LLC	\$5,218.50	3.8735	\$20.21	\$85.66	\$171.56	\$46.00	\$0.00	\$323.43
453	953153002	K4K LLC	\$3,195.00	3.8735	\$12.38	\$85.66	\$171.56	\$46.00	\$0.00	\$315.60
454	954142710	DIH TAX PARTNERS LLC	\$5,005.50	3.8735	\$19.39	\$85.66	\$171.56	\$46.00	\$0.00	\$322.61
455	953153017	VOJNIKA MAZLUM	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
456	953152213	OVERSEAS INVESTMENT LLC	\$3,940.50	3.8735	\$15.26	\$85.66	\$171.56	\$46.00	\$0.00	\$318.48
457	967060704	CRUZ ALBERTO	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
458	954142619	JONES DONALD F JR	\$4,535.84	3.8735	\$17.57	\$85.66	\$171.56	\$46.00	\$0.00	\$320.79
459	953152611	TEREMBES MICHAEL	\$3,940.50	3.8735	\$15.26	\$85.66	\$171.56	\$46.00	\$0.00	\$318.48
460	953151935	DOWNING GERALD B	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
461	954141905	LIVITS LEONARD	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
462	967060944	SILVA NANCIANCENA D	\$4,819.13	3.8735	\$18.67	\$85.66	\$171.56	\$46.00	\$0.00	\$321.89
463	953151927	SZAFARZ MARY K (TTEE)	\$3,969.26	3.8735	\$15.37	\$85.66	\$171.56	\$46.00	\$0.00	\$318.59
464	954142711	COGOLLOS ANGELA	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
465	953152708	NANDIGAM SINDHURA	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
466	954142715	MOORE LISA	\$4,899.00	3.8735	\$18.98	\$85.66	\$171.56	\$46.00	\$0.00	\$322.20
467	953151928	MACHADO-CUNHA HUGO M	\$3,827.61	3.8735	\$14.83	\$85.66	\$171.56	\$46.00	\$0.00	\$318.05
468	954143223	MORROW BARTLEY E	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
469	954142003	PRIVATE EQUITY SOLUTIONS LLC	\$4,899.00	3.8735	\$18.98	\$85.66	\$171.56	\$46.00	\$0.00	\$322.20

VACANT LOTS

470	953152410	FARRELL MARK V	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
471	967060741	MULLEN MARK F	\$4,896.87	3.8735	\$18.97	\$85.66	\$171.56	\$46.00	\$0.00	\$322.19
472	942153316	LORUSSO JOSEPH J	\$3,195.00	3.8735	\$12.38	\$85.66	\$171.56	\$46.00	\$0.00	\$315.60
473	942153221	WERNER FAMILY TRUST	\$3,940.50	3.8735	\$15.26	\$85.66	\$171.56	\$46.00	\$0.00	\$318.48
474	953152418	MOSELEY STARLA	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
475	954142446	LEE HILTON	\$5,798.93	3.8735	\$22.46	\$85.66	\$171.56	\$46.00	\$0.00	\$325.68
476	954142449	TURGEON JR JOHN L	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
477	954142402	TORRANCE BARBARA J	\$3,969.26	3.8735	\$15.37	\$85.66	\$171.56	\$46.00	\$0.00	\$318.59
478	953152506	FERNANDEZ MARGARITA	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
479	953152001	DE VANEY WILLIAM B	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
480	953152306	PERNA III MANUEL	\$4,047.00	3.8735	\$15.68	\$85.66	\$171.56	\$46.00	\$0.00	\$318.90
481	953152421	RICKETTS ELIZABETH A	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
482	955153006	CALVERT MICHAEL K	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
483	967060703	HUYNH KIM T T	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
484	967060943	VARNER III ARCHIE D	\$4,535.84	3.8735	\$17.57	\$85.66	\$171.56	\$46.00	\$0.00	\$320.79
485	955153215	MAGGIO RONALD J	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
486	967060739	TRAN TUNG V	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
487	953152305	DEITZ SANDRA N CO-TTEE	\$3,621.00	3.8735	\$14.03	\$85.66	\$171.56	\$46.00	\$0.00	\$317.25
488	953152304	KERESTES PAUL A	\$3,621.00	3.8735	\$14.03	\$85.66	\$171.56	\$46.00	\$0.00	\$317.25
489	953151924	ESTEVEZ JOSE	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
490	953152320	PROSPER TERRANCE	\$3,621.00	3.8735	\$14.03	\$85.66	\$171.56	\$46.00	\$0.00	\$317.25
491	954142629	WJHFL LLC	\$4,899.00	3.8735	\$18.98	\$85.66	\$171.56	\$46.00	\$0.00	\$322.20
492	954142632	GILBERT DIANE L	\$4,819.13	3.8735	\$18.67	\$85.66	\$171.56	\$46.00	\$0.00	\$321.89
493	942080006	AXLINE JUDITH J (CO-TTEE)	\$18,041.10	3.8735	\$69.88	\$85.66	\$171.56	\$46.00	\$0.00	\$373.10
494	953152424	HOLINKO BRIAN J	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
495	954142604	COGOLLOS ANGELA	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
496	954142703	ADAMS GERALD	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
497	953152422	JOHN E AND LORRAINE M KUHN REVOCABLE LIVING TRUST	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
498	953152319	SGD INVESTMENTS LLC	\$3,621.00	3.8735	\$14.03	\$85.66	\$171.56	\$46.00	\$0.00	\$317.25
499	953152311	GRIGGS AVENUE LAND TRUST	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
500	954142533	JOHNSON SCOTT	\$4,899.00	3.8735	\$18.98	\$85.66	\$171.56	\$46.00	\$0.00	\$322.20
501	954142104	BUCCELLATO GIOVANNA	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
502	954142716	MOORE LISA	\$4,899.00	3.8735	\$18.98	\$85.66	\$171.56	\$46.00	\$0.00	\$322.20
503	953152016	BECKER STEPHEN	\$3,827.61	3.8735	\$14.83	\$85.66	\$171.56	\$46.00	\$0.00	\$318.05
504	954141726	HEIVA HOLDINGS USA LLC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
505	954143005	UNDERHILL WILLIAM R	\$5,103.48	3.8735	\$19.77	\$85.66	\$171.56	\$46.00	\$0.00	\$322.99
506	954142405	NEW VISTA PROPERTIES INC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
507	954142121	KRACHKO ANDREY	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
508	954142123	JACKSON EMMA D	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
509	954142809	HEIVA HOLDINGS USA LLC	\$5,103.48	3.8735	\$19.77	\$85.66	\$171.56	\$46.00	\$0.00	\$322.99
510	953152519	SCHOELICH RONNIE IRA F/B/O	\$4,366.50	3.8735	\$16.91	\$85.66	\$171.56	\$46.00	\$0.00	\$320.13
511	954143327	ESTRADA DAVID	\$4,899.00	3.8735	\$18.98	\$85.66	\$171.56	\$46.00	\$0.00	\$322.20
512	955152816	NEW VISTA PROPERTIES INC	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83

VACANT LOTS

513	954143324	SANFORD STANLEY	\$4,579.50	3.8735	\$17.74	\$85.66	\$171.56	\$46.00	\$0.00	\$320.96
514	954142911	COOK JOYCE R	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
515	954141730	KRACHER EDITH M	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
516	955152814	MARY ACCOUNTING INC	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
517	954143323	DRES JUANITO T	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
518	954141805	EZER TOSIA	\$4,252.55	3.8735	\$16.47	\$85.66	\$171.56	\$46.00	\$0.00	\$319.69
519	954142603	COGOLLOS ANGELA	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
520	953152008	HENRY BRYAN	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
521	954143004	OVERSEAS INVESTMENT LLC	\$5,218.50	3.8735	\$20.21	\$85.66	\$171.56	\$46.00	\$0.00	\$323.43
522	954142903	ARSENAULT CHRISTINE	\$4,819.13	3.8735	\$18.67	\$85.66	\$171.56	\$46.00	\$0.00	\$321.89
523	953152411	ROWE STUART J TTEE	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
524	954142909	CHU WANG LING	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
525	953152514	GREENHALGH DAVID L	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
526	954142626	JACKSON MARYBETH ANN	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
527	953151925	BINGLE CHRIS	\$4,047.00	3.8735	\$15.68	\$85.66	\$171.56	\$46.00	\$0.00	\$318.90
528	942153322	COOGAN NANCY E	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
529	953152803	NORTH PORT LOTS AND REAL PROPERTY LLC	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
530	954142622	BURTON JAMES R	\$7,455.00	3.8735	\$28.88	\$85.66	\$171.56	\$46.00	\$0.00	\$332.10
531	953152516	DESROCHERS PATRICIA I	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
532	953152423	GRINDSTONE PARTNERS LLC	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
533	954142608	PHAM PHUONG LAN T	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
534	954142442	RICHARDSON KARIN B	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
535	954142620	DELL PAMELA D	\$10,347.54	3.8735	\$40.08	\$85.66	\$171.56	\$46.00	\$0.00	\$343.30
536	953152427	AMERICAN ESTATE AND TRUST	\$3,621.00	3.8735	\$14.03	\$85.66	\$171.56	\$46.00	\$0.00	\$317.25
537	953152604	LIN XIAOYING	\$5,103.48	3.8735	\$19.77	\$85.66	\$171.56	\$46.00	\$0.00	\$322.99
538	953152413	PEREZ MOSES	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
539	967060942	DIODATI FRANCESCO (CO-TTEE)	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
540	953152314	LONGO RICHARD B	\$4,394.19	3.8735	\$17.02	\$85.66	\$171.56	\$46.00	\$0.00	\$320.24
541	955152905	MOSES GAYLE	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
542	955153119	GEIST LOWELL K	\$3,408.00	3.8735	\$13.20	\$85.66	\$171.56	\$46.00	\$0.00	\$316.42
543	954142226	PURFEERST JAMES M	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
544	953151922	SEGUIN JEANNETTE	\$3,827.61	3.8735	\$14.83	\$85.66	\$171.56	\$46.00	\$0.00	\$318.05
545	953152318	MC RAE CHRISTINE	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
546	953152303	KERESTES PAUL A	\$3,621.00	3.8735	\$14.03	\$85.66	\$171.56	\$46.00	\$0.00	\$317.25
547	953152206	POLISHCHUK GRIGORY	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
548	954142527	GIBSON DOROTHEA	\$4,961.84	3.8735	\$19.22	\$85.66	\$171.56	\$46.00	\$0.00	\$322.44
549	954141906	HOUNG IRENE	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
550	954143014	LIM RONNIE B	\$4,819.13	3.8735	\$18.67	\$85.66	\$171.56	\$46.00	\$0.00	\$321.89
551	954142915	ORKNEY BERTHA A C (TTEE)	\$4,394.19	3.8735	\$17.02	\$85.66	\$171.56	\$46.00	\$0.00	\$320.24
552	955152813	SPANO WILLIAM A	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
553	954142628	WJHFL LLC	\$4,899.00	3.8735	\$18.98	\$85.66	\$171.56	\$46.00	\$0.00	\$322.20
554	953152502	ENLIGHTENING INVESTMENT LLC	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
555	953152625	K & N PROPERTY INVESTMENTS LLC	\$3,940.50	3.8735	\$15.26	\$85.66	\$171.56	\$46.00	\$0.00	\$318.48

VACANT LOTS

556	953152923	BARTOLOME DELILAH	\$3,088.50	3.8735	\$11.96	\$85.66	\$171.56	\$46.00	\$0.00	\$315.18
557	953152425	BATHORY STEVE	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
558	955152808	NEW VISTA PROPERTIES INC	\$3,727.50	3.8735	\$14.44	\$85.66	\$171.56	\$46.00	\$0.00	\$317.66
559	954142124	HEIVA HOLDINGS USA LLC	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
560	953151921	SWIFT CLEAR INVESTMENTS LLC	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
561	953152507	SINCLAIR M A	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
562	953152417	KALLOO JOAN A (TTEE)	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
563	953152207	BRESA LINO	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
564	942153315	BRAINERD III HAROLD W	\$3,301.50	3.8735	\$12.79	\$85.66	\$171.56	\$46.00	\$0.00	\$316.01
565	953151903	KOSTESKI SIMON	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
566	953151929	SCHMIDT ROBERT R	\$4,110.90	3.8735	\$15.92	\$85.66	\$171.56	\$46.00	\$0.00	\$319.14
567	942153224	TODARO PHILLIP S	\$3,727.50	3.8735	\$14.44	\$85.66	\$171.56	\$46.00	\$0.00	\$317.66
568	953152406	MASTRATI JOHN A	\$3,685.97	3.8735	\$14.28	\$85.66	\$171.56	\$46.00	\$0.00	\$317.50
569	942153303	NEW VISTA PROPERTIES INC	\$3,514.50	3.8735	\$13.61	\$85.66	\$171.56	\$46.00	\$0.00	\$316.83
570	955152914	NEW VISTA PROPERTIES INC	\$3,088.50	3.8735	\$11.96	\$85.66	\$171.56	\$46.00	\$0.00	\$315.18

\$9,462.11 \$48,826.20 \$97,789.20 \$26,220.00 \$0.00

Totals \$182,297.51 \$182,297.51



City of North Port Myakkahatchee Creek Blockages



Disclaimer: This map is for reference purposes only and is not to be interpreted as a legal document. Any reliance on the information contained herein is at the user's risk. The City of North Port and its agents assume no responsibility for any use of the information contained herein or any loss resulting therefrom.

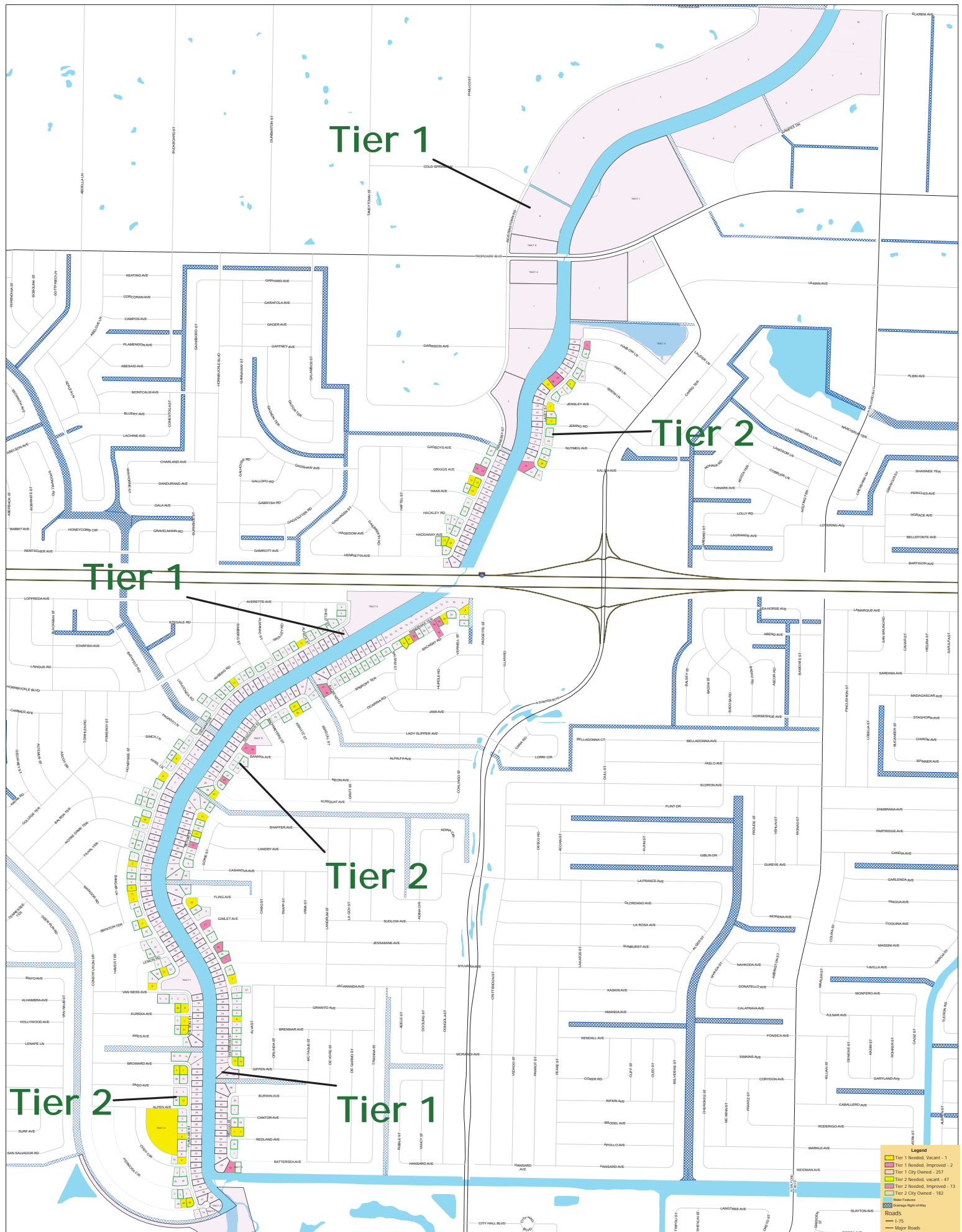
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CITY OF NORTH PORT
LOW IMPACT DEVELOPMENT (LID) PROJECTS AND CITY "GREEN ACHIEVEMENTS"
as of 11/30/20

Year Installed	Project number	Project Name	Description
~2007		Public Works Site	Use stormwater from Creighton Waterway for irrigation. Use of grass swales for pretreatment prior to entering master stormwater pond system.
2005 and continuing		Islandwalk @ The West Villages all phases	Stormwater harvesting for irrigation
2007		Fertilizer Ordinance	Adopted a City-wide Fertilizer Ordinance which prohibited a fertilization of lawns during the wet season period between June 1 and September 30. Required 50% slow release fertilizer if used in the allowable periods.
2008		North Port Medical Specialist facility on US 41 near Espanola Ave.	Developer installed 7 pervious asphalt parking spaces at a new North Port Medical Specialist facility along US 41.
2009		Sumter Boulevard Phase 2 widening project	City installed 3 aeration fountains in wet detention ponds and planted non-invasive littoral zone plants as part of the Sumter Boulevard Phase 2 widening project
2009		Lowes store	Stormwater harvesting for irrigation. A shallow well recharges the wet pond during the dry periods.
2009		PBSJ Study North Port Enhancement Project Report	City study cooperatively funded with SWFWMD indicated that the total nitrogen levels within North Port waterways are "lower than the reference levels for natural Florida Streams generated in the 1996 FDEP 305(b) report". This is due to the extensive grass swales system in North Port.
2010		SWFWMD Community Education Grant for \$1,761.94	Grant funded purchase 100 stormdrain markers which were installed with assistance from the Community and kids. Conducted public education on water quality protection and installed two educational signs
2010		City of North Port Unified Land Development Code (ULDC) New Stormwater Regulations	City adopted new ULDC Chapter 18 - Stormwater Regulations in June 2010 which required all developments to incorporate LIDs to the maximum extent practicable. City water quality regulations required treatment volume of 1-inch of runoff for any systems, wet or dry. This is above the SWFWMD requirement for 1/2" of runoff for dry systems. City required aeration systems in wet ponds and planted littoral zone with non-invasive aquatic plants with 85% survival rate.
2010		Grass parking at Morgan Family Center/Butler Park	Many parking spaces at these facilities were installed as grass parking.
2010	MAS-08-093	Cocoplum Village Shoppes on US 41 near Salford Blvd	Stormwater harvesting for irrigation.
2010		Toledo Blade Boulevard Widening Project	City planted littoral zones and entire pond periphery with cord grass (Spartina Bakeri) at two stormwater ponds.
2011		City Hall near Post Office	City installed an aeration fountain in a wet detention pond.
2011		Florida Green Building Coalition Gold Rating	City received the FGBC Gold Rating which is the highest rating achieved at that time in Florida for good environmental practices in "green" development
2011		Kingdom Hall Church	Kingdom Hall new church facility incorporated 10 pervious concrete parking spaces
2011		City's Atwater Park	Stormwater harvesting for irrigation with recharge well. Also installed an aeration fountain in a wet detention pond.
2012		SWFWMD Community Education Grant for \$4136	Grant funded planting of non-invasive aquatic plants around the periphery area of the North Port Library pond, Public workshops on proper fertilizer usage and aquatic planting benefits, two major City clean up events and six educational signs installed throughout the City to encourage protection of waterways.
2012		Sarasota County Area Transit at City Center	City coordinated with SCAT to install 15 pervious concrete parking spaces, along with a bioswale between parking spaces.
2012	MAS-08-093	Cocoplum Village Shoppes on US 41 new Salford Blvd	Developer installed aeration fountains in two wet detention ponds
2014		City Center George Mullen Activity Center (GMAC)	City installed a new section of Pervious Concrete sidewalk as part of the Phase 1 GMAC improvements
2014		Sarasota County Area Transit (SCAT) at City Center	An electric car charging station was added in June 2014.
2014	MAS-13-141	Turnberry Trace Recreation Center	Installed 7 parking spaces with Pervious Concrete
2014	MAS-14-032	Gran Paradiso Amenity Center Phase 2	Brick pavers on sand for sidewalks and decking, grassed swales for conveyance before entering inlets and ponds, FF landscaping, oversized stormwater pond, aeration in Lake 34. Project completed in March 2016
2015	MAS-13-137	Aldi food Store on US 41/Salford Blvd	Constructed 11 pervious concrete parking spaces
2015		City Center George Mullen Activity Center (GMAC)	City installed a new section of Pervious Concrete sidewalk as part of the Phase 2 GMAC improvements
2016	MAS 14-105	Goodwill	* 8 Pervious parking stalls - 2.36" thick "Aquaflow" Pavers on 2" thick 1/4" diameter clean crushed stone, over 140N Mirafi over 6" FDOT #57 stone 95% Modified Proctor, over 140N Mirafi, 12" Subgrade 98% Modified Proctor. Grass swales before inlets.
2017	MAS-15-129	Lowes Outparcel	Stormwater harvesting for irrigation.
2017	MAS-16-070	Autozone at Toledo Creek (S of Price, west side of Toledo Blade	20 pervious concrete parking spaces, grass retention area before master stormwater pond, deep sump at several inlets
2017	INF-15-089	Toledo Creek	Floguard inlet inserts installed on 9 Type 9 Index 214 inlets
2018	MAS-15-180	Circle K at Heron Creek Town Center	Less impervious than allowable, 77.88% vs 94.0%
2017	MAS-16-055	7-Eleven Store #37298 at Toledo Creek	70% impervious compared with allowable 95% impervious. Pervious concrete sidewalks adjacent to store
2017	INF-14-149	Gran Paradiso Phase 3	All of the driveways for the paired villa (duplex) units are pavers on sand. There are swales along the rear of lots 687-734 which will provide open flow contact time / pre-treatment prior to discharging to lake 29. There is also a 1,000± LF swale outfalling a portion of Renaissance Boulevard prior to draining into lake 68. This swale will also provide some open flow contact time / pre-treatment prior to discharging to the lake

Year Installed	Project number	Project Name	Description
2017	INF-16-122	Gran Paradiso Phase 7	<ul style="list-style-type: none"> Minimize impervious area - The overall Gran Paradiso property (± 1,068.09 acres) will consist of approximately ± 231.36 acres of conservation areas, including wetland and gopher tortoise preserves. There will also be approximately ± 222.84 acres of lake area and ± 135.72 acres of additional open space. Thus, as a percentage of the total development there will be 21.7% conservation area, 20.9% lake area, and 12.7% open area. Overland flow areas <p>Where achievable, stormwater runoff is allowed to sheet flow across areas of vegetation prior to flowing into on-site retention areas or wetland areas.</p> <ul style="list-style-type: none"> Minimizing of sidewalk widths in areas with lower pedestrian traffic <p>In strategic areas of the community (e.g. along Prestigio Boulevard), sidewalk widths were decreased, thus decreasing impervious area. This was done in order to minimize the amount of required disturbance of native vegetation and habitats.</p> <ul style="list-style-type: none"> Inclusion of aerators in lakes <p>Aerators have been added to lakes throughout the development, with 3 included in the Phase 7 project.</p> <ul style="list-style-type: none"> Use of pavers throughout the development <p>Where possible, pavers have been used in lieu of concrete pavement. This is most prevalent at the entrance / clubhouse area and driveways of home sites throughout</p>
2017	INF-16-022	Islandwalk Phase 5	Stormwater reuse for irrigation
2017	MAS-16-172	Gran Paradiso, Coach Homes-2 and Mass Grading	<ul style="list-style-type: none"> Limiting the footprint of improvements on the property. <p>The overall Gran Paradiso property (± 1,068.09 acres) will consist of approximately ± 231.36 acres of conservation areas, including wetland and gopher tortoise preserves. There will also be approximately ± 222.84 acres of lake area and ± 135.72 acres of additional open space. Thus, as a percentage of the total development there will be 21.7% conservation area, 20.9% lake area, and 12.7% open area.</p> <ul style="list-style-type: none"> Overland flow areas <p>Where achievable, stormwater runoff is allowed to sheet flow across areas of vegetation prior to flowing into on-site retention areas or wetland areas.</p> <ul style="list-style-type: none"> Minimizing of sidewalk widths in areas with lower pedestrian traffic <p>In strategic areas of the community (e.g. along Prestigio Boulevard), sidewalk widths were decreased, thus decreasing impervious area. This was done in order to minimize the amount of required disturbance of native vegetation and habitats.</p> <ul style="list-style-type: none"> Inclusion of aerators in lakes <p>Aerators have been added to lakes throughout the development, with 3 included in the Phase 7 project.</p> <ul style="list-style-type: none"> Use of pavers throughout the development <p>Where possible, pavers have been used in lieu of concrete pavement. This is most prevalent at the entrance / clubhouse area and driveways of home sites throughout</p>
2017	INF-14-089	Suncoast Plaza	Long Bioswales for additional treatment along roadways, fountains in wet ponds
1/24/18	MAS-17-013	Heartland Dental	Runoff into two grass retention swales prior to discharge into the master stormwater piping/pond system. Impervious area is 68% compared to allowable 95%
1/24/18	MAS-16-020	Jiffy Lube	Runoff into three grass retention swales prior to discharge into the master stormwater piping/pond system. Ditch bottom inlets in the grass retention swales are set 0.5' higher than swale bottom. 41.7% impervious compared with allowable 95% impervious.
1/24/18	GEN-15-172	North Port Library Parking Expansion	23 Pervious Concrete parking stalls for this parking expansion
2/9/18	MAS-15-179	Sherwin Williams	Long linear grass swales before entering dry retention pond
2/26/18	MAS-17-001	7-11 at Cranberry	3 Pervious Pavers parking stalls
2/27/18	MAS-16-131	Heron Creek Animal Hospital	Impervious area reduced by 20% from allowable
3/3/18	MAS-14-053	Pine Park Walking Trails	4ft wide Pervious path 1.5" Flexipave HD 1500 over 4" #57 stone over Filter Fabric US160NW over Stabilized Subgrade max 95% modified Proctor Density ASTM D-1557
5/2/18	MAS-17-030	O Reilly Auto Parks	Runoff into two grass retention swales prior to discharge into the master stormwater piping/pond system. Minimized impervious from 70% to 58.73%
5/16/18	INF-15-174	Oasis	Stormwater reuse for irrigation, 3 fountains for aeration in wet ponds, 684 sf (4 parking spaces) in pervious concrete at Amenity Center.
5/17/18	MAS-16-191	Tract C North Port Industrial Park (MTI)	8 Pervious Concrete Stalls, less impervious than allowed
Oct 2018	INF-15-153	Dog Park under included Renaissance	Stormwater Harvesting from Lake 3-2
12/7/2018	MAS-17-218	Taco Bell at Heron Creek Town Center	Less impervious than allowable, 63.8% vs 94.0%. Florida Friendly Landscaping used
5/23/19	INF-15-153	Renaissance At West Villages	Stormwater Harvesting for irrigation from Lake 5 with recharge well, Impervious area reduced by 8% from allowable
5/23/19	MAS-17-075	Braves Stadium	Stormwater Harvesting for irrigation with recharge from existing borrow pit, grass bioswales, grass parking >2000 spaces, fountains
12/4/19	MAS-17-107	Waffle House at Heron Creek Town Center	Less impervious than allowable, 60.6% vs 94.0%. Two grass pretreatment areas before entering master system.
3/25/20	MAS-18-186	Heartland Dental West Villages	3 Turf block pavers, small grass swale pretreatment area
7/6/20	MAS-18-081	Lakeside Medical Building	Grass pretreatment swales, 7 pervious concrete parking stalls
9/11/20	CIP-19-218	Garden of 5 Senses Walking Trail	Pervious Walking Trail 1.5" KBI Flexipave HD2000 on 4" of #57 stone on stabilized sub base LBR40. Two KBI Permadrive Parking Stalls 1.5-inch Permadrive with 4" #57 stone on stabilized sub base LBR40
11/3/20	INF-17-093	Gran Paradiso Phase 5B	<ul style="list-style-type: none"> Inclusion of aerators in lakes Use of pavers on driveways Preservation of Native and wetlands vegetation where possible Use of Florida Friendly landscaping Rear yards swales for extra treatment
11/3/20	INF-17-217	Gran Paradiso Phase 8	Use of pavers on driveways to minimize amount of impervious coverage, preservation of native vegetation where possible, the use of aerators to increase dissolved oxygen in lakes, implementation of rear yard swales to promote additional treatment prior to discharge, and the use of Florida Friendly Landscaping throughout the development.
Under Construcion	MAS-18-015	Oasis Amenity Center	Grass Swales before entering wet detention pond, 2728 sf pervious pavers
Under Construcion	MAS-18-127	Tire Kingdom / Coastal Car Wash	Runoff into two grass retention swales prior to discharge into the master stormwater piping/pond system
Under Construcion	INF-17-111	The Preserve Phase 3	Stormwater harvesting for irrigation from Pond 5-1P with recharge well, grass bioswale, fountain
Under Construcion	MAS-18-078	Kenvil Apartments	Multiple grass swale pre-treatment and 10 grass parking
Under Construcion	MAS-18-064	Hampton Inn & Suites @5664 Tuscola Blvd	Less impervious than allowable, 77.65% vs allowable 90%. Florida Friendly Landscaping used, stormwater harvesting.
Under Construcion	MAS-19-035	West Villages Welcome Center	Pavers proposed at the entrance are set on sand as a pervious pavement.
Under Construcion	MAS-19-140	Experience Living at North Port	Major Grass Swale discharges before entering stormwater pond. Only 20.23% percent impervious proposed when 69% is allowed.

Year Installed	Project number	Project Name	Description
Under Construcion	MAS-19-282	Chase Bank at West Villages Marketplace	15 parking stalls in pervious pavers Pave Drain. Runoff to grass swales for pretreatment prior to entering master stormwater system
Under Construcion	INF-20-051	West Villages Downtown Phase 1 Wellen Park	1. Stormwater harvesting for irrigation. 2 Use of pervious pavers that are set on shell material rather than concrete (In total, project proposes 25,660 SF of pervious pavers)
Under Construcion	INF-19-017	Tortuga	Stormwater harvesting for irrigation and paver driveways
Under Construcion	INF-20-19	Gran Park	Utilize paver driveways. Irrigation will be supplied through reuse provided by the WVID
Under Construcion	MAS-19-318	Palm Port Apartments	Stormwater harvesting for irrigation from 2 wet ponds with recharge well. 19 turf block parking stalls.
Under Construcion	MAS-20-091	Florida Cancer Specialists	Several large grass retention pretreatment swales prior to master stormwater system.
Future	MAS-17-003	Villas of Holly Brook	According to OPI (Office Professional Institutional) zone district, Section 5394-Maximum lot coverage; Buildings can cover up to 50% of available lot area. The current site design has a total impervious coverage of 55% (including building, parking, and sidewalks) so impervious area was kept at a minimum. Two landscaped gardens are provided between the building and the Cocoplum Waterway. The garden's runoff travels through yard drains which are all located in grassed depressions. The larger garden drains to the yard drains which then flow into a dry grassed swale before ultimately meeting the dry retention pond. The northwest parking lot quadrant was also regraded so the area flows into a grassed depression before draining to the dry pond.
Future	MAS-17-038	Wawa - Toledo Blade & Price	Modification of previous Bioswale #3 plus 2 more bioswales increase bioswale volume from 0.03 ac-ft to 0.086 ac-ft. impervious area is 74.2% compared to allowable 85%. 9 pervious pavement parking stalls
Future	MAS-18-047	Checkers only formerly included Fuzzy Taco at Shoppes of North Port	Redevelopment of existing shopping center reduce the impervious area from 39,525.29 SF to 35,962.46 SF. Impervious area under traffic is reduce by 13,530.00 SF.
Future	MAS-17-221	Gateway at Cocoplum Phase 2 part 1 Texas Road House	27 Pervious concrete parking spaces, 5" pervious concrete over 4" #57 stone
Future	MAS-18-289	Racetrac At Talon Bay MAS-18-289	Less impervious than allowable, 65% vs allowable 70%. Run off to long grass swales.
Future	INF-19-116	Oasis Phase 3	Grass swales for 8 lots before pond
Future		Kenvil Park Apartments MAS-19-090	The development has been designed to be as compact as possible, minimizing impervious areas. Large portions of the roofs are directed to green areas, to disconnect impervious areas. In addition, treated stormwater from the site is discharged through the proposed floodplain compensation pond, such that the discharge must travel through the entire length of the pond prior to leaving the site, which provides additional sediment settling capacity and nutrient assimilation beyond the treatment provided by the effluent filtration system. We have also included a floating fountain/aerator in the floodplain compensation pond to supplement the available dissolved oxygen supply and to provide an aesthetically pleasing visual amenity.
Future	PRE-19-203	US41 Linear Parking on Zagrobelny Way on north side of US41 between North Port Blvd and Espanola Ave.	76 pervious concrete parking between North Port Blvd and Espanola on the US 41 North access road
Future	MAS-20-055	North Port Village	Grass pretreatment swales.
Future	MAS-20-094	FIRESTONE STORE #912085 - NORTH PORT	Site approved max 85% impervious, only 64.75% impervious proposed. Vegetated treatment swale used prior to master stormwater system
Future	MAS-20-034	BISCAYNE SQUARE	Stormwater Reuse
Future	INF-20-120	West Villages - Village F-1 Phase 1	Stormwater harvesting for irrigation
Future	INF-20-218	Playmore Drive Extension	Master irrigation system which uses a combination of reuse, stormwater, and groundwater sources for its irrigation water



Public Outreach Activities

Event	Flood Information Related														
	Brochure Type	Date of Event	Amount Available	Date Remaining Brochures Counted	Amount Remaining	Amount of Flyers Given	Water Quality Protection Flyers	Flood Info. Flyers	No. of Participants (flood Related)	No. of Participants (Water Quality Related)	Neighborhood Presentation	Public Displays on Water Quality	School Presentation on Water Quality	Seminar/ Workshop on Water Quality	Special Event on Water Quality
Sumter Pond Clean up - Keep Sarasota beautiful Great American Cleanup, brought display of stormwater system		09/25/10							50	50		1			
Kiwanis Harvest Festival at Mullen Center	Know where your drinking water comes from (approved by Robin Grantham at SWFWMD)	10/16/10	3	10/16/10	0	3			300	300		1			
	Fertilizer Fact Sheet		12		0	12									
Jockey Club HOA presentation on Stormwater and Fertilizer Ordinance, brought display of stormwater system and draft flood map	Know where your drinking water comes from (approved by Robin Grantham at SWFWMD)	10/21/10	28	10/21/10	0	28			50	50	1				
	Fertilizer Fact Sheet		37		0	37	6								
Jeffery Waterway nearby Residents	letter mailer to not pollute	10/27/10				153									
Glenallen Elementary School, stormwater presentation to three classes for Government week	Fertilizer Fact Sheet	10/26/10	80	10/26/10	0	80			100	100			1	1	
North Port Newcomer's Day at North Port Library	Know where your drinking water comes from (approved by Robin Grantham at SWFWMD)	10/30/10	10	10/30/10	0	10			500	500					1
	Fertilizer Fact Sheet		10		0	10									
Charlotte County Green Expo	Know where your drinking water comes from (approved by Robin Grantham at SWFWMD)	11/13/10	15	11/13/10	9	6			300	300		1			1
	Fertilizer Fact Sheet		45		39	6									
CHNEP Nature Festival	Know where your drinking water comes from (approved by Robin Grantham at SWFWMD)	11/20/10	50	11/20/10	46	4			500	500		1			1
	Fertilizer Fact Sheet		50		45	5									
E. Wong gave a powerpoint presentation Noon Kiwanis at Family Table Restaurant	Fertilizer Fact Sheet	01/05/11	46	1/5/11	36	10				16			1	1	
	Know Where Your Drinking Water Comes From		45	1/5/11	33	12									
Commission/Public Meeting on Big Slough Watershed Flood Maps Model and Peer Review		01/26/11							38				1	1	
E. Wong gave a powerpoint presentation and training on NPDES to Utilities Operators trianees		02/26/11							4	4			1	1	
E. Wong gave a powerpoint presentation and training on NPDES to Utilities Operators trianees		02/27/11							6	6			1	1	
Ecofest at Warm Mineral Springs - City Booth	Fertilizer Fact Sheet and floodmap on easel	3/19/2011 to 3/20/11				25			500	500		1			1
	Know Where Your Drinking Water Comes From					10									
City Hall 2nd Floor table display	Fertilizer Fact Sheet	03/22/11	50	8/9/11	5	45									
City Hall 3rd Floor PZE Front Waiting area	Fertilizer Fact Sheet	03/22/11	50	8/9/11	49	1									
Great American Cleanup		04/02/11							18	18		1			
North Port Library Flood Awareness Seminar - Sarasota County CRS Coordinator Des Companion hosted	FEMA Brochures	04/14/11							12	12					1
Tree Festival	Fertilizer Fact Sheet	04/30/11	50	4/30/11	49	1			250	250		1			1
	Know Where Your Drinking Water Comes From														
North Port Newcomer's Day at North Port Library	Fertilizer Fact Sheet and floodmap on easel	05/07/11				1						1			1
North Port Environmental Festival	Fertilizer Fact Sheet	05/14/11	25	5/14/11	2	23			200	200		1			1
	Know Where Your Drinking Water Comes From		10	5/14/11	5	5									
	Flood Information 10 Topics Flyer and floodmap on easel		25	5/14/11	4	21		21							
North Port Library Flood Awareness Seminar - Des Companion hosted	Flood Information 10 Topics Flyer	05/26/11	20						2						1
City Hall 1st Floor Kiosk	Flood Information 10 Topics Flyer	05/27/11	100	8/9/11	85	15		15							
City Hall 2nd Floor table display	Flood Information 10 Topics Flyer	05/27/11	50	8/9/11	38	12		12							
City Hall 3rd Floor PZE Front Waiting area	Flood Information 10 Topics Flyer	05/27/11	30	8/9/11	27	3		3							
City Hall 1st Floor Kiosk	Know Where Your Drinking Water Comes From	05/27/11	50	8/9/11	42	8									

Public Outreach Activities

Flood Information Related															
Event	Brochure Type	Date of Event	Amount Available	Date Remaining Brochures Counted	Amount Remaining	Amount of Flyers Given	Water Quality Protection Flyers	Flood Info. Flyers	No. of Participants (flood Related)	No. of Participants (Water Quality Related)	Neighborhood Presentation	Public Displays on Water Quality	School Presentation on Water Quality	Seminar/ Workshop on Water Quality	Special Event on Water Quality
City Hall 2nd Floor table display	Know Where Your Drinking Water Comes From	05/27/11	50	8/9/11	24	26									
City Hall 3rd Floor PZE Front Waiting area	Know Where Your Drinking Water Comes From	05/27/11	50	10/3/11	29	21									
Presentation to the Planning Zoning and Advisory Board on Flood map update and stormwater maintenance discussions		06/16/11							11	11			1	1	
Mullen Center, City of North Port Summer Camp Kids, taught 4 x 1hr sessions of summer camp kids for a total of 120 kids on Don't Pollute and Flood Information. Kids range from 5yr to 13yr old	Fertilizer Fact Sheet	7/20/11 to 7/21/11	100	7/20/11 to 7/21/11	4	96			120	120			4	4	
	Know Where Your Drinking Water Comes From		100		1	99									
	Flood Information 10 Topics Flyer and floodmap on easel		100		2	98		98							
International Coastal Cleanup		09/24/11													1
Charlotte County Green Expo	Fertilizer Fact Sheet	10/01/11	47	7/20/11 to 7/21/11	35	12			1000	1000		1			1
	Know Where Your Drinking Water Comes From		49		22	27									
	Flood Information 10 Topics Flyer and floodmap on easel		27		4	23		23							
City Hall 3rd Floor Lobby area	Fertilizer Fact Sheet	10/10/11	25	3/5/11	0	25									
	Know Where Your Drinking Water Comes From		16	3/5/11	0	16									
	Flood Information 10 Topics Flyer		21	3/5/11	0	21		21							
North Port Community Garden at Warm Mineral Springs	Fertilizer Fact Sheet	10/10/11	20	10/10/11	10	10			11	11			1	1	
	Know Where Your Drinking Water Comes From		20		8	12									
	Flood Information 10 Topics Flyer		20		11	9		9							
North Port Democratic Club	Fertilizer Fact Sheet	10/17/11	5	10/17/11	0	5			35	35	1				
CHNEP Nature Festival	Fertilizer Fact Sheet	11/19/11	50		40	10			3000	3000		1			1
	Know Where Your Drinking Water Comes From		22		14	8									
	Flood Information 10 Topics Flyer and floodmap on easel		50		38	12		12							
North Port Library Flood Awareness Seminar - Des Companion hosted	Flood Information 10 Topics Flyer	12/1/2011	38		38	0		0	2	2					1
SWFWMD Public Open House on Draft Flood Maps	Flood Information 10 Topics Flyer and floodmap on easel	12/6/2011	50	12/7/11	45	5		5	523				1	1	
Wood Haven Estates HOA new Draft Floodmaps	Flood Information 10 Topics Flyer and floodmap on easel	1/17/2012	30	1/17/2012	27	3		3	36	36	1				
Jockey Club HOA Stormwater System and Pollution Prevention	Fertilizer Fact Sheet	01/19/12	40	01/19/12	30	10	10		50	50	1				
	Know Where Your Drinking Water Comes From		14		6	8	8								
	Flood Information 10 Topics Flyer and floodmap on easel		27		26	1		1							
	Grandfathering insurance FEMA brochure		30		30	0		0							
Warm Mineral Springs Open House	Fertilizer Fact Sheet	01/21/12	30		23	7			50	50		1			1
	Flood Information 10 Topics Flyer and floodmap on easel		20		15	5		5							
	Know Where Your Drinking Water Comes From		6		1	5									
Warm Mineral Springs Open Forum	Fertilizer Fact Sheet	1/26/12 and 2/2/12	30	2/10/12	21	9			40	40					
City Hall 1stFloor Lobby area	Fertilizer Fact Sheet	03/06/12	30		0	30									
	Know Where Your Drinking Water Comes From		30		0	30									
	Flood Information 10 Topics Flyer		30		0	30		30							
City Hall 2nd Floor Lobby area	Fertilizer Fact Sheet	03/06/12	37		37	0									
	Know Where Your Drinking Water Comes From		30		11	19									
	Flood Information 10 Topics Flyer		30		28	2		2							
City Hall 3rd Floor Lobby area	Fertilizer Fact Sheet	03/06/12	30		0	30									

Public Outreach Activities

Event	Flood Information Related															
	Brochure Type	Date of Event	Amount Available	Date Remaining Brochures Counted	Amount Remaining	Amount of Flyers Given	Water Quality Protection Flyers	Flood Info. Flyers	No. of Participants (flood Related)	No. of Participants (Water Quality Related)	Neighborhood Presentation	Public Displays on Water Quality	School Presentation on Water Quality	Seminar/ Workshop on Water Quality	Special Event on Water Quality	
	Know Where Your Drinking Water Comes From		30		15	15										
	Flood Information 10 Topics Flyer		30		0	30		30								
Warm Mineral Springs Ecofest	Fertilizer Fact Sheet	03/17/12	25		20	5			300	300		1			1	
	Know Where Your Drinking Water Comes From		25		20	5										
	Flood Information 10 Topics Flyer		25		20	5		5								
Great American Cleanup	Fertilizer Fact Sheet	04/07/12	20		14	6			9	9					1	
	Know Where Your Drinking Water Comes From		20		14	6										
	Flood Information 10 Topics Flyer							0								
North Port Second Nature Environmental Festival	Fertilizer Fact Sheet	05/12/12	30		27	3			200	200		1			1	
	Know Where Your Drinking Water Comes From		30		27	3										
	Flood Information 10 Topics Flyer		14		12	2		2								
Commission Presentation of the Improved CRS Rating		05/29/12							50							
Fertilizer and Aquatic plants Workshop	Fertilizer Fact Sheet	06/23/12	60		52	8			8	8			1	1		
	Know Where Your Drinking Water Comes From		60		52	8										
	Flood Information 10 Topics Flyer		60		52	8		8								
Commission Public Meeting Presenting NPDES Year 4 (2011) Report		7/10/2012							50	50			1	1		
Mullen Center, City of North Port Summer Camp Kids, taught 2 x 1.5hr sessions of summer camp kids for a total of 77 camp kids and 6 City staff on Fertilizers, Aquatic plants, Don't Pollute and Flood Information. Kids range from 5yr to 13yr old	Fertilizer Fact Sheet	08/13/12	120		77	43	43		83	83			2	2		
	Flood Information 10 Topics Flyer		120		82	38		38								
City Hall 1stFloor Lobby area	Fertilizer Fact Sheet	08/31/12	30	9/12/13	0	30	30									
	Know Where Your Drinking Water Comes From		30		0	30	30									
	Flood Information 10 Topics Flyer		30		0	30		30								
City Hall 2nd Floor Lobby area	Fertilizer Fact Sheet	08/31/12	37	9/12/13	0	37	37									
	Know Where Your Drinking Water Comes From		30		0	30	30									
	Flood Information 10 Topics Flyer		30		8	22		22								
City Hall 3rd Floor Lobby area	Fertilizer Fact Sheet	08/31/12	30	9/12/13	0	30	30									
	Know Where Your Drinking Water Comes From		27		0	27	27									
	Flood Information 10 Topics Flyer		30		0	30		30								
2012 International Coastal Cleanup	Fertilizer Fact Sheet	09/15/12	30		18	12	12		17	17			1	1		
	Know Where Your Drinking Water Comes From		30		18	12	12									
	Flood Information 10 Topics Flyer		30		19	11		11								
Public Works Office	Fertilizer Fact Sheet	09/17/12	30	9/12/13	20	10	10									
	Know Where Your Drinking Water Comes From		25		22	3	3									
	Flood Information 10 Topics Flyer		30		24	6		6								
Newcomers Day	Fertilizer Fact Sheet	11/03/12	18		0	18	18		256	256					1	
	Know Where Your Drinking Water Comes From		18		0	18	18									
	Flood Information 10 Topics Flyer		19		0	19		19								
CHNEP Nature Festival	Fertilizer Fact Sheet	11/17/12	50		24	26	26		3000	3000		1			1	
	Know Where Your Drinking Water Comes From		50		36	14	14									
	Flood Information 10 Topics Flyer and		14		7	7		7								
North Port Second Nature Environmental Festival	Fertilizer Fact Sheet	02/09/13	54		43	11	11		500	500		1			1	
	Know Where Your Drinking Water Comes From		66		54	12	12									

Public Outreach Activities

Flood Information Related															
Event	Brochure Type	Date of Event	Amount Available	Date Remaining Brochures Counted	Amount Remaining	Amount of Flyers Given	Water Quality Protection Flyers	Flood Info. Flyers	No. of Participants (flood Related)	No. of Participants (Water Quality Related)	Neighborhood Presentation	Public Displays on Water Quality	School Presentation on Water Quality	Seminar/ Workshop on Water Quality	Special Event on Water Quality
	Flood Information 10 Topics Flyer and floodmap on easel		37		33	4		4							
FDEP Public Workshop	Fertilizer Fact Sheet	03/07/13	43		41	2	2		50	50		1			1
	Know Where Your Drinking Water Comes From		54		52	2	2								
	Flood Information 10 Topics Flyer and floodmap on easel		33		31	2		2							
Great American Cleanup	Fertilizer Fact Sheet	04/27/13	41		30	11	11		20	20		1			1
	Know Where Your Drinking Water Comes From		52		40	12	12								
	Flood Information 10 Topics Flyer and floodmap on easel		31		19	12		12							
Newcomers Day	Fertilizer Fact Sheet	05/04/13	30		24	6	6		20	20					1
	Know Where Your Drinking Water Comes From		40		32	8	8								
	Flood Information 10 Topics Flyer and floodmap on easel		19		13	6		6							
Green Tour of North Port - hosted by E.Wong for Lisa Beever, Director CHNEP and other citizens									6	6					1
Mullen Center, City of North Port Summer Camp Kids, taught 50 summer camp kids 3 City staff on Fertilizers, Aquatic plants, Don't Pollute and Flood Information. Kids range from 5yr to 8yr old	Fertilizer Fact Sheet	07/19/13	30		2	28	28		50	50					1
	Know Where Your Drinking Water Comes From		30		0	30	30								
	Flood Information 10 Topics Flyer and floodmap on easel		30		1	29		29							
City Hall 1stFloor Lobby area	Fertilizer Fact Sheet	09/12/13	30	9/11/14	0	30	30								
	Know Where Your Drinking Water Comes From		30		0	30	30								
	Flood Information 10 Topics Flyer		30		0	30		30							
City Hall 2nd Floor Lobby area	Fertilizer Fact Sheet	09/12/13	30	9/11/14	0	30	30								
	Know Where Your Drinking Water Comes From		30		14	16	16								
	Flood Information 10 Topics Flyer		30		7	23		23							
City Hall 3rd Floor Lobby area	Fertilizer Fact Sheet	09/12/13	30	9/11/14	0	30	30								
	Know Where Your Drinking Water Comes From		30		0	30	30								
	Flood Information 10 Topics Flyer		30		0	30		30							
Public Works Office	Fertilizer Fact Sheet	09/12/13	30	9/11/14	0	30	30								
	Know Where Your Drinking Water Comes From		30		1	29	29								
	Flood Information 10 Topics Flyer		30		11	19		19							
2013 International Coastal Cleanup	Fertilizer Fact Sheet	09/20/13	30			30	30		30	30			1	1	
	Know Where Your Drinking Water Comes From		24			24	24								
	Flood Information 10 Topics Flyer		30			30		30							
North Port Cub Scouts	Fertilizer Fact Sheet	11/19/13	15		0	15	15								1
	Know Where Your Drinking Water Comes From		15		10	5	5								
	Sustainability		15		6	9		9							
CHNEP Nature Festival	Fertilizer Fact Sheet	11/23/13	50	11/25/13	41	9	9		3500	3500		1			1
	Know Where Your Drinking Water Comes From		50		38	12	12								
	Flood Information 10 Topics Flyer and floodmap on easel		50		35	15		15							
Public Works Road-eo	Fertilizer Fact Sheet	01/25/14	50	01/25/14	36	14	14		600	600		1			1
	Know Where Your Drinking Water Comes From		50		38	12	12								
	Flood Information 10 Topics Flyer and floodmap on easel		50		42	8		8							
North Port Second Nature Environmental Festival	Fertilizer Fact Sheet	02/08/14	36	02/08/14	24	12	12		400	400		1			1
	Know Where Your Drinking Water Comes From		38		22	16	16								
	Flood Information 10 Topics Flyer and floodmap on easel		42		28	14		14							
Newcomers Day	Fertilizer Fact Sheet	02/01/14				0			20	20					1
	Know Where Your Drinking Water Comes From					10	10								

Public Outreach Activities

Flood Information Related															
Event	Brochure Type	Date of Event	Amount Available	Date Remaining Brochures Counted	Amount Remaining	Amount of Flyers Given	Water Quality Protection Flyers	Flood Info. Flyers	No. of Participants (flood Related)	No. of Participants (Water Quality Related)	Neighborhood Presentation	Public Displays on Water Quality	School Presentation on Water Quality	Seminar/Workshop on Water Quality	Special Event on Water Quality
Great American Cleanup	Flood Information 10 Topics Flyer and	03/15/14		03/15/14		10		10							
	Fertilizer Fact Sheet		28			28	28		65	65	1				
	Know Where Your Drinking Water Comes From		28			28	28								
	Flood Information 10 Topics Flyer and		28			28		28							
Make Mitigation Happen Community Workshop held at North Port Library	Make Mitigation Happen Community Powerpoint	05/20/14							5	5					
Woodland Middle School Speaker, spoke to 6th, 7th and 8th graders on pollution prevention and pervious pavement use at STEM program	Fertilizer Fact Sheet	03/21/14	34	3/21/14	30	4	4		20	20			1		
Mullen Center, City of North Port Summer Camp Kids, taught 2 sessions 1.5hr to 41 summer camp kids 2 City camp counsellor on Fertilizers, Aquatic plants, Don't Pollute and Flood Information. Kids range from 5yr to 13yr old	Fertilizer Fact Sheet	08/08/14	60	08/08/14	32	28	28		43	43				2	
	Know Where Your Drinking Water Comes From		30		9	21	21								
	Flood Information 10 Topics Flyer and floodmap on easel		30		20	10		10							
City Hall Three Floors Lobby area	Fertilizer Fact Sheet	9/11/14	90	9/14/15	0	90	90								
	Know Where Your Drinking Water Comes From		90		21	69	69								
	Flood Information 10 Topics Flyer		90		11	79		79							
International Coastal Cleanup		9/20/14							61	61	1				
Commission Workshop on Big Slough Watershed study and draft Flood map		9/25/14							14	14					
Public Works Office	Fertilizer Fact Sheet	9/29/14	29	9/14/15	0	29	29								
	Know Where Your Drinking Water Comes From		30		19	11	11								
	Flood Information 10 Topics Flyer		50		36	14		14							
2014 International Coastal Cleanup	Fertilizer Fact Sheet	9/27/14	30	9/27/14	0	30	30		65	65	1				
	Know Where Your Drinking Water Comes From		30		0	30	30								
	Flood Information 10 Topics Flyer		30		0	30		30							
GIS Day at North Port Library - New draft flood map on display	Flood Information 10 Topics Flyer	11/19/14	50		48	2		2	2	2					
CHNEP Nature Festival	Fertilizer Fact Sheet	11/22/14	50	11/22/14	0	50	50		2500	2500		1			1
	Know Where Your Drinking Water Comes From		50		0	50	50								
	Flood Information 10 Topics Flyer and floodmap on easel		50		0	50		50							
Flood Map Changes Stakeholder Meeting	Sarasota County Organized with North Port coordination	1/9/15							90						
Sarasota County/FEMA 1st Public Open House on Draft FIRMs		1/20/15							140						
Venice/Sarasota County/FEMA 1st Public Open House on Draft FIRMs		1/21/15							503						
North Port/Sarasota County/FEMA 1st Public Open House on Draft FIRMs		1/22/15							452						
Public Works Road-eo	Fertilizer Fact Sheet	01/24/15	50	01/26/15	45	5	5		700	700					1
	Know Where Your Drinking Water Comes From		50		49	1	1								
	Flood Information 10 Topics Flyer and floodmap on easel		50		39	11		11							
Ecofest City Hall	Fertilizer Fact Sheet	02/07/15	45		33	12	12		1000	1000		1			1
	Know Where Your Drinking Water Comes From		49		46	3	3								
	Flood Information 10 Topics Flyer and floodmap on easel		50		35	15		15							
Sarasota County/FEMA 2nd Public Open House on Draft FIRMs		2/24/15							18						
Venice/Sarasota County/FEMA 2nd Public Open House on Draft FIRMs		3/4/15							60						

Public Outreach Activities

Flood Information Related															
Event	Brochure Type	Date of Event	Amount Available	Date Remaining Brochures Counted	Amount Remaining	Amount of Flyers Given	Water Quality Protection Flyers	Flood Info. Flyers	No. of Participants (flood Related)	No. of Participants (Water Quality Related)	Neighborhood Presentation	Public Displays on Water Quality	School Presentation on Water Quality	Seminar/ Workshop on Water Quality	Special Event on Water Quality
North Port/Sarasota County/FEMA 2nd Public Open House on Draft FIRMs	Fertilizer Fact Sheet	3/12/15	33			33	33		105						
	Know Where Your Drinking Water Comes From		46	3/12/15	45	1	1								
	Flood Information 10 Topics Flyer and floodmap on easel		75	3/12/15	65	10		10							
	Flood Insurance Premium Comparisons		25	3/12/15	22	3		3							
Public Works Office	Flood Insurance Premium Comparisons	3/12/15	21		10	11		11							
	Effect of Map Changes on Insurance		25	9/14/15	0	25		25							
	Electronic LOMA		25		0	25		25							
Great American Cleanup	Fertilizer Fact Sheet	03/28/15	28	03/28/15		28	28		50	50					1
	Know Where Your Drinking Water Comes From		28			28	28								
	Flood Information 10 Topics Flyer and floodmap on easel		28			28		28							
Charlotte County Board of Realtors, 3320 Loveland Blvd, Port Charlotte, FL 33980	Flood Information 10 Topics Flyer and floodmap on easel	04/09/15	21	04/09/15	0	21		21	80	80	1				
	Flood Insurance Premium Comparisons		19		18	1		1							
North Port Business Club	Flood Information 10 Topics Flyer and draft floodmap on easel	04/21/15	20	04/21/15	17	3		3	13	13	1				
TIGER Bay Club Monthly - Flood map updates		05/08/15							40						
Hurricane Exercise, and distribution of water and flyer at Atwater Park	Hurricane Disaster Planning Guide	05/20/15				100		100	100						
Utility Bill Mailer with Pet Waste Message June 2 to July 1st, 2015	Utilities Bill mailer included message "Keep our waterways and drinking water supply clean. Please collect your pet's waste and dispose in garbage."	06/01/15				20000	20000								
Lions Club meeting Speaker on new draft flood maps	Flood Information 10 Topics Flyer and draft floodmap on easel	06/02/15	17	06/02/15	0	17		17	20	20				1	
July 4th Fireworks Festival	Fertilizer Fact Sheet	07/04/15	45	07/07/15		45	45		5000	5000					1
	Know Where Your Drinking Water Comes From		45			44	1	1							
	Flood Information 10 Topics Flyer and floodmap on easel		45				45	45							
Mullen Center, City of North Port Summer Camp Kids, taught 2 sessions 1hr each to summer camp kids and City camp counsellor on Fertilizers, Don't Pollute and Flood Information. Kids range from 5yr to 13yr old	Fertilizer Fact Sheet	08/03/15	60	08/03/15	0	60	60		103	103			2		
	Know Where Your Drinking Water Comes From		60		0	60	60								
	Flood Information 10 Topics Flyer and floodmap on easel		60		21	39		39							
City Hall Three Floors Lobby area	Fertilizer Fact Sheet	9/16/15	90		0	90	90								
	Know Where Your Drinking Water Comes From		90		6	84	84								
	Flood Information 10 Topics Flyer		90		6	84		84							
Public Works Office	Fertilizer Fact Sheet	9/16/15	30		0	30	30								
	Know Where Your Drinking Water Comes From		30		10	20	20								
	Flood Information 10 Topics Flyer		30		23	7		7							
International Coastal Cleanup - ulie Bellia discussed water quality and flood info		09/19/15			0	0			65	65					1
CRS first quarterly meeting City Staff and Public Sector Representatives	Fertilizer Fact Sheet	10/30/15	30	10/30/15	10	20	20		21	21				1	
	Know Where Your Drinking Water Comes From		30		11	19	19								
	Flood Information 10 Topics Flyer and floodmap on easel		30		11	19		19							
CHNEP Nature Festival	Fertilizer Fact Sheet	11/21/15	33	11/23/15	22	11	11		1500	1500		1			1

Public Outreach Activities

Flood Information Related															
Event	Brochure Type	Date of Event	Amount Available	Date Remaining Brochures Counted	Amount Remaining	Amount of Flyers Given	Water Quality Protection Flyers	Flood Info. Flyers	No. of Participants (flood Related)	No. of Participants (Water Quality Related)	Neighborhood Presentation	Public Displays on Water Quality	School Presentation on Water Quality	Seminar/Workshop on Water Quality	Special Event on Water Quality
	Know Where Your Drinking Water Comes From		44		39	5	5								
	Flood Information 10 Topics Flyer and floodmap on easel		37		30	7		7							
North Port Library Flood Zone Workshops	Flood Information 10 Topics Flyer and floodmap on easel	01/13/16				2		2	2						
2016 Public Works Road-E-O	Fertilizer Fact Sheet	01/30/16	50		35	15	15		900	900		1			1
	Know Where Your Drinking Water Comes From		50		30	20	20								
	Flood Information 10 Topics Flyer and floodmap on easel		50		30	20		20							
Newcomer Day	Fertilizer Fact Sheet	02/06/16	35		0	35	35		300	300					1
	Know Where Your Drinking Water Comes From		30		0	30	30								
	Flood Information 10 Topics Flyer and floodmap on easel		30		0	30		30							
North Port Library Flood Zone Workshops	Flood Information 10 Topics Flyer and floodmap on easel	02/08/16				2		2	3						
Roadways & Waterways Celebration @ McKibben Park	Fertilizer Fact Sheet	02/27/16	50		30	20	20		150	150					1
	Know Where Your Drinking Water Comes From		50		35	15	15								
	Flood Information 10 Topics Flyer and floodmap on easel		50		30	20		20							
North Port Library Flood Zone Workshops	Flood Information 10 Topics Flyer and floodmap on easel	03/15/16				2		2	3						
City Commission Meeting on Status of FEMA Draft Flood Maps		03/22/16							20						
HOA Presentation @ Talon Bay	Fertilizer Fact Sheet	03/23/16	65		0	65	65		65	65				1	
	Know Where Your Drinking Water Comes From		65		0	65	65								
	Flood Information 10 Topics Flyer and floodmap on easel		65		0	65		65							
Great American Cleanup	Fertilizer Fact Sheet	04/16/16	30	04/16/16	28	2	2		35	35	1				
	Know Where Your Drinking Water Comes From		30		26	4	4								
	Flood Information 10 Topics Flyer and floodmap on easel		30		28	2		2							
Public Works Office	Fertilizer Fact Sheet	4/21/16	30	12/31/16	0	30	30								
	Know Where Your Drinking Water Comes From		30		10	20	20								
	Flood Information 10 Topics Flyer		30		23	7		7							
6th Annual Regional Reverse Trade Show & Conference in Sarasota	Fertilizer Fact Sheet	04/22/16	28	04/22/16	28	0	0		322	322					1
	Know Where Your Drinking Water Comes From		26		26	0	0								
	Flood Information 10 Topics Flyer and floodmap on easel		28		28	0		0							

Public Outreach Activities

Event	Flood Information Related														
	Brochure Type	Date of Event	Amount Available	Date Remaining Brochures Counted	Amount Remaining	Amount of Flyers Given	Water Quality Protection Flyers	Flood Info. Flyers	No. of Participants (flood Related)	No. of Participants (Water Quality Related)	Neighborhood Presentation	Public Displays on Water Quality	School Presentation on Water Quality	Seminar/ Workshop on Water Quality	Special Event on Water Quality
City Hall Three Floors Lobby area	Fertilizer Fact Sheet	4/25/16	90	12/31/16	24	66	66								
	Know Where Your Drinking Water Comes From		96		58	38	38								
	Flood Information 10 Topics Flyer		96		31	65		65							
Lamarque Elementary Earth Night	Fertilizer Fact Sheet	03/24/16	50	03/24/16	27	23	23		25	25			1		
	Know Where Your Drinking Water Comes From		50		22	28	28								
	Flood Information 10 Topics Flyer and floodmap on easel		50		20	30		30							
Newcomer Day	Fertilizer Fact Sheet	05/07/16	50	05/07/16	30	20	20		50	50					1
	Know Where Your Drinking Water Comes From		50		26	24	24								
	Flood Information 10 Topics Flyer and floodmap on easel		50		30	20		20							
Toledo Blade Elementary Spring Showcase	Fertilizer Fact Sheet	05/12/16	50	05/12/16	35	15	15		50	50			1		
	Know Where Your Drinking Water Comes From		50		40	10	10								
	Flood Information 10 Topics Flyer and floodmap on easel		50		42	8		8							
Heron Creek HOA - Head from each Block	Flood Information 10 Topics Flyer and floodmap on easel	06/09/16	30		0	30		30	20	20				1	
Final FEMA flood map Public Open Houses 6/20/16, 6/21/16 6/23/16, 6/27/16 6/28/16, 6/29/16	Fertilizer Fact Sheet	06/23/16	50	06/24/16	48	2	2		155						
	Know Where Your Drinking Water Comes From		50		43	7	7								
	Flood Information 10 Topics Flyer and floodmap on easel		50		38	12		12							
North Port Commission Meeting on Ordinance 2016-21 to revise ULDC Chapter 17 to adopt new FIRMs		07/26/16					0		30						
North Port Library Flood Zone Workshops	Flood Information 10 Topics Flyer and floodmap on easel	08/23/16					0		8						
North Port Commission Meeting on Ordinance 2016-21 to revise ULDC Chapter 17 to adopt new FIRMs		09/13/16					0		30						
International Coastal Cleanup	Fertilizer Fact Sheet	09/17/16	100	09/17/16			0		125	150	1				
North Port GIS Day at the North Port Library	Flood Information 10 Topics Flyer	11/16/16	38		38	0	0	0	50						
CHNEP Nature Festival	Fertilizer Fact Sheet	11/19/16	43	11/19/16	32	11	11		2000	2000		1			1
	Know Where Your Drinking Water Comes From		43		31	12	12								
	Flood Information 10 Topics Flyer and floodmap on easel		38		20	18		18							
Leadership North Port Tour	Fertilizer Fact Sheet	01/13/17	25	01/13/17	0	25	25		25	25				1	
	Know Where It Flows		25		0	25	25								
	Flood Information Sheet		25		0	25		25							
Meeting with Canal Watch Program Volunteers	Fertilizer Fact Sheet	01/17/17	32	01/17/17	22	10	10			7	1				
	Know Where Your Drinking Water Comes From		31		25	6	6								
Public Works Road-E-O	Fertilizer Fact Sheet	01/28/17	50	01/28/17	38	12	12		2000	2000		1			1
	Know Where Your Drinking Water Comes From		50		37	13	13								
	Flood Information 10 Topics Flyer and floodmap on easel		50		43	7		7							
Newcomer Day	Fertilizer Fact Sheet	02/04/17	300	02/04/17	50	250	250		300	300		1		1	
	Know Where It Flows		300		47	253	253								
	Flood Information 10 Topics Flyer and floodmap on easel		300		0	300		300							
Lamarque Elementary Earth Night	Fertilizer Fact Sheet	02/14/17	75	02/14/17	10	65	65		100	100			1		
	Know Where It Flows		75		13	62	62								

Public Outreach Activities

Flood Information Related															
Event	Brochure Type	Date of Event	Amount Available	Date Remaining Brochures Counted	Amount Remaining	Amount of Flyers Given	Water Quality Protection Flyers	Flood Info. Flyers	No. of Participants (flood Related)	No. of Participants (Water Quality Related)	Neighborhood Presentation	Public Displays on Water Quality	School Presentation on Water Quality	Seminar/ Workshop on Water Quality	Special Event on Water Quality
	Flood Information 10 Topics Flyer and floodmap on easel		75		17	58		58							
Great American Cleanup	Fertilizer Fact Sheet	04/22/17	38	4/23/17	17	21	21		50	50					1
	Know Where Your Drinking Water Comes From		37		17	20	20								
	Flood Information 10 Topics Flyer		43		24	19		19							
Newcomer Day	Fertilizer Fact Sheet	05/06/17	200	05/06/17	53	147	147		200	200		1		1	
	Know Where It Flows		200		45	155	155								
	Flood Information 10 Topics Flyer		200		48	152		152							
Toledo Blade Elementary Spring Showcase	Fertilizer Fact Sheet	05/18/17	150	05/18/17	101	49	49		150	150			1		
	Know Where It Flows		150		97	53	53								
	Flood Information 10 Topics Flyer		150		86	64		64							
Public Works Office	Fertilizer Fact Sheet	6/15/17	42			42	42					1			
	Know Where Your Drinking Water Comes From		30			30	30								
	Flood Information 10 Topics Flyer		30			30		30							
City Hall Three Floors Lobby area and Planning Dept	Fertilizer Fact Sheet	6/16/17	120	10/19/17	25	95	95					1			
	Know Where Your Drinking Water Comes From		120		80	40	40								
	Flood Information 10 Topics Flyer		120		100	20		20							
SKYWARN® spotter training class on June 28, 2017		06/28/17							76						
Radio interview with WKDW FM Radio		9/14/17							500						
City Hall Three Floors Lobby area and Planning Dept	Fertilizer Fact Sheet	10/19/17	25		0	25	25					4			
	Know Where Your Drinking Water Comes From		80		29	51	51								
	Flood Information 10 Topics Flyer		40		2	38		38							
Utilities Office	Fertilizer Fact Sheet	10/20/17	20		0	20	20					1			
	Know Where Your Drinking Water Comes From		19		0	19	19								
	Flood Information 10 Topics Flyer		20		0	20		20							
International Coastal Cleanup	Fertilizer Fact Sheet	10/28/17	30	10/28/17	12	18	18		21	21					1
	Know Where Your Drinking Water Comes From		30		12	18	18								
	Flood Information 10 Topics Flyer		30		12	18		18							
Newcomer Day brochures - for Edie Driest to distribute	Fertilizer Fact Sheet	11/4/17	30			30	30		30	30					
	Know Where Your Drinking Water Comes From		30			30	30								
	Flood Information 10 Topics Flyer		30			30		30							
Newcomer Day - Public Works Customer Service handed out	Fertilizer Fact Sheet	11/3/17	50			42	42		35	42		1		1	
	Know Where Your Drinking Water Comes From		50			37	37								
	Flood Information 10 Topics Flyer		50			35		35							
Newcomer Day	Fertilizer Fact Sheet	11/04/17	200		0	200	200		300	300		1		1	1
	Know Where Your Drinking Water Comes From		200		0	200	200								
	Flood Information 10 Topics Flyer		200		0	200		200							
CHNEP Nature Festival	Fertilizer Fact Sheet	11/18/17	50		0	50	50		2000	2000		1			1
	Know Where Your Drinking Water Comes From		50		41	9	9								

Public Outreach Activities

Flood Information Related															
Event	Brochure Type	Date of Event	Amount Available	Date Remaining Brochures Counted	Amount Remaining	Amount of Flyers Given	Water Quality Protection Flyers	Flood Info. Flyers	No. of Participants (flood Related)	No. of Participants (Water Quality Related)	Neighborhood Presentation	Public Displays on Water Quality	School Presentation on Water Quality	Seminar/Workshop on Water Quality	Special Event on Water Quality
	Flood Information 10 Topics Flyer and floodmap on easel		50		48	2		2							
Leadership North Port Tour	Drainage System Tips	1/12/18	20				20	20	20	20				1	
	Flood Information 10 Topics Flyer		20					20							
Newcomer Day - Public Works Customer Service	Drainage System Tips	2/3/18	200	2/3/18	0	200	200	300	300	200				1	
	Flood Information 10 Topics Flyer		200		0	200		150							
Public Works Road-eo	Fertilizer Fact Sheet	02/24/18	50	02/24/18	38	12	12		2200	2200		1			1
	Know Where Your Drinking Water Comes From		50		43	7	7								
	Flood Information 10 Topics Flyer and		50		27	23		23							
Gran Paradiso Coach Homes HOA Pres Vlad Basch	Flood Information 10 Topics Flyer	03/13/18	27		0	27		27	1						
Florida Native Plant Society Mangrove Chapter	Fertilizer Fact Sheet	03/13/18	38	03/13/18	20	18	18			23				1	
	Know Where Your Drinking Water Comes From		38		19	19	19								
West Villages Town Hall	Fertilizer Fact Sheet	03/15/18	50	03/15/18	0	50	50		400	400	1				
	Know Where Your Drinking Water Comes From		50		0	50	50								
	Flood Information 10 Topics Flyer		50		0	50		50							
Earth Night - Lamarque Elementary	Fertilizer Fact Sheet	03/22/18	50	03/22/18	0	50	50		75	75			1		
	Know Where Your Drinking Water Comes From		50		0	50	50								
	Flood Information 10 Topics Flyer		50		0	50		50							
Great American Cleanup		03/24/18		4/23/17					23	23					1
Peace River Engineering Society	Flood Information 10 Topics Flyer	04/10/18	20	4/10/18	13	7		7	12	12				1	
Oscar Scherer Park for the Earth Day celebration	Flood Information 10 Topics Flyer	04/27/19	200	04/21/18	0	200		200	200						
Toledo Blade Elementary Spring Fling	Fertilizer Fact Sheet	05/10/18	50	05/10/18	0	50	50		400	400			1		
	Know Where Your Drinking Water Comes From		50		0	50	50								
	Flood Information 10 Topics Flyer		50		0	50		50							
Atwater Elementary School Earth Day	Fertilizer Fact Sheet	05/11/18	43		21	22	22		200	200			1		
	Know Where Your Drinking Water Comes From		43		21	22	22								
	Flood Information 10 Topics Flyer		43		21	22		22							
July 4th Freedom Festival	Fertilizer Fact Sheet	07/04/18	30	07/09/18	27	3	3		5	5					1
	Know Where Your Drinking Water Comes From		30		25	5	5								
	Flood Information 10 Topics Flyer		30		26	4		4							
City of North Port Summer kids camp	Fertilizer Fact Sheet	07/19/18	30	07/19/18	3	27	27		150	150			1		
	Know Where Your Drinking Water Comes From		30		5	25	25								
	Flood Information 10 Topics Flyer		30		5	25		25							
Canal Watch Group members + outreach	Fertilizer Fact Sheet	07/19/18	30	08/02/18	44	16	16		7	7				1	
	Know Where Your Drinking Water Comes From		30		11	19	19								
	Flood Information 10 Topics Flyer		30		32	7		7							

Public Outreach Activities

Event	Flood Information Related														
	Brochure Type	Date of Event	Amount Available	Date Remaining Brochures Counted	Amount Remaining	Amount of Flyers Given	Water Quality Protection Flyers	Flood Info. Flyers	No. of Participants (flood Related)	No. of Participants (Water Quality Related)	Neighborhood Presentation	Public Displays on Water Quality	School Presentation on Water Quality	Seminar/ Workshop on Water Quality	Special Event on Water Quality
Water Control Structure No. 115 Ribbon Cutting Ceremony									55	55					1
International Coastal Cleanup	Fertilizer Fact Sheet	09/15/18	30		0	30	30		100	100					1
	Know Where Your Drinking Water Comes From		30		0	30	30								
	Flood Information 10 Topics Flyer		30		0	30		30							
Canal Watch Group members + outreach + WTP tour	Know Where Your Drinking Water Comes From	10/25/218	80		0	80	80			10				1	
CHNEP Nature Festival	Fertilizer Fact Sheet	11/17/18	30	11/19/18	25	5	5		1750	1750		1			1
	Know Where Your Drinking Water Comes From		30		18	12	12								
	Flood Information 10 Topics Flyer		30		26	4		4							
Public Works Road-E-O	Fertilizer Fact Sheet	01/25/19	39	01/25/19	0	39	39		2400	2400		1			1
	Fertilizer Resolution Sheet		91		0	91	91								
	Know Where Your Drinking Water Comes From		49		0	49	49								
	Flood Information 10 Topics Flyer and floodmap on easel		47		46	1		1							
Flood Reduction Study Public Outreach Meeting	Fertilizer Fact Sheet	02/13/19	50	02/13/19	0	50	50		47						
	Know Where Your Drinking Water Comes From		29		0	29	29								
	Flood Information 10 Topics Flyer and floodmap on easel		46		0	46		46							
Clean up of Myakkahatchee Canal using kayaks		02/23/19							6	6					1
Fertilizer Regulation for HOAs and subcontractors	Fertilizer Fact Sheet	03/12/19	2		0	2	2			2	1				
NP Friends of Wildlife Seminar	Fertilizer Fact Sheet	03/20/19	20		0	20	20			20				1	
Fertilizer Regulation for HOAs and subcontractors and Illicit Discharge	Fertilizer Fact Sheet	03/26/19	20		4	16	16			9	1				
Clean up of Myakkahatchee Canal using kayaks		03/30/19							9	9					1
Fertilizer Regulation for Gran Paradiso HOA manager Landscape Management subcontractor	Fertilizer Fact Sheet	04/11/19	2		0	2	2			2				1	
Great American Cleanup		04/13/19							14	14					1
Canal Watch Group Meeting	Fertilizer Fact Sheet	04/23/19	50	04/23/19	0	50	50		8	8				1	
	Know Where Your Drinking Water Comes From		50		0	50	50								
	Flood Information 10 Topics Flyer		50		0	50		50							

Public Outreach Activities

Event	Flood Information Related														
	Brochure Type	Date of Event	Amount Available	Date Remaining Brochures Counted	Amount Remaining	Amount of Flyers Given	Water Quality Protection Flyers	Flood Info. Flyers	No. of Participants (flood Related)	No. of Participants (Water Quality Related)	Neighborhood Presentation	Public Displays on Water Quality	School Presentation on Water Quality	Seminar/ Workshop on Water Quality	Special Event on Water Quality
Atwater Elementary School Earth Day	Know Where Your Drinking Water Comes From	04/26/19	20		0	20	20		160	160			1		
Earth Day Celebration at Oscar Scherer	Flood Information 10 Topics Flyer	04/27/19	250		0	250		250	1783						
City Hall Three Floors Lobby area and Planning Dept	Fertilizer Fact Sheet	5/10/19	120	5/13/20	78	42	42					4			
	Know Where Your Drinking Water Comes From		120		55	65	65								
	Flood Information 10 Topics Flyer		120		50	70		70							
Water Quality Public Outreach Workshop by IFAS		05/16/19								16				1	
City of North Port Hurricane Preparedness Training		05/22/19							13						
July 4th Celebration at Braves Stadium	Fertilizer Fact Sheet	7/4/19	30		0	30	30		30	30					1
	Know Where Your Drinking Water Comes From		30		0	30	30								
	Flood Information 10 Topics Flyer		30		0	30		30							
ERA Advantage Realty associates Presentation on Flood Information, Flood Insurance CRS and Water/Sewer	Fertilizer Fact Sheet	7/4/19	30		0	30	30		25	25					1
	Know Where Your Drinking Water Comes From		30		0	30	30								
	Flood Information 10 Topics Flyer		30		0	30		30							
Hurricane / Flooding Preparedness Presentation to City Staff		7/8/19	26						26						
Annual Summer Camp at George Mullens Activity Center	Fertilizer Fact Sheet	7/12/19	30	7/12/19	2	28	28		120	120			2		1
	Know Where Your Drinking Water Comes From		30		2	28	28								
	Flood Information 10 Topics Flyer		30		2	28		28							
Hurricane Preparedness Exercise		7/17/19							108						
City Hall Three Floors Lobby area and Planning	Fertilizer New Flyer (CHNEP funded)	8/5/19	120	5/13/20	36	84	84								
Environmental Advisory Board (EAB)	Fertilizer New Flyer (CHNEP funded)	09/09/19	48		0	48	48			4				1	
Commissioner McDowell	Fertilizer New Flyer (CHNEP funded)	09/16/19	1		0	1	1			1					
International Coastal Cleanup	Fertilizer New Flyer (CHNEP funded)	09/21/19	30		30	0	0		70	70					
	Flood Information 10 Topics Flyer		30		30	0	0								
Halloween at City Hall	Fertilizer Fact Sheet	10/25/19	50	7/12/19	49	1	1		2000	2000		1			1
	Fertilizer New Flyer (CHNEP funded)		500		499	1	1								
	Know Where Your Drinking Water Comes From		83		82	1	1								
	Flood Information 10 Topics Flyer		50		49	1		1							
CHNEP Nature Festival	Fertilizer New Flyer (CHNEP funded)	11/16/19	300	11/16/19	0	300	300		1000	1000		1			1
NWS Skywarn Severe Weather Spotter Class		11/18/19							42						
Public Works Road-e-O	Fertilizer Fact Sheet	2/22/20	20	2/22/20	19	1	1		2000	2000		1			1
	Fertilizer New Flyer (CHNEP funded)		17		17	0	0								
	Know Where Your Drinking Water Comes From		20		15	5	5								
	Flood Information 10 Topics Flyer		16		14	2		2							
FEMA new Preliminary 12/31/19 Coastal Risk Maps One on One Meetings with Commissioner		2/7/20							5						

Public Outreach Activities

Flood Information Related															
Event	Brochure Type	Date of Event	Amount Available	Date Remaining Brochures Counted	Amount Remaining	Amount of Flyers Given	Water Quality Protection Flyers	Flood Info. Flyers	No. of Participants (flood Related)	No. of Participants (Water Quality Related)	Neighborhood Presentation	Public Displays on Water Quality	School Presentation on Water Quality	Seminar/Workshop on Water Quality	Special Event on Water Quality
FEMA new Preliminary 12/31/19 Coastal Risk Maps HOA reps meeting with CM		2/19/20							15						
FEMA new Preliminary 12/31/19 Coastal Risk Maps Venice Public Outreach Meeting		3/4/2020 4pm to 7pm							315						
FEMA new Preliminary 12/31/19 Coastal Risk Maps SCF Public Outreach Meeting	Fertilizer Fact Sheet	3/5/2020 9am to 12n	19	3/6/20	19	0	0		191						
	Fertilizer New Flyer (CHNEP funded)		17		17	0	0								
	Know Where Your Drinking Water Comes From		15		13	2	2								
	Flood Information 10 Topics Flyer		39			39		39							
FEMA new Preliminary 12/31/19 Coastal Risk Maps SCTI Public Outreach Meeting		3/5/2020 4pm to 7pm							272						
City Hall Three Floors Lobby area and Planning Dept	Fertilizer Fact Sheet	5/13/20	78			78	78					4			
	Know Where Your Drinking Water Comes From		55			55	55								
	Flood Information 10 Topics Flyer		50			50		50							
	Fertilizer New Flyer (CHNEP funded)		36			36		36							
2020 Hurricane Preparedness in the Age of Covid-19	Presentation to Gran Paradiso	7/14/20	28			28		28	28						
2020 Hurricane Preparedness in the Age of Covid-19	Presentation to Gran Paradiso	7/29/20	21			21		21	21						
Hurricane Preparedness email to all City Employees	2 FEMA brochures (1)FEMA How To Prepare for a Hurricane - Before During After (2)create-your-family-emergency-communication-plan	8/7/20							600						
Annual Summer Camp at George Mullens Activity Center		8/6/20							50	50			50		
Virtual CRS meeting for City staff and Stake holders and General Public to encourage Participation	Virtual TEAMs meeting	9/17/20													
Radio WKDW 97.5 Talk Show with John Rawlings - DiscussED Canal / Creek system for potable water supply and Flood protection, fertilizer usage, flood mapping efforts, CRS flood insurance discounts.		9/28/20							2						1
Total from 9/25/10 to 10/27/20							26743	4415	57100	50475	15	53	82	40	65

News, Newsletters, Social Media Public Outreach

Date	Description	No. of Distribution	Water Quality	Flood Related
Sept 2010 and Oct 2010	Message on the Utility bills is: "Help keep our drinking water clean. Prevent domestic animal waste from reaching our swales, canals and the Myakkahatchee Creek. Pick up after your animals."	36000	36000	
Oct-10	City Insight Newsletter Article "25th Annual International Coastal Cleanup"	569	569	
Oct-10	City Insight Newsletter Article "Drainage Project Programs"	569	569	
Oct-10	City	7400	7400	
Mar-11	City Insight Newsletter Article on Neighborhood Clean-up on 2/12/11 and 2/19/11	580	580	
Jun-11	Journal for Surface Water Quality Professionals - E.Wong contribution to article on "Public Outreach and Education"	26000	26000	
Jun-11	Journal for Surface Water Quality Professionals - E.Wong contribution to article on "Pollution Prevention and Good Housekeeping"	26000	26000	
Jun-11	CHNEP Charlotte Harbor Happenings - City of North Port Rainwater Harvesting	13700	13700	
6/14/11	Ad in North Port Sun Herald Newspaper on Flood Information 10 CRS topic flyer	7400	7400	7400
Aug-11	City Insight Newsletter Article Camp Kids workshop on Don't Pollute and Hurricane Flood Preparedness	580	580	580
Sep-11	City Insight Newsletter Article on Learning about Stormwater	580	580	
Dec-11	North Port Presents" TV show on draft Flood Maps in run every Monday in January 2012	59,231	59,231	59231
5/31/12	North Port Sun Herald Newspaper Article - Flood Insurance Discount from North Port's CRS Program	4,192	4,192	4192
Spring 2012	CHNEP article on "The City of North Port's environmental stewardship is golden"	13700	13700	
5/30/12	Ad in North Port Sun Herald Newspaper on Flood Information 10 CRS topic flyer	4,192	4,192	4192
June-12	North Port Presents" TV show on Proper Fertilizer usage in run every Monday in July 2012	59,231	59,231	
6/12/13	Ad in North Port Sun Herald Newspaper on Flood Information 10 CRS topic flyer	4,192	4,192	4192
6/4/14	Ad in North Port Sun Herald Newspaper on Flood Information 10 CRS topic flyer	4,192	4,192	4192
8/25/14	North Port Sun Herald Newspaper Article - Help Keep Drinking Water Clean	4,192	4,192	
9/10/14	North Port Currents Newsletter (27,580 mailers) on Flood info.	30,652	30,652	30652
December 2014	City Insight news article on Promoting Environmental Protection (sent to all City Employees)	591	591	
12/22/14	North Port Website News Release - Learn more about Flood Maps and changes to North Port	3,500	3,500	3500
12/31/14	Federal Register - FEMA placed Ad on preliminary FIRMS	Unknown	Unknown	Unknown
Jan-15	Utility Billing message on FEMA Public Outreach 1/22/15 meeting	12,908	12,908	12908
Jan-15	City Insight Newsletter Article "New Flood Maps for the City"	567	567	567
1/20/15	North Port Website News Release on First Preliminary Flood Map Open House Hosted by FEMA - Learn more about Flood Maps and changes to North Port	3,500	3,500	3500
1/20/15	ABC Website New - FEMA's Update Flood Map Workshops heading next to Venice, North Port	Unknown	Unknown	Unknown
1/21/15	Englewood Sun Herald Newspaper - Flooded with questions	Unknown	Unknown	Unknown
1/21/15	North Port Sun Herald Newspaper - Flood map may cause real estate 'crisis'	4,192	4,192	4192
1/23/15	FEMA placed Ad on preliminary FIRMS in North Port Sun Herald, Sarasota Herald Tribune and other Newspapers - see Mike Taylor email 1/29/15	4,192	4,192	4192
1/30/15	FEMA placed Ad on preliminary FIRMS in North Port Sun Herald, Sarasota Herald Tribune and other Newspapers - see Mike Taylor email 1/29/15	4,192	4,192	4192
1/23/15	Sarasota Herald-Tribune - FEMA placed Ad on preliminary FIRMS	2,106	2,106	2106
1/30/15	Sarasota Herald-Tribune - FEMA placed Ad on preliminary FIRMS	2,106	2,106	2106
1/23/15	North Port Sun Herald Newspaper - FEMA placed Ad on preliminary FIRMS	4,192	4,192	4192
1/30/15	North Port Sun Herald Newspaper - FEMA placed Ad on preliminary FIRMS	4,192	4,192	4192
2/4/15	North Port Sun Herald Newspaper - Flood map appeal process begins	4,192	4,192	4192
2/10/15	North Port Sun Herald Newspaper - User-friendly maps released	4,192	4,192	4192
2/11/15	Herald Tribune -\$20 Million expected for flood control	2,106	2,106	2106
2/24/15	North Port Sun Herald Newspaper - Chamber to discuss updated FEMA flood maps	6,298	6,298	6298
2/27/15	North Port Currents Newsletter	30,652	30,652	
3/3/15	Mailed 758 postcards inviting property owners of all building structures affected by the new draft FIRMS to the March 12, 2015 public outreach open house in North Port.	758	758	758
3/6/15	North Port Website Second News Release on Second Preliminary Flood Map Open House Hosted by Sarasota County/CNP - Learn more about Flood Maps and changes to North Port	3,500	3,500	3500
3/6/15	Email Blast of News Release for Second Open House on draft FEMA Flood Maps	4,702	4,702	4702
3/12/15	City Calendar for 3/12/16 Public Open House	Unknown	Unknown	Unknown
April 2015	North Port Magazine Article on Flood map changes April 2015	6,500	6,500	6500
4/17/15	North Port Website News Release on Appeals Period on FEMA Preliminary FIRMS	3,500	3,500	3500
9/14/14	North Port Sun Herald Newspaper Article - New floodplain maps await final approval	4,192	4,192	4192
4/26/15	Sarasota Herald-Tribune - Flooding Classification for area FEMA maps Questioned	3,388	3,388	3388
5/24/15	Hurricane Season Preparation Week topical message to residents on hurricane hazards and preparedness tips	1,074	1,074	1074
6/3/15	Ad in North Port Sun Herald Newspaper on Flood Information 10 CRS topic flyer	4,192	4,192	4192
12/1/15	North Port Website News Release on Second draft of FIRMS	3,500	3,500	3500

News, Newsletters, Social Media Public Outreach

Date	Description	No. of Distribution	Water Quality	Flood Related
3/16/16	Sun Herald Newspaper Article on Changes in Flood Maps Coming Soon	4,192		4,192
6/1/16	North Port Facebook News Release on FIRMs Will Become Effective Nov 4, 2016 and 6 more open houses in June 2016	2,099		2,099
6/1/16	North Port Website News Release on FIRMs Will Become Effective Nov 4, 2016 and 6 more open houses in June 2016	1,401		1,401
6/8/16	Ad in North Port Sun Herald Newspaper on Flood Information 10 CRS topic flyer and June Open Houses on Flood Maps, 10 topics include water quality protection	4,192	4,192	4,192
6/3/16	Sarasota Herald-Tribune - Article on 28K more properties deemed high-risk	2,106		2,106
6/3/16	ABC and SNN TV news on new Flood Maps. Julie Bellia was interviewed, E. Wong assisted	unknown		unknown
6/16/16	City fo North Port Facebook News Release - Reminder of Open houase	2,341		2,341
6/16/16	City Website News Release - Reminder of Open houase	2,659		2,659
6/16/16	City Email to All Employees on 6/23/16 Final FIRMs Open House	300		300
June 2016	Sarasota County mailed on behalf of the City of North Port 483 flyers on June, 2016 inviting property owners of all building structures affected by the new draft FIRMs to the June 23, 2016 public outreach open house in North Port	483		483
7/18/16	Sun Article - Managing Local Systems 7-18-16	4,192		4,192
7/22/16	City of North Port mailed 472 letters on July 22, 2016 inviting property owners of all building structures affected by the new draft FIRMs to the March 12, 2015 public outreach open house in North Port	472		472
7/29/16	Charlotte Sun - Get an Insurance Checkup	unknown		unknown
9/20/16	North Port Website News Release - New Flood Maps approved by Commission and will become effective on November 4, 2016	3,500		3,500
11/10/16	North Port Facebook News Release - New Flood effective on November 4, 2016.	4,514		4,514
11/10/16	North Port Website News Release - New Flood effective on November 4, 2016.	6,500		6,500
Summer 2017	North RePort Newsletter to all Every Home in North Port with Flood Protection Tips	30,000		30,000
1/11/18	New pervious concrete installed by the NP Library on Facebook	6,457		6,457
1/12/18	NBC and WBBH news "North Port introducing new material to help with flooding"	unknown		unknown
3/15/18	Facebook Posting of Annual Household Hazardous Waste Collection	1,505	1,505	
3/20/18	Flood Zone Workshops North Port Sun Newspaper	4,192		4,192
4/28/18 to 5/5/18	For flood awareness Week, North Port Facebook and Twitter messages on 8 Topics related Flood Protection, one topic per day	16,000		16,000
8/30/18	North Port Environmental Board Kicks Off Sun Newspaper Article	4,192	4,192	
9/10/18	Facebook Posting - Recycle Plastic Bags	9,911	9,911	
10/17/18	ABC News on Canal Neighborhood Watch and water quality protection	unknown	unknown	
10/23/18	News Release City encouraging the voluntary non-use 10-23-18	11,000	11,000	
10/24/18	Utility Bill Message encouraging Fertilizer non-use	22,000	22,000	
11/1/18	Herald Tribune Newspaper Article 11-1-18 Local officials unite in fight against red tide	2,106	2,106	
12/18/18	We are more than Garbage Man Christmas Video Sun Newspaper Article	4,192	4,192	
Holiday 2018	North RePort Newsletter to all Every Home in North Port with Flood Protection	30,000		30,000
2018	Disaster Planning Guide	1,000		1,000
1/29/19	City Web News Release Household Hazardous Waste Collection Event	38	38	
2/25/19	Clean up of the Myakkahatchee Creek Facebook news release	3,200	3,200	3,200
3/1/2019 - 4/1/19	Utility Billing message on Flood Awareness "Flood Awareness Week March 11-17. Be prepared. Look up your flood zone and buy flood insurance if needed because it only takes one storm. For more information, visit Cityofnorthport.com (keyword flood information) or call 941-240-8050." to send 03/01/19 to 4/1/19. 17,724 people via paper cycle bills, 7,331 e-bills	25,055		25,055
3/9-16/2019	Flood Awareness message on Facebook and Twitter	6,976		16,000
4/5/19	Annual CRS mailer to Real Estate Broker, Financial Institutions, Insurance Agency, Insurance Company and Abstract & Title Co.	187		187
5/16/19	Water Quality Education Outreach Team Meeting message on Facebook	16,000	16,000	
7/18/19	Facebook Post - Water Quality Protection Fertilizers, Pet Waste	9,911	9,911	
7/18/19	Facebook North Port Friends of Wildlife - Edie Driest Posts 7-18-19	14	14	
8/1/19	North RePort Newsletter to all Residents with Flood Information	70,631		70,631
9/16/19	Herald Tribune Article - Water Control structures and North Port Canals	2,106	2,106	2,106
2/26/20	City Webpage "FEMA Flood Map Updates Updated re FEMA new Preliminary 12/31/19 Coastal Risk Maps	4329		4329
2/26/20	News Release re FEMA new Preliminary 12/31/19 Coastal Risk Maps	161		161
2/26/20	Facebook postings re new Preliminary 12/31/19 Coastal Risk Maps	3,800		3,800
2/26/20	Twitter postings re new Preliminary 12/31/19 Coastal Risk Maps	3,682		3,682
3/4/20	Facebook News Release to encourage attendance at 3/5/20 FEMA meeting on new Preliminary 12/31/19 Coastal Risk Maps	3,294		3,294
3/4/20	Twitter News Release to encourage attendance at 3/5/20 FEMA meeting on new Preliminary 12/31/19 Coastal Risk Maps	3,682		3,682
3/5/20	Facebook News Release of 3/5/20 FEMA morning meeting on new Preliminary 12/31/19 Coastal Risk Maps and encourage attendance at the next 3/26/20 meeting	2,196		2,196

News, Newsletters, Social Media Public Outreach

Date	Description	No. of Distribution	Water Quality	Flood Related
3/5/20	Twitter News Release of 3/5/20 FEMA morning meeting on new Preliminary 12/31/19 Coastal Risk Maps and encourage attendance at the next 3/26/20 meeting	3,682		3,682
5/1/20	Posted on Facebook, Twitter, Instagram and Nextdoor - North Port Receives Increased Discount on Flood Insurance Effective May 1, 2020	11353		11353
5/1/20	City News Release - North Port Receives Increased Discount on Flood Insurance Effective May 1, 2020	546		546
5/28/20	Facebook Post reminding residents of the Fertilizer Ban that starts June 1st	3764	3764	
6/30/20	Utility bill message <i>"To protect the water quality in our waterways, no fertilizers containing nitrogen and/or phosphorus can be applied to lawns during the rainy season from June 1 – Sept 30. However, we are encouraging residents to voluntarily avoid using fertilizer year-round."</i>	26,595	26,595	
7/2/20	Facebook post by Colleen Hibbitts in Utilities reminding resident to refrain from Fertilizer year round and fertilizing restriction June 1 to Sept 30	7,508	7,508	
7/31/20	Utilities bill message <i>"Rainy season is here. Please access the City's website at www.cityofnorthport.com/flood for flood protection information. Know your flood zone and purchase flood insurance if needed."</i>	26,595		26,595
8/29/20	Virtual CRS meeting posted on City Calendar of Events to encourage Public Participation			
9/28/20	Facebook and City's North RePort podcast and the WKDW Radio 97.5 Talk Show with John Rawlings - Discuss Canal / Creek system for potable water supply and Flood protection, flood mapping efforts, CRS flood insurance	983	983	983
Total as of 10/27/20		845,440	561,353	515,964

Youtube

Date	Youtube Videos	Date of Views recorded	No. of Views	Flood Related Info.	Water Quality	Flood Related
6/20/19	Hurricane Season Solid Waste Tips	4/16/20	1,300		1,300	
6/25/19	Plastic Bags Not Accepted	4/16/20	5,300		5,300	
7/31/19	Concrete poured at Water Control structure (WCS) #106	4/16/20	1,200	1		1,200
8/21/19	WCS #106 Update	4/16/20	2,000			2,000
9/23/19	Imagine a Day Without Water	4/16/20	853		853	
11/27/19	Recycling Center Update	4/16/20	2,000		2,000	
12/6/19	Recycling Tips	4/16/20	6,700		6,700	
12/20/19	NP Solid Waste Let It Go	4/16/20	53,500		53,500	
12/23/19	Amphibious Vehicle Video for clearing City Waterways for flood prevention and water quality	4/16/20	3,100,000		3,100,000	3,100,000
3/20/20	Help Utilities By Only Flushing the 3 P's	4/16/20	8,300		8,300	
3/31/20	Solid Waste starting COVID-19 precautions on April 6	4/16/20	3,500		3,500	
Total for 2019			3,184,653		3,181,453	3,103,200

2019 Web hits

Webpage Name	Web page URL	No of Hits 1/1/19 - 12/31/19	Water Quality	Flood Related
Flood Information	http://www.cityofnorthport.com/index.aspx?page=956	1581		1581
FEMA Flood Map Updates	http://www.cityofnorthport.com/index.aspx?page=1004	4950		4950
Is My Property in a Flood Zone?	http://www.cityofnorthport.com/index.aspx?page=217	2902		2902
1981/1984 FEMA Flood Maps	http://www.cityofnorthport.com/index.aspx?page=1271	409		409
Elevation Certificates	http://www.cityofnorthport.com/index.aspx?page=1269	533		533
Community Rating System (CRS) & Flood Insurance	http://www.cityofnorthport.com/index.aspx?page=1264	174		174
Flood Warning	http://www.cityofnorthport.com/index.aspx?page=1513	189		189
Environmental Services	http://www.cityofnorthport.com/index.aspx?page=1508	829	829	
Storm Water Management	http://www.cityofnorthport.com/index.aspx?page=1044	652	652	652
Total		12219	1481	11390

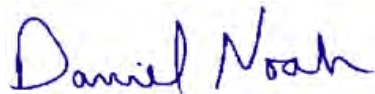
November 18, 2019

Eric Tiefenthaler
Chief of Emergency Management
City of North Port
4980 City Center Blvd
North Port, FL 34286

Dear Eric,

Congratulations on the successful *StormReady* application for North Port. The recognition is valid until July 8, 2023 at which time the City will have the opportunity to renew. North Port has been recognized as StormReady since 2014. Your efforts, and those of your team, will better prepare North Port to protect life and property from the onslaught of hazardous weather through better planning, education, and awareness. No community is storm proof, but *StormReady* can help save lives.

Sincerely,



Daniel Noah
Warning Coordination Meteorologist
National Weather Service – Tampa Bay Area
(813) 645-2323

Cc: *StormReady* Advisory Board



The West Central and Southwest Florida Storm Ready
Advisory Board has Recognized

North Port

as a

STORM READY COMMUNITY

until July 8, 2023



Daniel Noah

Daniel Noah, Warning Coordination Meteorologist
National Weather Service, Ruskin, FL



City of North Port

RESOLUTION NO. 2019-R-06

A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF NORTH PORT, FLORIDA, ADOPTING THE SARASOTA COUNTY PROGRAM FOR PUBLIC INFORMATION; PROVIDING FOR CONFLICTS; PROVIDING FOR SEVERABILITY; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the City of North Port, Florida, is a participant in the National Flood Insurance Program Community Rating System ("CRS"), a national program developed by the Federal Emergency Management Agency ("FEMA") to provide flood insurance premium reductions to participating communities; and

WHEREAS, the reductions in flood insurance premiums are based on a community's floodplain management programs, which include public information outreach activities; and

WHEREAS, in accordance with the 2018 CRS audit results, the City of North Port received a CRS rating of 6, which corresponds to a twenty percent (20%) flood insurance discount for structures within the Special Flood Hazard Area ("SFHA") and a ten percent (10%) flood insurance discount for structures outside of the SFHA; and

WHEREAS, Sarasota County initiated the Program for Public Information ("PPI"), a FEMA planning tool, to coordinate such outreach; and

WHEREAS, Sarasota County's PPI has a number of ongoing outreach efforts with goals to increase flood hazard awareness, encourage flood insurance coverage, protect people from the flood hazard, protect property, build responsibly, protect the natural functions of floodplains, encourage hurricane preparations, educate people about flood economics and inform people about how sea level rise will affect the community; and

WHEREAS, the Sarasota County Program for Public Information ("PPI") Committee is comprised of a cross-section of employees and community stakeholder members from Sarasota County Government, the City of Sarasota, the City of Venice, the City of North Port, the Town of Longboat Key, the Sarasota Bay Estuary Program, Mote Marine, and local business representatives such as Realtors, Insurance Agents, and Mortgage Lenders, is open for participation by all interested parties including private citizens, and is chaired by the Sarasota County Stormwater Department Director or designee; and

WHEREAS, by adopting Sarasota County's PPI, the City of North Port may achieve a CRS rating of 5, which will increase the City's flood insurance discount for structures within the SFHA to twenty-five percent (25%); and

WHEREAS, the City Commission of the City of North Port, Florida finds that it serves the public health, safety, and welfare of the citizens of the City to adopt Sarasota County's Program for Public Information.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF NORTH PORT, FLORIDA:

SECTION 1 – INCORPORATION OF RECITALS

- 1.01 The above recitals are hereby ratified and confirmed as being true and correct and are incorporated herein by reference.

SECTION 2 – RESOLUTION

- 2.01 The City Commission hereby adopts the Sarasota County Program for Public Information.
- 2.02 The City Commission directs the City Manager to assign a coordinator on the Sarasota County Program for Public Information Committee.

SECTION 3 – CONFLICTS

- 3.01 In the event of any conflict between the provisions of this resolution and any other resolution or portions thereof, the provisions of this resolution shall prevail to the extent of such conflict.

SECTION 4 – SEVERABILITY

- 4.01 If any section, subsection, sentence, clause, or phrase of this resolution is held invalid or unconstitutional by any court of competent jurisdiction, such provision shall be deemed a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining portions hereof.

SECTION 5 – EFFECTIVE DATE

- 5.01 This resolution shall take effect immediately upon adoption by the City Commission of the City of North Port, Florida.

PASSED and DULY ADOPTED by the City Commission of the City of North Port, Florida this 23rd day of July 2019.

THE CITY OF NORTH PORT, FLORIDA




CHRISTOPHER HANKS
MAYOR

ATTEST

for 
KATHRYN WONG
CITY CLERK

APPROVED AS TO FORM AND CORRECTNESS


AMBER L. SLAYTON
CITY ATTORNEY



City of North Port
City Manager's Office

Interoffice Memorandum

To: Cari Branco, Assistant City Manager
Jason Yarborough, Assistant City Manager
Julie Bellia, Public Works Director
Kimberly Ferrell, Finance Director
Todd Garrison, Police Chief
Christine McDade, Human Resources Director
Frank Miles, Neighborhood Development Services Director
Rick Newkirk, Utilities Director
Sandy Pfundheller, Parks & Recreation Director
Scott Titus, Fire Chief
Katy Wong, City Clerk
Amber Slayton, City Attorney

From: Peter D. Lear, City Manager

Date: July 26, 2019

RE: Sarasota County Program for Public Information

Pursuant to Resolution 2019-R-06, the City will be participating in the Sarasota County Program for Public Information (PPI) and I am designating Elizabeth Wong to be the City's Coordinator on the PPI Committee.

PDL/amd



Elizabeth Wong

From: Elizabeth Wong
Sent: Thursday, October 4, 2018 4:28 PM
To: Donna Bailey
Cc: Dean McConville (dean.mcconville.p6je@statefarm.com); Mary Foster (mary.foster.hzp4@statefarm.com); Barbara Lockhart (bml3220@gmail.com); Alan Fish (landsurveyor@vbfainc.com); Heather Hansen - Clatsop County (hhansen@co.clatsop.or.us); Craig Carpenter - CRS Specialist (BCarpenter@iso.com); Gerardo Traverso; Julie Bellia
Subject: City of North Port Joining the County's PPI program for CRS Program

Hello Donna, thank you so much for letting us join your Sarasota County Program for Public Information (PPI) program to share information with the public on flood protection. Following are the North Port Team staff and stakeholder members to add to your PPI plan. Can you please send our team (cc'd on this email) a copy of your PPI plan when finalized?

Craig, I am copying you so you know we are on track hopefully towards the better rating of CRS 5.

Name	Affiliation	Email	Telephone
Elizabeth Wong, P.E. (Prime City Staff)	City of North Port Stormwater Manager	ewong@cityofnorthport.com	941-240-8321 office 941-628-1475 Cell
Heather Hansen (Alternate City Staff)	City of North Port Senior Planner	hhansen@cityofnorthport.com	941-429-7022 office
Dean McConville (Prime Stakeholder)	State Farm Insurance	dean.mcconville.p6je@statefarm.com	(941) 429-3326 office
Mary Foster (Alternate Stakeholder)	State Farm Insurance	mary.foster.hzp4@statefarm.com	(941) 429-3326 office
Alan Fish (Alternate Stakeholder)	VBF Surveying	landsurveyor@vbfainc.com	(941) 426-0681 office
Barbara Lockhart (Alternate Stakeholder)	North Port Canal Watch Group and Environmental Advisory Board	bml3220@gmail.com	(941) 218-9775 cell

Elizabeth Wong P.E.
Stormwater Manager
City of North Port
Department of Public Works
1100 N. Chamberlain Blvd
North Port, FL 34286
Phone 941.240.8321
Fax 941.240.8063
ewong@cityofnorthport.com
www.cityofnorthport.com

A City where you can "Achieve Anything."

The City of North Port, Florida

Comprehensive Emergency Management Plan

***A STRATEGIC GUIDE FOR A CITYWIDE PREVENTION OF,
PREPARATION FOR, RESPONSE TO, AND RECOVERY
FROM MAJOR EMERGENCIES AND DISASTERS***

***Revised
2019***

Prepared By:

***City of North Port Fire Rescue
Division of Emergency Management***

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TABLE OF CONTENTS**THE CITY OF NORTH PORT COMPREHENSIVE EMERGENCY MANAGEMENT PLAN - 2019**

i.	<u>DISTRIBUTION</u>	6
ii.	<u>RECORD OF CHANGES</u>	7
iii.	<u>EXECUTIVE SUMMARY</u>	8

BASE PLAN

I.	<u>INTRODUCTION</u>	9
	A. Purpose	
	B. Scope	
	C. Methodology	
II.	<u>SITUATION</u>	13
	A. Hazard Analysis	
	B. Geographic Information	
	C. Demographic Information	
	D. Economic Profile	
	E. Emergency Management Support Facilities	
III.	<u>METHOD OF OPERATIONS</u>	36
	A. Organization	
	B. Level of Emergencies	
	C. Department Responsibilities	
	D. Emergency Support Function to City Department Crosswalk	
	E. Demobilization	
IV.	<u>PREPAREDNESS ACTIVITIES</u>	57
	A. General Issues	
	B. Public Awareness and Education	
	C. Training	
	D. Exercise	
	E. Continuity of Operations Planning	
	F. Resource Management	

V.	<u>RESPONSE ACTIVITIES</u>	64
A.	General Issues	
B.	Evacuation	
C.	Special Needs Program	
D.	Facilities Needing Attention During Evacuation	
E.	Re-Entry	
F.	Sheltering	
G.	Mutual Aid Agreements and Memorandum of Understanding	
H.	Communications	
I.	Fuel	
J.	Community Emergency Response Team	
K.	Public Emergency Notification	
VI.	<u>FISCAL MANAGEMENT</u>	76
IX.	<u>AUTHORITIES AND REFERENCES</u>	
X.	<u>GLOSSARY</u>	
XI.	<u>ACRONYMS</u>	
XII.	<u>LIST OF TABLES AND FIGURES</u>	

ANNEXES

- A. Recovery
- B. Mitigation
- C. Wildfire Operations
- D. Flood Warning and Response
- E. Utilities Disruption and Restoration
- F. Hazardous Materials and Oil Spill Response
- G. Terrorism
- H. Dam Response
- I. Cold Weather Emergencies
- J. Hazardous Weather Response
- K. Tropical Cyclone Response

APPENDICES

- A. Sample Emergency Ordinance of State of Local Emergency
- B. Incident Command System General Guidelines and Position Mission Statements
- C. City of North Port Resolution 06-R-10, Implementing National Incident Management System
- D. City of North Port Resolution 01-R-44, Adopting the Statewide Mutual Assistance Agreement
- E. City of North Port Resolution 2016-R-02 adopting the Sarasota County Unified Local Mitigation Strategy as the formal guide for the City of North Port's hazard mitigation activities in accordance with Public Law 106-390, the Federal Disaster Mitigation act 2000 (44 CFR §201.6), and the Florida Administrative Code rule 9-g22
- F. City of North Port Resolution 2018-R-31 adopting the Comprehensive Emergency Management Plan as the Formal Guide for the City of North Port's Emergency Management Activities
- G. Crisis Communication and Public Information
- H. Debris Management

i. DISTRIBUTION

1 each	North Port City Commissioners
3	North Port City Manager
1	North Port City Attorney
2	North Port City Clerk
1	North Port Emergency Manager
1 each	North Port City Department Directors
1	North Port Public Library
2	Sarasota County Emergency Management
1	Florida Division of Emergency Management

ii. **RECORD OF CHANGES (within review cycle)**

[illegible]

iii. EXECUTIVE SUMMARY

The City of North Port is vulnerable to a variety of natural, man-made and technological hazards that can potentially threaten the citizens, businesses, and environment. The *City of North Port Comprehensive Emergency Management Plan* (CEMP) establishes the framework to ensure that the City will be adequately prepared to deal with these hazards. The CEMP outlines the general roles and responsibilities of City departments when preparing for, responding to, or recovering from a large-scale emergency or disaster. The CEMP also coordinates emergency and disaster activities with volunteer organizations and businesses that serve the City of North Port. To ensure consistency between the City's CEMP and Sarasota County's CEMP (as well as State guidelines), much of the language contained in this Plan is drawn from the County's Plan, which is then adapted to meet the City's specific needs.

The CEMP addresses all four phases of emergency management: mitigation, preparedness, response, and recovery. These phases parallel activities set forth in three key documents: the Sarasota County CEMP, State of Florida CEMP and the National Response Framework (NRF). The City of North Port CEMP also describes how resources from local, State, Federal, national and other sources will be coordinated to supplement City resources for disaster response.

The CEMP is divided into three sections: The Base Plan, Hazard-Specific Annexes, and Appendices. The following is a brief description of the CEMP.

1. The Base Plan - The Base Plan describes, in general terms, how the City of North Port will mitigate, prepare for, respond to, and recover from the impacts of a large-scale emergency or disaster. The Base Plan contains sections that address specific operations and planning areas such as: an analysis of the hazards which the City may encounter, the responsibilities of the City government, method of operations, and financial policies that will be adhered to during times of emergency or disaster.
2. The Hazard Specific Annexes - The CEMP contains annexes that are specific to hazards that require special action.
3. The Appendices - These are sample documents, guidelines, or procedures which support the CEMP.

BASE PLAN

I. INTRODUCTION

A. Purpose. The CEMP establishes a framework for an effective system of comprehensive emergency management for:

1. Reducing loss of life, injury and property damage and loss resulting from natural or man-made emergencies;
2. Preparing for prompt and efficient response and recovery activities to protect lives and property impacted by emergencies;
3. Responding to emergencies with the effective use of all relevant plans and resources deemed appropriate;
4. Recovering from emergencies by providing for the rapid and orderly implementation of restoration and rehabilitation programs for persons and properties affected by emergencies; and
5. Assisting in awareness, recognition, education, prevention and mitigation of emergencies that may be caused or aggravated by inadequate planning for, and regulation of, public and private facilities and land use.

B. Scope.

1. The CEMP establishes the basic policies, assumptions and strategies for a comprehensive all-hazards Citywide emergency management program.
2. The CEMP is Citywide in scope and encompasses coordination with its municipal jurisdictions and other special.
3. The CEMP provides an all-hazard organizational structure to emergency operations.
4. The CEMP establishes basic direction and control for all levels of disasters creating a consistent unified approach to emergency management.
5. The CEMP is functional in a multi-jurisdictional setting where cross coordination is required.
6. The CEMP assigns specific functional responsibilities to appropriate local departments and agencies, as well as private sector groups and volunteer

organizations, and defines means of prioritizing and coordinating with municipal, state, and federal partners to maximize resource utilization.

7. The CEMP prioritizes protection of human life as a priority, with the preservation and protection of property being the second priority.
8. The CEMP provides a format for the shift of focus of the EOC from Response to Recovery and Mitigation. Long-range recovery and mitigation is addressed by the ability of the EOC to continue operations in a modified form, after the response phase has been terminated.
9. The CEMP establishes an effective format for emergency management by identifying the types of hazards that can occur within the City; determining the City's vulnerability to diverse types of disasters, and identifying the most threatening so that appropriate preparedness, mitigation and planning steps can be taken and addressing each phase of the emergency management cycle:
 - a. **Preparedness:** Preparedness actions utilize lessons learned and best practices from previous disasters, locally and elsewhere, to determine what is likely to occur during types of and intensity of disasters. Typical community needs can be identified and prioritized. Adequate planning pre-determines the best utilization of resources in responding to needs. Identification and training of personnel for roles and responsibilities during the disaster is included in this phase. It involves working with the private sector, residents and volunteer organizations to assist them in pre-disaster education and planning activities to lessen the impact of disasters.
 - b. **Response:** The response phase is the operational implementation of the CEMP. The county responds to emergencies by activating its plan, incrementally increasing response as needed, giving direction and control to the emergency management effort and looking ahead to recovery. Response actions are conducted in accordance with the National Incident Management System. During response, decision-making will be implemented utilizing the City's emergency response organizational structure found in the Method of Operations in this Plan.
 - c. **Recovery:** The recovery phase begins after life safety and property preservation have been addressed. Recovery actions can occur simultaneously during the response phase. The emergency management organization initiates procedures to assess needs and resources, establish priorities, review state and federal aid criteria

and coordinate with representatives from both levels of government. Once the extent of the recovery effort is determined, the appointed recovery team members determine how best to manage the specific activities, what resources and personnel will be required and what other actions are needed to return the impacted areas to normal operations as quickly as possible. Assessment of both short and long-term mitigation measures takes place during this phase and the “after action” evaluation process is conducted.

- d. **Mitigation:** This phase involves identifying preventative and/or corrective measures and actions to prevent or limit bodily injury, loss of life or property damage from disasters. It includes policy issues as well as structural projects within government and the private sector. A separate Local Mitigation Strategy serves as the guidance document for both pre-disaster mitigation planning and post-disaster recovery.

C. Methodology.

1. Planning Process

The CEMP is a dynamic document that adapts to changes in local policies, state and federal guidance, and after-action recommendations from exercises and real-world incident. The City of North Port considers the CEMP to be a living document and as such the plan is to be regularly updated to reflect these changes and to ensure compliance with the State of Florida and the National Incident Management System. ~~The City Manager shall determine whether changes to the plan reach a level of significance to require Commission review and approval.~~ The CEMP will be presented to the City Commissioners for approval at every update cycle required by the Florida Division of Emergency Management which are typically every four years. Local ordinances, state and federal statutes, regulations and priorities provide the foundation for the CEMP. Development is further guided by best practices and lessons learned.

2. Implementation Process:

Implementation of the CEMP involves the following actions:

- a. A promulgation letter from the ~~Mayor of the~~ North Port City Commission displayed at the front of this document.

- b. Signed Concurrence acknowledging and accepting plan responsibilities displayed at the front of this document.
- c. A distribution list of the Comprehensive Emergency Management Plan is displayed at the front of this document.
- d. The Emergency Manager is responsible for ensuring that all changes have been distributed to recipients of the CEMP. The distribution list displayed at the front of this document is used to verify that all appropriate persons/offices are copied.
- e. A Record of Changes Log displayed at the front of this document is used to record all published changes as those holding copies of the CEMP receive them. The holder of the copy is responsible for making the appropriate changes and updating the Log.
- f. A master copy of the CEMP, with a master Record of Changes Log, is maintained in Emergency Management. A comparison of the master copy with any other will allow a determination to be made as to whether the copy in question has been posted to it with all appropriate changes.

II. SITUATION

A. Hazard Analysis

The City of North Port has exposure to numerous and diverse types of hazards. This Section will attempt to identify the threat posed by each to assist planners in anticipating future needs. The hazards are listed in the sequence identified by the Florida Division of Emergency Management (FDEM) CEMP Review Criteria.

Table 1: Hazard Analysis

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
High Winds from Tropical Cyclone Events	The City of North Port has only been indirectly affected by a tropical cyclone event. However, The City of North Port (Port Charlotte statistical area) has been exposed to 54 hurricanes/tropical storms since 1871 ¹ . The hurricanes of the 2004 and 2005 seasons had some minimal to moderate impact on the City. The City was included in the Presidential Declarations for Hurricanes Charley, Frances, Ivan, Jeanne (2004) and Wilma (2005); and Tropical Storm Gabrielle (2001). In 2008, the City activated for TS Fay, but quickly demobilized when the storm turned in a southerly direction missing the City. A comparable situation occurred in 2012 with Tropical Storm Isaac.	Injured and/or entrapped persons and the loss of life. Mass traffic congestion and other evacuation-related issues. Temporary and long-term sheltering needs. Private property loss. Damage to City infrastructure. Lost business revenue, with accompanying unemployment and loss of tax revenue. Fire, hazardous materials releases, search and rescue operations related to storm activity. Looting and increased crime due to economic conditions created by long-term recovery. Potential loss of water and/or sewer service.	A Gulf Coast landfall is one of the three most likely Florida hurricane tracks based on planning models. Among the hazards analyzed in this section, hurricane activities pose the greatest threat to the broadest population in North Port.	Frequency	Low to Moderate
				Vulnerability	Low to Moderate
				Exposure	Moderate
				Risk	Moderate

¹ <http://www.hurricanecity.com/city/portcharlotte.htm>.

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
	In September 2017, the City experienced minor disruptions because of Hurricane Irma. Power outages, localized flooding and vegetative debris were among the key impacts.				
Storm Surge from Tropical Cyclone Events (See Figure 1 Hurricane Evacuation Level, which are built from SLOSH models)	The City of North Port has never been affected by storm surge from a tropical cyclone; however, areas adjacent to the tributaries of the Myakka River are subject to tidal influences, which themselves are affected by storm surge.	Injured and/or entrapped persons and the loss of life. Mass traffic congestion and other evacuation-related issues. Temporary and long-term sheltering needs. Private property loss. Damage to City infrastructure. Lost business revenue, with accompanying unemployment and loss of tax revenue. Fire, hazardous materials releases, search and rescue operations related to storm activity. Looting and increased crime due to economic conditions created by long-term recovery. Potential loss of water and/or sewer service.	<p>Since the updated storm surge maps in 2017, all North Port is still in at least one storm surge zone. Areas west of I-75 are most susceptible; and the risk of storm zone increases in proximity to the Myakka River, and to the Gulf of Mexico.</p> <p>The Holiday Park Mobile Home community is in Evacuation Level B.</p> <p>Several City-owned critical infrastructures are also located in the storm surge areas:</p> <p><u>B Zone</u> - Utilities' Water Treatment Plant, Utilities' Wastewater Treatment Plant, Fire Station 82 and Police Department's District 2 substation, Family Service Center, Property Maintenance Yard (fueling station)</p> <p><u>C Zone</u> - Utilities' Hillsborough and Southwest water booster stations.</p> <p><u>D Zone</u> - Municipal Complex (City Hall, Fire Station 81, Police Department and Mullen's Center), Fire Stations 83, 84 and 85, Utilities' central office, Utilities' Northeast water booster station, Public Works Complex (fueling station)</p>	Frequency	Low to Moderate
				Vulnerability	Low to High
				Exposure	Moderate
				Risk	Moderate
Floods (See Figure 2)	At least 750 residences were affected for more than a week in the City due to continued major flooding on the Myakka River and Myakkahatchee Creek from the Spring Flooding Event of 2003.	Possible evacuation of residents. Temporary sheltering and congregate feeding. Evacuation traffic and traffic related to road closures. Property and infrastructure damage. Loss of business revenue. Possible search and rescue operations. Possible shutdown of water treatment facilities. Possible contamination of water systems. Possible waste water system overload.	Seasonal flooding is a re-occurring issue in Florida, most specifically for those areas which are near the Florida coast, adjacent to bays or inlets, or which contain river systems. Per the risk analysis of the Sarasota County Emergency Management, increased development causes an increase in flooding risk due to the interruption of the natural swamp	Frequency	Moderate to High
				Vulnerability	Low to High
				Exposure	Moderate
				Risk	Moderate

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
			<p>and marsh systems ability to mitigate the excess water. The City of North Port fits all the criteria of a flood prone area.</p> <p>The Community Rating System (CRS) is a set of flood mitigation initiatives set forth by the National Flood Insurance Program (NFIP), which allows participating communities to participate in and initiate programs which reduce the flood hazard in the community. For each initiative, there are points that can be awarded, which equate to a Class when enough points are gained by the community. The City of North Port is an active member of the Community Rating System under the National Flood Insurance Program. At this writing, the City of North Port stands at a Class 6 in the Community Rating System under the National Flood Insurance Program. This equates to a 15% saving on flood insurance for policy holders in the Special Flood Hazard Area (SFHA) in both the City and the County.</p>		
Hazardous Material Spills	<p>On February 2, 2004, a gasoline tanker traveling on I-75 exploded over the Myakkahatchee Creek bridge. An unknown amount of gasoline and diesel fuel entered the creek but was contained prior to reaching the main drinking water intake at the Water Treatment Plant.</p> <p>Two nearly identical gasoline tanker accidents occurred in 2016 on I75. Contamination was limited to the local area, however a threat to the City's drinking supply resulted in closure of the Water Treatment Plant and purchase of water from the Peace River system.</p>	<p>Area evacuation and related traffic issues. The possibility of significant numbers of people being injured or becoming ill due to the hazardous materials release. Temporary sheltering of evacuated residents. Adequate equipment and trained personnel for hazardous materials containment and disposal. Adequate disposal facilities. Possible contamination of surface water, and source water for the water treatment plant.</p>	<p>There are few end users of large amounts of industrial or agricultural chemicals and other hazardous materials in North Port. The only fixed facilities using Extremely Hazardous Substances (EHS), as defined by the US Environmental Protection Agency (EPA), are owned and operated by the City of North Port Utilities Department. Other fixed facilities subject to federal reporting have been identified and maintained in Fire Rescue's records' management system. Significant amounts of a wide variety of hazardous materials are transported on I-75. It is considered the leading risk area for hazardous materials incidents in the County. Significant amounts of hazardous materials transit through North Port on US 41.</p> <p>The Sarasota County Fire Department is first responding to hazardous materials incidents in the City of North Port.</p>	Frequency	Low
				Vulnerability	Moderate
				Exposure	Moderate
				Risk	Moderate
Commercial Nuclear Power Plant Incidents	<p>North Port is not within the Emergency Planning Zone or Ingestion Pathway Zone of a</p>	<p>North Port may receive a request to assist in furnishing mutual aid under provisions of the Florida Statewide Mutual Aid Agreement. Should an incident be of such magnitude as to require the evacuation of Tampa Bay,</p>	<p>Evacuees from a mishap at Florida Power Corporation nuclear generating facility at Crystal River, might arrive in Sarasota County seeking shelter.</p>	Frequency	Low
				Vulnerability	Low
				Exposure	Low

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
	nuclear generating facility, thus is not considered at risk.	traffic control could be an issue.		Risk	Low
Civil Disturbance	The City of North Port has no history of civil disturbance.	The vulnerability of businesses on US 41 to looting. The possibility that North Port might be requested to furnish mutual aid.	The City does not face some of the challenges present in other Florida communities where conflict exists between cultural groups. Similarly, Sarasota County has had no recent incident of civil disorder of any significance.	Frequency	Low
				Vulnerability	Low
				Exposure	Low
				Risk	Low
Mass Immigration	<p>There is no evidence that concerns caused by mass immigration has impacted the City of North Port. However, recent events along the Southwest coast of Florida indicate the potential for an event.</p> <p>In July 2007, 30 refugees from Cuba landed on Little Gasparilla Island; June 2007, 33 migrants from Cuba arrived on Sanibel Island; and in December 2006, 25 Cuban refugees landed on Longboat Key.</p>	<p>The City of North Port does not have a coastline for landings. However, if the refugees boated up the Myakka River or Myakkahatchee Creek, the City would be directly impacted.</p> <p>Otherwise, the City may provide mutual aid support to Charlotte and/or Sarasota counties for medical and/or law enforcement assistance.</p>	While mass immigration to Florida from the Caribbean, Central America and South America has increased dramatically since 1980, the City is too far north and inland to directly receive arriving "boat people," and is not a likely settlement site.	Frequency	Low
				Vulnerability	Low
				Exposure	Low
				Risk	Low
Coastal Oil Spill	<p>The City of North Port does not include any portion of the Gulf of Mexico's coast. However, given the tidal influence on the Myakka River, if a spill were to occur in the Gulf, there exists a potential for product to flow up the Myakka River towards the City.</p> <p>The City of North Port was not impacted by the Deepwater Horizon oil spill in 2010 which affected numerous interests to the north of Sarasota County in the Gulf of Mexico.</p>	<p>Economic impact due to temporary loss of recreational activities in Charlotte Harbor. Furnishing mutual aid support to communities on Charlotte Harbor.</p> <p>Regarding proposed drilling off the Gulf coast of Florida, the US Department of the Interior's Minerals Management Service (MMS) states "[f]or the foreseeable future any proposed development operations within 100 miles of the coast of Florida would be only for the development of natural gas fields. Even if a blowout were to occur, no oil would be released. Any pipelines proposed would carry only dry natural gas." They do indicate one potential for a worse case situation would be if the supply vessel carrying diesel oil to the drilling rig lost all its diesel during transfer operations - this could result in a spill of about 1,800 bbl. The MMS can and has required mitigation</p>	Traffic exists along Florida's Gulf Coast which could allow for a mishap to occur. The hazardous materials release could enter parts of Charlotte Harbor, but it is more likely that existing currents would move the release past the Harbor. A hazardous materials release in the Gulf would be responded to by Federal and State authorities. Public Works may receive mutual aid requests or be involved in environmental damage response to properties located on the Charlotte Harbor shoreline, City of Venice or unincorporated Sarasota and/or Charlotte counties.	Frequency	Low
				Vulnerability	Low
				Exposure	Low
				Risk	Low

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
		during past drilling operations to minimize this remote possibility.			
Extreme Temperatures	Freeze conditions in Florida are seasonal and relatively predictable.	Temporary sheltering of lower income persons whose homes may lack adequate heating capability. Increased utility costs to the City of North Port in maintaining City facilities with adequate heating for workers and the public.	There are few agriculture interests within the City which might suffer economic loss. Some temporary shortages of utility resources might take place. Potable water lines have frozen in past years causing a water service disruption to some houses.	Frequency	Low
	Florida Severe Freeze 2000 for which Sarasota County was included in the declared counties.	In 2012, a coalition of services for the homeless began to establish freezing weather shelters at local churches. These facilities open when the National Weather Service posts a freeze watch for our area.		Vulnerability	Low
	The last significant winter storm to occur in Sarasota County was the "no name" storm in March 1993.			Exposure	Low
				Risk	Low
Brush, Wildfires and Forest Fires	Brush or forest fires are generally seasonable during late winter to spring and predictable based on weather conditions.	Wildland-Urban interface fuel loading is high, as compared to normal. Area evacuation and traffic control. Temporary sheltering of evacuees. Mutual aid support to other impacted communities, or requests for assistance to North Port.	As the population density increases, the probability factor will decrease, but the impact factor will increase. The scattered development within the City, and the lack of land clearance, creates an environment in which many residences are grouped in relatively isolated areas surrounded by forested land. There is a history of arsonist activity in South Sarasota County. The possibility of an accidental fire caused by construction equipment, or controlled burning by contracts is a possibility.	Frequency	Moderate to High
	Sarasota County was included in the declared counties for the Florida Extreme Fire Hazard in 1998.	See Tables 3 and 4 Seasonal KBDI Values for Florida Forest Service's South Region and Sarasota County as a measure that conditions are favorable for the occurrence and spread of wildfires.		Vulnerability	Moderate to High
	The largest wildfire in the City was experienced in May 2017 during which more than 1000 acres with the City's boundaries were burned and an additional 4000 acres just outside the City limits.			Exposure	Moderate to High
				Risk	Moderate to High
Thunder Storms and Tornadoes	Heavy rains, winds and storm action are common in Florida.	Possible area evacuation. Road blockage from debris. Temporary sheltering of small numbers of persons whose residences became significantly damaged by the storm or winds. The possible loss of water and/or sewer service.	North Port is not located in an area with a high incident of tornado activity. Tornadoes are common occurrences with thunderstorms. Florida has the second highest record of tornadoes in the United States.	Frequency	Low
	On May 24, 2012, an EF-0 tornado affected residences in the Highland Ridge Community of North Port. No injuries were			Vulnerability	Low to Moderate
				Exposure	Moderate

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
	<p>reported, but an estimated \$50,000 in damages was recorded.</p> <p>In January 2015, a Myakka State Forest Ranger reported tornado damage to a ranger station and a mobile home trailer at around 3:50 a.m. A subsequent NWS storm survey classified the tornado as an EF-0.</p>		Given the number of mobile homes in the City and adjoining areas, there exists significant exposure should a tornado move through the region.	Risk	Low to Moderate
Drought	<p>Droughts are occurring with frequency in Southwest Florida.</p> <p>The Keetch-Byram drought index typically indicates a severe value during the spring season.</p> <p>The US Drought Monitor indicates the State ranges from Abnormally to Exceptionally Dry, with Sarasota County on the upper scale of drought conditions.</p>	<p>Necessary slow-down in planned city projects due to water restrictions. Assistance to residents on well-water supply systems. Increased responses to wildfire events. Potential damage to residential and commercial structures, and City infrastructure.</p>	<p>Droughts generally impact the most on agricultural-based communities. Water restrictions and enforcement might be required. Droughts have an impact on wildfires.</p> <p>The Florida Forest Service has analyzed weather data over a 35-year period was examined to determine average Keetch-Byram drought index (KBDI) values for each region of Florida on a seasonal basis. These average KBDI values are given in the following table as the "NORMAL" classification. Departures from this average value were related to fire activity to determine the breakpoints for the other classes. (See tables 2 and 3).</p>	Frequency	Moderate to High
				Vulnerability	Moderate to High
				Exposure	Moderate to High
				Risk	Moderate to High
Sinkholes and Subsidence	<p>Sinkholes of a significant magnitude are an infrequent occurrence.</p> <p>Since July of 1981, Sarasota County and the jurisdictions within have recorded seven sinkhole events, all less than ten feet in diameter, and each was centered on a specific property. Of the seven Subsidence Incident Reports in Sarasota County, only one occurred in the last seven years. Reported on July 7, 2013 several small holes were reported after heavy rainfall. The</p>	<p>Property loss. Damage to the infrastructure. Area evacuation, closure, traffic control and security.</p>	<p>Allowing for the vastness of the City limits, the probability of a sinkhole development threatening property is very significant. Sinkhole development could require area security to prevent members of the public from risk.</p>	Frequency	Low
				Vulnerability	Low to Moderate
				Exposure	Low
				Risk	Low

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
	maximum dimensions were 2-8' wide with no property damage.				
Terrorism	There is no specific reason to believe that a terrorist type of occurrence is anticipated.	Potential mass casualties. Public panic. Environmental concerns.	One tactic of terrorists is to target "innocent" person rather than a specific group for which hostility exists. The news media would inundate the City should it be the focal point of an incident. The City does not possess targets of interest to an international terrorist; however, an individual with a hatred of local government, or a disgruntled employee may pose a greater risk to the security of City facilities, staff and visitors.	Frequency	Low
				Vulnerability	Moderate to High
				Exposure	Low
				Risk	Low
Exotic Pests and Diseases	The City of North Port has not had any known reports of such diseases or pests, but the threat exists on a consistent basis.	Infectious disease control. Quarantine for livestock or people. Need for many treatment agents. Disposal of deceased animals.	Exotic threats and diseases are a pervasive threat to the agricultural interests in the City. This biological hazard is associated with any insect, animal, or pathogen that could pose an economic or health threat. The Mediterranean fruit fly and citrus canker are two examples of this threat. There is also a possibility for the importation of pathogens that could have a negative effect on the livestock industry.	Frequency	Low
				Vulnerability	Low
				Exposure	Low
				Risk	Low
Disease and Pandemic Outbreaks	The City of North Port has not had any known reports of such diseases or outbreaks, but the threat exists on a consistent basis. The City of North Port was not significantly impacted by the H1N1 Pandemic in 2009 or the Ebola event of 2014.	Economic loss. Mass casualty/fatality. Infectious disease control. Disproportionate effects on elderly and children. Disposal of diseased livestock/agricultural stock. Need for mass feeding. Mass care. Quarantine of people and/or livestock. Large number of treatment agents	The City is vulnerable to epidemic on a constant basis. Although the threat is minimal, an epidemic is still possible. With tourists coming in from all over the world during the months of October through April, there is an increased vulnerability during this time. The environment is regularly monitored for diseases and pathogens by local and state agencies.	Frequency	Low
				Vulnerability	Moderate
				Exposure	Low
				Risk	Low
Critical Infrastructure Disruption	Utility disruptions are an infrequent event, typically arising from a severe weather event, an accidental cutting through of a transmission line by a contractor or nesting bird. On January 12, 2015 components of an osprey nest contacted high voltage wires which started a fire at the top of an electrical pole on Greenwood Avenue between	Evacuation. Sheltering. Mass feeding. Mass casualty. Large scale contamination. Contamination of water supply. Decontamination. Economic loss. Agricultural loss. Inability of public safety officials to communicate. Civil unrest. Inability to provide critical support functions at medical facilities.	This technological hazard is a consistent threat in the City. This hazard may become present through an accident, sabotage, or terrorism. This hazard includes, but is not limited to, utility disruptions and communications system failures. This hazard can cause other hazardous incidents to occur. These may include, but are not limited to, hazardous material spills, delay of medical operations, and loss of ability to provide power or communications, and loss of ability to provide utility services.	Frequency	Low
				Vulnerability	Moderate
				Exposure	Low
				Risk	Low

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
	Greenway Drive and S. Sumter Boulevard in North Port. The fire caused damage to the feeder lines resulting in a secondary emergency – that of a power outage impacting 3,510 FPL customers including traffic lights at several intersections and the City of North Port municipal complex. Telephone lines to Sarasota County 9-1-1 were overwhelmed and callers were unable to reach the North Port Police dispatch center.				
Special Events	The City of North Port has no history of dignitary visits, cultural events, or a significant impact from spring break.	Public safety resources overwhelmed. Potential for terrorism, mass casualty, civil unrest.	<p>With Special Events, the need for additional logistics and manpower to handle the possibility of large crowds increases significantly. The possibility for acts of terrorism or civil disobedience in these events also increase.</p> <p>The North Port High School's Performing Arts Center is the second largest theater in Sarasota County. With 1,023 seats, it presents unique challenges during an emergency.</p> <p>The City-sponsored July 4th celebration attracts more than 5,000 attendees.</p> <p>A spring training complex for the Atlanta Braves will be situated in the West Villages-section of the City. The stadium will have 6,200 fixed seats and 2,200 berm seating along with suites.</p>	Frequency	Low
				Vulnerability	Low
				Exposure	Low
				Risk	Low
Dam Failure	The Peace River Manasota Regional Water Supply Authority has constructed a 6-billion-gallon reservoir adjacent to their water treatment plant on US 17 in Desoto County. As this is a relatively new facility, there is no history of incidents; however,	Possible evacuation of residents. Temporary sheltering and congregate feeding. Evacuation traffic and traffic related to road closures. Property and infrastructure damage. Loss of business revenue. Possible search and rescue operations. Possible shutdown of water treatment facilities. Possible contamination of water systems. Possible waste water system overload.	Based on the construction of the retention walls and the distance from the reservoir, the effects on the City of North Port may be minimal.	Frequency	Low
				Vulnerability	Low
				Exposure	Low
				Risk	Low

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
	similar type reservoirs have experienced retention wall cracks, but no failures.				
Major Transportation Incidents	Motor vehicle accidents are a frequent occurrence on the roadways in North Port. However, most which are minor in nature, and have minimal impact on the City.	Traffic rerouting issues. Environmental impacts from release of hazardous materials.	In the City of North Port, I-75 extends from mile marker 171 (Charlotte County line) to 185 in an east to west direction. Exits are at mile marker 179 (Toledo Blade Blvd.), and mile marker 182 (Sumter Blvd.). This is a two-lane roadway in each direction, with a posted speed limit of 70 mph. US 41 extends from Cranberry Blvd. (Charlotte County line) to Ortiz Blvd. This is a two-lane roadway, with a posted speed limit of 45 mph. Significant amounts of a wide variety of hazardous materials are transported on I-75. It is considered the leading risk area for hazardous materials incidents in the County. Significant amounts of hazardous materials transit through North Port on US 41.	Frequency	Moderate
				Vulnerability	Moderate
				Exposure	Moderate
				Risk	Low to Moderate

Figure 2: Sarasota County Hurricane Evacuation Levels
(2017 Revision)

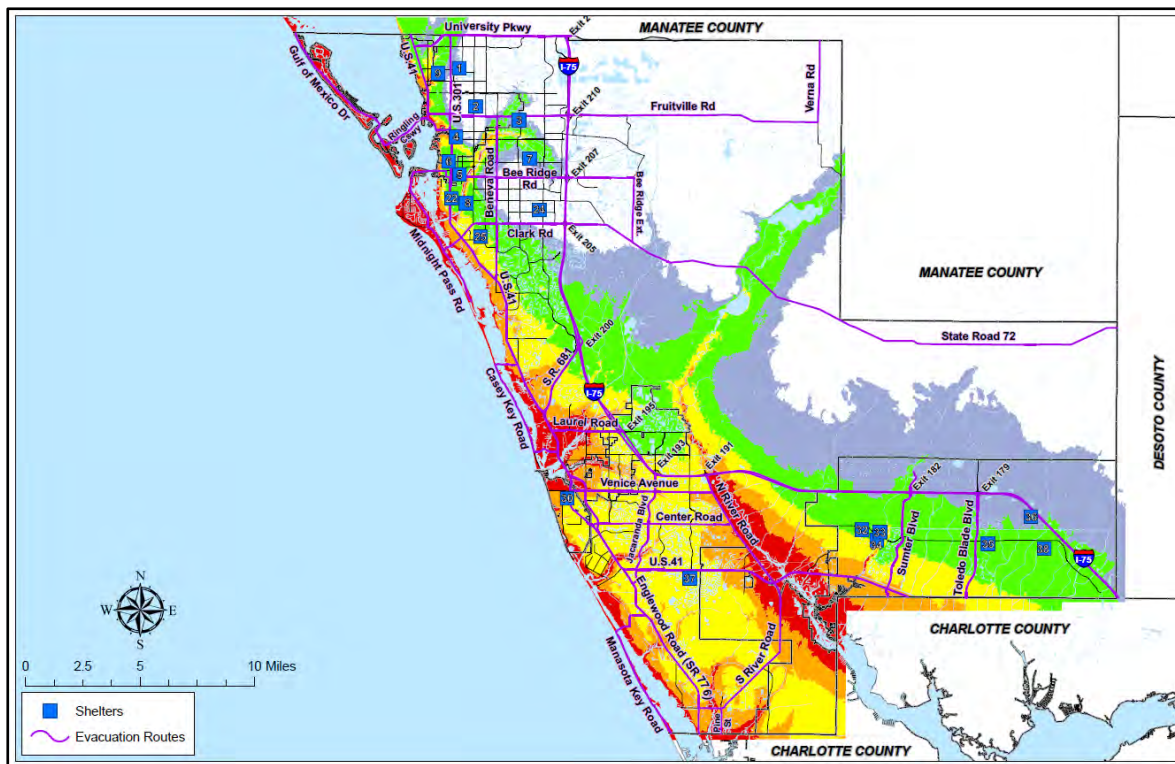


Table 3: Seasonal KBDI Values in the Southern Region of Florida²

	Winter	Spring	Summer	Fall
Very low	0-230	0-260	0-150	0-220
Low	231-300	261-340	151-200	221-270
Normal	301-490	341-550	201-350	271-420
Moderate	491-630	551-700	351-450	421-510
Severe	631-800	701-800	451-800	511-800

² Florida Forestry Service, <http://www.freshfromflorida.com/Divisions-Offices/Florida-Forest-Service/Wildland-Fire/Keetch-Byram-Drought-Index-KBDI/Regional-Seasonal-Drought-Classification>

Table 4: Seasonal KBDI Values for Sarasota County³
Monthly Average from 2014 to 2017

Year	Winter	Spring	Summer	Fall
2014				295
2015	454	537	339	413
2016	291	445	340	493
2017	375	453	179	411

[Note regarding Tables 5 and 6: The Keetch-Byram drought index (KBDI) is a continuous reference scale for estimating the dryness of the soil and duff layers. The index increases for each day without rain (the amount of increase depends on the daily high temperature) and decreases when it rains. The scale ranges from zero (no moisture deficit) to 800. The range of the index is determined if there is eight inches of moisture in a saturated soil that is readily available to the vegetation.

For different soil types, the depth of soil required to hold 8 inches of moisture varies (loam = 30", clay = 25" and sand = 80"). A prolonged drought (high KBDI) influences fire intensity largely because more fuel is available for combustion (i.e. fuels have a lower moisture content). In addition, the drying of organic material in the soil can lead to increased difficulty in fire suppression.

High values of the KBDI are an indication that conditions are favorable for the occurrence and spread of wildfires, but drought is not by itself a prerequisite for wildfires. Other weather factors, such as wind, temperature, relative humidity and atmospheric stability, play a significant role in determining the actual fire danger.⁴

North Port Fire Rescue references the KBDI when making operational decisions on staffing, resource availability, dispatch procedures, etc.

B. Geographic Information

1. Area in Square Miles. The City of North Port occupies 104 square miles of southeast Sarasota County midway between the cities of Sarasota and Fort Myers, east of the Gulf of Mexico.
2. Topography of the Land. Sarasota County consists of a lying coastal plain. The City of North Port is generally consistent with the County at large.
3. Land Use Patterns. The City of North Port is a predominant low density

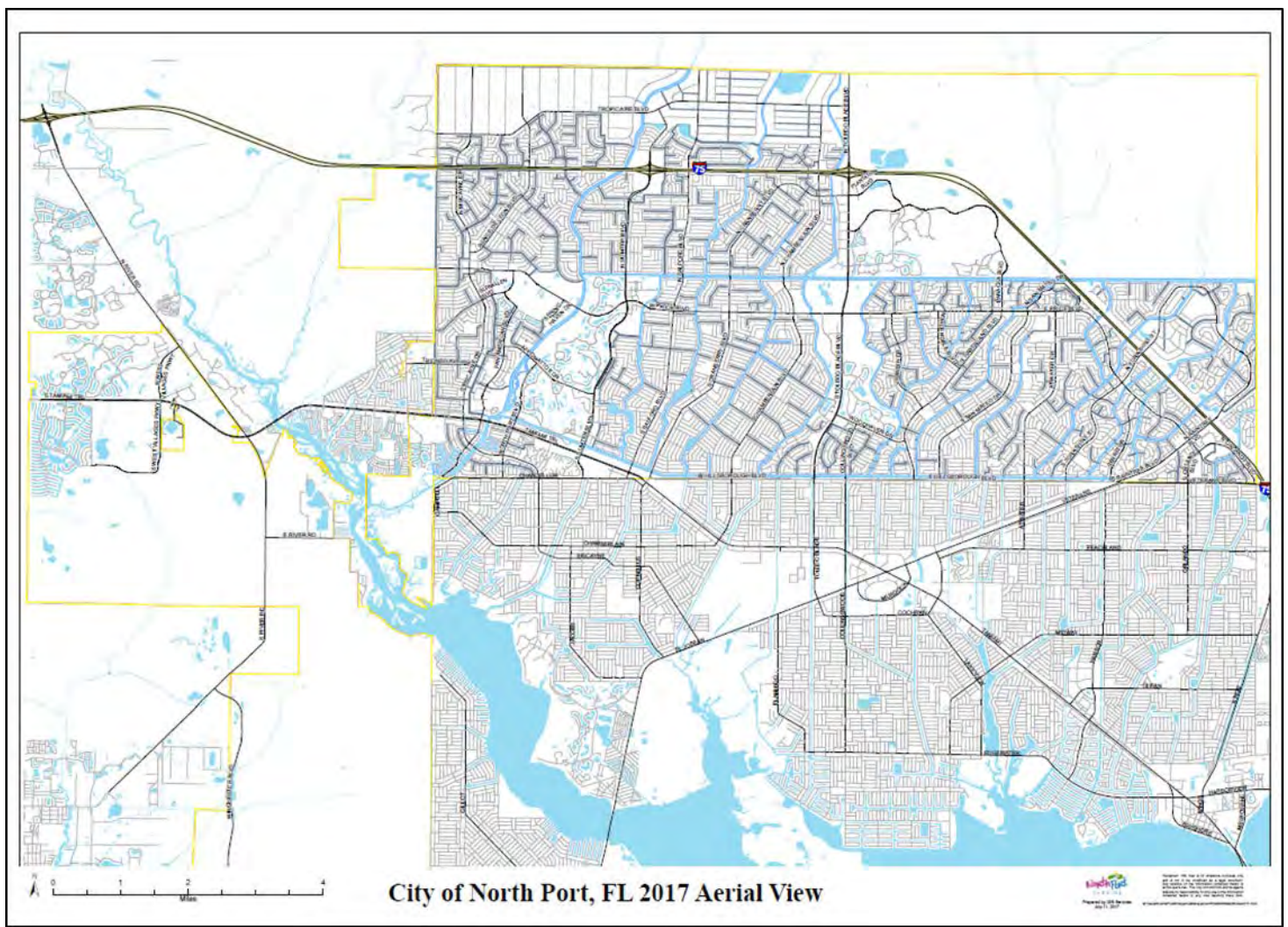
³ Florida Forestry Service. Pre-Fall 2014 data not available.

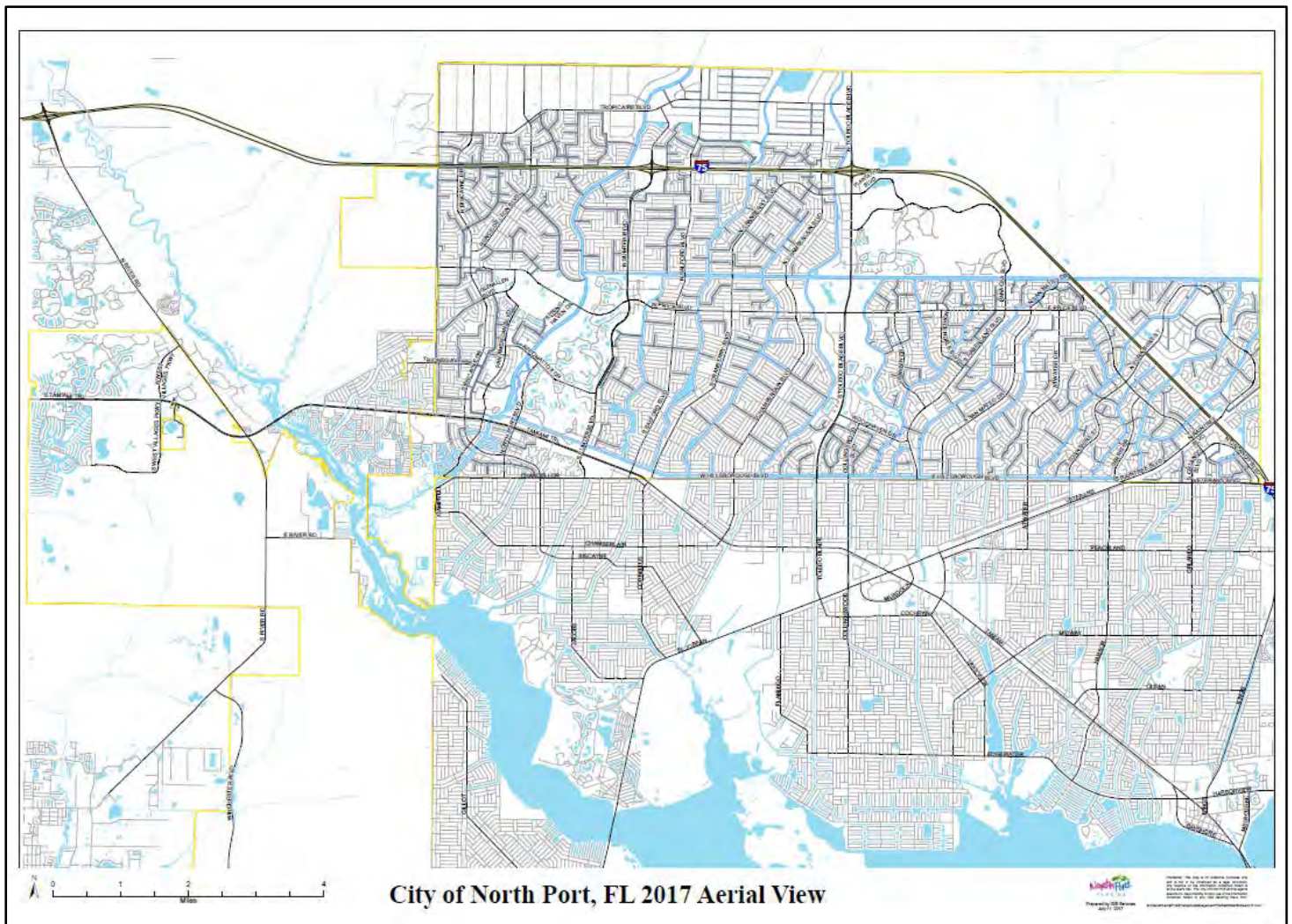
residential community. Medium and high-density development is planned, primarily for the southwestern portion of the City, north-central areas, and extreme eastern part of North Port. Agricultural/estates are planned for the areas north of the I-75 corridor. Commercial, industrial and professional developments are generally co-located along major roads.

Recreational/open space, public land and activity centers are generally adjacent to medium and high-density areas. Two portions of the City consist of approximately 10,000 acres of the Myakka River State Forest.

4. Water Area. Total area not available, see Figure 5 for map.

Figure 5: City of North Port Water Bodies





5. Drainage Patterns. Generally, drainage takes place into the Myakkahatchee Creek (Big Slough), Myakka River and toward the swamps and marshes located along Charlotte Harbor. A concern of emergency planners is the disruption of normal drainage caused by development and the reliance on controlled canal and lock systems.
6. Environmentally Sensitive Areas. All Federal and State lands are considered environmentally sensitive by the Florida Department of Environmental Protection, as are areas continuous with river systems, bays and harbors.
 - i. Little Salt Spring is an archaeological and paleontological site located at 6701 West Price Boulevard. On July 10, 1979, it was added to the U.S. National Register of Historic Places. The

Rosenstiel School's Division of Marine Affairs manages an underwater archeological and ecological preserve. Donated to the University in 1982, the spring is surrounded by undisturbed native hydric hammock containing several rare and endangered plant and animal species.

During early prehistoric times (12,000–7,000 years ago) the sinkhole was an oasis in the peninsula that attracted seasonal hunters and gatherers. The site has produced the second-oldest dated artifact ever found in the southeast United States — a sharpened wooden stake some 12,000 years old. Little Salt Spring contains some of the oldest cultural remains in the United States.

The unique anoxic water that fills most of the sinkhole (below 5 meters/16 feet depth) has preserved a great range of organic materials including wood, textile fragments, hair, skin and brain tissue dating back to the Late Paleoindian and Early Archaic stages of Florida's prehistory, ca. 9,500–7,000 radiocarbon years ago. Archaeological remains exist both in the spring basin and the "27 meters/90 feet ledge," a natural cavern at that depth below the spring surface.⁵

- ii. Immediately to the west of 6664 West Price Boulevard (roughly across the road from Little Salt Spring), exists a Native American burial ground for the Timucuan peoples dating back 12,000 to 40,000 years. The platted property is owned by the School Board of Sarasota County and Sarasota County government.
- iii. Warm Mineral Springs, 12200 San Servando Ave, is listed in the National Register of Historic Places, as one of the most important underwater archaeological sites in America. As for the buildings and cyclorama, these are recommended by the State of Florida that they are eligible to list on the State Register and may also be eligible for the National Register (but neither is completed as of this update). The City of North Port did add the entire Warm Mineral Springs property (water and buildings) to the City's historic register in 2017.

Warm Mineral Springs is considered a health spa, visited by thousands of people seeking the warm soothing mineral waters believed to be helpful in healing many ailments. Fifty years ago, William Royal, the first diver to ever venture below the surface,

⁵ <http://www.rsmas.miami.edu/groups/little-salt-spring>

discovered extinct animal bones, stalactite formations, and human remains. The archaeological world initially dismissed his findings as a farce because, according to fossil records, it was believed that man arrived in Florida no earlier than seven thousand years ago. For the last forty years, several archaeological projects have been conducted in and around Warm Mineral Springs resulting in many outstanding discoveries. The most astonishing was the discovery of a ten-thousand-year-old human skull still containing brain matter.

When the Indians arrived, Warm Mineral Springs was a giant pit surrounded by a huge forest. This giant pit dropped quickly from the surrounding forest vegetation. Water trickled down the walls and into the pit below. This is revealed today by the water channels sculpted into the walls at depths from 40 to 55 feet. At 32 feet, the walls undercut themselves making a natural shelter from the outside elements. These early Paleo Indians must have considered Warm Mineral Springs a sacred place because they buried their dead along the walls at 35 feet. Human remains and primitive tools dating from three to ten thousand years old have been excavated from the sink and the surrounding lands over the last forty years.

Geologically, Warm Mineral Springs is a solution hole descending into one of the deepest Florida aquifers. The water flowing from this spring is anaerobic (low in oxygen) and is believed to have been trapped underground for over thirty thousand years at depths exceeding 7000 feet. Under these great pressures, the water is geothermally heated to 97° degrees Fahrenheit and flows from several small caves located on the northern wall at depths from 195 to 210 feet. As the water rises towards the surface, it mixes with cooler water from colder vents. When it reaches the surface, the temperature drops to 85° degrees Fahrenheit. Eight million gallons of water a day flow down a natural run on the surface and eventually into the Gulf of Mexico.⁶

- iv. The Myakkahatchee Creek Environmental Park, located at 6968 Reisterstown Road, is a publicly-owned natural resource conservation and outdoor recreation area that includes approximately 160 acres. The park provides an Old Florida nature experience with winding rustic paths, footbridges, wooded trails, overlook, pavilion, primitive camping site (by permit only) and restroom. The park is owned by the City of North Port and is operated by Sarasota County through an interlocal agreement

⁶ <http://www.warmmineral.com/>

adopted in 1993. Activities at the park include birding, hiking, horseback riding, and biking. The park is also home to the Myakkahatchee Creek Connector Bridge which connects the park to Sarasota County's Carlton Reserve.⁷

- v. Myakka State Forest was purchased in 1995 as part of the Myakka Estuary Conservation and Recreation Lands project. The purchase was made using Preservation 2000 and Save Our Rivers funds.

The Florida Forest Service manages the forest for multiple uses, including timber, outdoor recreation, wildlife, and ecological and hydrological restoration. The Southwest Water Management District provided funding to purchase half of the state forest and is an important cooperator in the management of the property, especially regarding hydrological management.

Most the forest falls within the city limits of North Port. Access is available off River Road, about 11 miles south of I-75.

Myakka State Forest is made up primarily of mesic flatwoods with a mixture of longleaf pine and slash pine overstory with a palmetto understory. Numerous depression marshes are scattered throughout the flatwoods, providing many opportunities for viewing wading birds and other wildlife. The forest includes approximately 2.5 miles of frontage on the Myakka River, which is designated as an Outstanding Florida Water and a Wild and Scenic River. The Myakkahatchee Creek flows through the forest for 1.5 miles and provides an additional water resource.⁸

1. Flood-Prone Areas. Flood Prone Areas in Sarasota County are identified as those areas within the 100-year floodplain, and other areas subject to repetitive flooding along the rivers and creeks (Figure 5).

Figure 6: City of North Port FEMA Flood Zones

⁷ <http://www.cityofnorthport.com/government/city-services/parks-recreation/parks/myakkahatchee-creek-environmental-park>

⁸ <https://www.freshfromflorida.com/Divisions-Offices/Florida-Forest-Service/Our-Forests/State-Forests/Myakka-State-Forest>





C. Demographic Information

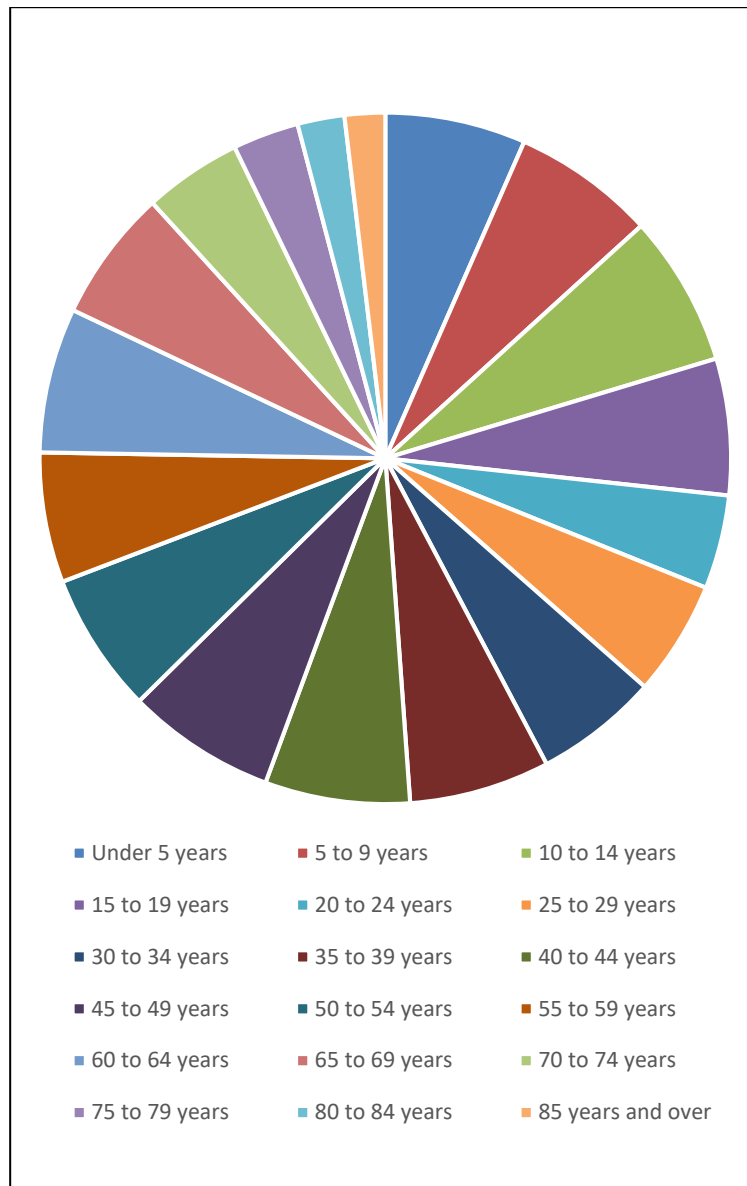
1. Population of the City

- a. Total Population (2018).⁹ 67,235
- b. Population Density and Distribution (2018). Approximately 650 persons per square mile, less the State forest. The greatest population will continue to be in the western and northern portions of the city.
- c. Distribution of Population by Age.

⁹ Bureau of Economic and Business Research.

Table 8a: Distribution of Population by Age

Population by Age	Number	Percent
Under 5 years	3,531	6.6
5 to 9 years	3,869	6.7
10 to 14 years	4,079	7.1
15 to 19 years	3,673	6.4
20 to 24 years	2,511	4.4
25 to 29 years	3,069	5.4
30 to 34 years	3,351	5.8
35 to 39 years	3,811	6.6
40 to 44 years	3,895	6.8
45 to 49 years	4,035	7.0
50 to 54 years	3,811	6.6
55 to 59 years	3,526	6.1
60 to 64 years	3,909	6.8
65 to 69 years	3,549	6.2
70 to 74 years	2,613	4.6
75 to 79 years	1,760	3.1
80 to 84 years	1,237	2.2
85 years and over	1,085	1.9
Median Age	40.9	

Figure 8b: Distribution of Population by Age

- d. Medically Dependent Population. For the 2018 Hurricane Season, Sarasota County Emergency Management is reporting 228 individuals are registered as Medically Dependent Persons with North Port's area of responsibility.
- e. Farm Workers. The City of North Port has no commercial agricultural operations which use migrant farm workers.
- f. Areas of Large Tourist Population (including annual tourist and seasonal population). Season population may represent an

increase of 30% over resident population. There is no specific area where the seasonal population resides.

The City of North Port has no major hotels, but a single tourist attraction. Warm Mineral Springs, which is believed to be the “Original Fountain of Youth” sought by the Spanish explorer Ponce de Leon, is located just within the City’s northern boundary at 12200 San Servando Avenue.

- g. Non-English-Speaking Populations (including persons when English is not the first language) and persons with hearing impairment or loss. Figures for the City of North Port are not available; however, per the 2010 US Census, approximately 11% of the respondents reported speaking language other than English. It should also be noted that among the “other” languages being reported, a large population of Ukrainian immigrants and/or descendants live in the City, an estimate of which is between eight and 10% of the City’s population. The City addresses language barrier by making Spanish-language versions of the annual Hurricane Guide available and creating a Ukrainian-language version of the “Stay-or-Go?” literature. All of them are available from either Fire Rescue headquarters or Fire Rescue’s Emergency Management website.

No figures are available for persons with hearing impairment or loss and will be handled by the dispatch center through the Telecommunications Device for the Deaf (TDD) equipment as needed.

- h. Transient Populations. The City of North Port has no recognizable issue with transient populations.
- i. Manufactured Housing Parks and Population. The City of North Port has only one mobile home park within its limits (Holiday Park). However, there are four additional mobile home parks for which the City of North Port Fire Rescue provides fire protection and emergency medical services. For hurricane evacuation purposes, all manufactured housing is in “A” zone. For property risk purposes, the Surge Zone column represents the actual zone in which the park is located. (See Table 10: Mobile Home Communities Served by North Port Fire Rescue)

Table 9: Mobile Home Communities Served by North Port Fire Rescue

Name	Office Address	Units	Surge Zone
Holiday Park	5401 Holiday Park Blvd	865	B
Harbor Cove	499 Imperial Drive	805	A/B
La Casa Mobile Home Park	300 El Prado	974	A/B
Lazy River Village Inc	10500 Tamiami Trail South	356	A/B
Riverwalk Mobile Home Village	150 Riverwalk Drive	223	A/B

- j. Inmate Population. There are no correctional facilities within the City of North Port.

2. Vulnerable Populations

Table 11 describes the potential effects to the population, and economic loss if a hurricane with sufficient storm surge, or flooding in a FEMA Special Hazard Flood Area were to affect the City of North Port.

Assisted Living Facilities (ALF). Per the Florida Agency for Health Care Administration (AHCA), five ALFs are registered within the City of North Port:

Name and AHCA Registration Number	Street Address	Licensed Beds	Evacuation Level
Gardens of North Port (The) - 11966640	4900 S Sumter Blvd	50	C
Joy of Living, Inc - 11966162	8548 Alam Avenue	6	C
La Belle La Vie, LLC - 11968629	3973 Lubec Avenue	3	D
North Port Retirement Center - 11912071	4950 Pocatella Ave	50	C
The Springs at South Biscayne - 11968855	6235 Hoffman St	147	B

Nursing Homes. According to the Florida Agency for Health Care Administration, One Nursing Home Is Registered Within the City of North Port:

Name and AHCA Registration Number	Street Address	Licensed Beds	Evacuation Level
Quality Health Care of North Port - 85810	6940 Outreach Way	120	B

Table 10: Vulnerabilities by Population and Property Loss

Residential Non-Residential / Population / Valuation Information in Storm Evacuation Zones and FEMA Hazardous Zones

Evacuation Zones	Non-Residential	Residential		Total Units		Total Potential Property Value Loss	Residential Population (Units *2.65)
	Units	Potential Property Value Loss	Units	Potential Property Value Loss			
A	4	\$2,800,300	289	\$47,415,800	293	\$50,216,100	766
B	209	\$245,514,000	4,394	\$364,506,800	4,603	\$610,020,800	11,644
C	11	\$12,962,000	8,777	\$1,277,681,000	8,788	\$1,290,643,000	23,259
D	95	\$269,482,000	12,693	\$1,948,933,600	12,788	\$2,218,415,600	33,636
E	137	\$74,981,300	2,629	\$482,517,900	2,766	\$557,499,200	6,967
Grand Total	456	\$605,739,600	28,782	\$4,121,055,100	29,238	\$4,726,794,700	76,272

FEMA Zone	Non-Residential	Residential		Total Units		Total Potential Property Value Loss	Residential Population (Units *2.65)
	Units	Potential Property Value Loss	Units	Potential Property Value Loss			
FEMA AE Zone	92	\$384,014,800	6,122	\$968,199,400	6,214	\$1,352,214,200	16,223

Notes:

Known units not currently on 2017 taxroll is estimated values and included in unit counts.

Residential Units include individual Condo Units.

Residential Units only count one per apartment complex.

Total Value Loss includes total value of apartment complex.

Non-Residential includes individual Business Condo Units.

Centers under one ownership is counted as one unit and includes total value complex.

All data is based on GIS Data (August 2017): Surge Zones, FEMA A / AE Zone, Sarasota County Property Appraiser Parcels and Attribute tables.

The 2.65 multiplier is the average household size.

The valuation is from the JUST value from the Property Appraisers Office data (2017 Tax Role).

D. Economic Characteristics**1. Economic Profile**

- a. Employment by Major Sector. Most residents are employed in the service sector or government – 32% are retired.
- b. Unemployment Rate. Per the US Bureau of Labor Statistics, the unemployment rate for the North Port-Bradenton-Sarasota Metropolitan Statistical Area (MSA) in the spring of 2018 was 3.6%.
- c. Average Property Value. \$192,800
- d. Median Income. \$49,465

2. Potential Property Value Loss

See Figure 11: Vulnerabilities by Population and Property Loss (above).

E. Emergency Management Support Facilities

1. Critical Facilities. North Port Emergency Management maintains a Critical Facilities Inventory (CFI) for the City. Given the sensitive nature of the facilities, they are protected under Florida Statutes Chapter 119, the locations of which are not included in this Plan.
2. Logistical Staging Areas. Potential staging areas should have adequate space to store palletized resources, maneuver and service vehicles and stock end use items. Some site security should be possible. Pre-identified sites may include:
 - a. Utilities Department Work Yard
 - b. Public Works Department Complex
 - c. Municipal Complex – City Center
 - d. George Mullen’s Activity Center
 - e. Morgan Family Community Center
 - f. Property Maintenance Yard
3. Neighborhood Points of Distribution. Neighborhood Points of Distribution (NPOD) is a County-led operation for the establishment and operation of sites at which the public may acquire emergency commodities in a post-disaster environment. If, due to power outages or road closures, the public is unable to procure food, water, ice or tarps, NPODs will be established at pre-identified locations throughout the City. However, consistent with State policy, no NPOD shall be opened within five miles of an operating retail store selling these commodities. Emergency Management’s Standard Operating Procedure 200.001 details how NPODs will be established and managed.
4. Emergency Helispots. The City of North Port has registered two helispots with the Florida Department of Transportation and the Federal Aviation Administration located at the Fire Stations 81 and 84.

III. METHOD OF OPERATIONS

A. Organization

1. Emergency Management Organization

- a. The City Manager is responsible for appointing an Emergency Manager (EM). The EM is responsible for day-to-day planning and operations.
- b. The EM is responsible for preparedness and training coordination during normal or “blue skies” conditions. The EM will be responsible for:
 - i. Maintaining ongoing coordination with County and State counterparts.
 - ii. Advising the City Manager and department directors of training and exercise opportunities as well as coordinating the City’s involvement in such.
 - iii. Coordinate the development of internal training programs.
 - iv. Maintain and update the CEMP, approve and make changes to the CEMP and distribute copies of updates or changes to copy holders of the CEMP.
 - v. Maintain the EOC and supporting supplies in a state of readiness.
 - vi. Coordinate public awareness and education campaigns.
- c. The City of North Port has adopted the National Incident Management System (NIMS), to include the Incident Command System (ICS) as the standard by which “no-notice events/incidents and pre-planned events will be organized and managed (See Appendix C). Based on ICS guidance, and City protocols, ICS may be implemented at any level of emergency, for any situation, and by any qualified individual. The use of ICS includes all the standardized forms approved by the National Wildfire Coordinating Group, or the NIMS Integration Center of the US Department of Homeland Security.
 - i. ICS implementation must include the consistent application

of Incident Action Planning, and Common Communications Plans, as appropriate.

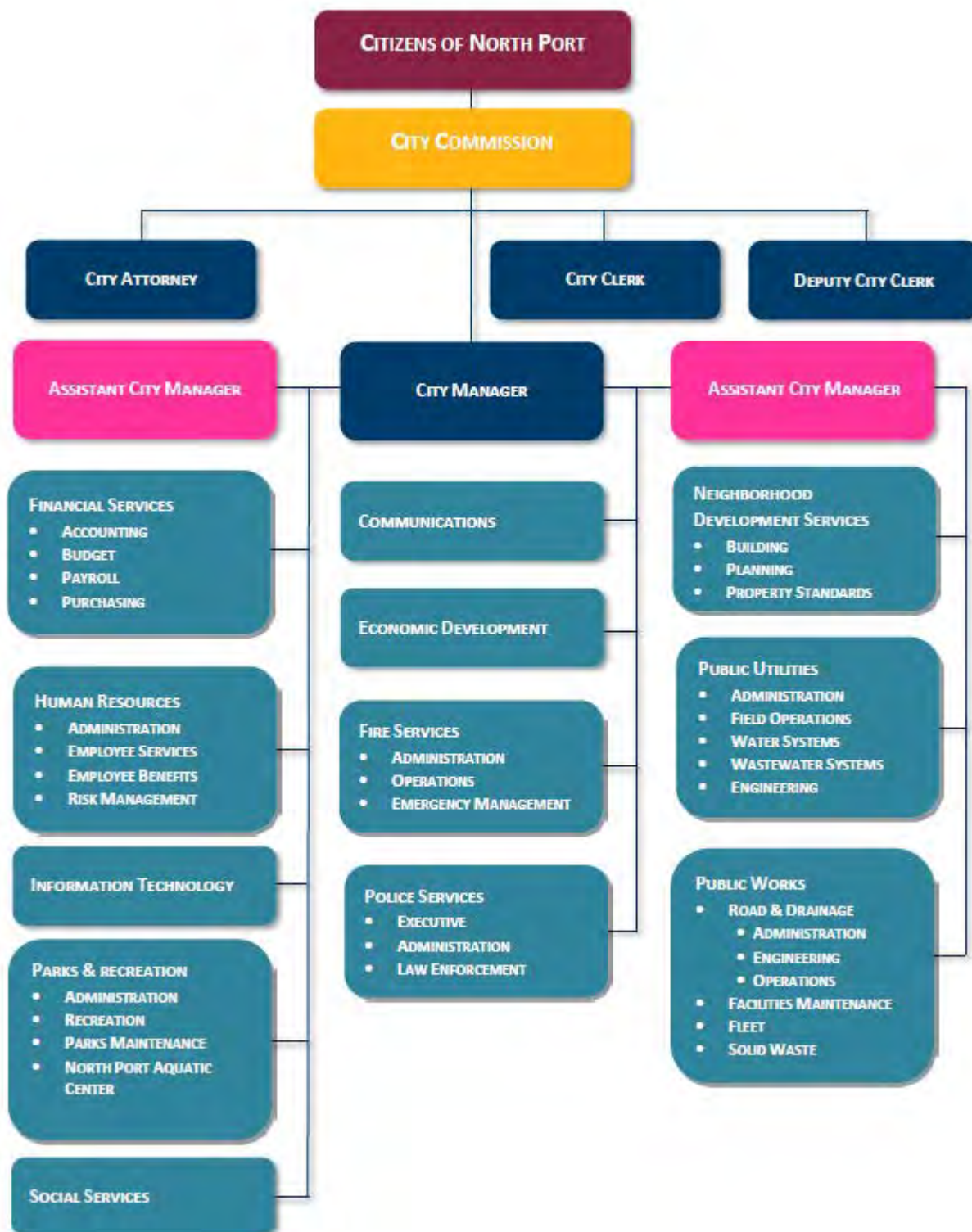
- d. When the ICS has been instituted to manage a current emergency, the EMD's position will be suspended, and the EMD will assume a position with the ICS structure as assigned by, or, if selected by the City Manager, as the Incident Commander.
 - i. The Incident Management Team, comprised of the City Manager, Assistant City Manager, Police and Fire Chiefs, Public Works Director and Emergency Manager is responsible, and has the authority to manage the incident or disaster under the direction of the Incident Commander.
 - ii. The City Manager will function as the coordinator and communication link from the Incident Management Team to the ~~Mayer and the assembled board of Commissioners of the North Port~~ City Commission.
 - iii. The City Manager will continue to oversee non-emergency operations of the City.
 - iv. The City ~~of North Port~~ ~~Mayer and~~ Commissioners may give guidance and recommendations to the City Manager but will not give specific direction to the Incident Management Team or attempt themselves to assume management of the incident or disaster.
- e. All employees are required to assist in the City's disaster response and recovery efforts. The City has instituted an Employee Disaster Role Registration program. As supported by the City Manager, all City employees will be designated as one of the following:
 - i. Department Essential for their Continuity of Operations (COOP). Each department is responsible for designating their employees COOP- or EOC-essential. Department essential employees are required to report to their regular work assignment to assist with the department's role in the response and recovery effort.
 - ii. Emergency Operations Center (EOC) Essential. Employees designated as EOC-essential are required to report to their EOC work assignment to assist with the Emergency Management's role in the response and recovery efforts.

- iii. Support role. All employees not previously designated.

All new employees will complete the Employee Disaster Role Registration form on arriving at their workplace for orientation.

The forms will be maintained by the Emergency Management Division and EOC managers during a disaster.

Figure 11: Organizational Chart of the City of North Port Government



2. Lines of Succession^[SB1]

- a. The Line of Succession from the City Commission Mayor is to the Vice-Mayor.
- b. The Line of Succession from the City Manager is ~~to the Assistant City Manager~~ as provided in the Department COOP.
- c. Each department director shall identify two alternates as successors as outlined in the Department COOP. Realizing that some departments may not have such depth, plans will be established to utilize supervisors or managers from other departments as appropriate.

3. ICS and CEMP Activation. The North Port CEMP will be activated, and ICS implemented, under the following conditions:

- a. On the issuance of a declaration of a State of Emergency by the President of the United States for a geographic area which includes the City of North Port, or
- b. On the issuance of a declaration of a State of Emergency by the Governor of the State of Florida, for a geographic area that includes the City of North Port, or
- c. On the issuance of a declaration of a Local State of Emergency by the Sarasota County Board of County Commissioners, or
- d. On notification of the Sarasota County Emergency Management, or the Sarasota County EOC, that Sarasota County has implemented its CEMP, or
- e. On a declaration by the City of North Port Commissioners, or the City of North Port City Manager, that a Local State of Emergency exists, or
- f. The senior employee present from any department of the City of North Port, who is responsible for management of an emergency, may activate the City of North Port CEMP and initiate the Incident Command System, if in the best judgment of the employee in-charge of the incident, circumstances necessitate such action. The senior employee present will serve as Incident Commander until the City Manager selects a permanent Incident Commander.

4. Actions by the City Manager. On activation of the CEMP and initiation of the ICS, the City Manager will notify the various department directors, and City Commissioners, regarding the situation and identifying the Incident Commander.
 - a. The Incident Commander will be selected by the City Manager from a pool of qualified individuals within the City staff or he may assume the role himself. The Incident Commander will have overall responsibility for management of the disaster.
 - i. The choice of Incident Commander and management structure may be made on the nature of the event. The City Manager may select an individual with subject matter expertise (e.g., Police Chief for a terrorist attack, or Fire Chief for wildfire, Utilities director for a drinking water emergency, etc.).
 - ii. The City Manager may decide to implement a Unified Command structure, by which each department providing resources to the incident may provide a director or senior division manager to share in command decision-making.
 - b. The Operations Section Chief will be appointed by the Incident Commander from a pool of qualified individuals within the City staff. The Operations Section Chief may be selected based on the nature of the incident. For instance, the Deputy Fire Chief may be appointed as Operations Section Chief for firefighting and hazardous materials, or the Superintendent of the Water Treatment Plant for a water contamination issue. This selection process will apply to other incident categories.
 - c. The Finance Section Chief will be selected by the Incident Commander from a pool of qualified individuals within the City staff.
 - d. The Logistics Section Chief will be selected by the Incident Commander from a pool of qualified individuals within the City staff.
 - e. The Plans Section Chief will be selected by the Incident Commander from a pool of qualified individuals within the City staff.
 - f. The Public Information Officer shall be filled by individual holding

that role during blue skies.

- g. Other staff will be selected and appointed by the Incident Commander as he/she deems necessary. The staff may include, but not limited to: Safety Officer and Liaison Officer.

5. Coordination from City EOC to County, State or Federal counterparts.

- a. Coordination with County, State and Federal emergency management organizations will be conducted through the City EOC.
- b. Direct coordination between departments of City government with their County counterparts may be authorized at the discretion of the Incident Commander (e.g., City police to the County Sheriff's office).
- c. The City will furnish liaisons to County, State and Federal entities as resources permit.
- d. The City will encourage County, State and Federal authorities to furnish liaison personnel to the City EOC.

6. Emergency Operations Center.¹⁰ The Emergency Operations Center is a site selected by the Incident Commander from which he/she deems is most suitable for managing the incident. The site may be mobile or fixed.

- a. Mobile EOC. This is most likely the site from which the incident is first managed. It may be a vehicle from the Fire or Police Department, or it could be a service truck from the Public Works or Utilities Department.
- b. Mobile Command Vehicle. This vehicle serves as the City's mobile command post and back-up 9-1-1 dispatch center.
- c. Primary EOC. The City of North Port City Hall room 244 will serve as the Primary EOC for the City. The Incident Commander may select to use it or to continue operations from a more mobile position.
- d. Alternate EOC. Alternate EOCs may be selected by the Incident

¹⁰ See the City of North Port Emergency Operations Center, Standard Operating Guidelines (SOG) for details of the EOC operations.

Commander based on the nature of the incident, and the capability of the building. They include, but are not limited to:

- i. Municipal Complex – Fire Rescue Headquarters or Police Headquarters
- ii. Morgan Family Community Center or George Mullen Activity Center

7. Public Information System. The Incident Commander/Unified Command will establish a Joint Information Center (JIC) to disseminate public information. Information released by the JIC must be pre-approved by the Incident Commander/Unified Command members. The JIC will be composed of Public Information Officer (PIO) elements from each responding department/agency to include but not limited to City, State and Federal. This center will release public preparedness, response, recovery, and mitigation information, as well as certain information on the disaster or emergency at hand such as evacuation center information, danger zones, and open or closed businesses. The JIC will establish a schedule for press briefings and release other information as needed.

B. Levels of Emergencies and Disasters

1. The City of North Port closely follows the definitions of “emergency” and the various levels of “disasters” provided in Florida Statutes §252.34. Those definitions and their relationship to EOC activation levels are as follows:
 - a. Level III - Minor Emergency (EOC Monitoring)
 - i. Defined. Any unexpected occurrence that can be met with a single department's normally available resources. “Normally available resources” may include the response of other City departments in a routine capacity.
 - ii. Responsibility. The department that would normally handle the situation is responsible for the decision making to properly resolve the incident.
 - iii. Notifications. None
 - iv. Action. The responsible department may set up an on-site command post if it so desires. No City-wide action is required. Press relations will be handled by the responsible

department. Needed logistical support, additional personnel, or other resources will be the responsibility of the responsible department.

b. Level II - Major Disaster (EOC Partial Activation)

- i. Defined. Any unexpected occurrence that requires response by two or more City departments above a routine capacity, or where outside agencies have responded to render such assistance. Such emergencies require a cooperative effort and a commitment of personnel, equipment, or resources of personnel, and equipment from many departments.
- ii. Responsibility. The primary decision-making responsibility rests with the department which would normally handle the situation, but a cooperative effort with departments that are responding in support is required. The cooperative efforts should be designed to properly resolve the incident.
- iii. Notifications. The City Manager and the Emergency Management Director should be notified to the situation by the department(s) involved.
- iv. Action. An on-site command post should be set up by the responsible department and all responding departments should be notified of its location. The responsible department may also set up an administrative command post (usually at its main facility or possibly the City EOC). The City Manager and the Emergency Management Director should be notified of its location. Press relations will be handled by the responsible department. Needed logistical support, additional support, or other resources will be the added responsibility of the responsible department.

c. Level I - Catastrophic Disaster (EOC Full Activation)

- i. Defined. Any extraordinary occurrence of such magnitude that all City departments and resources must be utilized or where the combination of City departments and outside agencies has been mobilized to handle the situation.
- ii. Responsibility. The primary responsibility for decision making rests with the Incident Commander or Unified

Command. The on-site commanders may make those decisions necessary to protect life and property and to stabilize the situation. Decisions designed to properly resolve the entire emergency shall be the responsibility of the Incident Commander. This level of emergency usually results in an "Ordinance of a State of Local Emergency" by the Commission of the City of North Port, who invokes the emergency powers of the office.

- iii. Notifications. The following personnel will be notified (or, in their absence, an alternate from their department): City Manager, Emergency Manager, Fire Chief, Police Chief, and all other department directors as seen necessary for primary EOC activation. The initiating department shall have the responsibility for making the above notifications. The initiating departments may get assistance in any instance by notifying dispatch or the City Emergency Management Director of the need for such assistance.
- iv. Action. The senior representative of the initiating department shall establish an on-site command post and notify all departments of the location. The City EOC shall be activated. All members of the Incident Management Team and support staff will report to the EOC. Press Relations will be assumed by the EOC. The further acquisition of personnel, equipment, or other resources will become the duty of the EOC. The City EOC will assume the incident-related communications functions during a Level I activation. All other department heads and those with designated responsibilities elsewhere in this plan should report to their regular areas of business (other instructions may be given at time of mobilization).

- 2. Full activation of the EOC does not occur in every emergency event. Even situations with multi-discipline and mutual aid involvements are often managed effectively in the field using the Incident Command Systems' principles practiced by responders in the County.
 - a. The EOC may be activated simply to provide support to the Incident Commander(s) in the field.
 - b. Any incident may escalate from a field command emergency to one managed from the EOC.

C. Department Roles and Responsibilities

1. General

- a. Elected officials and other governmental authorities of the City operate essentially the same during normal and emergency times. Non-emergency activities may be suspended, and resultant uncommitted personnel reallocated to the City EOC.
- b. The scene of decision-making may shift from the normal City Commission conference rooms and Department offices to the City EOC and/or other special facilities.
- c. The City of North Port's organization for disaster management commits all units of local government to provide the service and assistance for which they are best trained and most experienced. Those organizations that have no inherent emergency management roles will make their personnel available to support disaster operations as may be directed.

2. The Mayor of the City Commission's Responsibilities:

~~a. Provide the City Manager with a listing of the Commissioners specifying their succession in authority to exercise the emergency powers of the Mayor in his absence or inability to function.~~

~~a.~~ b. Analyze the Citywide social and economic impact of the situation and provide policy and guidance as requested.

~~b.~~ b. ~~c.~~ Prepare to participate in public information presentations and media briefings.

~~c.~~ c. ~~d.~~ Delegate policy and direction, including authority to declare a Citywide emergency/disaster, to the City Manager ensuring continuity of government, one-voice decisions and unified community support as requested.

~~d.~~ d. ~~e.~~ Convene ~~the Commission to continuous~~ emergency session as soon as is practicable. ~~Exercise all essential emergency functions of the Commission unilaterally until the full Commission can be convened.~~

3. The City Manager's Responsibilities:

- a. Proclaim/declare State of Local Emergency declarations pursuant to F.S. 252.38(3)(a)(5). Extend or terminate disaster declarations as required.
- b. Provide to Emergency Management a line of succession, naming the two officials in sequence authorized to act with his authority in his absence.
- c. Function as the coordination point between the Commission ~~Mayor~~ and the City department and office heads and private and volunteer sector representatives.
- d. Provide the City EOC with an empowered representative to assist in coordination of City-County emergency operations.
- e. Ensure participation throughout the event on the part of City police, fire, public works and other City government offices in coordination with the overall City's operations.
- f. Ensure the establishment of Standard Operating Guidelines (SOG) for all elements in City government as needed to implement this Plan. Establish readiness procedures that ensure the availability of trained personnel and requisite equipment and facilities in time of emergency.

4. The City Attorney's Responsibilities:

- a. Provide a two-person successor list to the Emergency Manager ~~Management Director~~.
- b. Provide legal counsel as required throughout the emergency with emphasis on SLE/disaster declarations, curfew, sales restrictions, and re-entry issues.

5. The Police Chief's Responsibilities:

- a. Provide a two-person successor list to the Emergency Manager ~~Management Director~~.

- b. Staff the City EOC on request.
 - c. Provide professional advice and expertise as well as resources to the City Commission, City Manager and other elements of City government operations particularly in support of evacuations, public warnings and notifications, physical security activities, and movement control.
 - d. Request, coordinate and control all other law enforcement resources brought in to assist the City.
 - e. Draft and coordinate requests for "Military Support of Civil Authority" in coordination with the City EOC for forwarding to the County EOC.
 - f. Operate a central 9-1-1 and police dispatch system and center throughout the emergency.
 - g. Provide field incident commanders upon request.
 - h. Maintain mutual aid agreements with State-wide and adjacent law enforcement agencies.
 - i. Provide resources to the Tactical First-In Team Task Force.
 - j. Provide security for the City EOC, each shelter, and incident facilities.
6. The Fire Rescue Chief's Responsibilities:
- a. Provide a two-person successor list.
 - b. Staff the City EOC on request.
 - c. Coordinate the activities of all fire rescue organizations used in the City throughout the emergency with overall City operations.
 - d. Submit requests for mutual aid and other forms of external aid through the City EOC to the County EOC.
 - e. Assist in the evacuation of Medically Dependent Persons.
 - f. Provide resources to the Tactical First-In Team Task Force.

- g. If requested, Provide an EMT or Paramedic or fully-staffed rescue to each hurricane evacuation center for medical assistance.
- 7. The Director of the Neighborhood Development Services Department's Responsibilities:
 - a. Provide a two-person successor list to Emergency Manager.
~~Management Director.~~
 - b. Be prepared to perform normal functions at routine locations, situation allowing, or at alternate locations, as necessary.
 - c. Provide input to the City EOC regarding the need to suspend or modify ordinances or other City rules due to an emergency or disaster.
 - d. Conduct damage assessment of public infrastructure in coordination with the Utilities, Public Works and Building Departments.
 - e. Provide trained personnel to conduct public infrastructure damage estimation and assessment tasks by both land vehicle and aircraft in coordination with City/County damage assessment operations.
 - f. Effect contractor pre-registration and other preparations for expedited issue of building permits and contractor licensing as may be necessary to rebuilding of the community in the aftermath of a disaster.
- 8. The Director of the Finance Department's Responsibilities:
 - a. Provide a two-person successor list to Emergency Manager.
~~Management Director.~~
 - b. Staff the City EOC on request.
 - c. Manage the City-wide tracking of disaster-related costs.
 - d. Act as primary point of contact for financial matters with County, State and Federal agents during disaster recovery and reimbursement processes.

- e. Provide emergency procurement support for supplies and equipment needed by City agencies under authority of the Sec. 2-408, Emergency Procurement, of the Code of the City of North Port.
- f. Develop and promulgate emergency procurement procedures to be used by departments and offices funded by City government that are compatible with State and Federal financial reporting requirements.

9. The Director of the Public Works Department's Responsibilities:

- a. Provide a two-person successor list to Emergency Manager ~~Management Director~~.
- b. Staff the City EOC on request.
- c. Conduct damage assessment of public infrastructure in coordination with the Utilities and Neighborhood Development Services Departments.
- d. Provide maintenance services as needed to keep evacuation routes open, flooded or otherwise blocked road areas barricaded, and traffic rerouting coordinated with law enforcement agencies.
- e. Monitor water flow in the waterway system and adjust water control facilities.
- f. Implement the Debris Management Plan through management of post-disaster debris clearance, removal, monitoring, transportation and disposal.
- g. Provide resources to the Tactical First-In Team Task Force.
- h. Provide for emergency fueling and repairs of City vehicles.
- i. Ensure that all City buildings are prepared/protected during emergency and disaster events.
- j. Provide servicing and repair of governmental buildings to ensure operational ability and prevention of damage if needed.
- j. Work with Emergency Management to identify projects that could reduce damage to government buildings.

- k. Provide for on-site facility maintenance and janitorial duties in City Hall during disaster operations.
- l. Coordinate facility closings with the EOC and PIO.
- m. Provide facility technicians to resolve problems related to mechanical, plumbing, electrical, or otherwise for the City EOC.

10. The Public Information Officer Responsibilities:

- a. Provide a two-person successor list to Emergency ~~Management Director~~ **Manager**
- b. Establish and operate a Joint Information Center (JIC) and Call Center near the EOC, collecting information in the EOC, and from field unit Public Information Officer (PIO). The JIC will be composed of PIO elements from each responding department/agency to include but not limited to City, State and Federal.
- c. Activate the Crisis Communication and Public Information appendix.
- d. Organize, schedule and manage media briefings regarding actual emergency preparedness, response and recovery operations.
- e. Prepare and disseminate emergency public information materials incidental to an emergency operation.
- f. During and following an emergency, serve as the single official point of contact between City government and all media representatives.
- g. Coordinate public information releases and rumor items with representatives of County, State and Federal governmental agencies as may be on scene in any official capacity.
- h. Assist the essential services in developing and disseminating post-disaster health and safety instructions for the reoccupation of evacuated areas and storm damaged homes.

11. The Director of Parks and Recreation Department's Responsibilities:

- a. Provide a two-person successor list to Emergency ~~Management Director~~ **Manager**

- b. Staff the EOC as requested.
- c. Staff the Morgan Center's employee dependent shelter
- d. Provide the availability of park facilities (structures and land) for disaster preparedness, response, sheltering and recovery operations as needed by the City.

12. The City Clerk's Responsibilities:

- a. Provide a two-person successor list to Emergency ~~Management Director~~ **Manager**
- b. Staff the City EOC on request.
- c. Draft the Emergency Ordinance of a State of Local Emergency (SLE) declaration for the City Commission or City Manager.
- d. Schedule the City Commission to continuous emergency session as soon as is practicable.
- e. Provide administrative staff support for maintenance of an official operations log in the City EOC when activated to Level I, maintain the City official log of situations and events encountered, decisions rendered, and actions taken.
- f. Provide technical advice and assistance to the activated EOC regarding records for each specific disaster or emergency.

13. The Director of the Utilities Department's Responsibilities:

- a. Provide a two-person successor list to Emergency ~~Management Director~~ **Manager**
- b. Staff the City EOC as requested.
- c. Issue any precautionary notices as required.
- d. Provide support to other emergency response agencies as needed.
- e. Provide resources to the Tactical First-In Team Task Force.

- f. Conduct damage assessment of public infrastructure in coordination with the Public Works and Neighborhood Development Services Departments.
- g. Provide emergency supplies of potable water, when required.

14. The Director of the Human Resources' Department's Responsibilities:

- a. Provide a two-person successor list to Emergency Manager ~~Management Director~~.
- b. Maintain insurance records and support the Workers' Compensation program.
- c. Conduct damage assessment of City facilities in conjunction with Facilities Maintenance.
- d. Provide staff for the Call Center.
- e. Develop and maintain a roster of government employees who have foreign language or sign language capability.

15. The Office of Information Technology's Responsibilities:

- a. Provide Geographic Information Systems staffing for the EOC following an event for mapping and plotting of damage, areas of concern, and other items as required.
- b. Provide on-site computer technicians to resolve problems related to computers, printers, networking, or otherwise for the City EOC.
- c. Provide network systems' technical support for all City departments to ensure continuity of operations.

16. The Office of Economic Development's Responsibilities:

- a. The Economic Development Manager, within the City Manager's Office, shall serve as point of contact for business/industry related issues in pre- and post-disaster scenarios, and assist in identification of and collection of information from businesses that have been affected by a disaster event.

D. Emergency Support Function to City Department Crosswalk

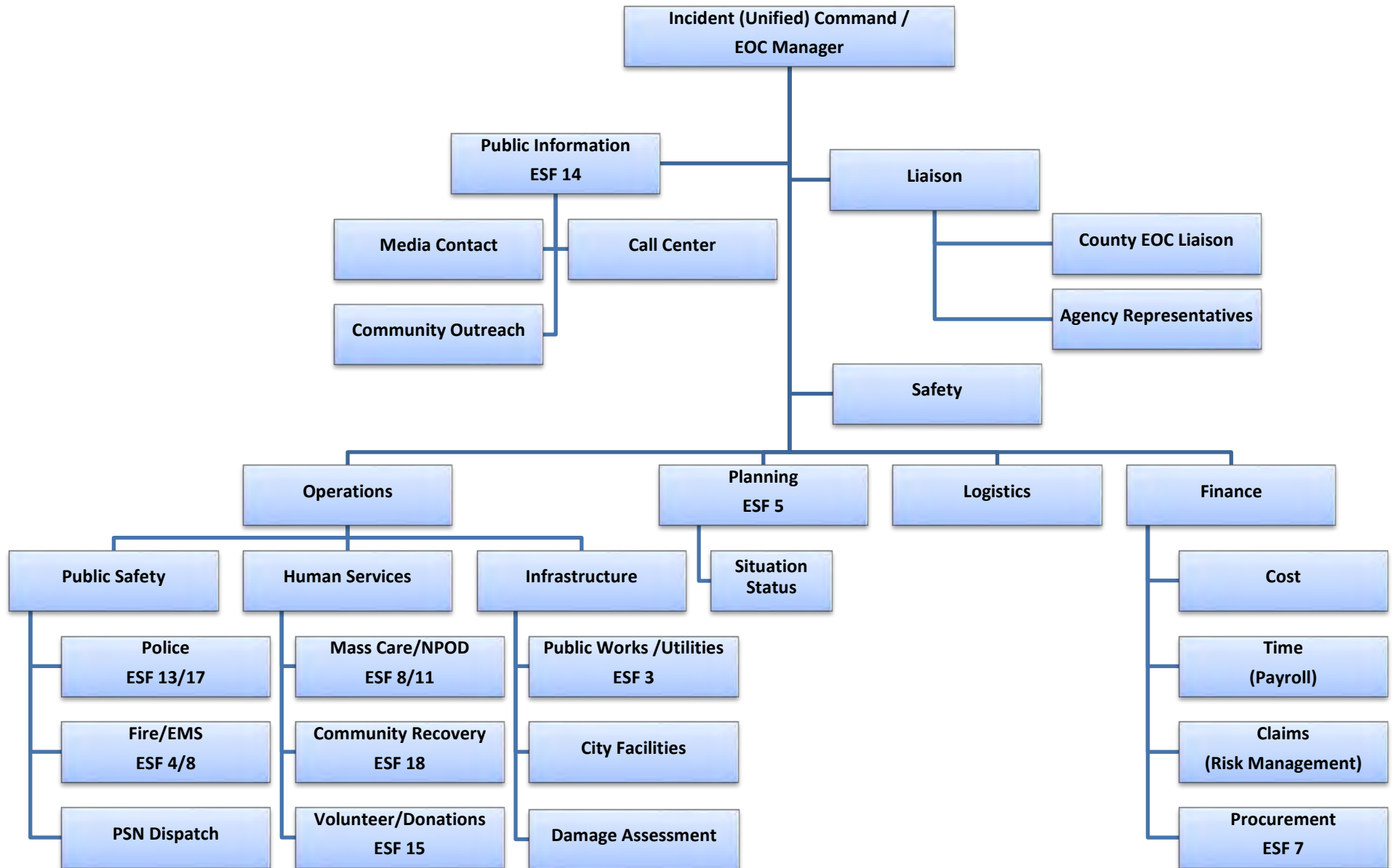
The City of North Port's Emergency Operations Center (EOC) is organized by the standards of the Incident Command System (ICS). This is to ensure consistency with the Sarasota County EOC and State of Florida EOCs. Given there is some difference in the way other EOCs are organized, the below table (12) and organizational chart (Figure 13) crosswalks the traditional Emergency Service Functions to the ICS organizational component or department found in the City of North Port EOC.

Table 12: Emergency Support Function to City Department Crosswalk

ESF	Discipline	ICS Position (CNP Lead Agency)
ESF-1	Transportation	Sarasota County
ESF-2	Communications	Verizon
ESF-3	Public Works and Engineering	Operations (CNP Public Works)
ESF-4	Firefighting	Operations (CNP Fire Rescue)
ESF-5	Information and Planning	Planning (CNP Neighborhood Development Services)
ESF-6	Mass Care	Sarasota County
ESF-7	Resource Support	Finance (CNP Purchasing)
ESF-8	Health and Medical	Operations (CNP Fire Rescue)
ESF-9	Search and Rescue	Operations (CNP Fire Rescue)
ESF-10	Hazardous Materials	Sarasota County
ESF-11	Food and Water	Sarasota County
ESF-12	Energy	FP&L
ESF-13	Military Support	Florida National Guard
ESF-14	Public Information	PIO (CNP City Manager)
ESF-15	Volunteers and Donations	Operations (CNP Social Services)
ESF-16	Law Enforcement and Security	Operations (CNP Police)
ESF-17	Animal Protection	Sarasota County Sheriff's Office
n/a	Damage Assessment	Operations (CNP Neighborhood Development Svcs.)
n/a	Environmental Protection	Sarasota County
n/a	Community Relations	CNP City Manager
n/a	Disaster Recovery Centers	Sarasota County
n/a	Infrastructure / Public Assistance	As identified by the City
n/a	Unmet Needs Coordination	Sarasota County
n/a	Emergency Housing	Sarasota County
n/a	Debris Management	Operations (CNP Public Works)
n/a	Disaster Field Office	Sarasota County
n/a	Mitigation Assessment	CNP Public Works
n/a	Business Recovery	CNP City Manager
n/a	Others	As identified by the City

- E. Demobilization of the City EOC. The release of personnel from the EOC and the ultimate closure of the EOC should be preplanned and conducted in an orderly method. The Incident Commander and general staff should determine when and how such draw down and closure will be accomplished. Considerations include, but are not limited to:
1. Determining which positions are no longer required to operate on a continuous 24-hour basis and reducing their hours of operation.
 2. Determining which positions can be consolidated to release some personnel.
 3. Determining which personnel should be released first due to fatigue, family and personal needs, or the requirement for them to return to their normal duty positions.
 4. Determining if some new personnel should be integrated into the EOC to allow for others to be released, or if the release can take place without the infusion of new personnel.
 5. Ensuring all financial records are completed and collected by the EOC Cost Unit.
 6. Verifying that historical documentation is transferred to the City Clerk for custodial care.
 7. Appointing a person or persons to assure that all EOC supplies, forms, displays and equipment are returned to the City Emergency Manager for future utilization.
 8. Notifying the City Manager of the intention to close the EOC with an estimated effective time.

**Figure 13: Organization Chart of the City of North Port
Emergency Operations Center**



IV. PREPAREDNESS ACTIVITIES

A. General Issues

1. The Emergency Management Director is responsible for updating the City CEMP and assuring that changes are distributed to copy holders of the CEMP. Department directors are responsible for furnishing necessary updated information to the Emergency Management Director for inclusion in revision. Each City department shall develop and annually maintain its own procedures to address its preparedness and response to a disaster.
2. The City Clerk is responsible for assuring that vital records are maintained. The City Manager may task department directors with the responsibility for capturing and maintaining department specific information and furnish appropriate information to the Clerk for preservation.
3. Sarasota County Emergency Management is statutorily-responsible for the registration of persons with special needs. The City's Emergency Manager will provide information on the program during preparedness talks.

B. Public Awareness and Education

1. Throughout the year, Public Service Announcements are submitted to local broadcast, cable, print and social media on topics relevant to current events, time of year, or special programs.
2. Dissemination of recovery information is primarily the responsibility of Sarasota County. The City of North Port will supplement their information with advisories to local media, the City of North Port web site, social media and, if electricity is out, use of variable message boards strategically placed around the City.
3. Maps of centers and surge/evacuation level and routes on the Sarasota County Emergency Management website are linked from the City of North Port's website.
4. City-produced brochures on emergency preparedness, pet-friendly centers and medically-dependent persons are made available from Fire Rescue Headquarters. Additionally, the County-sponsored annual disaster preparedness guides are also available from Fire Rescue, City Hall, community centers, and distributed to homeowner/condominium/mobile home park associations, and other locations as requested.

C. Exercise

1. Exercise Opportunities

- a. The City of North Port will develop and conduct emergency management-oriented exercises.
- b. The City of North Port will participate in similar exercises conducted by other government entities.
- c. The Emergency Management ~~Director~~ will seek out exercise opportunities by coordinating with regional, State and Federal entities which offer such.

2. City-wide exercises will be coordinated by the Emergency Management ~~Director~~. Department directors will participate in coordination meetings with the Emergency Management ~~Director~~ in planning such exercises.

3. All exercises will incorporate NIMS/ICS principles.

4. There is no formal exercise schedule established. The City may participate in exercises scheduled by other agencies, such as Florida Division of Emergency Management, or Sarasota County Emergency Management.

5. Exercise Evaluation

- a. When conducting internal exercises, the Emergency Management ~~Director~~ may select one or more non-involved third parties to observe and evaluate the process.
- b. The evaluators should be versed in emergency management and have subject matter expertise the disaster being exercised.
- c. Evaluators will prepare their reports in a format consistent with the Homeland Security Exercise and Evaluation Program (HSEEP), or a more appropriate format as selected by the Emergency Management ~~Director~~, based on recommendations from the City Manager and department directors.

- d. The City Manager will conduct a post-exercise meeting with the Emergency Management ~~Director~~ and other department directors or individuals, to critique the exercises. The meeting will determine what types of corrective actions are needed, if any. It will also be determined if modifications are required of the CEMP, departmental SOPs or other guidance.
- e. An After-Action Report will be created to document corrective actions and lessons learned from the exercise and present a schedule and mechanism for their implementation and monitoring.

D. Training

1. General

- a. The Emergency Management ~~Director~~ is responsible for identifying and coordinating subject-related training opportunities.
- b. The Emergency Management ~~Director~~ will give notice to the department directors relative to available training opportunities.
- c. Individual department directors will advise the Emergency Management ~~Director~~ of training opportunities for the possible inclusion of other departments.
- d. Department directors will designate Emergency Coordinators within their organization.

2. Training Levels. Whether conducted in-house, or whether available through other sources, consideration should be given to the differing needs of employee/community functions. Levels may include:

- a. Responder Training for the response workers which focuses of their immediate actions and safety.
- b. Supervisor Training focuses on the needs of the first line supervisors, with emphasis on prioritizing response needs, safety of personnel and record/time keeping.
- c. Management Training for those with a broad range of authorities and responsibilities. Emphasis will be on fiscal management, resource utilization, inter-government dynamics and recovery and mitigation concerns.

- d. Community-based awareness, self-help, population protection procedures, and public awareness training for the public.
3. Training by Emergency Management Function
- a. Mitigation/Preparedness Training
 - i. Department directors and Emergency Coordinators will participate in risk assessment and plans development training to better prepare their organizations for responding to emergencies/disasters.
 - b. Response Training
 - i. The Florida Division of Emergency Management provides on-site training for law enforcement, medical, fire services, utilities and emergency management personnel, as well as local appointed officials and their staffs.
 - ii. Resident training at the Emergency Management Institute and other US Department of Homeland Security facilities, is encouraged for response groups from the jurisdiction to better understand the Integrated Comprehensive Emergency Management concept and the local Plan.
 - iii. The objectives of Emergency Management training are to develop team skills for the City of North Port Emergency Operations Center, field operations, information systems, technical information related to hazard mitigation, preparedness, response and recovery, and roles and responsibilities of all levels of government and the private sector in the face of emergencies or disasters.
 - iv. Group training is encouraged for the City of North Port Emergency Operations Center staff, Incident Management Team, individuals, information officers, all department directors and their Emergency Coordinators, damage assessment teams, etc.
 - v. Internal training consists of the concepts of field operations and key components of the City of North Port Comprehensive Emergency Management Plan.

- vi. Internal training should be done on-site, and in-groups.
 - vii. Community awareness programs are provided to train citizens as to what actions are expected of them before, during and after an emergency/ disaster.
 - viii. Preparing citizens for protective action and self-help practices immediately following a disaster is part of the Emergency Management training program, through the Community Emergency Response Team program.
- c. Recovery Training
- i. This training would include planning for the long-term recovery, financial reimbursement, assistance to the public and businesses, etc.

4. Required Basic Levels of NIMS and ICS Training

- a. All City personnel are deemed essential and shall complete Incident Command System training per their role in the response/recovery organization.

The following is consistent with Department of Homeland Security (DHS) recommendations for NIMS and ICS training.

- i. All employees shall complete the Introduction to the Incident Command System (ICS-100) and Introduction to the National Incident Management System (IS-700).
- ii. First line supervisors, single resource leaders, field supervisors, and other emergency management/response personnel shall complete Basic Incident Command (ICS-200).
- iii. Mid-level management including strike team leaders, task force leaders, unit leaders, division/group supervisors, branch directors, and EOC staff shall complete the Intermediate Incident Command System for Expanding Incidents (ICS-300).

- iv. Executives, command and general staff, select department heads with multi-agency coordination system responsibilities, area commanders, and emergency managers shall complete the Advanced Incident Command System (ICS-400).
 - v. City Commissioners should receive the Incident Command System (ICS) Overview for Executives/Senior Officials (ICS-402).
 - vi. The Emergency Management ~~Director~~ and Emergency Management Division staff shall complete the Introduction to the National Response Framework course (IS-800).
- b. City personnel will receive additional ICS and subject matter training on their specific role and responsibility within the ICS organization.

- E. Continuity of Operations Planning. It is the intent of City of North Port to have in place a comprehensive program to ensure continuation of essential functions under all circumstances. COOP is defined as the activities of individual departments and agencies to ensure that their essential functions are performed. This includes plans and procedures that delineate essential functions, specify emergency delegation of authority, provide for safekeeping of vital records/resources, identify alternate facilities, provide interoperable communications, and validate these operations through tests, training, and exercises.

COOP is a “good business practice” – part of the fundamental mission of agencies as responsible and reliable public institutions. Due to the changing threat environment, and the potential for “no notice” emergencies (i.e., acts of nature, accidents, technological emergencies, terrorist incidents), the need for COOP capabilities that enable agencies to continue their essential functions has increased. This environment has emphasized the criticality to ensure the continuity of essential government functions.

The Continuity of Operations (COOP) Plan establishes policy and guidance to ensure the continued execution of City of North Port mission-essential functions. This may be required if an emergency threatens or incapacitates operations, and the relocation of selected personnel/functions is required.

The COOP Plan is composed of two parts:

1. A Base Plan which serves as a City-wide policy guide
2. Individual plans specific to the needs of each City department

This Plan is designed to:

1. Ensure that the City will provide critical services in an environment that is threatened, diminished, or incapacitated.
2. Provide a means of information coordination to the City of North Port government to ensure uninterrupted communications within the internal organization of the City and externally to all identified critical customers.
3. Provide timely direction, control, and coordination to the City leadership and other critical customers before, during, and after an event or upon notification of a credible threat.
4. Establish and enact time-phased implementation procedures to activate various components of the "Plan" to provide sufficient operational capabilities relative to the event or threat thereof to the City of North Port.
5. Facilitate the return to normal operating conditions as soon as practical, based on circumstances and the threat environment.
6. Ensure that the City of North Port COOP Plan is viable and operational and is compliant with all guidance documents.
7. Ensure that the City of North Port COOP Plan is fully capable of addressing all types of emergencies, or "all hazards" and that mission-essential functions can continue with minimal or no disruption during all types of emergencies.

- F. Resource Management. The Emergency Management Director will inventory City of North Port assets to conform to US Department of Homeland Security resources' typing standards.

To the extent possible, the City's acquisition program incorporates the Standard Equipment List (SEL) and other Federal equipment standards data when purchasing interoperable equipment.

V. RESPONSE ACTIVITIES**A. General Issues**

1. The City Manager and Emergency Management Director will, when deemed necessary, begin the process of requesting an Emergency Ordinance of a State of Local Emergency using the following measures:
 - a. Solicit draft Emergency Ordinance of a State of Local Emergency (document) input from City departments, including recommendations to modify, suspend, or cancel enforcement of ordinances and other rules in which they have an interest or responsibility.
 - b. With the assistance of the City Attorney and City Clerk, draft the Emergency Ordinance of a State of Local Emergency document.
 - c. Request for an Emergency Ordinance of a State of Local Emergency before the City of North Port Commission at a duly-convened Commission meeting
 - i. Under Section 2-54 of the Code of the City of North Port, “[t]he city manager and any one commissioner may call an emergency meeting. An emergency meeting shall be called only when the conditions and circumstances indicate that emergency measures must be taken.”
 - d. Disseminate the original, and all subsequent ordinances to all department directors, County and State emergency management, other affected entities, and the media. [A sample Emergency Ordinance of a State of Local Emergency Document may be found as Appendix A to the CEMP.]
2. Closing of Schools and Businesses
 - a. The decision for the closing of schools will be made by the School Board of Sarasota County School, with the advice of the Sarasota County Emergency Operations.
 - b. Businesses will close using the decision of their owners/managers, and under recommendations from the City EOC.

3. Requesting State Assistance

- a. All requests for County and State assistance from City agencies will follow this protocol:
 - i. The requesting department will forward its request to their respective liaison in the City EOC.
 - ii. The message will then be analyzed and forwarded to the City Liaison Officer at the County EOC as seen necessary once all local resources have been exhausted.
- b. Departments shall not initiate resource requests directly to the County or State. All requests for County or State Assistance must be made through the City of North Port City EOC.

4. Departmental Pre-Storm Checklists

A department/office-specific checklist has been developed to serve as job aid for tasks which should be either reviewed or completed within certain time-frames relative to the onset of Tropical Storm-force winds. When directed, department directors will initiate the checklist and report status during director- and EOC operational-briefings.

B. Evacuation Routes

Through the City of North Port, River Road, Sumter Boulevard, Toledo Blade Boulevard, Tamiami Trail (US 41) and I-75 are designated as primary evacuation routes. Although all routes can be considered primary, citizens are urged to use I-75 and US 41 as a last resort. The reason for this is that most people are familiar with I-75 and US 41, and therefore use of these roads during an evacuation will be high. However, since these routes run along the coast, and, historically, these roads are normally crowded in an evacuation, people are urged to use US 17, County Road 74, and Kings Highway to evacuate North Port. These roads will take people inland, away from the high wind and storm surge threat.

C. Medically Dependent Persons Program. Sarasota County is mandated under Florida Statutes §252.355 to register all persons who have special transportation or medical needs during an evacuation situation. The process for registration is as follows:

1. The presence of the Medically Dependent Person (MDP) registration is advertised in many different formats throughout the year.

2. People are urged not to register unless it is needed. If people have friends or family that can transport them and/or take care of them, then they need to use those options. The reason for this is that the City of North Port, as of Summer 2018, has 228 people registered in this program. City resources to transport and shelter this population is extremely limited.
 3. Once interest is shown in the program, a form is sent to this person, or their caregiver, to fill out. The form requests information such as name, address, special needs, and how many people they are to bring with them.
 4. Once Sarasota County Emergency Management is in receipt of this returned form and eligibility is confirmed, the name is then entered their database, which is maintained by Sarasota County.
 5. Once a storm threatens, and evacuation orders are imminent, the persons on the list which are residing in the potentially threatened area are called by a phone bank, which has been staffed and trained by Sarasota County Emergency Management and managed from the County EOC. The people are notified that they are about to be picked up, and that they need to get their personal effects together.
 6. The list is given to the MDP Operations at the County EOC which develops routes to pick up these people via school bus with hydraulic lift, the Sarasota County Area Transit (SCAT) via buses with hydraulic lift, and North Port Fire Rescue for transport of non-ambulatory clients.
 7. These individuals and their caregivers will then be picked up and brought to a designated facility in county, if the situation allows for it, or out of county, for larger incidents.
- D. Facilities Needing Attention During Evacuation. Lists of facilities needing special attention during the evacuation process may be found in the City EOC.
- E. Re-entry. Re-entry to evacuated areas is a controlled activity for residents, people who work in the area and for contractors, and others seeking work in the evacuated area. Re-entry will be permitted only during daylight hours.
1. The Police Department will manage appropriate Traffic Control Points (TCP), as identified by number and intersection on the TCP maps maintained in the EOC.
 2. Proof of residency in the area or area employment must be presented at the TCP to gain re-entry.

- a. For residents, a driver license listing an address in the evacuated area is acceptable for re-entry. Lacking that specific documentation of residency in the evacuated area can be established by photo ID along with a utility bill addressed to the bearer at the area address, or a lease or proof of building ownership.
 - b. Employees of businesses in the evacuated area must present a photo ID issued by that business for the address in the evacuated area, or a photo ID along with other proof of employment at the business address in the evacuated area such as a paycheck stub.
3. Re-entry to evacuated areas will begin and will be only during daylight hours, and as damage assessment, debris removal and the status of utilities restoration permits. When the evacuated area is large or involves multiple sectors, re-entry is likely to take place in phases. Local radio broadcasts will be used to announce which areas are open for re-entry, and when re-entry will commence.
4. Persons evacuated under the PSN program will be returned to their homes after their homes are determined to be habitable.

F. Sheltering

1. Within the City of North Port are six hurricane evacuation centers and two medical dependent persons' centers which are operated by the Sarasota County Health Department and School Board of Sarasota County. The City of North Port will support those centers with fire inspection, law enforcement and emergency medical personnel as needed.
2. Sheltering of Emergency Worker Families

The City of North Port has draft a plan for an emergency worker family center program. At the inception of an event, City department heads are to poll their employees to find out how many spaces their employees' families might need should they need to work in the EOC (or elsewhere in the County) during a disaster.

3. Refuges of Last Resort

The Emergency Management Director, based on the authority granted in the Governor's declaration, will authorize that identified facilities be commandeered for use as refuges of last resort. Refuges of Last Resort are structures/buildings designated as the best possible accommodation for

people who cannot or do not evacuate in time to reach safe public evacuation centers. Refuges provide no special accommodations such as food, water, security, first aid, or parking. These structures are not guaranteed to be structurally sound in strong hurricane situations; however, they are deemed better than persons trapped on the road in their vehicle during strong winds and rising waters. Refuges are viewed as a last resort until the hurricane or other disaster passes.

G. Mutual Aid Agreements and Memoranda of Understanding

1. The City of North Port is a signatory to the Florida Statewide Mutual Aid Assistance program (see Appendix D) and the Florida Fire Chiefs Association's Statewide Emergency Response Plan. When resource needs beyond the capabilities of the City are identified, all mutual aid requested will be processed through the Sarasota County Emergency Operations Center.
2. Given availability of resources, City of North Port assets may respond to requests for assistance, received through the appropriate channels. Requests for mutual aid will be directed to the appropriate signatory of the inter-local mutual aid agreement. If mutual aid is required for which no agreement has been pre-established, the request will be forwarded to Sarasota County Emergency Management.
3. Various municipal departments may enter mutual aid agreements specific to their needs. All mutual aid agreements, whether called letters of agreement, memoranda of understanding, or other designation will be reviewed by the City Attorney prior to the City becoming a signatory.
4. If Florida Statutes so requires, or the City Attorney believes it appropriate, a specific mutual aid agreement may be required to have the approval of the City Commission prior to the City becoming a signatory.
5. When appropriate, the City will seek financial reimbursement from the requesting agency.
6. The North Port EOC is the coordination point (i.e., agency dispatch) for mutual aid activities for assets of the City when the CEMP has been activated.

H. Communications

1. Establishment of Plain Language Communications
 - a. During disaster operations when mutual aid resources are operating, personnel will use common terms and definitions that can be understood by individuals from all responder disciplines. When communicating with others, all personnel shall employ “plain speak” or “clear text” language. The use of 10-codes, signals or other jargon is prohibited.
 - b. Personnel will also use commonly accepted language that is consistent with policies, plans or procedures in the NIMS, NRF, or CEMP (State, County or City) to facilitate multi-agency, multi-disciplinary or multi-jurisdictional communications during an incident.
 - c. Standardized terminology will also be used in all publications.
2. Telephone
 - a. All command and supervisory personnel are issued cellular smartphones.
 - b. The City EOC has landline telephone and facsimile services.
 - c. Prior to full activation of the EOC, a listing of all key personnel and their contact numbers shall be widely distributed.
 - d. In the event of a loss of landline and cellular telephone communication, two satellite telephones are available from the Police Department. Additional satellite-based telephone units are available from the Sarasota County EOC.
3. Radio
 - a. All Fire Rescue and Police Department units and some Public Works’ and Utilities vehicles have the capability to communicate on the County’s 800 MHz radio system, on their respective talkgroups. Fire Rescue also maintains a VHF system for communications with the Florida Forest Service and as a back-up to the 800 MHz system.
 - b. During an emergency or disaster, units on the 800 MHz system may operate off the County’s “wide-area” talkgroups (A-10 to A-15) for mutual aid or mission-specific purposes. In addition, units may

operate on the State Mutual Aid channel (Fire Rescue talkgroup B-10) and the National Public Safety Radio channels (Fire Rescue talkgroups B-11 to B-15) to communicate with out-of-county resources.

- c. In the event of an 800 MHz system failure, units shall switch to the talk-around channels (Fire Rescue talkgroups B-7, B-8 or B-9), and relay information to Dispatch via Command.
- d. Combination satellite radio/telephone units are available from the Sarasota County EOC should all land-based communications fail. Two satellite phones are available from the North Port Police Department.

4. Data

- a. The City has internet functionality provided by Verizon FIOS, Comcast cable access and broadband wireless connections.
- b. The City EOC has wired and wireless network/internet capability.
- c. When requested to report to the EOC, City personnel shall bring their City-issued laptop and smartphone (which may be tethered to provide a last-resort measure of internet connectivity).

I. Fuel

1. Availability During Normal Conditions

- a. During normal operations, the City of North Port may purchase motor vehicle fuel from local service stations using a fleet credit card.
- b. Fleet Management maintains a supply of 10,000 gallons of gasoline and 20,000 gallons of diesel fuel at the facility at 1100 N. Chamberlain Blvd and 5455 Pan American Blvd.
- c. Road and Drainage has vehicles with 100-gallon L-tanks with diesel fuel. They also have a portable fuel trailer with the capability of holding 500 gallons of fuel. This unit would be topped off and if necessary driven out of the City of North Port until the effective scope of the storm until the storm passes.

2. Availability During Emergency Conditions

- a. During the preparatory stages of an event, Fleet will ensure the tanks are full and their generator functional.
- b. Prior to a storm, an email would be issued by Fleet reminding all employees to immediately top-off their tanks at the local gas stations.
- c. If, during an emergency, City vehicles are unable to obtain fuel from a commercial source, they will be permitted to fuel at the Fleet Management facility.
- d. The City has a fuel supplier who can obtain fuel from any refinery and has multiple contracts with almost every fuel shipping vendor in the state. They also give priority to local governments over retail establishment.
- e. If necessary, the City may request the fuel truck from Sarasota County.

J. Community Emergency Response Team. The City of North Port Emergency Management is the primary liaison to the North Port Community Emergency Response Team and neighborhood-based teams at Islandwalk and Cypress Falls. Membership consists of individuals who have completed the 21-hour CERT training program and have applied to become a member.

There are three levels of membership:

- Level 1-Trained but inactive: Applies to those who have completed CERT basic training to gain knowledge about preparing for and surviving a disaster and responding to the post disaster needs of their family and neighbors. These are individuals who do not want to be part of the North Port CERT organization and will not be part of the NP CERT City response plan.
- Level 2-Trained with basic skills: Applies to those who have completed CERT basic training and meet the membership eligibility requirement of the North Port CERT organization. These individuals will, after taking care of their families and neighbors, respond to other neighborhoods as members of a district team if necessary. To qualify as a Level 2 a person must be certified in CPR/AED and Advanced First Aid per either the American Heart Association or the

Red Cross curriculum [SB2] and must have completed ICS100 and ICS700 training.

- Level 3-Trained with advanced skills: Applies to those who have completed CERT basic training, training in more advanced skills and meet the membership eligibility requirements of the North Port CERT organization. These individuals will be part of the North Port CERT response plan. To qualify as a Level 3 a person must have been a Level 2 for a minimum of six months and must have completed the recommended training protocols and agreed to abide by the guidelines outlined in the organization's standard operation procedures (SOPs) and standard operating guidelines (SOGs) in any of the six emergency response and community support disciplines outlined below.
 - i. Communications - Includes Amateur Radio licensure and/or communications equipment training in accordance with the communications needs of NP CERT and the City of North Port. Members of this team might be called upon to provide communications links between NP CERT teams and the City of North Port Emergency Operations Center (NPEOC) or the NPEOC and other disaster response agencies.
 - ii. Damage Assessment - Includes training in the County's and City's damage assessment process in accordance with the needs of the City of North Port. Members of this team are assigned as scribes and ride along as part of a three-member team assessing the damage to properties throughout the City.
 - iii. Grid Search - Includes pattern search training. Training to be provided by an agency approved/recognized by the City of North Port. Members of this team would participate as part of a large-scale search rescue operation under the direction of a law enforcement or fire rescue agency.
 - iv. Medical Operations - Includes an acceptable level of medical response training to include applicable American Heart Association, Red Cross, Sarasota County Department of Health or other recognized current first responder training programs, including EMT/Paramedic. Members of this team would provide stand-alone first aid/medical

services in times of overwhelming community need exceeding CERT basic training skills.

- v. Neighborhood Point of Distribution (NPOD) - Includes training in establishing and managing a NPOD per the City of North Port's Comprehensive Emergency Management Plan and North Port Emergency Management SOP 200.001. Members of this team would lead/assist in the operations of a NPOD which includes handing out water, ready-to-eat meals, tarps and ice to citizens, keep track of inventory, ordering more inventory, managing the NPOD rehab area, assigning duties to on-site personnel, overseeing the safety and wellbeing of on-site personnel, and working with other agencies such as North Port Police, North Port Fire Rescue, other City departments, etc.
- vi. Center Support - Includes training by Red Cross for emergency center management and operations in times of community or disaster deployment. Members of this team would provide support to the center management or medical staff as appropriate.

Organization, management and operation of CERT will be under the direction of the CERT Volunteer Coordinator from each team with support provided by City Emergency Management. CERT members shall follow the policies and procedures described in the CERT Operations Manual. In no cases, will a CERT member self-deploy to a mission within or outside of the City of North Port.

K. Public Emergency Notification.

The ability to save lives and protect property during an emergency activation depends upon rapid, accurate, and coordinated information distribution to all segments of the population utilizing all available distribution mechanisms. The City's Management Team, comprised of directors of each of the City's departments, will meet periodically before, during and after an emergency to minimize conflicting information being disseminated to the public. A Crisis Communication Plan has been developed and attached to the Plan as Appendix G. The Plan outlines the roles, responsibilities and protocols that will guide the City in promptly sharing information with all of City's audiences during an emergency or crisis.

- 1. Media Releases. The PIO prepares and distributes regular press releases, schedules press briefings and media interviews. All press releases must be reviewed and approved by the Incident Commander prior to distribution.

2. Emergency Alert System (EAS). The Emergency Alert System (EAS) is a national public warning system that requires TV and radio broadcasters, cable television systems, wireless cable systems, satellite digital audio radio service (SDARS) providers, direct broadcast satellite (DBS) service providers and wireline video service providers to offer to the President the communications capability to address the American public during a national emergency. The system also may be used by state and local authorities to deliver important emergency information such as AMBER (missing children) alerts and emergency weather information targeted to a specific area.

- a. Primary and Back-Up Warning Systems - During periods of County Emergency Operation Center activations, WMTX 100.7 FM (the LP1 and LP2A stations), WWRM 94.9 FM (the LP2B station), WHPT 102.5 FM (the LP2C station) and local government access (Comcast cable channel 19, Verizon FIOS channel 32) may broadcast directly from Sarasota County. Other EAS Operational Stations in Sarasota County include:

WKXY AM 930	WJIS FM 88.1
WFLA AM 970	WLTQ FM 92.1
WTMY AM 1280	WKZM FM 104.3
WDDV AM 1320	WCTQ FM 106.5
WSDV AM 1450	WSRZ FM 107.9

- b. All other media sources will be fed information from the City EOC via facsimile or email.
- c. Television customers will see the warning as a “crawl” at the bottom of the TV screen. The Weather Channel (Comcast cable channel 31 and 522, Verizon FIOS channel 119) routinely transmits all warnings for this area on receipt.
- d. The National Weather Service Office in Tampa Bay will activate the EAS on request of the City EOC.
- e. A low-wattage radio station serving the North Port-area, WKDW at 97.5 FM and live internet stream via <http://kdwradio.com/> may provide City-specific information during emergencies.

3. Interpreter for the Deaf and Foreign Language Translators. During activations, the EOC may be staffed by an interpreter for the hearing

impaired and translators for the Spanish and Ukrainian speaking population of the City. The Sarasota County Public Safety Communication's Center and City of North Port Police Department dispatch use TDD equipment for providing information to the hearing impaired.

4. Internet Website. An Internet website containing City of North Port emergency management information that would be of interest to the public and official agencies is available. This information is regularly updated, especially when the EOC is activated.
5. Direct Notification. If necessary due to a nighttime threat or a quickly escalating threat to residents, sirens and loudspeakers from police and fire vehicles may be utilized to warn the public of impending flood conditions, tornado potential, or hazard materials spill. Vehicles with sirens will pass through the threatened neighborhood to awaken the public with instructions to tune into local media stations for further information on the impending dangers.
6. City Contact Center. During an emergency/disaster that may affect parts of the City, a team of telephone operators will be assembled near the EOC to provide information to the public. At least one of the operators may be bilingual (to include Spanish and Ukrainian).
7. Telephone Notification System. Emergency Management operates the North Port Community Notification System (CodeRED®) which is an emergency notification system for recorded messages, text and email.
8. Social Media. The City of North Port provides routine and emergency information via Twitter and Facebook.

VI. FISCAL MANAGEMENT

- A. It is the practice of City of North Port employees to use the same process to fill-out and file financial reports in daily activities as it is during emergency situations. These procedures are compatible with State and Federal financial procedures. City and County finance agents work together to ensure continuity in financial procedures during emergency and disaster events; however, FS §252.38(2) states a municipality is not required to coordinate requests for reimbursement under Federal public disaster assistance programs.
- B. The City's Finance Department will work as a team to support preparedness, response, recovery, and mitigation activities on an everyday basis. This includes any training and guidance as needed. All disaster costs will be captured and handled through a Disaster/Emergency Account established by the Finance Department.
- C. The City's Purchasing Division will provide procurement support for supplies, facilities, equipment, and supplies needed by City agencies. Items that may be included are meals, vehicle repair parts, construction materials, and rental equipment. Under Section 2-408, Emergency Procurement, of the Code of the City of North Port, the normal competitive process is waived, and the purchase of certain equipment and contracts is authorized with the approval of the department director, City Manager or City Commission, depending on the cost.
- D. City emergency operations are initially funded by the budgeted allocations of each department engaged in emergency operations.
- E. The City may allocate and expend funds as appropriate for local emergency operations in accordance with FS §252.37. As a rule, funding availability may be assumed for all emergency response efforts.
- F. Close expenditure controls must be exercised during any emergency operation. The City Manager, operating from the EOC, is the screen point for expense authorization. The City Purchasing Manager will provide technical overview of this area. No emergency staff shall make funding commitments without the coordination of the Finance Department director and City Manager.
- G. Complete and accurate accounts of emergency expenditures and obligations, including personnel and equipment costs, must be maintained. Accounting is required on a daily (sometimes more regular) basis to identify and document personnel costs, supplies and materials used, and equipment hours committed to each specific preparation, response and recovery task. Equipment use charges must be associated with an equipment operator. All personnel hours must be identified with a specific and definable task. When responding to another

jurisdiction for mutual aid, the responding party must obtain a mission number or tracking number which will be used to identify costs. Once costs are figured at the end of the event, the department head shall forward all costs to the Cost Unit Leader, who shall then forward any costs to the hosting jurisdiction. In cases of mutual aid requests from the State, City Finance shall forward costs, along with the appropriate paperwork to the Florida Division of Emergency Management (FDEM). Required forms may be obtained from City Emergency Management.

- H. Following an event, the City Emergency Management will coordinate with all departments and volunteers to compile costs and proper documentation needed for reimbursement under Public Assistance procedures. A member of the City Finance Department, Emergency Management, and pertinent department officials will be present during the reimbursement application process with FEMA and/or FDEM.
- I. When Federal Public Assistance is provided under the Stafford Act, local projects approved by the FEMA are subject to both State and Federal audit (except small projects approved under Section 419 of Public Law 92-288 which require only Federal inspection).
- J. There are several funding agreements that are made available to counties and other local jurisdictions during peacetime, as well as disasters. Most of these agreements come in the form of grants. The following is a list of examples of funding agreements that can and/or will assist the City of North Port in emergency and disaster mitigation, preparedness, response, and recovery:
 - 1. Emergency Management Preparedness and Assistance (EMPA) Competitive Grant. This is a competitive grant for which municipalities may opt to apply for each year. This competitive grant, sponsored by the Florida Division of Emergency Management, awards monies to communities who submit projects that will enhance emergency management capabilities on local, regional, and state levels. Submitted projects can consist of mitigation activities, preparedness activities, response capability upgrades, and recovery needs. Once projects are submitted, they are reviewed for consistency with State and local plans and awarded points to establish a priority of projects. Each year, the City reviews its list of projects and decides on sufficiency and rationality of submitting a project to this grant process.
 - 2. Program/Technical Funding. On occasion, funding becomes available from the State to implement programs on the local level. The City of North Port uses monies from these funding sources as necessary to enhance its program capabilities.

3. Mitigation Program Funding. This category includes programs such as the Flood Mitigation Assistance Program (FMAP) and the Hazard Mitigation Grant Program (HMGP). The City reviews its situation annually to determine if there are any outstanding projects which might qualify for these types of programs. Once identified, the City works with the property owners to fill out an application for these programs and submits the application on behalf of the property owner. If the application is approved, the City enters an agreement with the State of Florida to oversee and manage the project and reimbursement process. The City of North Port works with the Florida Division of Emergency Management to identify funding sources that can be used to implement programs and enhance already-existing programs. Any programs that are made available are reviewed by the City Emergency Management and used as needed to enhance emergency mitigation, preparedness, response, and recovery capabilities in the City of North Port.

IX. AUTHORITIES AND REFERENCES

A. Primary Enabling Legislation

1. Florida Statutes, Chapter 252 which delineates specific local responsibilities regarding emergency management.

B. Applicable Laws, Ordinances, Rules and other Regulations

1. Federal Statutes, Regulations and Directives

- a. Homeland Security Presidential Directive 8
- b. Public Law 93-234, Flood Disaster Protection Act of 1973
- c. Public Law 106-390, Disaster Mitigation Act of 2000
- d. Public Law 99-499, Community Right to Know Act of 1986
- e. Public Law 95-510, Comprehensive Emergency Response, Compensation and Liability Act of 1980
- f. Public Law 84-99, Flood Emergencies (1976)
- g. Public Law 89-665, National Historic Preservation Act (1966)
- h. National Flood Insurance Act of 1968
- i. 44 CFR Parts 59-76, National Flood Insurance Program
- j. 44 CFR Part 206, Federal Disaster Assistance
- k. National Response Framework

2. *Constitution of the State of Florida*

- a. Article VIII S.2(b), Municipal Powers

3. State of Florida Statutes

- a. Chapter 23, Florida Mutual Aid Act (1998)
- b. Chapter 119, Public Records

- c. Chapter 125, County Government
 - d. Chapter 252, Emergency Management
- 4. State of Florida References
 - a. State of Florida Comprehensive Emergency Management Plan and Administrative Rules, Chapter 9G-2
 - b. Southwest Florida Regional Planning Council, Local Emergency Planning Committee Plans and Standard Operating Procedures
 - c. State of Florida Hazard Mitigation Plan
 - d. Florida Fire Chiefs Association's Statewide Emergency Response Plan
- 5. Sarasota County References
 - a. Sarasota County Comprehensive Emergency Management Plan, and accompanying Standard Operating Procedures
 - b. Sarasota County Unified Local Mitigation Strategy 2015
- 6. City of North Port References
 - a. Charter and Code of the City of North Port
 - b. ~~General Services~~[Human Resources](#) Department, Risk Management Manual
 - c. Human Resources Department, Personnel Rules and Regulations
 - d. Finance Department, Claims Handling Procedures
 - e. Fire Rescue, Standard Operations Guidelines
 - f. Police Department, Emergency Operations
 - g. Utility Department, Standard Operating Procedures

7. Other References

- a. U.S. Coast Guard, Tampa, Area Contingency Plan for Oil and Hazardous Materials Substance Pollution Response
- b. National Response Framework
- c. National Wildfire Coordinating Group, Incident Command System forms

X. GLOSSARY

- A -

After Action Report (AAR). The AAR documents the performance of exercise related tasks and makes recommendations for improvements. The Improvement Plan outlines the actions that the exercising jurisdiction(s) plans to take to address recommendations contained in the AAR.

Assembly Site. A pre-identified temporary field site.

- B -

- C -

Call Tree. A matrix of people and their telephone numbers, with instructions on who should call whom, and in what order.

Common Communication Plan (CCP). An interoperable communications plan designed to be utilized for multi-agency and multi-jurisdictional incident management operations. All entities involved in managing the incident will utilize common terminology, prescribed by the NIMS, for communications.

Comprehensive Emergency Management (CEM). An integrated approach to the management of emergency programs and activities for all four emergency phases (mitigation, preparedness, response, and recovery), for all types of emergencies and disasters (natural, manmade, and attack), and for all levels of government (local, state, and Federal) and the private sector. A CEM program supports the mission, vision, and strategic goals of the organization to ensure the safety of patients, staff, and resources, and provides for COOP in the event of a disaster or emergency that affects the organization. The overall goal of CEM is the prevention or minimization of the loss of life and injuries, and the provision for the continuity of the organization's critical operations.

Contingency. A future event that is likely but not certain to happen. The consequences of the occurrence are such that one must prepare for the event.

Contingency Plan. Describes how an agency intends to respond to events, which disrupts normal operations. It provides instructions on how to perform recovery tasks to continue essential functions.

Continuity of Operations (COOP). An internal effort within an organization to assure that the capability exists to continue essential business functions across a wide range of potential emergencies, including localized acts of nature, accidents, and technological and/or attack/terrorist-related emergencies. In addition to the CEM phase of mitigation, preparedness,

response and recovery, COOP planning includes resumption and restoration phases. The goal of COOP is that an effective CEM process would guarantee that critical business functions would continue without interruption. COOP adds a resumption phase that identifies efforts that are directed to restoring the organization's critical operations if a disaster or emergency disrupts essential functions.

Continuity of Operations Plan. Describe activities that will enable an agency to continue to perform essential functions after a disruption has occurred.

Corrective Actions. Improved procedures that are based on lessons learned from actual incidents or from training and exercises.

Critical Infrastructure. Systems and assets, whether physical or virtual, so vital to the United States that the incapacity or destruction of such systems and assets would have a debilitating impact on security, national economic security, national public health or safety, or any combination of those matters.

- D -

Damage Assessment. An appraisal or determination of the effects of the disaster on human, physical, economic, and natural resources.

Direction, Control and Coordination. Development of the capability for the chief executive and key staff to direct, control and coordinate response and recovery operations.

Disaster. Accidental or uncontrollable events, actual or threatened, that are concentrated in time and space, in which a society undergoes severe danger and incurs such losses to its members and physical appurtenances that the social structure is disrupted and the fulfillment of all or some of the essential functions of the society is prevented.

Disaster Levels.

- Minor

An occurrence which may be managed by the resources of the City with some inter-local mutual aid support.

- Major

An occurrence of such magnitude that the County Board of Commissioners has declared a Local State of Emergency. All County resources are utilized and mutual aid from other counties, or the State of Florida, are likely. The Governor may have issued a Disaster Declaration.

- **Catastrophic**

An occurrence of such magnitude that several counties have been impacted. The Governor has most likely issued a Disaster Declaration. Federal resources may have been requested and a Disaster Declaration may have been issued by the President.

- E -

Education, Training and Exercises. Assessment, development, and implementation of a training or educational program and evaluation of emergency response plans and capabilities through a program of regularly scheduled tests and exercises.

Emergency. An unexpected, serious occurrence or situation urgently requiring prompt action.

Emergency Management. The discipline and the profession of applying science, technology, planning, and management to deal with extreme events that can injure or kill large numbers of people, do extensive damage to property and disrupt community life.

Emergency Management Program. A program that implements the mission, vision, and strategic goals and objectives as well as the management framework of the program and organization.

Emergency Management Team. Individuals that are authorized to declare a disaster and activate the Continuity of Operations Plan (COOP). The purpose of this team is to provide immediate and ongoing coordination of the contingency and recovery processes during an interruption in service.

Entry-level First Responders. Entry-level first responders are defined as any responders who are not a supervisor or manager.

Essential Functions. Functions that must occur to enable a department or agency to perform services.

Exercise. Exercises are a planned and coordinated activity allowing homeland security and emergency management personnel—from first responders to senior officials—to demonstrate training, exercise plans, and practice prevention, protection, response, and recovery capabilities in a realistic but risk-free environment. Exercises are a valuable tool for assessing and improving performance, while demonstrating community resolve to prepare for major incidents.

Evaluations. Tools used after exercises or actual events to document strengths and weaknesses in a jurisdiction's preparedness, e.g., Lessons learned or after-action reports.

- F -

Finance and Administration. Development of fiscal and administration procedures to support

emergency measures before, during, and after disaster events and to preserve vital records.

- G -

- H -

Hazard. Natural, technological, or civil threats to people, property, and the environment.

Hazard Identification and Risk Assessment. The process of identifying situations or conditions that have the potential of causing injury to people, damage to property, or damage to the environment, and the assessment of the likelihood, vulnerability and magnitude of incidents that could result from exposure to hazards.

Hazard Management. Systematic management approach to eliminate hazards that constitute a significant threat to the entity or to reduce the effects of hazards that cannot be eliminated through a program of hazard mitigation.

Homeland Security Exercise and Evaluation Program (HSEEP). A capability- and performance-based exercise program that provides a standardized policy, methodology, and language for designing, developing, conducting, and evaluating all exercises. HSEEP also facilitates the creation of self-sustaining, capabilities-based exercise programs by providing tools and resources such as guidance, training, technology, and direct support

- I -

Incident Action Plan (IAP). An oral or written plan containing general objectives reflecting the overall strategy for managing an incident.

Incident Command System (ICS). A standardized organizational structure used to command, control, and coordinate the use of resources and personnel that have responded to the scene of an emergency. The concepts and principles for ICS include common terminology, modular organization, integrated communication, unified command structure, consolidated action plan, manageable span of control, designated incident facilities, and comprehensive resource management. It's sometimes referred to as the National Incident Management System.

Information Technology (IT). Applied computer systems - both hardware and software, and often including networking and telecommunications, usually in the context of a business or other enterprise.

Interoperable. A principle of the NIMS that holds that systems must be able to work together and should not interfere with one another if the multiple jurisdictions, organizations, and functions that come together under the NIMS are to be effective in domestic incident management. Interoperability and compatibility are achieved through the use of such tools as common communications and data standards, digital data formats, equipment standards, and

design standards.

- J -

Joint Information Center (JIC). A facility established to coordinate all incident-related public information activities. It is the central point of contact for all news media at the scene of the incident. Public information officials from all participating agencies should collocate at the JIC.

Joint Information System (JIS). Integrates incident information and public affairs into a cohesive organization designed to provide consistent, coordinated, timely information during a crisis or incident operations. The JIS provides a structure for developing and delivering coordinated interagency messages; developing, recommending, and executing public information plans and strategies on behalf of the Incident Commander (IC); advising the IC concerning public affairs issues that could affect a response effort; and controlling rumors and inaccurate information that could undermine public confidence in the emergency response effort.

- K -

- L -

Laws and Authorities. Federal, state, and local statutes and any implementing regulations that establish the legal authority for the development and maintenance of the emergency management program and organization, and define the emergency powers, authorities and responsibilities of the chief executive official and the emergency program manager.

Lessons Learned. Knowledge gained through operational experience (actual events or exercises) that improve performance of others in the same discipline.

Logistics and Facilities. Identification, location, acquisition, distribution, and accounting for services, resources, materials and facilities to support emergency management.

- M -

Multi-Agency Coordination System (MACS). A MACS is a combination of facilities, equipment, personnel, procedures, and communications integrated into a common system with responsibility for coordinating and supporting domestic incident management activities.

Mitigation. Activities taken to eliminate or reduce the degree of risk to life and property from hazards, either prior to or following a disaster or emergency.

- N -

National Response Framework (NRF). A planning tool mandated by HSPD-5 that integrates National domestic prevention, preparedness, response, and recovery plans into one all-discipline, all-hazards plan.

NIMS Compliance Assistance Support Tool (NIMSCAST). The NIMSCAST will be a self-assessment instrument for State, territorial, tribal, local, private sector, and non-governmental organizations to evaluate and report their jurisdiction's achievement of all NIMS implementation activities.

No-Notice Event/ Incident. An occurrence or event, natural or human-caused, that requires an emergency response to protect life or property (i.e., terrorist attacks and threats, wild land and urban fires, floods, hazardous materials spills, nuclear accident, aircraft accident, earthquakes, hurricanes, tornadoes, public health and medical emergencies etc.)

- O -

Operations and Procedures. Development, coordination, and implementation of operational policies, plans, and procedures.

- P -

Planning. The collection, analysis, and use of information, and also the development, promulgation, and maintenance of the organizational comprehensive emergency management plan, action plans and mitigation plans.

Plain Language. Common terms and definitions that can be understood by individuals from all responder disciplines. The intent of plain language is to ensure the clear and accurate communication of information during an incident.

Preparedness. Activities, programs, and systems developed prior to a disaster or emergency that are used to support and enhance mitigation of, response to, and recovery from disasters or emergencies.

Preplanned Event. A non-emergency activity. ICS can be used as the management system for a wide range of events, e.g., parades, concerts, or sporting events.

Public Information. Procedures to disseminate and respond to requests for pre-disaster, disaster, and post-disaster information involving employees, the public and the media. Also, an effective public education program regarding hazards affecting the jurisdiction.

- Q -

- R -

Records Management. The planning, controlling, directing, organizing, training, promoting, and other managerial activities involved with respect to records creation, records maintenance and use, and records disposition in order to achieve adequate and proper documentation of the policies and transactions of the Federal government and effective and economical management of agency operations.

Recovery. Activities and programs designed to return the entity to an acceptable condition.

Resource Management. Systematic development of methodologies to assure the prompt and effective identification, distribution, accounting, and use of personnel and major items of equipment for essential emergency functions.

Resource Typing. Resource typing is the categorization of resources that are commonly exchanged through mutual aid during disasters. Resource typing definitions help define resource capabilities for ease of ordering and mobilization during a disaster.

Response. Activities designed to address the immediate and short-term effects of the disaster or emergency.

Response Asset Inventory. An inventory of the jurisdiction's resources that have been identified and typed according to NIMS Resource Typing Standards. Development of a Response Asset Inventory requires resource typing of equipment, personnel, and supplies identified in the inventories of City resources.

Response Assets/Resources. Response Resources are defined as assets that include equipment, personnel and supplies that are available for use during an incident.

Risk. The probability that a hazard will occur.

- S -

Saffir-Simpson Scale. The Saffir-Simpson Hurricane Scale is a 1-5 rating based on the hurricane's present intensity. This is used to give an estimate of the potential property damage and flooding expected along the coast from a hurricane landfall. Wind speed is the determining factor in the scale, as storm surge values are highly dependent on the slope of the continental shelf and the shape of the coastline, in the landfall region. Note that all winds are using the U.S. 1-minute average.

Category One Hurricane: Winds 74-95 mph (64-82 knot or 119-153 km/hour). Storm surge generally 4-5 feet above normal. No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Some damage to poorly constructed signs. Also, some coastal road flooding and minor pier damage.

Category Two Hurricane: Winds 96-110 mph (83-95 knot or 154-177 km/hour). Storm surge generally 6-8 feet above normal. Some roofing material, door, and window damage of buildings. Considerable damage to shrubbery and trees with some trees blown down. Considerable damage to mobile homes, poorly constructed signs, and piers. Coastal and low-lying escape routes flood 2-4 hours before arrival of the hurricane center. Small craft in unprotected anchorages break moorings.

Category Three Hurricane: Winds 111-130 mph (96-113 knot or 178-209 km/hour). Storm surge generally 9-12 feet above normal. Some structural damage to small residences and utility buildings with a minor amount of curtain-wall failures. Damage to shrubbery and trees with foliage blown off trees and large trees blown down. Mobile homes and poorly constructed signs are destroyed. Low-lying escape routes are cut by rising water 3-5 hours before arrival of the center of the hurricane. Flooding near the coast destroys smaller structures with larger structures damaged by battering from floating debris. Terrain continuously lower than 5 feet above mean sea level may be flooded inland 8 miles (13 km) or more. Evacuation of low-lying residences with several blocks of the shoreline may be required.

Category Four Hurricane: Winds 131-155 mph (114-135 knot or 210-249 km/hour). Storm surge generally 13-18 feet above normal. More extensive curtain-wall failures with some complete roof structure failures on small residences. Shrubs, trees, and all signs are blown down. Complete destruction of mobile homes. Extensive damage to doors and windows. Low-lying escape routes may be cut by rising water 3-5 hours before arrival of the center of the hurricane. Major damage to lower floors of structures near the shore. Terrain lower than 10 ft above sea level may be flooded requiring massive evacuation of residential areas as far inland as 6 miles (10 km).

Category Five Hurricane: Winds greater than 155 mph (135 knot or 249 km/hour). Storm surge generally greater than 18 feet above normal. Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. All shrubs, trees, and signs blown down. Complete destruction of mobile homes. Severe and extensive window and door damage. Low-lying escape routes are cut by rising water 3-5 hours before arrival of the center of the hurricane. Major damage to lower floors of all structures located less than 15 feet above sea level and within 500 yards of the shoreline. Massive evacuation of residential areas on low ground within 5-10 miles (8-16 km) of the shoreline may be required.

Standardized Equipment List (SEL). A list issued annually to promote interoperability and standardization across the response community at the local, state, and Federal levels by offering a standard reference and a common set of terminology. It is provided to the responder community by the Interagency Board for Equipment Standardization and Interoperability (IAB). The SEL contains a list of generic equipment recommended by the IAB to organizations in preparing for and responding to all-hazards.

Standard Operating Procedures or Guidelines (SOP or G). A complete reference document that details the procedures or guidelines for performing a single function or several interdependent functions.

Standardized Terminology. Commonly accepted language that is consistent with policies, plans, or procedures in the NIMS and NRP to facilitate multi-agency, multi-disciplinary or multi-jurisdictional communications during an incident.

- T -

Task. An action that is performed to complete an essential function.

- U -

- V -

Vulnerability. The susceptibility to injury and damage from hazards.

- W - X - Y - Z -

XI. ACRONYMS

This list is not designed to be an authoritative source, merely a handy reference. Certain organizations and terms listed herein are obsolete but are included because they may still appear in publications and other correspondence.

AAR	After Action Report
ALF	Assisted Living Facility
ARES	Amateur Radio Emergency Services
CAP	Civil Air Patrol
CCP	Crisis Communications Plan
CEMP	Comprehensive Emergency Management Plan
CERT	Community Emergency Response Team
CISD	Critical Incident Stress Debriefing
CNP	City of North Port
COG	Continuity of Government
COOP	Continuity of Operations
CRS	Community Rating System
DACS	[FL] Department of Agriculture and Consumer Services
DBPR	[FL] Department of Business and Professional Regulations
DEM	[FL] Division of Emergency Management
DEP	[FL] Department of Environmental Protection
DFO	Disaster Field Office
DHS	[US] Department of Homeland Security
DMAT	Disaster Medical Assistance Team
DMORT	Disaster Mortuary Response Team
DMS	[FL] Department of Management Services
DOC	[FL] Department of Corrections
DOH	[FL] Department of Health
DOT	[FL] Department of Transportation
DRM	Disaster Recovery Manager
DSCO	Deputy State Coordinating Officer
DST	Damage Survey Team
EAS	Emergency Alert System
ECO	Emergency Coordination Officer
EHS	Extremely Hazardous Substance
EM	Emergency Manager
EMAC	Emergency Management Assistance Compact
EMPA	Emergency Management Preparedness and Assistance
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
EOC	Emergency Operations Center
EPA	[US] Environmental Protection Agency
ERT	Emergency Response Team

ESATCOM	Emergency Satellite Communications System
ESF	Emergency Support Function
F-SERT	Forward State Emergency Response Team
FAC	Florida Administrative Code
FBI	Federal Bureau of Investigation
FCO	Federal Coordinating Officer
FDLE	Florida Department of Law Enforcement
FEMA	Federal Emergency Management Agency
FEPA	Florida Emergency Preparedness Association
FFCA	Florida Fire Chiefs Association
FHP	Florida Highway Patrol
FLNG	Florida National Guard
FMAP	Flood Mitigation Assistance Program
FPCA	Florida Police Chiefs' Association
FP&L	Florida Power & Light Company
FRP	Federal Response Plan
FSERT	Forward State Emergency Response Team
FS	Florida Statutes
GIS	Geographic Information System
HMGP	Hazard Mitigation Grants Program
HSEEP	Homeland Security Exercise and Evaluation Program
IAP	Incident Action Plan
ICS	Incident Command System
IMT	Incident Management Team
JIC	Joint Information Center
LSA	Logistical Staging Area
LMS	Local Mitigation Strategy
MACS	Multi-Agency Coordination System
MHz	Megahertz
MME	Mass Migration Event
MOU	Memorandum of Understanding
MSU	Medical Support Unit
NAWAS	National Warning System
NFIP	National Flood Insurance Program
NOAA	National Oceanic Atmospheric Administration
NWS	National Weather Service
PAO	Public Assistance Officer
PDA	Preliminary Damage Assessment
PDAT	Preliminary Damage Assessment Team
PIO	Public Information Officer
PSN	Person with Special Needs
PW	Project Worksheet
RIAT	Rapid Impact Assessment Team
ROC	Regional Operations Center

RPA	Request for Public Assistance
RRT	Rapid Response Team
SAR	Search and Rescue
SBA	Small Business Administration
SCO	State Coordinating Officer
SEL	Standard Equipment List
SEOC	State Emergency Operations Center
SERT	State Emergency Response Team
SOG	Standard Operating Guideline
SOP	Standard Operating Procedure
SMO	State Mitigation Officer
SWFWMD	Southwest Florida Water Management District
SWO	State Warning Office
TDD	Telecommunications Device for the Deaf
USAR	Urban Search and Rescue
VHF	Very High Frequency
VOAD	Voluntary Organizations Active in Disasters

XII. LIST OF TABLES AND FIGURES

Table 1:	Hazard Analysis
Figure 2:	Sarasota County Evacuation Levels
Table 3:	Seasonal KBDI Values in the Southern Region of Florida
Table 4:	Seasonal KBDI Values for Sarasota County Monthly Average from 2014 to 2017
Figure 5:	City of North Port Water Bodies
Figure 6:	City of North Port FEMA Flood Zones
Figure 7:	City of North Port 2006 Aerial View
Table 8a:	Distribution of Population by Age
Figure 8b:	Distribution of Population by Age (Graphic)
Table 9:	Mobile Home Communities Served by North Port Fire Rescue
Table 10:	Vulnerabilities by Hazard by Population and Property Loss
Figure 11:	Organizational Chart of the City of North Port Government
Figure 12:	Crosswalk of Emergency Support Functions to City Government Department
Figure 13:	Organization Chart of the City of North Port Emergency Operations Center

CITY OF NORTH PORT
COMPREHENSIVE EMERGENCY MANAGEMENT PLAN
ANNEXES

- A. RECOVERY**
- B. MITIGATION**
- C. WILDFIRE OPERATIONS**
- D. FLOOD WARNING AND RESPONSE**
- E. HAZARDOUS MATERIALS AND OIL SPILL RESPONSE**
- F. UTILITIES DISRUPTION AND RESTORATION**
- G. TERRORISM**
- H. DAM FAILURE**
- I. COLD WEATHER EMERGENCY SHELTERING**
- J. HAZARDOUS WEATHER RESPONSE**
- K. TROPICAL CYCLONE RESPONSE**

ANNEX A

RECOVERY ACTIVITIES

- I. General. In the post-disaster phase of a disaster, the Emergency Operations Center will manage, coordinate, control and direct the response and recovery efforts. The EOC charts in the Organizational Charts Appendix define the assumptions and functions associated with the EOC. The EOC will serve as the coordination point for establishing the Rapid Impact Assessment Teams (RIAT's), staging areas and other sites for coordinated assistance. The EOC will be manned by representatives from each ESF and other agencies involved in the recovery process. The EOC will be organized consistent with the state and federal response and recovery systems.

Direction, control and coordination during the immediate recovery phase focuses on the following types of activities:

- Establishment of an inter-county recovery network designed to provide the support for movement of response actions, relief supplies and services into the county.
- Acquisition, allocation and administration of the distribution of emergency supplies including food, water, ice and medications.
- Managing post-event sheltering operations.
- Initiating preliminary damage assessment (airborne and ground), debris removal and the restoration of utilities.

The primary local coordinating agency for requesting resources and relief supplies and support within the City is Emergency Management.

- A. Sarasota County Emergency Management has primary responsibility for coordinating Countywide recovery efforts. The Emergency Management Chief will appoint the local representative to the Joint Field Office (JFO) and state recovery staff, upon activation of the JFO.
- B. The National Disaster Recovery Framework states that jurisdictions will designate a Local Disaster Recovery Manager (LDRM). For Sarasota County, the LDRM shall be appointed by the County administrator. The role of the LDRM is to organize, coordinate and advance the recovery at the local level. This position will manage and coordinate the redevelopment and rebuilding of the community. The LDRM should be able to represent and speak on behalf of the chief executives. The LDRM will serve as the county's primary point of contact with the State.
- C. For incidents that necessitate an LDRM, the Emergency Management chief will designate individuals with the necessary knowledge, skills and abilities to assist the LDRM with the task of redevelopment and rebuilding of the county. The LDRM

will coordinate the long-term recovery needs of the community utilizing a committee comprised of infrastructure, planning & development, emergency services, along with various volunteer organizations active in county disaster groups.

1. The Emergency Management Chief will request the State to participate in establishing Disaster Recovery Centers (DRCs) and will appoint a representative to the State Recovery Staff. Individual ESF's in the EOC will coordinate with their state counterparts during response and recovery operations. To assure the flow of accurate and timely recovery information, and to coordinate relief and recovery efforts, state and federal agencies will coordinate with the Local Disaster Recovery Manager in the EOC.
2. The Local Disaster Recovery Manager or designee will coordinate recovery activities with the municipalities. Individual ESF's in the EOC will coordinate with their municipal counterparts during response and recovery operations. To assure the flow of accurate and timely recovery information, and to coordinate relief and recovery efforts, municipalities will be encouraged to have representatives in the EOC.
3. All recovery activities are coordinated through the Local Disaster Recovery Manager and begin during the response phase with an evaluation of:
 - situation reports
 - mission assignments logged and tracked
 - municipal status update reports received from local governments
 - EOC briefings
 - local conference calls
 - impact assessment data, as well as other impact information received from other sources
 - damage reports received from citizens

These information sources are reviewed and monitored to start the identification of areas that should receive priority for damage assessment and human needs assessment. This gathering of intelligence sets the stage for the operational transition from response to recovery activities, which takes place as the incident begins to stabilize

4. The Coordinator for ESF-14 is the Public Information Officer (PIO) and is responsible for providing public information and education programs regarding the recovery effort and available local, state and federal assistance. The PIO will follow procedures established in ESF-14 Public Information for the dissemination of information as well as the EOC

ROG's/ROP's. The PIO will participate in the Joint Information Center (JIC). Public information programs will use all the resources outlined above in reaching the population in Sarasota County. Special efforts will be made to reach the hearing/sight impaired; non-English speaking or those that are not in touch with traditional communications outlets.

5. The Local Disaster Recovery Manager or designee is responsible for the county participation in the Disaster Recovery Center for the affected area. The Local Disaster Recovery Manager or designee will serve as the Special Projects Coordinator/County Recovery Center Coordinator to coordinate with state and federal individual assistance officers in the establishment of a Joint Field Office.
6. The Emergency Management Chief is responsible for the following items in support of the State of Florida RECON.
 - Pre-designation of helicopter landing zones for RECON aviation support. Landing zone locations (GPS coordinates) are listed in the Critical Facilities Inventory and have been transmitted to State of Florida Division of Emergency Management.
 - Pre-designation of staging areas and sites for RECON operations. Staging area locations (GPS coordinates) have been transmitted to State of Florida Division of Emergency Management.
7. The City utilizes the established process under the Stafford Act, as amended by the Disaster Mitigation Act 2002, for obtaining and administering state and federal disaster assistance. When the President issues a disaster declaration that includes Sarasota County, the County will receive notice from the State directly as well as through the media coverage. The County Emergency Management Chief will ensure that this information is transmitted to the municipalities for coordination of financial reimbursement with county agencies while maintaining compliance procedures for financial transaction, accurate accounting, grants management, document tracking and payroll procedures. Each City department is responsible for the collection and documentation of reimbursement information, identification of public assistance projects, and submission to the contractor consolidation and submission to FEMA.

The Local Disaster Recovery Manager will transmit disaster declaration, recovery assistance information and technical assistance resources to the municipalities, special taxing districts and not-for-profit organizations, who perform essential governmental type services, as described in FEMA

regulations via fax, conference calls, e-mail and Internet, media outlets and other communications mechanisms.

8. The LDRM will assign representatives to solicit and provide technical assistance and support to municipal jurisdictions throughout Sarasota County to assist in community-wide recovery efforts. The Municipal Liaison will also ensure that multi-jurisdictional issues which require coordination, such as infrastructure restoration of roads, bridges, utility systems and telecommunications, can be effectively coordinated across jurisdictional lines. The lead coordination agency will work directly with the city managers for each impacted jurisdiction and request that a staff assignment is made for recovery working groups requiring representation from the municipality. These assignments may be based upon level of impact to the municipality, available technical expertise within the municipality, level of interest, need for coordination, and jurisdictional regulatory authority.
9. During a disaster event, the county recovery activities outlined in this section are the same for declared and non-declared disasters except for available federal and/or state resources. Without a federal disaster declaration, financial assistance for victims is limited and heavy reliance is placed on the American Red Cross, Salvation Army, charitable agencies, volunteer donations and insurance coverage. In the absence of a Presidential disaster declaration, agency declarations, such as by the Small Business Administration, may provide other sources of funding to assist with costs of the incident. Businesses must depend on insurance coverage or obtain loans/refinancing for recovery. The County and municipal governments must meet infrastructure recovery needs through existing operating funds and insurance or issue bonds to fund disaster recovery. The unmet needs committee may be an additional source of recovery resources and will be convened to identify victims' needs and possible recovery assistance.
10. The primary departments and agencies that have lead or support roles for the implementation of long term recovery are the following:
 - Emergency Management
 - Property Appraiser
 - School Board
 - Planning and Development Services
 - Community Services
 - Health and Human Services
 - Talent and Performance Management
 - Environmental Services

- Public Works
- Administrative Services
- Information Technology
- Office of Financial Management
- Sarasota Community Organizations Active in Disasters (COADs)

II. Transition to Recovery

While there is no clear line of differentiation between the Response Phase and the Recovery Phase, there are general activities which begin to occur in recovery that signify a gradual de-escalation of the response phase. The recovery phase marks the transition from response to recovery, and in Sarasota County, it begins as soon as the Response is initiated. The county may implement a Disaster Recovery Center to assist the transition to its long-term recovery, which is guided by the Post Disaster Redevelopment Plan (PDRP) and the Long-Term Recovery Coalition (LTRC) manual.

The core principles and organizational constructs in the Recovery Annex coexist with the CEMP and build upon its organizational structure and resources to more effectively address recovery needs. The CEMP fully transitions to the recovery when the disaster-specific mission objectives of the Emergency Support Functions (ESFs) are met and the EOC begins to demobilize. Response organizations will deactivate at the end of the response phase. Other organizations will remain active and/or transform into a broader post-disaster recovery role. Such organizations can include, but are not limited to, infrastructure repair, housing reconstruction, economic stabilization, and health and social services. As these post disaster redevelopment actions are implemented, oversight for long-term recovery will transition back to organizations which are typically responsible for overseeing these activities during normal operations.

The recovery process is best described as a sequence of interdependent and often concurrent activities that progressively advance the county toward a successful recovery. However, decisions made and priorities set early in the recovery process will have a cascading effect on the nature and speed of the recovery progress.

- A. Joint Field Office Coordination - The Joint Field Office is a temporary Federal multi-agency coordination center. It is established locally to facilitate field-level, domestic, incident-management activities. The Joint Field Office provides a central location for coordination of federal, state, local, non-governmental and private sector organizations. The Local Disaster Recovery Manager will coordinate all activities with state and federal recovery personnel at the Joint Field Office. The Local Disaster Recovery Manager, through the County Emergency Management Chief, will liaison with the State Recovery Staff and will provide local representation if necessary. A municipal representative, selected by the Local Disaster Recover Manager will coordinate recovery activities with the municipalities.

The bulk of federal recovery field operations during a declared event are coordinated through the JFO. Unlike the State Emergency Operations Center, the Joint Field Office facility is determined by, and under the authority of, the Federal Emergency Management Agency. The Joint Field Office will be staffed with representatives from federal agencies having emergency responsibilities, and may be co-located with the office of the State Coordinating Officer. Joint Field Office site selection will be made by the Federal Coordinating Officer and the State Division of Emergency Management director. State Emergency Response Team personnel work alongside their Federal Emergency Management Agency counterparts to achieve mutual objectives. For additional information, see the State's Recovery Operations for the Joint/Disaster Field Office Standard Operating Guidelines.

- B. State and Federal Disaster Assistance Process - To receive a Federal disaster declaration under the Stafford Act, the following steps must be conducted. Each step is addressed in detail in an upcoming section of this Plan. Following is a brief overview:
1. Local State of Emergency Declaration: The process for issuing a local state of emergency is outlined in the Sarasota Comprehensive Emergency Management Plan. A local state of emergency may be issued at any time deemed necessary by the executive leadership. However, to receive recovery assistance from a higher level of government (state and federal), a local state of emergency must be declared by Sarasota County.
 2. Rapid Impact Assessment and Initial Damage Assessment: Sarasota County Planning and Development Services Damage Assessment Branch (consisting of members of Sarasota County, and its municipalities) will assess the impacts of the disaster as detailed in the Rapid Impact Assessment and Initial Damage Assessment of this annex. These assessments provide an initial overview of the type and extent of the damage and include inputs from municipalities, special districts and other eligible entities within the county. The initial assessment is transmitted to the State Emergency Operations Center from Sarasota County Emergency Operations Center.
 3. State of Emergency Declaration by the Governor: When deemed appropriate, the Governor will issue an executive order or proclamation in support of the County's request for assistance. This will provide the authority to activate State emergency response resources to assist the County's efforts.

4. Preliminary Damage Assessment: The State Emergency Response Team and the Federal Emergency Management Agency will initiate a damage assessment with Sarasota County to document the severity of the impact and to justify the need to pursue a request for a Presidential Declaration. When the damage is of such magnitude and severity that it would appear a declaration is imminent, this assessment may not be necessary.
5. Emergency Declaration Request and Notification: When the minimum thresholds have been exceeded for a Presidential Disaster Declaration, the Governor requests a Federal Disaster Declaration, in writing to the President, through the Federal Emergency Management Agency's Region IV Headquarters in Atlanta, Georgia. If the Federal Emergency Management Agency concurs with the request, it is sent to the President who determines whether the request will be approved or rejected. Approval may be for any or all the three primary categories of Federal Disaster Assistance that are made available through the Stafford Act: Request for Public Assistance, the Individual and Household Program, and Small Business Administration loans. The response is transmitted back to the Governor through the Federal Emergency Management Agency's Region IV Headquarters. Once the State Emergency Operations Center receives the official notification, it will notify each of the counties within the State of Florida. It is the responsibility of the County Emergency Operations Center to notify all municipal jurisdictions and special districts within the County of the Federal Disaster Declaration.

III. Damage Assessment

Damage assessment is the basis for determining the type and amount of state and/or Federal financial assistance necessary for recovery and mitigation. An initial damage assessment is conducted during the response and immediate recovery phase to support a request for a gubernatorial proclamation and for the state to request a presidential declaration. Damage assessment has a two-fold mission:

- To identify the immediate needs and resources required to assist disaster victims.
 - To substantiate requests for supplemental assistance.
- A. Initial Impact Assessment Survey. In the immediate aftermath of the disaster, a City-wide "Initial Impact Assessment Survey" will be conducted. The goal of this survey is to determine the magnitude and severity of damage to private and public buildings and infrastructure; and, in the event of a severe rainfall event, determine the level of flooding damage. All Impact Survey Team members must report impact survey results to the City EOC within hours of disaster impact. The results are mapped in the City EOC on a Geographic Information System map. The impact survey data provides a City-wide general overview of the most significantly

impacted areas and, therefore, establishes a prioritization mechanism for damage assessment team deployment, resource allocation, and disaster assistance.

- B. Damage Assessment Process. While response activities (such as search and rescue, firefighting and care for the injured) are in full operation, recovery field operations begin with clearing debris from all major roads to assist emergency units in their response operations and to facilitate access to impacted areas by joint County/City Damage Assessment Teams.

Rapid and accurate damage assessment of both the private and public sectors is essential to determine:

- Type of assistance to request
- Prioritization of resource distribution for disaster victims
- Prioritization of infrastructure restoration

A damage assessment report is created which includes the damage assessment data Citywide. The joint County/City Damage Assessment Teams are composed of individuals representing building inspections, clerical and other support. The Public Works Department and Utilities Department will coordinate damage assessment data for all public infrastructure.

Damage assessment data is reported to the recovery staff at the County EOC, which is reviewed, then transmitted to the City EOC.

Based on the magnitude and severity of the disaster impact as well as intelligence data gathered from City situation reports and mission requests, the County or State may deploy a State or joint State/Federal Preliminary Damage Assessment Team to the City of North Port before the City-wide damage assessment and reporting is complete. If this circumstance occurs, the County EOC will coordinate the activities of the City/County/State/Federal Preliminary Damage Assessment Teams with that of the City EOC. The goal is to ensure a complete and accurate damage assessment of the disaster event's impact upon the City of North Port and to assist the Governor in making a timely request for a Presidential Disaster Declaration.

Once the damage assessment process is complete, the City of North Port Neighborhood Development Services Department conducts the post-disaster habitability inspections. The purpose of these inspections is to ensure that all structures are safe for entry and that water, electric, and gas services may be reconnected to the structure. These inspections are not conducted until the damage assessment process has been completed. All buildings damaged must be permitted for rebuilding or restoration and all new work must be up to current codes. Condemnation of severely damaged buildings and structures will be

accomplished when they become public safety issues. These are legal responsibilities of all jurisdictions within the City.

III. Disaster Recovery Center. A Disaster Recovery Center may be established in the area to provide “one-stop” assistance for information and tele-registration. The County EOC will initiate a request through the State Emergency Operations Center for the establishment of a DRC within Sarasota County. The Recovery Section Chief will coordinate with the Florida Division of Emergency Management for the establishment of Disaster Recovery Centers. This coordination includes ensuring the selected facilities or locations can support DRC operations for extended periods. Although only one DRC may be established after an incident, Sarasota County Emergency Management has pre-identified a variety of locations to serve as DRC’s. The location will be selected based on community need and structural suitability. The Emergency Management Coordinator has lead responsibility for coordination with the County, State and FEMA for the establishment of a Disaster Recovery Center and will work with Sarasota County to identify potential location(s).

IV. Public Assistance Process. When the President issues a major disaster declaration that includes Sarasota County, the City will receive notice from the State. The City EOC will ensure that this information is transmitted to City departments for coordination of financial reimbursement. Each City department is then responsible for the collection and documentation of reimbursement information and identification of Public Assistance projects.

The Emergency Management Director will transmit disaster declaration, recovery assistance information, and technical assistance resources to the City departments via fax, conference calls, internet e-mail and web page, media outlets, and other communications mechanisms.

V. Debris Management. In some cases, debris clearance, removal and disposal actions can be accomplished quickly using community resources augmented by assistance from neighboring communities, State agencies and contractor resources. In many other cases, however, the damage and debris are so extensive that a comprehensive debris clearance, removal and disposal management plan is required to efficiently and effectively control the operations.

The City of North Port developed, and approved by FEMA, a Debris Management Plan (Appendix H) to provide guidance to City management in planning, mobilizing, organizing and controlling a large-scale debris clearance, removal and disposal operation. These response efforts may be accomplished with local force account labor and equipment, contractors, volunteers and assistance from adjacent communities. The Plan identifies key staff members and their responsibilities for managing and controlling debris clearing, removal and disposal operations. This staff will be immediately activated whenever a natural disaster occurs. Staff members will document the critical decisions made in

response to the disaster and provide the debris manager and local, State and Federal officials with a clear plan of action. The debris clearing, removal and disposal operations may extend for weeks or months and insufficient documentation of the evolving plan could cause confusion and inefficiency.

VI. Community Outreach/Relations Teams. Private citizens and businesses are advised through the media and Community Outreach/Relations Teams of:

- Open shelter locations for immediate housing needs
- City, American Red Cross, Salvation Army, and other distribution points where food and water can be obtained
- FEMA's toll-free number to register for long term disaster recovery assistance (through the Individual Assistance Program)
- Location and hours of operation of Disaster Recovery Centers that can assist and guide persons in their individual recovery efforts.

The Community Outreach teams consist of a Federal, State, and local team member.

VII. Unmet Needs Coordination.

The Sarasota County Human Service Director, in conjunction with Sarasota County COADs, has the lead responsibility for coordinating unmet needs during long-term recovery. With assistance from the member groups and other volunteer organizations, the COAD will utilize existing lists of community service providers, local churches, community outreach programs and municipalities to fulfill all requests. A volunteer center may be established in the county to support unmet needs coordination and operations. Human Needs Assessment Teams, municipalities and local officials will meet to help identify unmet needs. The Sarasota COAD maintains the lists of volunteers and community organizations.

Generally, agencies (both nonprofit and profit) will notify the EOC of the needs of the communities which they canvas. SCEM has a cooperative relationship with a multitude of field agencies in both emergency and non-emergency times. During a major disaster operation, FEMA will provide Community Relations Teams. Sarasota County, along with the American Red Cross, will field damage assessment teams to get a sense of the community's needs. Emphasis areas for the teams will be:

- A. Areas of the greatest disaster impact
- B. Isolated and rural areas
- C. Low socio-economic areas
- D. Elderly, special needs, and socially isolated individuals

Training and workshops are available through several resources such as health care organizations that specialize in home health care, workshops provided or coordinated by

SCEM staff, and training provided to members of volunteer organizations such as American Red Cross and United Way.

- VIII. Post-Disaster Emergency Housing. In a catastrophic disaster, many homes may be destroyed which may require the use of non-permanent structures, such as mobile homes, travel trailer and recreational vehicles, as temporary housing by individuals and families who have been displaced from their primary residence. In general, City Code prohibits the use of these structures.

In 2009, City Commission adopted an ordinance (09-08) which permits the use of these structures for temporary housing on their declaration of a housing emergency. Residents would be able to live in a trailer on their property while their home is being repaired, and allow the creation of a FEMA-style mobile home park for those from apartment buildings or condominiums until they can locate and transition into permanent housing. All structures must have water, sanitary sewer and electricity connections approved by the City. Residents would be permitted to remain in the temporary structure for up to 18 months, with additional increments of six months on application to the City's Neighborhood Development Services Department.

The county may establish an expedited permitting process which may include "one-stop permitting" centers staffed by county permitting representatives for implementing streamlined permit processing. The purpose of this process is to expedite repair and reconstruction of buildings, and to provide information support for provision of temporary housing and encouragement of business resumption and industrial recovery. The County may establish such centers and procedures in coordination with other governmental entities that may provide services and support, such as the Florida Division of Emergency Management, FEMA, SBA, and HUD. These centers combine the presence of multiple agencies to provide better coordination of information that disaster victims may need to rebuild.

A. Transitional Housing

If it is determined that shelter residents and evacuees will not be able to return to their homes for an extended period, it may be necessary to activate transitional shelters until more suitable, longer-term housing options are available. Such transitional shelters can be operated in churches, community centers, convention centers, barracks, or similar existing structures. The Federal Emergency Management Agency's Transitional Sheltering Assistance (TSA) Program may approve, fund, and administer the use of hotels and motels as transitional shelters, which is not charged against disaster survivors' maximum amount of Individual and Housing Program financial assistance. The Federal Emergency Management Agency can also provide reimbursement for hotel/motel accommodations to eligible applicants (County/municipality/special district) through the

Housing Assistance Program, which is subject to the Individual and Housing Program financial assistance limit.

B. Interim Housing

The main objective of interim housing is to identify interim housing solutions with the goal of providing safe and functional temporary housing that allows a family to live together, with a reasonable amount of privacy, while meeting the physical accessibility needs of the household. This includes providing essential utilities, and access to areas for food preparation and bath facilities. Interim housing requires coordination between the Disaster Housing Task Force, municipal partners, and the Joint Field Office. Interim housing is designed to provide a solution for a period of generally up to 18 months. Interim housing may include:

- Rental properties
- Hotels and motels
- Mobile home and RV parks
- Seasonal housing units
- Mobile housing units on private property or group sites
- Big box facilities
- Cruise ships

ANNEX B**MITIGATION ACTIVITIES**

- I. The City of North Port has adopted the Sarasota County Local Mitigation Strategy Multi-Jurisdictional Plan – which is State and FEMA-approved, and expires on February 9, 2020 (Appendix E). A copy of which is available for download from:
<https://www.scgov.net/government/emergency-services/documents-forms-and-plans>.
- II. The City' Emergency Manager is responsible for coordinating mitigation activities with the Local Mitigation Strategy Group. This person currently serves as the Vice-Chairperson of the Group and coordinates all City mitigation activities that are required to maintain compliance with the Sarasota County Local Mitigation Strategy Multi-Jurisdictional Plan.
- III. The City of North Port Emergency Manager in conjunction with the Sarasota County Emergency Management Recovery Section, Damage Assessment Branch, is responsible for conducting damage assessment operations throughout the City including Special Flood Hazard Areas (SFHAs), in collaboration with the jurisdiction. The Recovery Section will forward all damage assessment reports to the Planning Section Documentation Unit. The Planning Section Chief will forward to each jurisdiction's Floodplain Manager the final damage assessment reports including damage to SFHAs, for their review. Additional assistance for the Floodplain Managers can be found within each jurisdiction damage assessment division or by requesting assistance to the Recovery Section Chief through the Planning Section Chief.

ANNEX C

WILDFIRE OPERATIONS

EXECUTIVE SUMMARY

I. INTRODUCTION

- A. General
- B. Scope and Purpose
- C. Assumptions

II. RESPONSE ORGANIZATION

- A. Local
- B. State

III. RESPONSIBILITIES

- A. City of North Port Fire Rescue
- B. Sarasota County Emergency Management
- C. Florida Forest Service, Myakka District
- D. Florida Department of Agriculture and Consumer Service
- E. Florida Division of Emergency Management
- F. Florida Fire Chiefs' Association
- G. Florida Division of State Fire Marshal

IV. METHOD OF OPERATION

- A. General
- B. Levels of Activation
- C. Medical Unit
- D. Air Operations
- E. Resources
- F. Logistical Support

V. PUBLIC INFORMATION AND INFORMATION FLOW

- A. General
- B. Unified Public Information
- C. Information Flow

VI. AUTHORITIES AND REFERENCES

VII. ACRONYMS

EXECUTIVE SUMMARY

The Wildfire Operations Annex to the City of North Port Comprehensive Emergency Management Plan identifies the actions that may be taken by the Florida Forest Service and those State and local agencies in support of the Forest Service in preparing for, responding to, and recovering from wildfire event(s). This Annex addresses the role of State and local government in providing the necessary support to the Florida Forest Service in its statutory responsibilities in responding to, controlling and suppressing wildfires. The City of North Port Fire Rescue, in cooperation with the Forest Service, will update and coordinate the plans with other response and support agencies.

The Annex is a living document; being reviewed and updated after a major wild land fire event or annually. It is presently divided into four (4) Chapters as follows:

- I. **Introduction:** Provides a discussion of the purpose and planning assumptions used to prepare the annex.
- II. **Response Organization:** Identifies the various levels of support that may be provided through a Unified Command structure. It describes the circumstances under which the various agencies will unify under a single command structure in responding to, controlling and suppressing wildfires and the responsibilities of the Unified Command components (agencies). This Chapter also addresses the delegation of authority during a wildfire event.
- III. **Responsibilities:** Identifies the response organizations, and their roles and responsibilities specific to wildfire operations.
- IV. **Method of Operation:** Presents the key guidelines that will be used to make key decisions during the event. Based on joint considerations discussed and determined by the City's liaison agencies of the Unified Command (Forest Service, North Port Fire Rescue), guidelines for the three levels of activation (Monitoring, Partial, and Full) for the City of North Port Emergency Operations Center during a wildfire event have been developed. This Chapter also addresses medical unit activation, air operations, logistical support, and resources.
- IV. **Public Information and Information Flow:** Discusses the notification process for active wildfires to the public, and State Warning Point, and the coordination of situation reports and incident action plans.

I. INTRODUCTION

A. General

This Annex identifies the actions that may be taken by the Florida Forest Service and those State and local agencies in support of the Forest Service in preparing for, responding to, and recovering from wildfire event(s). This Annex addresses the role of State and local government in providing the necessary support to the Florida Forest Service in its statutory responsibilities in responding to, controlling and suppressing wildfires.

B. Scope and Purpose

This Annex covers all wildfires to which the City of North Port that the Forest Service respond. The purpose of the response is to contain, control and extinguish the wildfire.

C. Planning Assumptions

1. The Forest Service is statutorily responsible for wildfire prevention, detection, and suppression on 26,000,000 acres in Florida.
2. The United States Forest Service and the Department of Interior are responsible for wildfire suppression on their respective Federal lands throughout the State.
3. Each year, lightning fires that are associated with Florida's thunderstorm season (April through September) can create tremendous wildfire activity when associated with the State's dry Spring conditions.
4. Nationwide, from 2000 through 2016, an average of 73,303 wildfires occurred per year, burning an average of 114,323,903 acres¹.
5. In Florida, the Deceiving Wildfire burned 173,000 acres in 1999 – which represented the most significant wildfire from 1981 to 2008². However, the most intense fire season on record occurred in 1998 due to the escalating wildland/urban interface in the State.
6. The President of the United States is authorized to aid, including grants, equipment, supplies, and personnel, to any State for the suppression of

¹ https://www.nifc.gov/fireInfo/fireInfo_stats_totalFires.html

² <http://www.freshfromflorida.com/Divisions-Offices/Florida-Forest-Service/Wildland-Fire/Significant-Wildfires-in-Florida-1981-2008>

any fire on publicly or privately-owned forest or grassland, which threatens such destruction as would constitute a major disaster.

II. RESPONSE ORGANIZATION

A. General

This Chapter of the Annex describes the organization to be used to coordinate the City of North Port's agencies support of the Forest Service's response during wildfire events. It describes the Unified Command structure the various agencies will work under to control and suppress wildfires. Also, it addresses the circumstances under which the unified structure will support Forestry in its response to wildfires. The Unified Command structure will be the process used to manage serious wildfire events.

B. Response Organization

1. Local

The Incident Management Team (IMT) comprised of locally-trained State and local firefighters will be used to manage fire-fighting operation when two mutual aid departments and Forest Service assets are engaged in a wildland fire-fighting operation. The Incident Management Team will request activation of the City and County Emergency Operations Center and/or State's response system when the wildland fire is expected to exceed local firefighting capabilities.

2. State

The Unified Command is established as conditions warrant based on a joint decision by the State Forester and the Forest Supervisor of the National Forest in Florida and/or a representative of the Department of the Interior. Unified Command is organized like a State Multi-Agency Coordination (MAC) group, but with the important difference being that the Unified State Command also retains operational command of resources as well as provides logistical coordination. The Unified Command is set up so that an Incident Commander is provided from the primary jurisdictional agencies on which the wildfires are occurring. Unified Commanders will include the Florida Forest Service and either the USDA Forest Service, National Park Service, the United States Fish and Wildlife Service, or the Bureau of Indian Affairs.

In addition to the Incident Commanders and jurisdictional agency liaisons, the Command Staff will also include liaisons from several key support

agencies. These support agencies include the Division of Emergency Management, Division of State Fire Marshal, Florida Fire Chief's Association; Florida National Guard, and if involved, the Federal Emergency Management Agency.

III. RESPONSIBILITIES

A. City of North Port Fire Rescue and Emergency Management

1. Conduct wildland firefighting operations.
2. Operate and manage the City EOC.
3. Monitor the operation to request the City Commissioners issue a Local State of Emergency and issue warnings to the affected communities as the situation warrants.
4. Transmit resource requests to the Sarasota County EOC.

B. Sarasota County Emergency Management

1. Support wildland firefighting operations with logistical support.
2. Enter resource requests to the State Emergency Operations Center.
3. Monitor the operation to request the Board of County Commissioners issue a Local Declaration of Emergency and issue warnings to the affected communities as the situation warrants.
4. Activate the Emergency Alerting System to facilitate area evacuation(s).
5. Activate sheltering/cooling operations for those evacuated.

C. Florida Forest Service, Myakka District

The FFS Myakka District manager, or designated representative, will activate the Incident Management Team when the situation warrants.

D. Florida Department of Agriculture and Consumer Service, Forest Service

The Department of Agriculture and Consumer Services, Forest Service has statutory responsibility for the suppression of wildland fires in the State of Florida. The Forest Service has the lead role in determining when a State Unified Command will be established. In consultation with other State and Federal partners, the

Forest Service will appoint one member of their organization and at least one alternate to serve as State Incident Commander. The Incident Commander will determine the scope and structure of the Unified Command for the wildland(s) burning in the State.

E. Florida Division of Emergency Management

The Florida Division of Emergency Management has statutory responsibility for coordinating State and local support to the Forest Service in the response and recovery from wildland fires. A liaison will be appointed to coordinate the Division's Support Role. Various support elements will be initiated as requested by the Incident Commander.

F. Florida Fire Chiefs' Association

The Florida Fire Chiefs' Association provides the Forest Service logistical support through the services of fire departments throughout the State. This support effort will be initiated per the Florida Fire Chiefs' Association State Emergency Response Plan (SERP) that is activated by request for Emergency Support Function 4, Firefighting.

G. Florida Division of State Fire Marshal

The State Fire Marshal appoints an Emergency Coordination Officer for Emergency Support Function 4, Firefighting. Emergency Support Function 4 is responsible for logistical request from State and local governments for firefighting and EMS resources. These resources are then dispatched per the requirements of the Florida Fire Chiefs' Association State Emergency Response Plan.

IV. METHOD OF OPERATION

A. General

This section of the Annex presents key guidelines that can be used to make key decisions during the event. These decisions will be based on experience, the best evaluation of the current situation, and the forecast for the near future. All wildfire responses will use the National Incident Management System (NIMS) as the emergency response organizational management structure.

Based on joint considerations discussed and determined by the liaison agencies of the Unified Command (Forest Service, and the Fire Chief(s) of the affected area(s)), guidelines for the three levels of activation (Monitoring, Partial, and Full) for the City of North Port Emergency Operations Center during a wildfire event will be

developed. When the EOC is activated in support of the Wildfire Response it will act as a Multi-Agency Coordination Center in support of the Unified Command.

B. Levels of Activation

1. Level III, Monitoring Phase

When two mutual-aid departments and Forest Service or one Strike Team is called out, the City of North Port Fire Rescue may deploy a liaison to the scene upon request of the Incident Commander. The City of North Port Fire Rescue will maintain a liaison with the Incident Management Team at the point when the Multi-Agency Coordination Vehicle Post is deployed. When wildland fire-fighting activities increase whereby greater logistical support is anticipated and the State's Incident Management Team is not in place, the City and/or County Emergency Operations Center will be activated to support all logistics operations. The Emergency Management liaison will remain in contact with the Forest Service and the Emergency Operations Center, unless a firefighter liaison is deployed to the EOC.

2. Level II, Partial Activation

The City and/or County Emergency Operations Center may be activated to a Level II based on a variety of considerations.

- a. When appropriate, the City Manager and the Emergency Manager will request a Local State of Emergency from the City Commissioners based on the following factors:
 - i. When the wildland fire is out of control and threatening a community.
 - ii. When the Emergency Management Director or the IMT requests additional powers to speed the logistical support effort.
 - iii. When community evacuations may be required.

3. Level I, Full Activation

- a. The Emergency Manager, in consultation with the City Manager, will make the decision when to activate the City Emergency Operations Center to a Level I. The following factors may be used in the decision-making process:

- i. When a response to a wildfire event requires the resource and/or logistical support from most the City's Emergency Support Functions.
 - ii. When a wildfire event necessitates evacuations that require resource support from neighboring counties.
- b. The City of North Port Liaison to the County Emergency Operations Center

Once the County Emergency Operations Center has gone to Level I, the City of North Port Fire Rescue will liaison between the City and the County Emergency Operations Center, and provide information coordination for the County Emergency Support Functions.

C. Medical Unit

A medical unit may be activated when an Incident Management Team is put in place to coordinate large numbers of firefighters or emergency personnel. If the Incident Management Team requests a Medical Unit, the request will go through the County Emergency Operations Center.

D. Air Operations

When the Forest Service and the United States Department of Agriculture, Forest Service, under increased wildfire activity, establish Unified Air Operations for statewide wildfire aviation coordination, the Unified Air Operations will establish an Air Operations Plan that will coordinate all aircraft associated with fire operations or flying within wildland fire aviation air space. Within Sarasota County, the Myakka District Forestry manager, or designated representative, oversees the local air space around the wildland fire. This includes:

- Forestry Aircraft
- Fire agency aircraft
- Law Enforcement aircraft
- Military aircraft
- Contractor aircraft
- Media aircraft

E. Resources

The Forest Service and North Port Fire Rescue will be responsible for command and control of all operational elements of the wildfire response to include

resource ordering for wildfire incidents. The City and County EOCs will support the wildland fire-fighting operations by managing and coordinating any non-wildfire resource ordering through the Emergency Support Functions and the State Emergency Operations Center. The Incident Commander will order fire-fighting resources through local dispatch.

F. Logistical Support

Separate processes exist for the ordering of resources and other logistical support for the wildfire events and the Incident Management Teams commanding the suppression of wildfires. In addition, the linkage needed between these resources and logistical ordering processes to provide the correct resource, to ensure that it is provided in a timely manner, and that they are provided cost-effectively.

The primary method in which resources and logistical support is ordered for wildfire events include:

1. The Logistics Section of the City and County Emergency Operations Centers.
2. The Florida Fire Chiefs' Association State Emergency Response Plan (SERP) in support of the Division of State Fire Marshal as the Lead Agency for Emergency Support Function 4 (Firefighting), 8 (Health and Medical), 9 (Search & Rescue) and 10 (Hazardous Materials).
3. Florida Forest Service.

V. PUBLIC INFORMATION AND INFORMATION FLOW

A. General

This Chapter provides how information will be shared during a wildfire event. During a wildfire event a Joint Information Center (JIC) will be established at the scene comprised of representatives of the City of North Port and the Florida Forest Service. During the activation of the City Emergency Operations Center, the EOC representative to the JIC will establish a mechanism that efficiently provides and disseminates information to the public. The EOC's lead Public Information Officer will facilitate the logistical support and orientation for all Public Information Officers working in the City Emergency Operations Center.

B. Unified Public Information

When the City Emergency Operations Center is activated (Level II or I), City, County and State agencies will provide experienced Public Information Officers or provide

access to Public Information Officers to respond to information requests of that agency. In the initial stages of an Incident Management Team Information Flow, a plan will be developed. During Level II Activation, the additional Public Information Officers may include:

- The Florida Division of Emergency Management
- The Florida Department of Agriculture and Consumer Services, Florida Forest Service

During Level I Activation, staffing may increase based on the needs of the response and may include the Federal Emergency Management Agency, the Florida National Guard, and others as warranted. Each agency will become part of the Unified Public Information.

C. Information Flow

1. Fire Activity

- a. The Forest Service, Myakka District will notify the State Watch Office of any significant fires that develop.
- b. The City of North Port Fire Rescue will notify the County Emergency Management liaison or Emergency Operations Center of any significant fires that develop.
- c. The criteria for significant fires includes:
 - i. Wildfires that threaten structures, or where structures are lost.
 - ii. That forces or has the potential to force evacuations of citizens.
 - iii. Wildfires that cause the injury or death.
 - iv. Wildfires that create significant smoke problems that may cause road closures to major thoroughfares.
 - v. Large significant wildfires that require movement of out of district forestry resources.

2. Situation Report Information

- a. The Forest Service will continue to produce a daily wildfire summary, which is available at their website <http://www.freshfromflorida.com/Divisions-Offices/Florida-Forest-Service/Wildland-Fire/Current-Fire-Conditions>.
- b. The City's PIO will extract pertinent information from that scene and liaison officers for its situation reports, which will be completed and transmitted to the County Emergency Operations Center.

3. Public Reporting

- a. Information may be shared with the public in several ways:
 - i. City of North Port's Community Notification System.
 - ii. City's Web Site for local fire conditions and the social media sites Twitter and Facebook.
 - iii. Local government access Comcast channel 19 or Verizon FIOS channel 32.
 - iv. Variable message boards positioned at strategic locations.
 - v. CodeRED emergency notification system

VI. AUTHORTIES AND REFERENCES

The authority for the development, implementation and maintenance of this Annex and all compatible county/municipal plans in support of the Florida Forest Service and Division of Emergency Management in its statutory responsibilities in responding to, controlling and suppressing wildfires is derived from Chapter 252.38(1)(a) of the Florida Statutes.

This Annex further serves as the fundamental governing policy as prescribed for the Forest Service under Chapter 590 of the Florida Statutes.

The Federal Emergency Management Agency policy on requesting Fire Suppression Assistance is contained within 44 CFR Part 206, Subpart L.

The Federal Emergency Management Agency's Interim Policy on Fire Suppression Assistance, April 1999.

Statewide Mutual Aid Agreement between the City and State, and the State Emergency Response Plan with the Florida Fire Chief's Association.

VII. ACRONYMS

EOC	Emergency Operations Center
FDEM	Florida Division of Emergency Management
FEMA	Federal Emergency Management Agency
FFCA	Florida Fire Chiefs' Association
FFS	Florida Forest Service
IMT	Incident Management Team
ICS	Incident Command System
KBDI	Keetch-Byram Drought Index
MAC	Multi-Agency Coordination
NIMS	National Incident Management System
PIO	Public Information Officer
SCO	State Coordinating Officer
SEOC	State Emergency Operations Center
SERP	State Emergency Response Plan
USDA	United States Department of Agriculture

ANNEX D**FLOOD WARNING AND RESPONSE****I. INTRODUCTION**

- A. Purpose
- B. Scope
- C. Planning Assumptions
- D. Situation

II. HAZARDS ANALYSIS AND DEMOGRAPHICS

- A. Hazards Analysis
- B. City Geographic Information (See Base Plan, section II(B))
- C. City Demographics (See Base Plan, section II(C))

III. PREPAREDNESS

- A. Exercises
- B. Public Information

IV. METHOD OF OPERATIONS

- A. General
- B. Supplemental Assistance
- C. Sources of Weather-Related Data and Warnings

V. RESPONSE

- A. Public Notification
- B. Critical Facilities Inventory
- C. Activation Levels and Department Responsibilities
- D. Re-entry

VI. ADMINISTRATION

- A. Records Preservation and Restoration
- B. Funding and Accounting
- C. Emergency Purchasing
- D. Maintenance and Auxiliary Activation of the City of North Port Flood Warning and Response Program

VII. AUTHORITIES AND REFERENCES

VIII. ACRONYMS

IX. LIST OF FIGURES

I. INTRODUCTION

A. Purpose

1. This program establishes a framework through which the City of North Port may mitigate the impacts of, prepare for, respond to, and recover from fresh water flooding conditions that could adversely affect the health, safety and general welfare of North Port residents, businesses and guests.
2. Provisions are made for the needed flexibility of direction, coordination, and method of operation to enable government and non-government entities to accomplish their objectives of mitigation, preparedness, response and recovery. This Annex also provides the framework for rendering support to other counties, municipalities, States and the Federal government in their flood management efforts.

B. Scope

1. Describes the various types of flooding that could occur and provides procedures for disseminating warning information and for determining, assessing and reporting the severity and magnitude of flooded areas.
2. Establishes the concepts under which the City government will operate in response to flood emergencies.
3. Creates a framework for expeditious, effective and coordinated employment of local resources.
4. The National Weather Service administers/disseminates flood warning information to the County, City and other municipalities.
5. Response operations are conducted under the authority of the City of North Port and Sarasota County Comprehensive Emergency Management Plans.

C. Planning Assumptions

1. The business centers of Sarasota County government and State agencies of Florida have certain expertise and resources at their disposal that may be used in relieving emergency or disaster related problems that are beyond the City's capability.
2. When the City declares a State of Local Emergency and requests County and State assistance following a flooding disaster, the Governor may

declare a State of Disaster Emergency, and the State Emergency Operations Center (SEOC) will be activated if conditions warrant.

3. Should State assistance be inadequate to cope with the flooding disaster, the Governor will request Federal assistance under a Presidential Disaster Declaration.
4. The National Weather Service (NWS), Tampa Bay, will issue flood advisory, watches and warning information to both government and the citizens via the Emergency Alert System (EAS). The State Warning Point will follow-up the NWS' warning information with direct contact with the Sarasota County Warning Point, who will issue a notification alert to the City of North Port.

D. Situation

1. Because of the seasonal possibility of large-scale flooding events within the City of North Port, the City must be adequately prepared to reduce the vulnerability to, deal with, and recover from these flood emergencies. The Emergency Management functions within the City must be coordinated as much as possible with other City government and non-governmental agencies as well as with Sarasota County Emergency Management and Florida Division of Emergency Management and surrounding jurisdictions to ensure the most effective preparation and use of manpower, resources, and facilities in response to flood threats and/or emergencies.
2. The principal causes of flooding affecting the City of North Port are as follows:
 - a. Weather systems, both tropical and non-tropical, can produce up to 20 inches of rain over a five-day period. These occur primarily during the hurricane season but can occur at other times. This flooding can cause the Myakkahatchee Creek and canals to overflow their banks.
 - b. Severe thunderstorms, which are local in nature, can cause flashflood-like isolated flooding from torrential rains, which may or may not be accompanied by high winds. These usually occur late May to late September, but also can occur at any time of the year.
 - c. Hurricanes/tropical storms generate high winds and widespread flooding over much of the populated area of the City. Storm surge has the potential to affect up to 100% of the population depending on the intensity of the storm. Although tropical systems can form

during any month of the year, hurricane season begins on June 1 and ends on November 30.

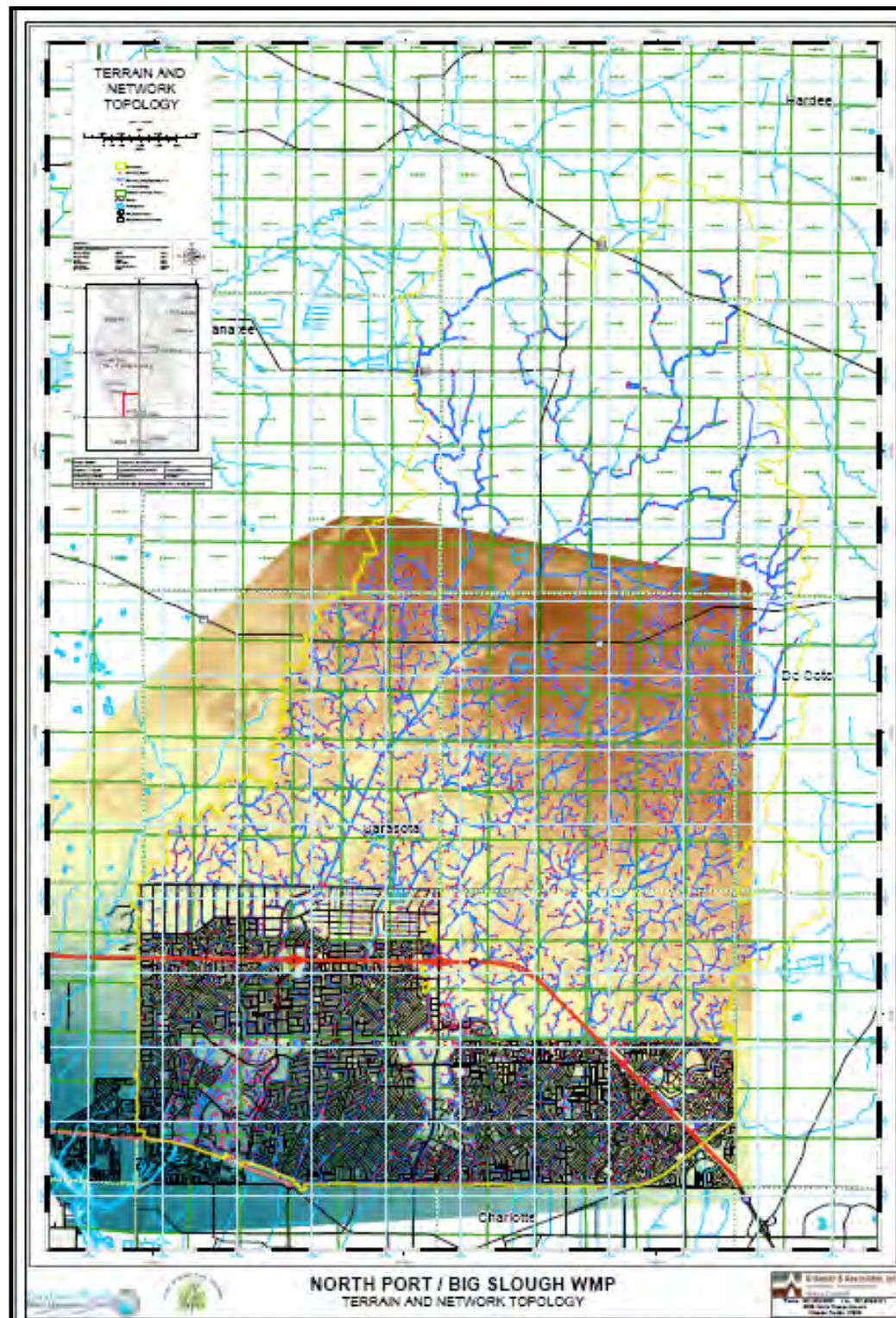
3. The City of North Port is in the southern portion of the Big Slough Watershed, which covers approximately 195 square miles (See Figure 1). The current land uses within the watershed north of the City boundaries are predominantly agricultural with some mining activities. A large portion of the runoff from the Big Slough Watershed drains through tributaries to the Myakkahatchee Creek, which runs through the City of North Port.

As the City of North Port is located at the low end of the Big Slough Watershed/Myakkahatchee Creek “pipeline,” the City’s current flooding and water quality conditions are attributed not only to the City’s growth, but also to upstream runoff in the Sarasota, Manatee and Desoto County portions of the Big Slough Watershed.

During the mid-2000s, the Big Slough Watershed Study was conducted under a cooperative funding agreement with the Southwest Florida Water Management District (SWFWMD) and the City of North Port. Included is a detailed watershed computer model created to simulate the hydraulic conditions of the Big Slough Watershed. Once the model is calibrated to simulate historic storm conditions, it can be used as a tool to predict the level of flooding in the City under various storm events. The model will be used to revise the 100-year FEMA flood maps, and to evaluate options for drainage improvement projects to reduce the flooding currently experienced within the City. Viable drainage improvement projects are expected to be costly, and are likely to take five to 10 years to complete. Implementation of these projects will require cooperation with Sarasota County and Manatee County, acquisition of large tracts of land and rigorous review and permitting by Federal, State and local agencies.

The City has begun a program to clear the City canals of sediment deposits that have accumulated over time. The City will also clear fallen trees and debris in the Myakkahatchee Creek. This will help restore the flow capacity of the canals and creek.

4. Due to Statewide Building Code requirements, all new construction is above the flood plain, and therefore the structure is typically not subject to flooding. However, streets may flood resulting in “islands” of structures, and strand residents. Delivery of emergency commodities or rescue using high-clearance vehicles or boats may be necessary.

Figure 1: City of North Port / Big Slough Water Shed Map

II. HAZARDS ANALYSIS AND DEMOGRAPHICS

A. Hazards Analysis

1. Non-Tropical/Severe Thunderstorm Flooding

Flooding from non-tropical and severe thunderstorms provide the greatest flood threats to the City of North Port. The City is especially vulnerable to flooding from canal overflow and ponding.

- a. Flooding from Myakkahatchee Creek and canal overflow is almost always caused by heavy rains within a drainage area and the subsequent inability of the Myakkahatchee Creek and canal to accommodate the additional runoff. Myakkahatchee Creek and canal overflow would occur following an extended period of rainfall causing most bodies of water within the City to overflow their banks. The problem would be compounded if abnormally heavy rains were to fall in South and Central Florida.
- b. Ponding occurs in low-lying areas that are characterized by poorly drained or super-saturated soils (high water table). This type of flooding in the City occurs in all areas of the City where it is flat and drainage conveyance capacity is limited and the water table is high.

c. History

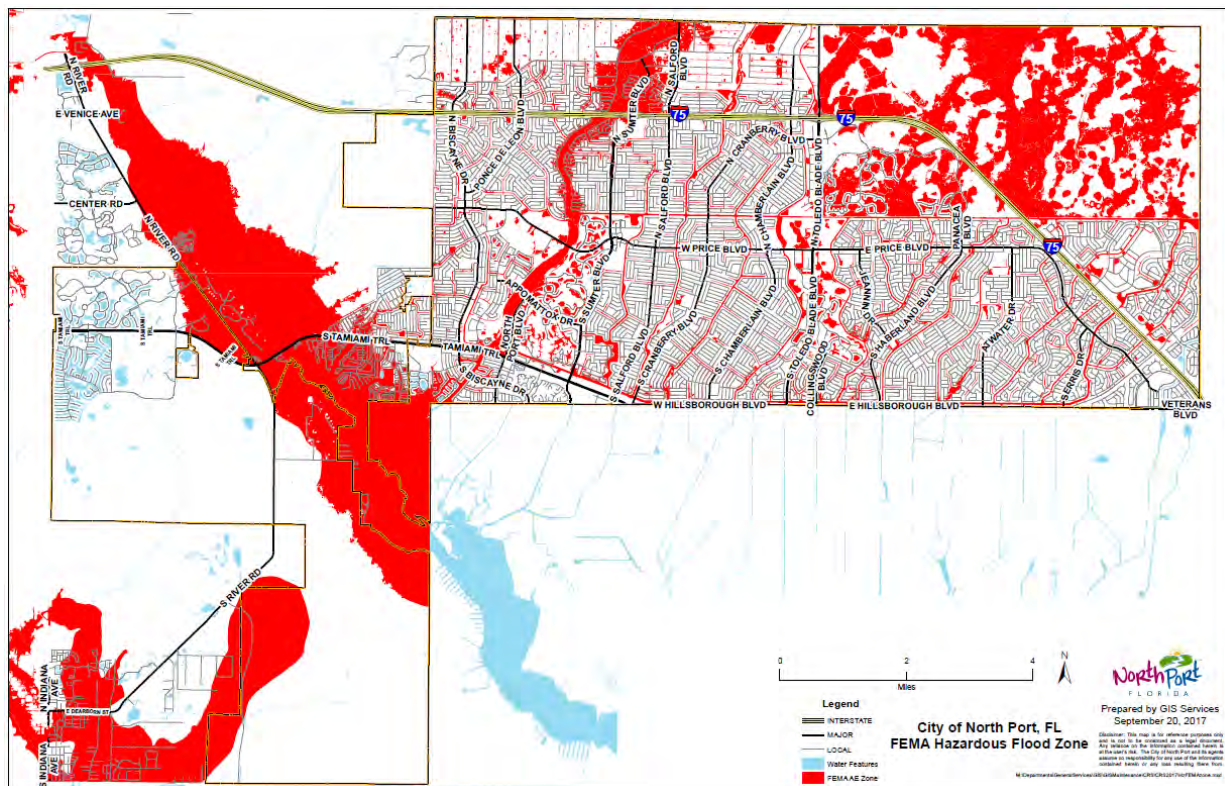
March 23-31, 1987	5.4 to 9.1 inches
September 5-9, 1988	8.2 to 8.9 inches
June 23 - July 2, 1992	16.2 to 20.7 inches
September 14-23, 2000	4.7 inches
July 20-26, 2001	4.6 to 6.9 inches
September 6-14, 2001	10.0 to 11.0 inches
June 17-22, 2003	13.6 to 14.3 inches
August 12-19, 2004	3.0 to 4.5 inches
September 10-15, 2018	9.8 inches

Seasonal flooding is experienced each year. Rainfall amounts of several inches per day spread over two to three days will have a significant impact on riverine flooding (particularly from the Myakkahatchee Creek) and street flooding due to the City's location downstream of a 200 square mile watershed and limited stormwater designed conveyance capacity.

d. Population at Risk

Areas particularly at risk are those in North Port Estates, where overflow from the canal or Myakkahatchee Creek affects the streets between Tropicaire Boulevard and Estates Drive. In addition, the residential area southwest of the I-75 interchange with Sumter Boulevard is also subject to flooding from the Myakkahatchee Creek.

Figure 2: City of North Port FEMA Flood Zones



2. Tropical Cyclone Flooding and Storm Surge

- a. A Category 2 land falling or paralleling storm with a storm surge up to 10 feet would force the evacuation of most of the coastal area to the south and west of US 41. A Category 3 storm with a storm surge up to 13 feet could result in the evacuation of 20% of the City's population, which includes all the mobile home parks within and adjacent to the City.

b. History

The City of North Port (Port Charlotte statistical area) has been exposed to 44 hurricanes/tropical storms since 1870¹. Most recently:

- 1960 Hurricane Donna September 10th, barometric pressure 28.08 inches, caused heavy storm surge flooding and damage, with gusts over 130 mph, water was first pulled out into Gulf then brought back in as eye passed north causing heavy damage.
- 2004 Friday, August 13th, Hurricane Charley hits with 145 mph winds. Very heavy destruction in Charlotte and Desoto counties from wind. A rather small but powerful hurricane with a six- to 10-mile wide eye. Thirty-three people were killed, with five deaths in Charlotte county. More than 14 billion dollars in damage. Surge was less than 7 feet on the Gulf, and only 1.5 feet in coastal waters.
- 2017 Hurricane Irma, September 10th passes just 18 miles to the east while moving north with 100mph winds. Rainfall from September 10th through 15th totaled 9.8 inches and flooded many streets in the Estates area and north/south of I75 along the Creek.

c. Population at Risk

Per the 2017 updated count, there are 64,472 persons living in North Port

The below table describes the potential effects to the population, and economic loss if a hurricane with sufficient storm surge, or flooding in a FEMA Special Hazard Flood Area were to affect the City of North Port.

¹ <http://www.hurricanecity.com/city/portcharlotte.htm>.

Residential Non-Residential / Population / Valuation Information in Storm Evacuation Zones and FEMA Hazardous Zones

Evacuation Zones	Non-Residential	Residential		Total Units		Total Potential Property Value Loss	Residential Population (Units *2.65)
	Units	Potential Property Value Loss	Units	Potential Property Value Loss			
A	4	\$2,800,300	289	\$47,415,800	293	\$50,216,100	766
B	209	\$245,514,000	4,394	\$364,506,800	4,603	\$610,020,800	11,644
C	11	\$12,962,000	8,777	\$1,277,681,000	8,788	\$1,290,643,000	23,259
D	95	\$269,482,000	12,693	\$1,948,933,600	12,788	\$2,218,415,600	33,636
E	137	\$74,981,300	2,629	\$482,517,900	2,766	\$557,499,200	6,967
Grand Total	456	\$605,739,600	28,782	\$4,121,055,100	29,238	\$4,726,794,700	76,272

FEMA Zone	Non-Residential	Residential		Total Units		Total Potential Property Value Loss	Residential Population (Units *2.65)
	Units	Potential Property Value Loss	Units	Potential Property Value Loss			
FEMA AE Zone	92	\$384,014,800	6,122	\$968,199,400	6,214	\$1,352,214,200	16,223

Notes:

Known units not currently on 2017 taxroll is estimated values and included in unit counts.

Residential Units include individual Condo Units.

Residential Units only count one per apartment complex.

Total Value Loss includes total value of apartment complex.

Non-Residential includes individual Business Condo Units.

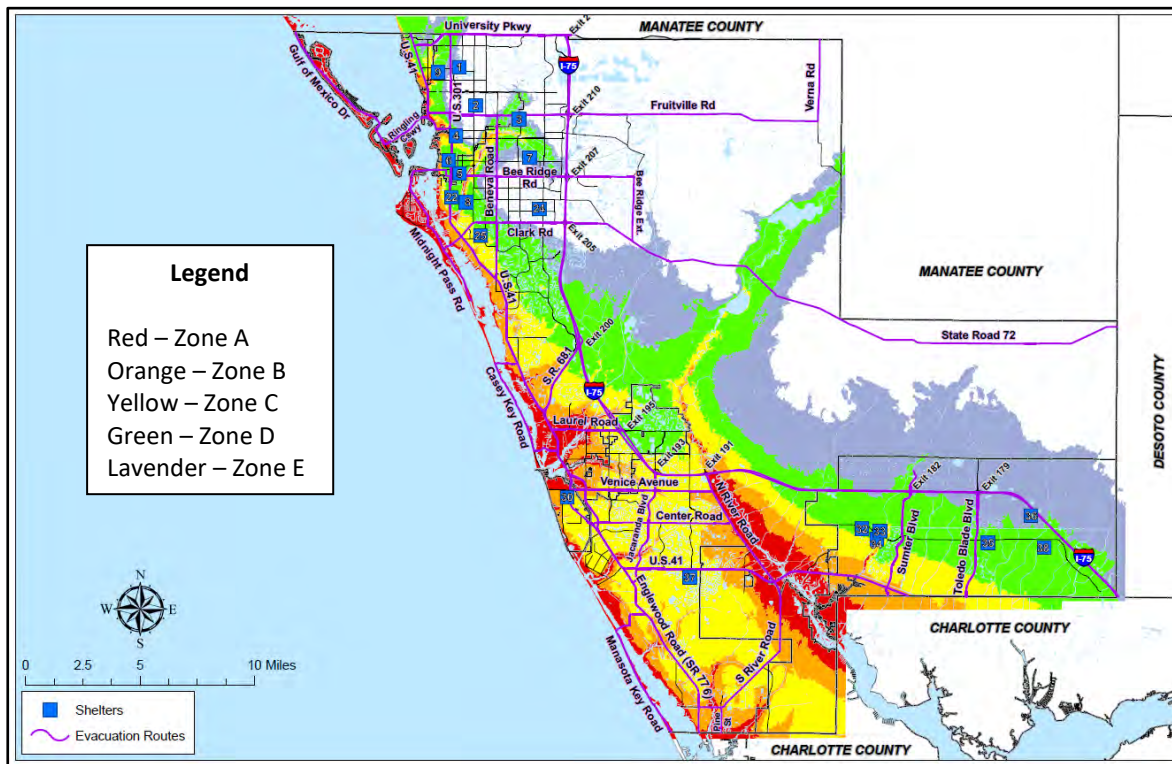
Centers under one ownership is counted as one unit and includes total value complex.

All data is based on GIS Data (August 2017): Surge Zones, FEMA A / AE Zone, Sarasota County Property Apprasier Parcels and Attribute tables.

The 2.65 multiplier is the average household size.

The valuation is from the JUST value from the Preoperty Appraisers Office data (2017 Tax Role).

**Figure 3: Sarasota County Hurricane Evacuation Zones
(Potential Areas of Storm Surge)**



B. City Geographic Information (See Base Plan, section II(B))

C. City Demographics (See Base Plan, section II(C))

III. PREPAREDNESS

A. Exercises

1. General

- a. Exercises must be conducted at least annually to verify the Flood Warning and Response Program and the skills of emergency response personnel. Results of these exercises provide a basis for changes to the Program, implementing procedures, and for further scheduling of training for response personnel. A real-world flooding type event can fulfill the exercise requirement providing a written After-Action Report was accomplished and timelines for corrective actions were established.

- b. Generally, during the Statewide Hurricane Exercise, elements of the Flood Warning and Response Program may be tested and the After-Action Report will highlight those relevant portions of the plan. If the State opts not to conduct a Statewide Hurricane Exercise during a year, then the City Emergency Manager may develop and conduct it.

2. Concept of Operations

- a. An exercise is an event that tests the integrated response capability and major elements within the flood warning program. The emergency preparedness exercise will simulate a flood emergency that may result in massive evacuation and sheltering.

- b. There are three types of exercises

- i. Table-Top Exercise is a simulation in which response activities are discussed. There is no mobilization of emergency personnel and resources.
- ii. Functional Exercise is designed to demonstrate one or more functions or capabilities specified in the flood warning program. Mobilization of local personnel and resources will be limited.
- iii. Full Scale Exercise is designed to fully demonstrate the emergency capabilities of appropriate agencies and organizations. Mobilization of local personnel and resources will be demonstrated.

- c. Scheduling and Scenario Development

- i. Exercises will be scheduled jointly by the response agencies and the Emergency Manager. Scenarios will be developed with inputs from all participating agencies. Scenarios will be varied from year to year such that all major elements of the Flood Warning and Response Program are tested during a four-year period. The scenarios will include, but not be limited to the following:
 - Objectives of the exercise and appropriate evaluation criteria
 - Date, time, place and participating organizations

- The simulated event
- A time schedule of real and simulated events
- A narrative summary describing the conduct of the exercises
- A description of arrangements for advance materials to be provided to observers

d. Critiques and Reports

A critique will be conducted after each exercise to evaluate the capability of each participating agency to implement plans and procedures.

An After-Action Report will be developed to document the event scenario, evaluation and recommendations for improvements.

B. Public Education

1. The Emergency Manager is responsible for coordinating public information programs and related activities about flood emergencies or disasters. This responsibility includes public awareness programs in schools, civic organizations, community subdivisions and other organized groups including radio and television when requested. Preparedness information will be posted on the City's website and social media sites. The Emergency Management Division conducts a number hurricane seminars per year. In each seminar, storm surge vulnerability is stressed, along with flood insurance requirements and methods to mitigate against any damage from flooding. In these talks to the community, information regarding evacuation routes and shelters is also made available.
2. The Sarasota County "Disaster Planning Guide" is updated on an annual basis, and distributed throughout the community, and provided during presentations. Additionally, the City Emergency Management internet site <http://cityofnorthport.com/government/city-services/fire-rescue/emergency-management>, Public Works website <http://www.cityofnorthport.com/government/city-services/public-works/flood-information> and various social media sites (City of North Port, Sarasota County Emergency Services, National Weather Service, National Hurricane Center, etc.) have preparedness information on a variety of disaster- and weather-related topics.

3. Since the main flood threat to the City of North Port's residents is from non-tropical storms, every effort will be made to educate the public concerning this threat. Additional tips will be provided via helpful hints to the daily and/or weekly papers. In all the presentations, the following items must be stressed:
 - a. Areas that are particularly vulnerable to flooding from small stream or canal flooding.
 - b. The use of pre-disaster checklists
 - c. Flood and homeowner's insurance
 - d. Preparedness tips to minimize disaster related losses
 - e. Shelter locations and evacuation routes
 - f. Recovery information
 - g. Point of contact for additional information

IV. METHOD OF OPERATIONS

A. General

1. This program is based on the principle that the City bears the initial responsibility for disaster response and recovery. As a corollary to this principal, each department within local government will accomplish the functions for which it is responsible, requesting relief from the next higher level of government only after resources at that level are inadequate to respond to the flood emergency or disaster. Requests for assistance will be made to the Florida Division of Emergency Management, through Sarasota County Emergency Management only after the City Commission has adopted a State of Local Emergency.
2. The Emergency Manager may activate portions of the plan, if a flood disaster/emergency threatens, prior to the City Commissioners' decision to issue a Declaration of State of Local Emergency. In this situation, the Emergency Management Division will coordinate increased readiness procedures and such emergency response actions as might be necessary for the immediate protection of life and property.

B. Supplemental Assistance

1. Requests for State assistance must be forwarded to the Sarasota County Emergency Operations Center for assessment and approval before deployment of State resources. Prior to requesting State assistance, the current situation must be identified, the current and projected resource needs must be assessed, and a time frame indicating how long state resources would be needed must be identified.
2. When City, County and State resources are determined to be inadequate to the flood emergency, the Governor will request assistance through FEMA. The request will be based on local and state damage assessments and expenditure reports that are to be maintained and supplied by the City, County and/or State for each flood disaster related activity.

C. Sources of Weather-Related Data and Warnings

When conditions are favorable for either storm surge or fresh water flooding, the following actions will be taken by the agencies listed below:

1. Meteorological information will be obtained from the National Weather Service's Weather Prediction Center (WPC) for all flood threats. Tampa Bay Weather will issue flood advisories that may affect Sarasota County. Additionally, Sarasota County obtains meteorological information and images via a private meteorological service, StormGeo. Information may also be gathered from meteorological weather sites on the internet.
 - a. The National Weather Service's (NWS) "Interactive NWS" or iNWS, is a source of information of impending severe weather for emergency managers through text messages sent to a registered smartphone. The message displays a map of the warning area and the nature of the severe weather. Based on the severity of the weather, this text message is forwarded to City public safety and public works managers or followed-up with a telephone call to alert them of the impending weather.
 - b. All City-owned facilities are equipped with NOAA weather alert radios which activate when the NWS in Tampa Bay transmits a message indicating impending severe weather conditions.
2. Hurricanes and their related storm surge and inland precipitation amounts present a flood threat to citizens of the City; therefore, all tropical advisories will be monitored.

3. The WPC issues advisories at least at six-hour intervals during the progress of all tropical depressions, storms, and hurricanes. The National Hurricane Center (NHC) issues tropical and Hurricane “Watch” (48 hour) or “Warnings” (36 hour) for specified coastal areas. The Storm Surge Unit within the NHC will issue similar watches and warnings for storm surge potentials.
 - a. When a watch or warning has been issued for Southwest Florida, the Emergency Manager will assess the situation and if appropriate, call a briefing session with the directors of all City departments.
 - b. The Public Information Officer (PIO) in coordination with Emergency Management will begin issuing news advisories.
 - c. Depending on the situation, all advisories received from Tampa Bay Weather, the WPC, or Sarasota County will be condensed and retransmitted via email to all City department directors.
 - d. Announcement of pertinent information in the Sarasota County “Disaster Planning Guide” and the other sources will be brought to the public's attention.
4. The United States Geological Survey (USGS) and National Weather Service has established a monitoring system of gauges to display data on streamflow, precipitation and height. Personnel may subscribe to the USGS “WaterAlert” System to receive daily emails whenever a pre-determined gauge height has been exceeded. This data is then used by City Emergency Management and Public Works to determine the potential for stormwater flooding.
 - a. A gauge at the Myakkahatchee Creek at Tropicaire Boulevard is a key sentinel point for determination of flood probability and response by emergency personnel and public works. Historically, one inch of rainfall at the Creek is equivalent to 0.6 to 0.7 feet of rise in the Creek’s level. Adverse conditions (i.e., backup of the drainage system resulting in water-covered streets) are typically encountered at a gauge height of 23.00 feet. The City of North Port financially-supports the cost of this gauge with the USGS.
 - http://waterdata.usgs.gov/nwis/uv?site_no=02299450.

- b. The headwaters of the Creek at SR 72 in Myakka City are a secondary source of data from which the City makes assumptions of stormwater flow. Historically, rainfall in Myakka City flowing down the Myakkahatchee Creek will typically take about 12 to 24 hours to reach the City. The historic correlation of Tropicair gauge height to extent of street flooding is used to establish potential impacts on the streets in the Estates and downstream adjacent to the Creek.
- http://waterdata.usgs.gov/usa/nwis/uv?site_no=02299410.
- c. The Myakka River gauge at US 41 allows personnel to view stormwater effects from upstream against tidal flows from the River and Charlotte Harbor. From this information, we can make assumptions on drainage from the Myakkahatchee Creek and east/west waterways into the Myakka River. If the flow from the River is high and there is an incoming high tide and storm surge, flow from the Creek and waterways will be prevented from draining and may backup.
- https://waterdata.usgs.gov/nwis/uv/?site_no=02299230.
- d. Another gauge on the Myakka River at the Myakka River State Park, operated by the National Weather Service, Southeast River Forecasting Center, presents data on flow upstream of US 41 and therefore gives us, as with the headwaters of the Myakkahatchee Creek, an idea of what flow is headed to North Port.
- <https://water.weather.gov/ahps2/hydrograph.php?wfo=tbw&gage=mkcf1>.
- e. A USGS gauge on the Myakkahatchee Creek at the Water Treatment Plant (Water Control Structure 101) allows operators and stormwater managers to see the level at the plant's intake pipe. As stormwater managers open water control structures to divert flow, they must coordinate their actions with plant operators to ensure sufficient depth for water to gravity flow into the intake pipe.
- <https://waterdata.usgs.gov/nwis/uv?02299484>.

f. The gauge at the Myakkahatchee Creek at W. Price Boulevard serves as a backup to our primary point at Tropicair Boulevard.

- https://nwis.waterdata.usgs.gov/fl/nwis/uv?site_no=02299472.

5. All North Port Fire Rescue stations are equipped with weather stations which transmit real-time data to Fire Rescue's internet site: <http://cityofnorthport.com/government/city-services/fire-rescue/weather>. The information provided by the weather stations gives our emergency managers and the public a Citywide view to monitor changing weather conditions, make informed decisions, communicate with those involved, and take appropriate precautionary measures.

V. RESPONSE

A. Public Notification

Increasing the public's awareness of flood hazards and the methods they can use for protecting themselves from the effects of these hazards is a necessary part of reducing disaster potential, preparing for disasters as well as a continuing responsibility of public officials. In addition, providing accurate information immediately before, during and after a flood emergency or disaster is very important for saving lives, minimizing damage, and informing people of various assistance programs. This Annex describes the organization and procedures for providing accurate information to the public.

1. The City's Management Team, comprised of directors of each of the City's departments, will meet periodically before, during and after a flood emergency to minimize conflicting information being disseminated to the public.
2. Emergency Management operates the North Port Community Notification System (CodeRED®) which is an emergency notification system for recorded messages, text and email.
3. The City of North Port provides routine and emergency information via Twitter, Facebook and news releases on the City's website.
4. An Internet website containing City of North Port emergency management information that would be of interest to the public and official agencies is available. This information is regularly updated, especially when the EOC is activated.

5. The Crisis Communication and Public Information appendix to the Comprehensive Emergency Management Plan describes how the City will alert and continually update the public on impending or actual emergencies. Pre-scripted emails and text messages have been developed for use by the Public Information Officer in quickly disseminating relevant information.
 - a. During an emergency/disaster that might result in flooding over parts of the community, a team of telephone operators will be assembled near the EOC to provide information to the public. At least one of the operators may be bilingual (to include Spanish and Ukrainian).
6. The City may contact the National Weather Service to activate weather alert radio for North Port-specific flooding or for other emergencies, such as hazardous materials releases, wildfires and civil disturbances.
7. A low-wattage radio station serving the North Port-area, WKDW at 97.5 FM and live internet stream via <http://kdwradio.com/> may provide City-specific information during emergencies.
8. If necessary due to a nighttime threat or a quickly escalating threat to residents, sirens and loudspeakers from police and fire vehicles may be utilized to warn the public of impending flood conditions, tornado potential, or hazard materials spill. Vehicles with sirens will pass through the threatened neighborhood to awaken the public with instructions to tune into local media stations for further information on the impending dangers. A map will be produced for the specific area to be notified and provided to field personnel.
9. During periods of County Emergency Operation Center activations, WMTX 100.7 FM (the Local Primary (LP) 1 and LP2A stations), WWRM 94.9 FM (the LP2B station), WHPT 102.5 FM (the LP2C station) and local government access (Comcast cable channel 19, Verizon FIOS channel 32) may broadcast directly from Sarasota County. Other Emergency Alert System (EAS) Operational Stations in Sarasota County include:

WKXY AM 930	WJIS FM 88.1
WFLA AM 970	WLTQ FM 92.1
WTMY AM 1280	WKZM FM 104.3
WDDV AM 1320	WCTQ FM 106.5
WSDV AM 1450	WSRZ FM 107.9

10. The City of North Port does not use outside warning sirens for alerting the public of a weather-related emergency. A siren system cannot be as specific as the alert radio. Emergency Management for the City of North Port recommends the purchase of a NOAA weather radio, as opposed to using outside warning sirens, for the notification of weather-related emergencies.
 11. Television customers will see the warning as a “crawl” at the bottom of the TV screen. The Weather Channel (Comcast cable channel 31 and 522, Verizon FIOS channel 119) routinely transmits all warnings for this area on receipt.
 12. Sarasota County is mandated under Florida Statutes §252.355 to register all persons who have special transportation or medical needs during an evacuation situation. The process for notification is as follows:
 - a. Once a storm threatens, and evacuation orders are imminent, the persons on the list which are residing in the potentially threatened area are called by a phone bank, which has been staffed and trained by Sarasota County Emergency Management and managed from the County EOC. The people are notified that they are about to be picked up, and that they need to get their personal effects together.
 - b. The list is given to the Medically Dependent Person (MDP) Operations at the County EOC which develops routes to pick up these people via school bus with hydraulic lift, the Sarasota County Area Transit (SCAT) via buses with hydraulic lift, and North Port Fire Rescue for transport of non-ambulatory clients.
 - c. These individuals and their caregivers will then be picked up and brought to a designated facility in county, if the situation allows for it, or out of county, for larger incidents.
- B. North Port Emergency Management maintains a Critical Facilities Inventory (CFI) for the City. Given the sensitive nature of the facilities, they are protected under Florida Statute Chapter 119, the locations of which are not included in this Plan. Contact information for each facility is maintained in Fire Rescue’s records management system.
- C. Activation Levels and Department Responsibilities

In addition to the common roles and responsibilities of City departments in the CEMP's Base Plan (Section III(C)), the following missions are flood-specific during a level of EOC activation:

1. Flood Threat Recognition Phase (Level III, Monitoring Phase)

This phase may have several pre-disposing conditions whereby any, or all those conditions being absent may not warrant a flood threat concern. The following conditions, compounded, increase the flood threat concern and result in the associated Emergency Operations Center activation level.

- Saturated grounds due to prolonged rainy periods whereby absorption into the soil is hindered, and/or a period of three to five inches has fallen in the City or over the Big Slough Watershed within a 24-hour period.
- A series of rain clouds producing a "training effect" (i.e., repeated areas of rain, typically associated with thunderstorms, that move over the same region in a relatively brief period and are capable of producing excessive rainfall totals over an area).
- Condition of Myakkahatchee Creek's USGS gauge reading is at 21.00 feet and rising (Action Level)
- Condition of headwaters of Myakkahatchee Creek at State Road 72 in Myakka City is at gauge reading 27.00 feet and rising

a. Emergency Management will:

- i. Monitor the flooding potential and disseminate the information to those most affected via means identified in the Base Plan (e.g., City email, North Port's Community Notification system).
- ii. Collaborate with both the National Weather Service in Tampa Bay and Sarasota County Emergency Management on the flooding event potential.
- iii. Using Geographic Information System (GIS) mapping products depicting areas susceptible to past flooding events, alert response agencies based on the weather forecasts.
- iv. Brief the City Management Team, as needed.

- b. Public Works Department will maintain 24-hours x 7-day capability to respond to public regarding roadway, waterway, and drainage system concerns. They can also deploy low-draft water craft.
- c. The Police Department will be prepared to provide traffic control and rerouting in flooded areas.
- d. Fire Rescue will deploy high-clearance vehicles for potential rescue or delivery of emergency supplies.

2. Emergency Warning Dissemination (Level II, Partial Activation)

During this phase the National Weather Service - Tampa Bay has issued a "Flood Watch" and the conditions cited above are the most unfavorable for the grounds absorbing a heavy rainfall amount and therefore roadway flooding, etc., will present hazardous/adverse conditions to the public. Additional considerations for activating to this level:

- Public Works has redirected flow away from the Creek and additional capacity is limited
 - Condition of Creek is at 23.00 feet and rising (Flood Level)
 - Stormwater drainage system showing signs of being inundated
 - Water beginning to approach road surfaces in historically impacted areas
 - Water is covering road surfaces in areas typically unaffected by severe storms
 - Water is covering road surfaces of collector or arterial streets
 - Water is threatening critical infrastructure
- a. Emergency Management will:
 - i. Continue with all activities in the Threat Recognition Stage.
 - ii. Coordinate with the PIO regular updates via email/Web Page to City staff, and the public.

- iii. Assemble partial City EOC staff, and brief at the initial stages of Level II Activation, depending on the anticipated severity of the event.
- iv. Monitor the flooding event and disseminate details of the impacts via all means identified in the CEMP's Base Plan.
- v. Continue to collaborate with Sarasota County Emergency Management on situation status, and need for additional resources.
- vi. Pre-identify and coordinate shelter openings with the County and partner agencies, as required.
- vii. Initiate actions for a Local State of Emergency, if warranted.
- b. Fire Rescue will:
 - i. Coordinate resource requests and mission assignments for high-clearance vehicles for rescue and delivery of emergency commodities.
 - ii. Provide a liaison to the City EOC.
- c. Police will:
 - i. Coordinate road blockage and traffic rerouting.
 - ii. Provide a liaison to the City EOC.
- d. Public Works Department will:
 - i. Provide a liaison to the City EOC to maintain an accurate, current listing of affected roadways.
 - ii. Take reports from the public regarding flooding and maintain flooding records.
 - iii. Blockade flooded roadways as necessary.
 - iv. Monitor water flow in the waterway system, and adjust water control facilities.

- v. Provide analysis of flood waters, and coordinate with Public Works to adjust water control facilities.
 - vi. Provide low-draft watercraft
 - e. Other Participating Departments will:
 - i. Initiate tasks common to department irrespective of disaster (e.g., Damage Assessment - Buildings, Cost Accounting - Finance, Purchasing - Finance, etc.).
 - ii. Provide a liaison to the City EOC, as requested.
- 3. Emergency Response Elements (Level I, Full Activation)
 - a. Emergency Management will:
 - i. Activate the City EOC to Level I, and request full staffing from participating City departments.
 - ii. Coordinate the inter-departmental response and recovery to the event from the City EOC.
 - iii. Submit resource requests and situation status to the County EOC.
- D. Re-entry to evacuated areas is a controlled activity for residents, people who work in the area and for contractors, and others seeking work in the evacuated area. Re-entry will be permitted only during daylight hours.
 - 1. The Police Department will manage appropriate Traffic Control Points (TCP), as identified by number and intersection on the TCP maps maintained in the EOC.
 - 2. Proof of residency in the area or area employment must be presented at the TCP to gain re-entry.
 - a. For residents, a driver license listing an address in the evacuated area is acceptable for re-entry. Lacking that specific documentation of residency in the evacuated area can be established by photo ID along with a utility bill addressed to the bearer at the area address, or a lease or proof of building ownership.

- b. Employees of businesses in the evacuated area must present a photo ID issued by that business for the address in the evacuated area, or a photo ID along with other proof of employment at the business address in the evacuated area such as a paycheck stub.
3. Re-entry to evacuated areas will begin and will be only during daylight hours, and as damage assessment, debris removal and the status of utilities restoration permits. When the evacuated area is large or involves multiple sectors, re-entry is likely to take place in phases. Local radio broadcasts will be used to announce which areas are open for re-entry, and when re-entry will commence.
4. Persons evacuated under the Medically Dependent Person (MDP) program will be returned to their homes after their homes are determined to be habitable.

VI. ADMINISTRATION

A. Records Preservation and Restoration

1. The City Clerk is responsible for the maintenance and preservation of all records. All City departments, to specifically include the Information and Technology Division, must ensure the protection of vital records so that normal activities may continue after the disaster. These records may also be necessary for the rapid recovery from the effects of a flood disaster.
2. Damage to records is most often the result of fire and water damage. These records can often be saved by prompt salvage action. Technical guidance for records preservation can be obtained from the City Clerk's office.

B. Funding and Accounting

1. The City of North Port may allocate and expend funds as appropriate for local emergency operations. Depending on the onset of hazardous weather conditions, any of the following mechanisms may be implemented:

a. Local Accounting

Complete accurate accounts of emergency expenditures and obligations, including personnel and equipment costs, must be maintained. Accurate accounting is required to identify and document:

- i. The determination of eligibility under the FEMA Public Assistance grant program. Funds for which Federal reimbursement will be requested should a Presidential Declaration be made for a Major Disaster.
 - ii. Processing of insurance claims.
- b. Cost Centers

Given the time and the urgency of the threat, the Emergency Manager may ask the Finance Department, via the City Manager, to establish and fund any, or all the following types of cost centers:

- i. Departmental – This cost center will be used to fund all extraordinary departmental activities in response to, or associated with, the hazardous weather event.
 - ii. Debris Removal - This cost center draw will be limited only to those activities associated with debris removal (e.g., contractor services or force labor).
- 2. When the EOC is activated, all agencies should regularly, or upon request, report their expenditures so that the total budgetary impact to the City can be related to the County Emergency Operations Center.

C. Emergency Purchasing

Under Section 2-408, Emergency Procurement, of the Code of the City of North Port, the normal competitive process is waived, and the purchase of certain equipment and contracts is authorized with the approval of the department director, City manager or City Commission, depending on the cost.

D. Maintenance and Auxiliary Activation of the City of North Port Flood Warning and Response Program

The Emergency Manager will maintain and update this program as required. Portions of this program will be activated periodically to conduct exercises as part of the review process.

VII. AUTHORITIES AND REFERENCES

A. Public Law 91-606, Disaster Relief Act of 1970

- B. Public Law 93-288, Disaster Relief Act of 1984
- C. Public Law 100-707, Stafford Act
- D. Chapter 252, Florida Statutes, as amended
- E. City of North Port Charter, and Code of the City of North Port
- F. City of North Port Comprehensive Emergency Management Plan
- G. Sarasota County Comprehensive Emergency Management Plan
- H. Mutual Aid Agreements (e.g., Statewide Mutual Aid Assistance, Statewide, Florida Fire Chiefs, etc.)

VIII. ACRONYMS

CEMP	Comprehensive Emergency Management Plan
DCA	[Florida] Department of Community Affairs
EAS	Emergency Alert System
EOC	Emergency Operations Center
FDEM	Florida Division of Emergency Management
FFCA	Florida Fire Chiefs' Association
FEMA	Federal Emergency Management Agency
FLNG	Florida National Guard
FS	Florida Statutes
GIS	Geographic Information System
ICS	Incident Command System
LP1	Local Primary 1 [EAS operational radio station]
LP2	Local Primary 2 [EAS operational radio station]
MDP	Medically Dependent Person (People)
NHC	National Hurricane Center
NOAA	National Oceanographic and Atmospheric Administration
NWS	National Weather Service
PIO	Public Information Officer
SEOC	[Florida] State Emergency Operations Center
SMAA	Statewide Mutual Aid Agreement
SWFWMD	Southwest Florida Water Management District
SWP	[Florida] State Warning Point
TPC	Tropical Prediction Center

IX. LIST OF FIGURES

Figure 1: City of North Port / Big Slough Water Shed Map

Figure 2: City of North Port FEMA Flood Zones

Figure 3: Sarasota County Hurricane Evacuation Zones

ANNEX E**HAZARDOUS MATERIALS AND OIL SPILL RESPONSE****I. PURPOSE****II. EXPLANATION OF TERMS**

- A. Acronyms
- B. Definitions
- C. References

III. SITUATION AND ASSUMPTIONS

- A. Situation
- B. Assumptions

IV. METHOD OF OPERATIONS

- A. General
- B. Incident Classification
- C. Reporting
- D. Determining Affected Areas and Protective Actions
- E. Phases of Emergency Management
- F. National Incident Management System

V. ORGANIZATION AND ASSIGNMENT OF RESPONSIBILITIES

- A. Organization
- B. Assignment of Responsibilities
- C. Relationship to Other Plans

VI. ADMINISTRATION AND SUPPORT

- A. Support
- B. Documentation and Investigative Follow-up
- C. Resources, Training and Exercises
- D. Cost Recovery

VI. ANNEX DEVELOPMENT & MAINTENANCE

- A. Responsibility
- B. Schedule for Annex Updating

APPENDICES

1. Personal Protection of Citizens
2. Containment and Clean-up
3. Regulated Hazardous Materials Facilities
4. Transportation Routes

I. PURPOSE

- A. The purpose of this annex is to establish guidelines under which the City will operate in the event of a hazardous material or oil spill incident.
- B. It defines the roles, responsibilities and inter/intra organizational relationships of government and private entities in response to a hazardous material or oil spill incident.
- C. It provides guidance to protect the population and the environment from a hazardous material or oil spill incident.

II. EXPLANATION OF TERMS

A. Acronyms

CEC	Community Emergency Coordinator
CEMP	Comprehensive Emergency Management Plan
CHEMTREC	Chemical Transportation Emergency Center
EPA	[US] Environmental Protection Agency
EPCRA	Emergency Planning, and Community Right-to-Know Act of 1986
FEMA	Federal Emergency Management Agency
FDEM	Florida Division of Emergency Management
FDEP	Florida Department of Environmental Protection
FDOH	Florida Department of Health
FDOT	Florida Department of Transportation
FHP	Florida Highway Patrol
FOSC	Federal On-Scene Coordinator
HMRT	Hazardous Material Response Team
IC	Incident Commander
ICP	Incident Command Post
ICS	Incident Command System
LEPC	Local Emergency Planning Committee
NIMS	National Incident Management System
NPFR(D)	North Port Fire Rescue (District)
NPPD	North Port Police Department
OPA	Oil Pollution Act of 1990
PIO	Public Information Officer
RP	Responsible Party
SCFD	Sarasota County Fire Department
SOSC	State On-Scene Coordinator
SWO	State Watch Office
USCG	United States Coast Guard

B. Definitions

1. **Accident Site:** The location of an unexpected occurrence, failure, or loss, either at a facility or along a transport route, resulting in a release of listed chemicals.
2. **Acute Exposure:** Exposures that occur for relatively short periods of time, generally hours to 1-2 days.
3. **CHEMTREC:** The Chemical Emergency Transportation Center (CHEMTREC) is a centralized toll-free telephone service advice on the nature of the product and steps to be taken in handling the early stages of transportation emergencies where hazardous chemicals are involved. CHEMTREC promptly contacts the shipper of the material involved for more detailed information and appropriate follow-up action including on-scene assistance when feasible.
4. **Contingency Plan:** A document developed to identify and catalog all the elements required to respond to an emergency, to define responsibilities and specific tasks, and to serve as a response guide.
5. **Exclusion Zone:** Is the area where contamination does or could occur.
6. **Extremely Hazardous Substances:** Chemicals listed by EPCRA which can cause both severe short- and long-term health effects after a single, brief exposure (short duration). These chemicals can cause damage to living tissue, impairment of the central nervous system, severe illness or in extreme cases, death when ingested, inhaled, or absorbed through the skin.
7. **Fixed Facility:** A plant site where manufacturing, handling/transferring, processing, storage, and/or disposal of chemicals is performed.
8. **Hazard:** A situation that may result in death or injury to persons or in damage to property. Includes effects of toxicity, fire, explosion, shock, concussion, fragmentation and corrosivity.
9. **Hazard Analysis:** In this context, use of a simplified vapor dispersion model which looks at the movement of toxic or explosive vapors over distance at a concentration level of concern to determine whether the amount of chemical at a facility or in a transport container poses a threat to the surrounding community, requiring more detailed analysis and planning.

10. **Hazardous Materials:** Chemicals that are explosive, flammable, poisonous, corrosive, reactive, or radioactive and require special care in handling because of the hazards they pose to public health and the environment.
11. **NCP:** The National Contingency Plan establishes the structure by which the Federal government responds to episodic hazardous material release and oil spill events.
12. **Off-site:** The area outside the boundary of the on-site area that may be affected by the consequences of an extraordinary situation.
13. **On-scene:** The total area that may be impacted by the effects of an extraordinary situation. The on-scene area is divided into mutually exclusive on-site and off-site areas.
14. **On-scene Command Post:** Facility at a safe distance from an accident site, where the IC, responders and technical representatives can make response decisions, deploy manpower and equipment, maintain liaison with media and handle communications.
15. **On-site:** The area within the boundary established by the owner of a fixed facility.
16. **Plume:** A vapor cloud formation that has shape and buoyancy.
17. **Response:** The efforts to minimize the hazards created by an emergency by protecting the people, the environment, property and returning the scene to normal pre-emergency conditions.
18. **Terrorist Activities:** A violent act, or an act dangerous to human life, in violation of the criminal laws of the United States or of any State, to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives.
19. **Weapons of Mass Destruction:** Any destructive device as defined in 18 U.S.C. §§ 921 and 2332a, which reads: (1) any explosive, incendiary, or poison gas, bomb, grenade, rocket having a propellant charge of more than four ounces, missile having an explosive or incendiary charge of more than one quarter ounce, mine or device similar to the above; (2) poison gas; (3) any weapon involving a disease organism; or (4) any weapon that is designed to release radiation or radioactivity at a level dangerous to human life.

C. References

1. Emergency Planning and Community Right-to-Know Act (EPCRA), also known as Title III to the Superfund Amendments and Reauthorization Act of 1986, 42 U.S.C. § 11000.
2. Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §§ 6901-6992k.
3. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as the Superfund Law, 42 U.S.C. §§ 9601–9675.
4. Section 112r of the Clean Air Act Amendments of 1990, 42 U.S.C § 7412.
5. Oil Pollution Act, 33 U.S.C. § 2701.
6. Hazardous Waste Operations and Emergency Response, 29 C.F.R. § 1910.120.
7. Florida Emergency Planning and Community Right-To-Know Act, F.S. §§ 252.81-252.90.
8. Hazard Communication Standard, 29 C.F.R. § 1910.1200, as amended by 52 F.R. 31,852, August 24, 1987.
9. USCG Marine Safety Office Tampa Bay, Area Contingency Plan.
10. EPA Region IV Oil and Hazardous Substances Pollution Contingency Plan.

III. SITUATION AND ASSUMPTIONS

A. Situation

1. Hazardous materials are commonly produced, stored, used, distributed and transported in the City; hence, hazardous materials incidents may occur as the result of natural disasters, human error or accident, or terrorist acts.
2. The North Port Fire Rescue District's personnel are trained to the hazardous materials awareness level. The closest technician-level service is from the Sarasota County Fire Department (SCFD) which will be requested for hazardous materials incidents within the City.
3. The SCFD Hazardous Materials Response Team (HMRT) will have, to the extent possible, the capability to make protective responses in the event

of an incident involving the transportation, storage, usage, or manufacture of hazardous materials.

4. The resources of industry, environmental consultants; emergency response companies; and local, State or Federal governments, separately or in combination, may be required to effectively manage the situation.
5. Information on sites regulated by EPCRA is maintained by the Southwest Florida LEPC, and the North Port Fire Rescue, Division of Emergency Management. Refer to Appendix 3 for a map of regulated facilities.
6. Underground natural gas and propane distribution lines are ubiquitous in the City and are identified with above-ground pipeline markers. Tampa Electric (Peoples' Gas) is responsible for natural gas, and AmeriGas propane distribution lines; the AmeriGas lines are in the process of being vacated with the expectation of elimination by 2020.
7. Major transportation routes for hazardous materials cargo are indicated in Appendix 4 to this Annex.
8. Evacuation routes should be determined by the Incident Commander and disseminated to the residents in the affected area based on the current and projected situation.

B. Assumptions

1. The existence of fixed hazardous materials facilities and natural gas/propane distribution lines provide the potential for an episodic air release with the possibility of being hazardous to the populous located within the proximity of each fixed hazardous materials facility.
2. Protective actions include alerting, in-place sheltering, evacuation, and notification of any environmental contamination.
3. The amount of time available to determine the scope and magnitude of the incident (i.e., lead-time) will impact the recommended protective actions.
4. In the event of a hazardous material incident, many of the residents in the vulnerable zone may choose to evacuate spontaneously without official recommendation. Many may leave by way of routes not designated as main evacuation routes.

5. In the event of an evacuation, some of the populace may relocate to private homes or hotel/motel facilities.
6. A transportation incident involving hazardous materials may require the evacuation of the public at any location within the City.
7. Hazardous materials entering the wastewater (i.e., sanitary sewers, lift stations and/or treatment plants) systems may necessitate the shutdown of the affected system or its components which may result in the release (bypass) of untreated wastewater. Hazardous Materials entering the stormwater system (i.e., storm sewers, roadside swales, streams) may require containment to prevent or otherwise restrict further downstream flow.
8. Wind shifts may occur that result in changes in protective action measures.

IV. METHOD OF OPERATIONS

A. General

This Annex will become effective during any situation in which there is a danger to life, health, property or the environment because of an accident involving the uncontrolled release or spill of any hazardous materials. The primary agencies involved will be the City's fire and police departments, assisted by other City and County departments as appropriate. The extent of the hazard and circumstances involved may require the activation of the Emergency Operations Center (EOC) and full disaster response from City agencies and outside organizations as outlined in the City's Comprehensive Emergency Management Plan (CEMP).

Depending upon the seriousness of the incident, protective actions could include alerting, sheltering in-place, evacuation and notification of other appropriate agencies.

The Incident Commander (IC) / Unified Command (UC) will direct and control all on-site operations involving hazardous material emergencies that may include estimating the areas and population affected by a hazardous materials release and provide warning to and implementation of protective actions for the public in the immediate vicinity of the incident site.

B. Incident Classification

The North Port Fire Rescue District classifies the response to hazardous materials into two basic categories:

1. First Responder Operations - those events of a hazardous materials nature that can typically be resolved by first responders without the intervention of a hazardous materials response team. This may include:
 - a. Minor spills of a petroleum product
 - b. Natural gas/propane distribution line break
 - c. Other hazardous materials for which personnel have had specific training, and whose structural firefighting gear is sufficient protection
 2. Hazardous Materials Incident - those events of a hazardous materials nature that cannot typically be resolved by first responders and require the intervention of a hazardous materials response team.
- C. Reporting
1. First responders arriving upon a scene where hazardous materials are found to be involved will immediately notify their dispatcher and provide the following size-up insofar as possible:
 - a. Location of accident
 - b. Type of material involved
 - c. Extent of injuries and damage
 - d. Estimate of need for additional resources
 - e. Estimate of need for anticipated area evacuation
 - f. The actions being taken
 2. In the event the initial report is through police radio channels, the North Port Police Department dispatcher will immediately pass the above information to the Sarasota County fire dispatcher.
 3. **Special Statement: IF THE SITUATION OBVIOUSLY REQUIRES IMMEDIATE ACTION TO ISOLATE THE AREA OR TO EVACUATE NEARBY RESIDENTS OR BUILDING OCCUPANTS (i.e., IF THERE IS IMMINENT DANGER OF EXPLOSION OR RELEASE OF TOXIC GAS), THE FIRST OFFICER ON THE SCENE (EITHER FIRE OR POLICE) SHOULD RECOMMEND EVACUATION**

IMMEDIATELY. Adjustment of the evacuation zone can be made later after the senior fire official arrives on the scene.

4. Notification
 - a. On notification of an incident involving hazardous materials, the fire dispatcher will:
 - i. Dispatch NPFR units and the SCFD HMRT.
 - ii. If the situation warrants, notify the following departments:
 - North Port Police
 - North Port Public Works
 - North Port Utilities
 - b. The Emergency Management Coordinator, or other on-scene officer, shall contact the State Watch Office, and provide information on the incident.

D. Determining Affected Areas and Protective Actions

1. The Incident Commander shall estimate areas and population affected by a hazardous materials release. Aids for determining the size of the area affected may include:
 - a. The US Department of Transportation Emergency Response Guidebook
 - b. Computerized release modeling (CAMEO/other software)
 - c. Assistance by the responsible party
 - d. Assistance by expert sources such as CHEMTREC
 - e. Assistance by State and Federal agencies
2. The Incident Commander shall determine required protective actions for response personnel and the public. See Appendix 1 for emergency responder safety considerations. See Appendix 2 for public protective action information.

3. The Incident Commander will typically provide warning to and implement protective actions for the public in the immediate vicinity of the incident site. The Emergency Manager will normally oversee dissemination of warning and implementation of protective actions for the public beyond the immediate incident site and related activities such as traffic control and activation of shelters.

E. Phases of Emergency Management

1. Mitigation
 - a. Develop inspection guidelines
 - b. Conduct site inspections
 - c. Enforce current fire and other City codes
2. Preparedness
 - a. Conduct public orientation/education programs
 - b. Provide for training for all emergency response personnel
 - c. Conduct preplanning activities at regulated facilities
 - d. Identify resources (e.g., contractors and specialized equipment)
 - e. Develop recovery guidelines
3. Response
 - a. Determine hazard and its potential
 - b. Initiate protective actions to protect life, property and the environment
 - c. Contain and control the hazard
4. Recovery
 - a. Monitor/survey to declare area safe
 - b. Coordinate the removal of contaminants

- c. Document event
- d. Recover costs

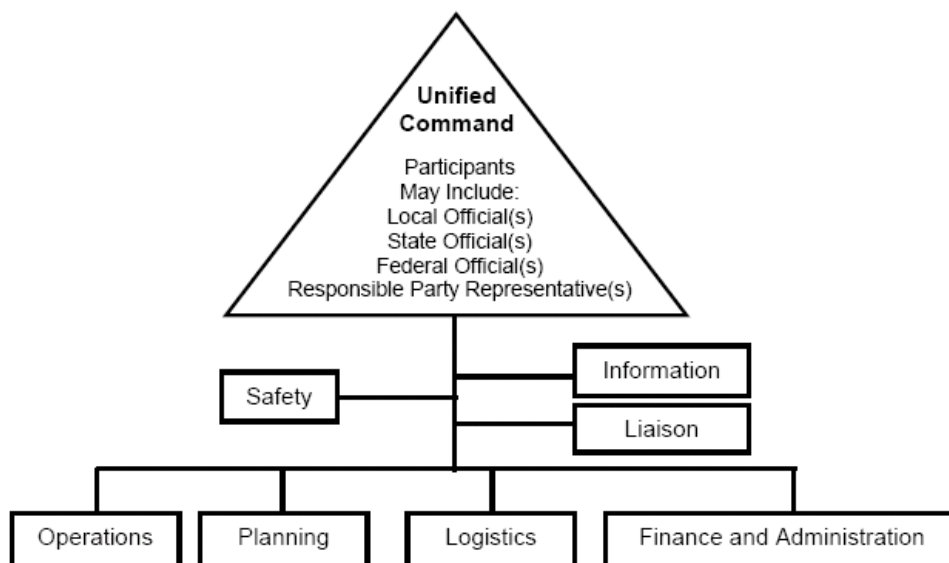
F. National Incident Management System (NIMS)

The National Incident Management System (NIMS) will be used to manage and efficiently mitigate any such incident by integrating a combination of facilities, equipment, personnel, procedures, and communications into a common organizational structure.

V. ORGANIZATION AND ASSIGNMENT OF RESPONSIBILITIES

A. Organization

1. See City's Base Plan.
2. Effective response to a hazardous materials incident or oil spill may also require response assistance from the responsible party (RP) for the spill and in some situations, by State and Federal agencies with responsibilities for hazardous materials spills. In this instance, a Unified Command (UC) structure would be established.



B. Assignment of Responsibilities

1. Southwest Florida Local Emergency Planning Committee

- a. Coordinate with the emergency coordinators of regulated facilities and vulnerable facilities to maintain the list of regulated facilities and the list of vulnerable facilities.
- b. Maintain an accurate and up-to-date hazardous materials emergency contact roster that provides 24-hour contact information for regulated facilities, local hazardous materials transportation companies, vulnerable facilities, State and Federal hazardous materials response agencies, and technical assistance organizations such as CHEMTREC. Disseminate this roster to local emergency responders.
- c. Ensure each regulated facility and local hazardous materials transportation company is notified of the telephone number to be used to report hazardous materials incidents to local authorities.
- d. Coordinate the review of regulated facility emergency plans by local officials.

2. North Port Fire Rescue

- a. The first fire department officer arriving on the scene
 - i. Assume duties of IC until relieved by a higher-ranking fire officer.
 - ii. Establish an Incident Command Post (ICP) and determine the safest approach route (either upwind or crosswind).
 - iii. Take immediate steps to identify the hazardous material, and report to fire dispatch.
 - iv. Isolate the area and deny entry to all but necessary emergency response personnel.
 - v. Develop and initiate a plan of action appropriate to the situation, in accordance with North Port Fire Rescue procedures.

- vi. Determine the need for emergency protective measures and ensure implementation of plan.
 - b. Initiate mass gross decontamination of victims.
 - c. Provide support to the HMRT as appropriate.
 - d. Provide a PIO as department spokesperson and coordinate public information and media releases with the City PIO.
 - e. If a Responsible Party (RP) has not been identified or is unwilling to assume the responsibility for cleanup and disposal of the hazardous substance and contaminated materials, it may be necessary for the City to contract with a hazardous materials cleanup company to perform those tasks.
3. The Sarasota County Fire Department HMRT
- a. Identify the hazardous material if possible and determine its hazards and any appropriate action(s) to be taken to manage the incident.
 - b. Confine or contain the hazardous material to the smallest area possible.
 - c. Stabilize the emergency through limiting or stopping further release of the hazardous material.
 - d. Serve as an advisor to the IC.
 - e. Decontaminate victims, personnel, equipment and facilities.
 - f. Work with the Responsible Party and hazardous materials clean-up contractor to identify appropriate methods for removal of hazardous substances and contaminated materials.
4. North Port Police
- a. The senior police officer at the incident scene will report to the ICP.
 - b. Initiate evacuation of persons from the danger area when requested to do so by the IC.

- c. Cordon-off access to the scene and restrict entry by unauthorized personnel. Entry by non-emergency personnel will be permitted based on officer judgment or proper identification.
 - d. When necessary, coordinate local law enforcement activities with State and Federal law enforcement agencies.
- 5. North Port Emergency Management
 - a. Emergency Management Coordinator will respond to the scene and report to the ICP.
 - b. Determine if use of a mass notification system is required and/or press briefings are needed to keep the public informed. Coordinate with NPFR and other Department PIO representatives before any releases are forwarded to the media.
 - c. Coordinate efforts of volunteer groups in relocating, sheltering and feeding evacuees.
 - d. When the IC recommends evacuation, coordinate the evacuation operations.
 - e. When directed by the IC, activate and manage the EOC.
 - f. Coordinate with other City departments and outside agencies as required.
 - g. Initiate and coordinate cost recovery.
- 6. American Red Cross
 - a. Staff and operate shelter/mass care facilities
 - b. Register evacuees
 - c. Provide emergency clothing
 - d. Provide emergency food
 - e. Process inquiries from concerned families outside the disaster area

- f. Maintain a current list of shelters, emergency feeding sites, and lodging facilities
 - 7. Recommended roles of transportation shippers and fixed facility operators of Hazardous Materials within the Incident Command System (ICS)
 - a. Designate a facility emergency coordinator to be assigned to the ICP
 - b. Implement facility contingency plan
 - c. Provide technical support to IC
 - d. Provide post planning support for dealing with contingency planning to include Risk Management plans
 - e. Provide expertise to the EOC
 - f. Provide emergency service representative (fire brigade) to the ICP
 - g. Provide public information representative to the ICP
 - h. Provide for the removal and ultimate disposal of hazardous substances and contaminated materials, and restoration of affected area.
 - 8. State Agencies with responsibility include:
 - a. Florida Division of Emergency Management (FDEM)
 - b. Florida Department of Environmental Protection (FDEP)
 - c. Florida Highway Patrol (FHP)
 - 9. Federal agencies with responsibility may include the Department Environmental Protection Agency (DEP), Federal Emergency Management Agency (FEMA) and the US Coast Guard (USCG) which may respond to certain hazardous materials incidents and oil spills when required by Federal environmental protection plans or requested to do so by the State.
- C. Relationship to Other Plans
- 1. See the City's Comprehensive Emergency Management Base Plan.

2. The SCFD's HMRT SOG establish operational concepts and activities for team activation, assessment, personnel safety, site control, identification containment, command post, staging areas, monitoring, on-site/off-site response coordination and recovery.
3. Extremely Hazardous Substance Fixed Facility Contingency Plan. Each fixed facility having extremely hazardous substances (as defined by EPCRA) is required to develop an on-site contingency plan that specifies notification, emergency response organization and responsibilities; emergency response organization procedures and coordination procedures for interfacing with off-site authorities and response organizations.
4. EPA and USCG Regional and Area Contingency Plans are required under OPA and the National Contingency Plan. They describe Federal response and recovery operations, and coordination with local and state agencies in the event of a spill or release of a hazardous material or oil in their respective areas of responsibility.

VI. ADMINISTRATION AND SUPPORT

A. Support

See the City's Basic Plan.

B. Documentation and Investigative Follow-up

1. The fixed-site facility is responsible for documentation of accidental releases and preparing the following:
 - a. Fixed-site version of the incident including time, cause of spills, material and quantity released, location, response actions, etc.
 - b. Chronological log that details a minute-by-minute account of spill response activities (e.g., emergency response team activation, notification of off-site authorities, significant changes in situation, time of recommendations to off-site authorities, etc.).
2. The on-scene NPFR senior officer is responsible for preparing an event log that summarizes the incident including cause of incident, incident critique, damage assessment and conclusion.
3. The North Port Emergency Manager will prepare an After-Action Report to document the event, and "lessons learned."

C. Cost Recovery

1. The City may directly invoice the responsible party for costs incurred during the response and recovery from the incident.
2. The US Environmental Protection Agency's (EPA) Local Governments Reimbursement Program provides Federal funds to local governments for costs related to temporary emergency measures conducted in response to releases or threatened releases of hazardous substances. Eligible local governments may submit applications to EPA for reimbursement of up to \$25,000 per incident.
3. If the incident involves an oil spill incident(s) which has impacted or substantially threatened the navigable waters of the U.S, the City may recover costs and damages under the Federal Oil Pollution Act (OPA) which is managed by the US Coast Guard.
4. If the disaster is of a such magnitude that a Major Disaster Declaration is designated by the President of the United States, the City will seek reimbursement under the Stafford Act administered by FEMA.

D. Resources, Training and Exercises

1. Resources

NPFR will provide its front-line suppression units with limited equipment and supplies for product identification, and, based on department procedures, mitigation of the spill or release.

2. Training

- a. Initial hazardous materials training is conducted during basic firefighter class, and refresher training is provided on an annual basis.
- b. Specialized Response Training and Equipment for SCFD HMRT is the responsibility of the SCFD HMRT Training Coordinator.

3. Exercises

- a. Methods for exercising this annex are the Tabletop, Functional, and Full-Scale models for Hazardous Materials Emergency Events.

- b. NPFR will conduct its own and participate in County-wide exercises as needed.

VII. ANNEX DEVELOPMENT & MAINTENANCE

A. Responsibility

1. The Emergency Manager will be responsible for the development and maintenance of this Annex.
2. Each department and tasked agency should develop its own implementing instructions and procedures to support this Annex and reviewing these annually.

B. Schedule for Annex Updating

This annex will be maintained in accordance with the following schedule:

1. The Annex will be updated with each updating of the City's Comprehensive Emergency Management Plan.
2. The Annex will be reviewed after each exercise and/or actual response to a hazardous materials event and modified as necessary.
3. The annex will be reviewed and revised, if needed, after each of the following types of events:
 - a. A major change in applicable Federal or State laws, regulations, or policies.
 - b. Major advances in applicable response technology and/or operational concepts.

APPENDICES

Appendix 1 - Personal Protection of Citizens
Appendix 2 - Containment and Clean-up
Appendix 3 - Regulated Facilities
Appendix 4 - Transportation Routes

APPENDIX 1 TO ANNEX E PERSONAL PROTECTION OF CITIZENS

The following establishes policies and guidelines regarding the personal protection of citizens potentially affected by a hazardous materials incident. It includes the strategies of in-place sheltering and evacuation as well as relocation, water supply protection, and wastewater system protection

1. Sheltering In-place

- a. In some cases, advising people to stay indoors and to attempt to reduce the flow of air into a structure may be the most effective protective option. Emergency officials have used this strategy when it has been recognized that people could not be evacuated from an area prior to the arrival of a toxic chemical cloud.
- b. For an indoors protective strategy to be effective, planning and preparedness activities should provide:
 - i. In-place sheltering or evacuation guidelines to be developed by the SCFD HMRT for determining when sheltering or evacuation is appropriate based on decision-making criteria such as the type of chemical, toxicity, duration, etc.
 - ii. A public information and notification system to warn and advise the public of immediate danger.
 - iii. A system for determining when a toxic chemical cloud has dissipated or cleared an area.
 - iv. Notification procedure for advising people to evacuate a building at an appropriate time.
 - v. Public education on the value of indoor protection and on expedient means to reduce ventilation rates.

2. Evacuation

- a. Evacuation can be an effective means of protecting the public if it can be accomplished prior to the arrival of the toxic cloud at a particular location. The effectiveness of evacuation is dependent upon the time required to evacuate an area, and the size of the area compared to the time available before the cloud arrives.

- b. The responsibility for recommending an evacuation normally rests with the IC. The NPPD working with NPFR will carry out the evacuation. In situations where rapid evacuation is critical to the continued health and safety of the population, the IC may advise the public in the immediate vicinity to evacuate. Emergency Management will coordinate with the City Parks manager for the opening of a nearby Community Center(s) as a shelter for evacuees, if required.
 - c. If the emergency warrants and the IC recommends evacuation, NPPD officers will immediately initiate an evacuation. (Recommended evacuation distance guidelines for specific hazardous materials are contained in the Emergency Response Guidebook). The IC will determine the routes of evacuation.
 - d. Ingress for incoming personnel must be identified, so as not to endanger their lives in the process of reporting to the incident site. Evacuation guidelines must be coordinated with liaison personnel at the on-scene ICP to ensure the safety of everyone.
 - e. If an ordinance declaring a Local State of Local Emergency is adopted by City Commission, the EOC will be activated to coordinate the efforts of other County and municipal agencies and response personnel per the City's Comprehensive Emergency Management Plan.
3. Other Public Protection Strategies
- a. Relocation: Some hazardous materials incidents may contaminate the soil, surfaces or water of an area and pose a lingering threat to people living there. It may be necessary for people to move out of the area for a substantial period until the area has been decontaminated or until natural microbiological degradation of the chemical has occurred with time.
 - b. Water Supply Protection: Surface and ground water supplies can be contaminated by a hazardous chemical spill or release. Recovery and restoration planning must provide for the quick identification of a threat of contamination to the drinking water supply and notification to the public and private water system operators, as well as warning of the public.
 - c. Wastewater and Stormwater Handling Systems: Hazardous chemicals entering stormwater and/or wastewater systems can cause serious and long-term damage to the environment or to a water/wastewater treatment plant. If wastewater is diverted, it could create public health and environmental problems.

APPENDIX 2 TO ANNEX E CONTAINMENT AND CLEAN-UP

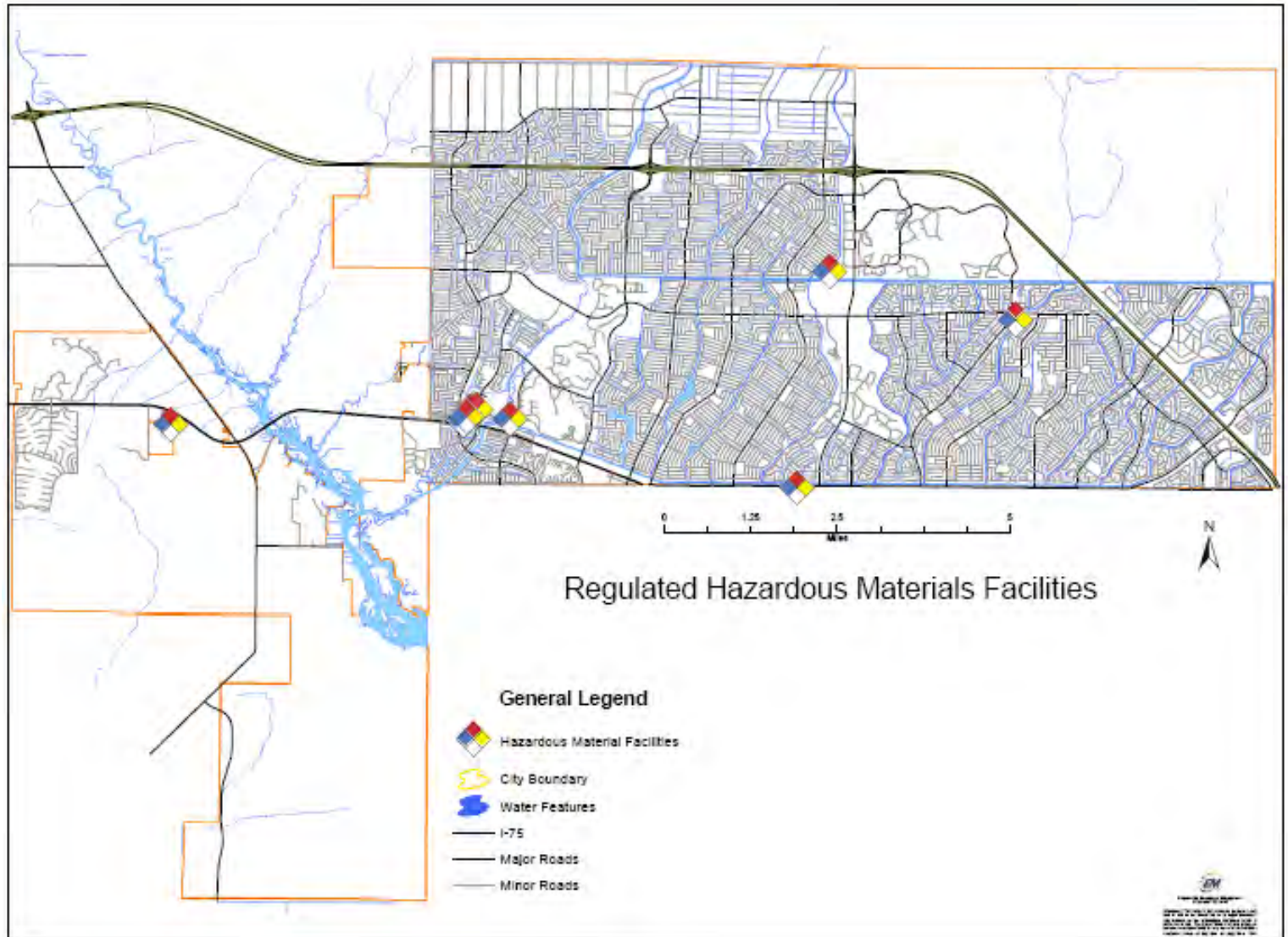
This Appendix provides for containment and clean-up operations and identifies resources available for clean-up and disposal.

1. Techniques for Spill Containment and Clean-up
 - a. The responsibility for selecting and implementing the appropriate countermeasures is assigned to the IC in coordination with the State/Federal on-scene coordinator.
 - b. The spiller is, by law, responsible for all clean-up counter-measures.
 - c. The IC is responsible for monitoring the response activity to ensure that appropriate containment/displacement techniques are being initiated.
 - d. Containment methods may include:
 - i. Dikes
 - ii. Berms and drains
 - iii. Trenches
 - iv. Booms
 - v. Barriers in soil
 - vi. Stream diversion
 - vii. Patching and plugging of containers or vessels
 - viii. Portable catch basins
 - ix. Over-packed drums or other forms of containerization
 - x. Re-orientation of the container
 - e. The IC, in the absence of a responsible party, may secure private contractors for displacement techniques. These may include:
 - i. Hydraulic and mechanical dredging

- ii. Excavating
 - iii. Skimming
 - iv. Pumping
 - v. Dispersing/dilution
 - vi. Vacuuming
- f. Treatment of spilled hazardous substances can be physical, chemical or biological in nature. Treatment operations are the responsibility of the operator. Monitoring responsibility is assigned to the FDEP, in accordance with the State of Florida Oil and Hazardous Substances Spill Contingency Plan.
- g. Exposure Assessment: Initial assessment of the incident is the responsibility of the fixed facility. It should be recognized that industrial capability to assess the situation is supported by in-depth knowledge of the chemicals, facilities and the environment. The fixed facility is liable for damages resulting from a release and is motivated to provide timely and accurate assessment of each situation. Other assessment capability is available.
- i. The HMRT has equipment to provide monitoring and assessment capability.
 - ii. The FDEP has an air toxic response program with personnel and equipment to sample suspected airborne toxic compounds.
- h. Restoration
- i. Treatment of contaminated soils and sediments is a responsibility of the owner of the property and/or the spiller.
 - ii. When feasible, contaminated soils and sediments will be treated on the site. Technologies available include:
 - Incineration
 - Wet air oxidation
 - Solidification
 - Encapsulation

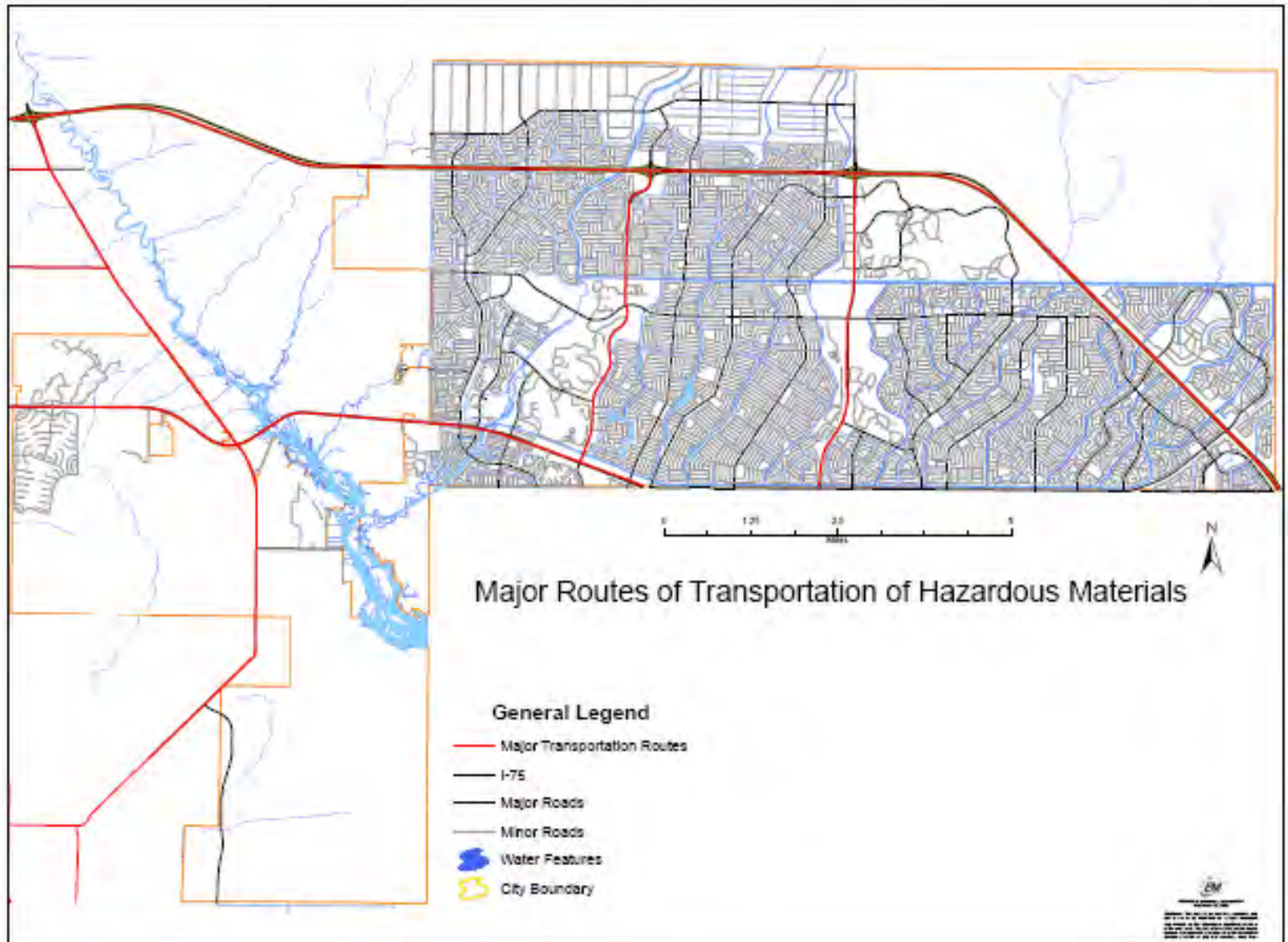
- Solution mining (soil washing or soil flushing)
 - Neutralization/detoxification
 - Microbiological degradation
- iii. Off-site transportation or storage, treatment, destruction, or secure disposition off-site may be provided in cases where State/Federal On-Scene Coordinator(s) determines such actions:
- Are most cost effective
 - Will create increased capacity to manage
 - Are necessary to protect public health, welfare or the environment
- iv. Contaminated soils and sediments may be removed from the site. Technologies used to remove contaminated sediments from soils include:
- Excavation
 - Hydraulic Dredging
 - Mechanical Dredging
- v. Provision of alternative water supplies can be provided in several ways:
- Individual treatment units
 - Water distribution system
 - New wells or deeper wells
 - Cisterns
 - Bottled water
 - Trucked-in water

APPENDIX 3 TO ANNEX E REGULATED HAZARDOUS MATERIALS FACILITIES¹



¹ The Tier II Emergency and Hazardous Chemical Inventory form identifies the specific locations and inventory of hazardous materials at a fixed facility. In accordance with 42 U.S.C. 11044], this information is available from the Southwest Florida Local Emergency Planning Committee during normal working hours.

APPENDIX 4 TO ANNEX E
MAJOR ROUTES OF TRANSPORTATION OF HAZARDOUS MATERIALS



ANNEX F**UTILITIES DISRUPTION AND RESTORATION****I. PURPOSE****II. SITUATION AND ASSUMPTIONS**

- A. Situation
- B. Assumptions

III. METHOD OF OPERATIONS

- A. General
- B. Organization
- C. Assignment of Responsibilities
- D. Restoration Priorities

IV. RESPONSE OPERATIONS

- A. City Response
- B. Facilitating Utility Response
- C. Protecting Resources and Preserving Capabilities
- D. Utility Support for Emergency Response Operations
- E. Utility Support for Disaster Recovery Operations
- F. Public Information
- G. Phases of Management

V. ADMINISTRATION AND TRAINING

- A. Administration
- B. Training

APPENDICIES

- 1. Local Utility Information & Service Area Maps
- 2. Utility Restoration Priorities for Critical Facilities
- 3. Emergency Generator Forms
- 4. Utility Conservation Measures

I. PURPOSE

The purpose of this Annex is to describe the organization, operational concepts and responsibilities to respond to and recover from a disruption of utility services.

II. SITUATION AND ASSUMPTIONS

A. Situation

1. During or after an emergency there may be a disruption of service in electrical power, telephone service, water and wastewater services as well as natural gas service.
2. The loss of utility services, particularly extended outages, could adversely affect the capability of local personnel to respond to and recover from the emergency that caused the disruption of utility service and create additional health and safety risks for the public.
3. Public utilities are defined as those companies and organizations that are authorized to provide utility services, including electricity, water, sewer service, natural gas, and telecommunications, to the public in a specified geographic area. Utilities may be owned and/or operated by a municipality, a municipal utility district, a regional utility authority, investors, or a by a private non-profit organization such as member of a cooperative (co-op).
4. Virtually all utilities are required by State regulators to have emergency operations plans for restoring disrupted services. Many utilities maintain emergency operations centers and those that do not, normally have procedures to establish temporary facilities when they need them.
5. Extended electrical outages can direct impact other utility systems, particularly water and wastewater systems. In areas where telephone service is proved by above ground lines that share poles with electrical distribution lines, telecommunications providers may not be able to make repairs to the telephone system until electric utilities restore power lines to a safe condition.
6. Municipal utilities and private non-profit utilities, such as electrical cooperatives, may be eligible for reimbursement of a portion of the costs for repair and restoration of damages and infrastructure in the event the emergency, which caused the damage, is approved for a Presidential disaster declaration that includes Public Assistance (PA).

7. Utility disruptions may delay return of individuals to their residences from evacuation shelters. An effect of which, the shelter (usually a public school), will not be able to re-open to students until the evacuees have departed. This will slow the return to normalcy in the post-disaster environment.

B. Assumptions

1. In the event of damage to or disruption of utility systems, utility operators will put forward their best effort to restore services as quickly as possible.
2. A major disaster or a disaster affecting a wide area may require extensive repairs and reconstruction of portions of utility systems that may take a considerable time to complete.
3. Damage to electrical distribution systems and sewer and water systems may create secondary hazards such as increased risk of fire and/or public health concerns.
4. Each utility will direct and control its own resources and plan and carry out its own response operations, coordinating as necessary with local government and other utilities.
5. Individual utility operators, particularly small companies, may not have sufficient resources to restore utility systems affected by a major disaster or one having widespread effects. Utilities typically obtain supplementary repair and restoration assistance from other utilities pursuant to mutual aid agreements, and by using contractors hired by the utility.
6. Equipment and personnel from other City departments may be employed to assist the municipal utility in repairing its systems and restoring service to the public.

III. METHOD OF OPERATIONS

A. General

The basic operational concept is that the various divisions within the City of North Port Utilities Department and private utility companies will continue their normal day to day responsibilities regardless of the emergency or disaster situation. Priority actions will be taken to restore interrupted services and provide for movement of vehicular traffic. Some specific actions to be accomplished are:

1. Make emergency repairs and restore vital utility services

2. Provide emergency power
 3. Replace damaged or destroyed utilities equipment
 4. Insure that adequate supplies of potable water are available and identify sources of additional supplies, if needed.
- B. Organization
1. City-owned water and wastewater operations and facilities will be managed by the City of North Port Utilities Department.
 2. Utilities not owned and operated by the City will be managed by those organizations based on their respective emergency operations plans.
- C. Assignment of Responsibilities
1. See City's Comprehensive Emergency Management Base Plan.
 - a. The Director of the Utilities Department will:

In an activation of the City EOC, the Utilities Group Director will be responsible for the overall coordination of public and private utilities during a disaster. If the disaster affects only the Utilities Department, the City Manager may appoint the Director as Incident Commander.
 - b. The Public Information Officer will:

Coordinate with the EOC and utilities representatives to provide timely, accurate, and consistent information to the public regarding utility outages, including communicating:

 - i. Protective measures, such as "boil water" orders.
 - ii. Conservation guidance.
 - iii. Instructions, including where to obtain water, ice, and other essentials.
 - c. The EOC will monitor utility response and recovery operations regarding major utility interruptions that may affect public health and safety or threaten public or private property.

2. Non-City owned and operated utilities will be responsible for the maintenance, repair and restoration of their respective utilities.
 - a. Each utility organization, both City and privately-owned and -operated, will direct its response and recovery activities.
 - b. Utility crews responding from other geographical areas pursuant to a utility mutual aid agreement and contractors hired by utilities to make repairs will normally receive their assignments from the utility that summoned or hired them.

D. Restoration Priorities

Priorities for utility restoration will depend on the nature, location, and extent of the incident. Vulnerable populations and facilities essential for public safety and health will be considered first. These facilities may include medical facilities, nursing homes, water and wastewater treatment facilities, schools, grocery stores, government buildings, telecommunications and power facilities. Other facilities may be determined as dependent by the nature of the disaster and location of the event. The Base Plan of the Comprehensive Emergency Management Plan (CEMP) identifies locations designated as "Critical Infrastructure," which would receive priority restoration.

IV. RESPONSE OPERATIONS

A. City Response

1. It is essential to obtain an initial estimate of the likely duration of a major utility outage from the utility as soon as possible after it occurs. Once the estimate is obtained, a determination of the anticipated impact and actions required to protect public health and safety, and public and private property can be made.
2. Extended utility outages may require the City to act to protect public health and safety and public and private property. Such actions may include:
 - a. Water or Wastewater Outage
 - i. Curtail general water service to residents to retain water for firefighting and for controlled distribution to residents in containers.

- ii. Arrange for supplies of emergency potable drinking water for the public and for bulk water for those critical facilities that require it to continue operations.
 - Open Neighborhood Points of Distribution (NPOD) in areas where access to open retail outlets is limited.
 - iii. If wastewater service is disrupted, arrange for portable toilets and hand washing facilities to meet sanitary needs.
- b. Electrical or Natural Gas Outage
- i. Operate emergency generators to power water pumping stations, water treatment facilities, wastewater lift stations, wastewater treatment facilities, fueling facilities, and other critical sites.
 - ii. During periods of extreme cold weather, coordinate the establishment of shelters for residents who lack heat in their homes.
 - iii. During periods of extreme heat, coordinate the establishment of “cooling sites” for residents who do not have air conditioning in their homes.
 - iv. Request appropriate volunteer groups to set up mass feeding facilities, as necessary, for those who do not have electrical or gas service and cannot prepare meals.
 - v. Arrange for fuel deliveries to keep emergency generators running at critical City facilities.
- c. Telecommunications Outage
- i. Request telecommunications providers to implement priority service restoration plans to include establishment of cellular on wheels units (COW).
 - ii. Activate amateur radio support, as needed.
 - iii. Request external assistance (e.g., telecommunication providers, Sarasota County, State Division of Emergency

Management, etc.) in obtaining additional radios and repeaters or satellite telephones.

d. General

- i. Isolate damaged portions of utility systems so as to restore service quickly to those areas where systems are substantially undamaged.
- ii. In cooperation with utilities, institute conservation measures. See Appendix 4 to this Annex.
- iii. Disseminate public information requesting conservation of utilities and water advisories (e.g., health issues such as a “boil water” advisory for emergency water purification.)
- iv. Coordinate with medical facilities that must relocate patients, residential schools and similar institutions that cannot maintain the required level of service for their clients.
- v. Assign law enforcement personnel at key intersections if traffic control devices are inoperative.
- vi. Consider increased security patrols and staging fire equipment in areas without electrical or water service.
- vii. Provide inspection services prior to restoration of service at building.

B. Facilitating Utility Response

1. The City may facilitate utility response by:
 - a. Coordinating with utility companies on utility outage areas that have been reported to the City.
 - b. Requesting citizens to initiate conservation measures. See Appendix 4.
 - c. Coordinating with the utility on priorities for clearing debris from roads which also provides access to damaged utility equipment.

- d. Providing access and traffic control in utility repair areas where appropriate.

2. Large-scale Emergency Situations/Disasters

In large-scale emergency situations which produce catastrophic damage in a limited area (such as a tornado) or severe damage over a wide area (such as a hurricane), utilities are typically faced with a massive repair and rebuilding effort that cannot be completed in a reasonable time without external support. In such circumstances, utilities typically bring in equipment and crews from other utilities pursuant to mutual aid agreements and from specialized contractors.

- C. Protecting Resources and Preserving Capabilities

In the event of a slowly developing emergency, it is possible that utilities may be able to mitigate some of the effects of a major emergency or disaster by protecting key facilities and equipment.

1. In the face of a threat of flooding, facilities may be protected by constructing dikes, sand-bagging, or using pumps to prevent water from entering the facility. To preserve pumps, electrical control panels, and other vital equipment, it may also be prudent in some cases to remove the equipment from facilities to prevent damage due to rising water.
2. Loss of power could severely affect critical functions such as communications, water pumping, purification and distribution, wastewater disposal, traffic control and operation of critical medical equipment. Critical facilities that require back-up electrical power should have appropriate generation equipment on site. If this is not feasible, emergency generator requirements should be pre-determined to facilitate timely arrangements for such equipment during emergency situations. Appendix 3 provides forms to record information on existing backup generators and to identify requirements for additional emergency generators.

- D. Utility Support for Emergency Response Operations

The assistance of utility providers may be needed to support other emergency response and recovery operations. Such assistance may include:

1. Rendering downed or damaged electric lines safe to facilitate debris removal from roadways.

2. Cutting off utilities to facilitate the emergency response to fires, explosions, building collapses, and other emergency situations.
3. Facilitating search and rescue operations by cutting off electrical power, gas, and water to areas to be searched.
4. Establishing temporary utility hookups to facilitate response activities.

E. Utility Support for Disaster Recovery Operations

Utilities play a primary role in the recovery process relating to:

1. Rendering electrical lines and gas distribution lines safe before local officials authorize re-entry of property owners into affected areas to salvage belongings and/or repair damage to their homes and businesses.
2. Participating in inspections of affected structures to identify hazards created by damaged utilities and eliminating those hazards.
3. Restoring utility systems to their pre-disaster condition.

F. Public Information

1. It is essential to provide the public information on utility status, the anticipated time it will take to restore service, recommendations on dealing with the consequences of a utility outage, conservation measures, and information on sources of essential life support items. Public information relating to utility outages should be developed by the utility/utilities affected to ensure that messages are accurate and consistent.
2. In some emergency situations, many of the normal means of disseminating public information may be unavailable and alternative methods of getting information out to the public will be necessary.
3. Utilities are complex systems and service may be restored on a patchwork basis as damaged components are repaired or replaced. Some neighborhoods may have utility service restored while adjacent neighborhoods may not.

G. Phases of Management

1. Mitigation

- a. Review proposed utility construction or renovation activities to determine if existing hazards will be increased by such activities.
- b. Utilities should assess the vulnerability of their systems to known hazards and act to lessen such vulnerability.
- c. Maintain portable generators and pumps to meet unexpected needs and/or identify sources for such equipment that can be accessed during an emergency.

2. Preparedness

- a. Work with utilities to identify damage assessment information they can normally provide in an emergency.
- b. Ensure the EOC has emergency contact numbers for the utilities providers.
- c. Request that utilities brief the EOC staff on their emergency service restoration plans periodically.
- d. Encourage the utilities to participate in drills and exercises conducted by the City.
- e. Utilities should ensure emergency plans are up-to-date and equipment is in good repair and secure.

3. Response

- a. Coordinate with utility companies to obtain regular reports on their operational status, number of customers affected by service outages and areas affected. Representatives from the City Utilities Department, Verizon, and Florida Power and Light may be present in the EOC.
- b. Provide expedient substitutes for inoperable utilities at critical facilities to the extent possible or relocate those facilities if necessary. Update utility restoration priorities for critical facilities as necessary.
- c. If an extended utility outage is anticipated, take those actions necessary to protect public health and safety, private and public property and implement utility conservation measures.

- d. Facilitate utility emergency response to the extent possible.
- e. Include utility status information in the Situation Reports produced during major emergencies and disasters.
- 4. Recovery
 - a. Request regular reports concerning the operational status, the number of customers affected by service outages and areas affected for utilities with system damage.
 - b. Obtain estimates of damages for inclusion in the City's requests for disaster assistance.
 - c. Update utility restoration priorities for critical facilities as appropriate.
 - d. Request utilities that participate in major emergency operations to participate in any post-incident review of such operations.

V. ADMINISTRATION AND TRAINING

A. Administration

- 1. A record of costs and expenses incurred in direct support of an emergency or disaster situation will be maintained to support subsequent reimbursement claims to state and federal government. Examples of fiscal expenditures which should be recorded, fully detailed, and maintained are:
 - a. Personnel costs which exceed "normal" costs, i.e., overtime.
 - b. Equipment rental or lease.
- 2. The persons responsible for the implementation of this Annex will annually review the Annex to insure currency.

B. Training

The individuals responsible for the Utilities function will participate in planning and training exercises conducted for the Emergency Operations Center Staff.

APPENDIX 1 TO ANNEX F**LOCAL UTILITY INFORMATION****1. Electric**

Florida Power and Electric, its mutual aid electric companies and private contractors, would be responsible for repair, restoration and maintenance of its infrastructure should an emergency or disaster damage it.

2. Telecommunications

Frontier, its mutual aid telephone companies and private contractors would be responsible for repair, restoration and maintenance of its infrastructure should an emergency or disaster damage it.

Verizon is the City's providers of cellular service and would be responsible for repair, restoration and maintenance of its infrastructure.

3. Natural Gas

Peoples Gas System, its mutual aid natural gas companies and private contractors would be responsible for repair, restoration and maintenance of its infrastructure should an emergency or disaster damage it.

4. Propane

AmeriGas, its mutual aid propane gas companies and private contractors would be responsible for repair, restoration and maintenance of its infrastructure should an emergency or disaster damage it.

5. Water

Owned by the City of North Port and operated by the Utilities Department, Water Treatment Plant.

6. Wastewater

Owned by the City of North Port and operated by the Utilities Department, Wastewater Treatment Plant.

7. Cable Television

Comcast and Frontier, their mutual aid natural cable television companies and private contractors would be responsible for repair, restoration and maintenance of their infrastructure should an emergency or disaster damage it.

APPENDIX 2 TO ANNEX F

UTILITY RESTORATION PRIORITIES FOR CRITICAL FACILITIES

Florida Power and Light maintains a listing of utility restoration priorities for critical facilities, emergency notification procedures, emergency telephone numbers and designated emergency points of contact.

This list is updated on an annual basis, prior to the beginning of hurricane season.

APPENDIX 3 TO ANNEX F

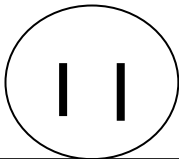
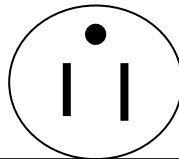
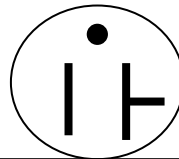
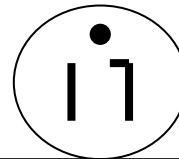
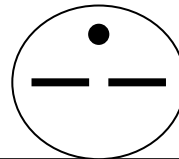
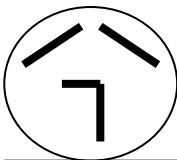
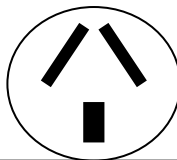
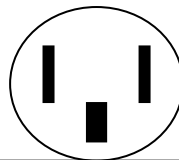
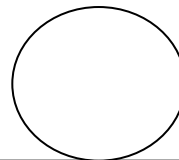
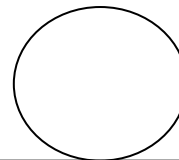
EMERGENCY GENERATOR FORMS

1. The emergency generator forms which follow are provided to facilitate pre-planning for emergency generator requirements, either to obtain a generator which does not have one or replace an existing generator which has failed.
 - a. The Emergency Generator Information – Existing Installation form should be used to record information on existing emergency generators in case they must be replaced.
 - b. The Emergency Generator Information – Additional Equipment form should be used to identify requirements for additional emergency generators for critical facilities that do not currently have such generators.
2. Forms should be completed by the owner or operator of the facility that has or may need a generator and provided to the local EMC. A separate form should be completed for each existing generator or additional generator that is required. The EMC will maintain completed forms for use during emergencies. It is suggested that individuals completing these forms retain a copy for their own records.
3. In completing these forms, keep the following in mind:
 - a. If in doubt about what type of capability is needed, consult a qualified electrician.
 - b. Generators are often quite heavy and should be placed on a firm, level site, and preferably a paved area.
 - c. A forklift is normally used to place a skid-mounted generator. The forklift operator must have adequate room to maneuver.
 - d. In considering emergency generator siting, remember that generators are often noisy and produce exhaust fumes that may be sucked into nearby ventilation intakes. Vehicle access will be needed to refuel.

APPENDIX 3 TO ANNEX F

EMERGENCY GENERATOR INFORMATION
(Existing Installation)

1	Facility Name:
2	Facility Address:
3	Facility Type: <input type="checkbox"/> EOC <input type="checkbox"/> Communications Ctr <input type="checkbox"/> Medical Facility <input type="checkbox"/> Fuel Facility <input type="checkbox"/> Law Enforcement <input type="checkbox"/> Fire/Rescue Facility <input type="checkbox"/> EMS Facility <input type="checkbox"/> Water Pumping /Treatment <input type="checkbox"/> Wastewater Pumping/Treatment <input type="checkbox"/> Other (specify)
4	Facility Point of Contact: Phone:
5	If more than one generator exists, provide generator number or location within facility:
6	Electrical Requirements: Kilowatts: Volts: Amperes: Phase: <input type="checkbox"/> Single <input type="checkbox"/> 3-Phase Wye <input type="checkbox"/> 3-Phase Delta <input type="checkbox"/> Other:
7	Fuel: <input type="checkbox"/> Gas <input type="checkbox"/> Diesel <input type="checkbox"/> Propane <input type="checkbox"/> Other:
8	Fuel Tank Size: Gallons: Pounds:
9	Fuel Tank Type: <input type="checkbox"/> Attached to generator <input type="checkbox"/> Separate tank
10	Generator Weight: <input type="checkbox"/> Pounds: <input type="checkbox"/> Tons:
11	Starting: <input type="checkbox"/> Automatic <input type="checkbox"/> Manual/Recoil <input type="checkbox"/> Other:
12	Generator Support: <input type="checkbox"/> Pad/Permanent Installation <input type="checkbox"/> Skid <input type="checkbox"/> Trailer
13	Generator in Weather Housing: <input type="checkbox"/> Yes <input type="checkbox"/> No
14	Electrician On-site or Available: <input type="checkbox"/> Yes <input type="checkbox"/> No
15	Is Generator Hard Wired to Electrical System? <input type="checkbox"/> Yes <input type="checkbox"/> No
16	Generator Receptacles Required (indicate numbers and types; see illustrations below):
17	Other Pertinent Information:

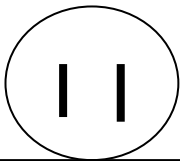
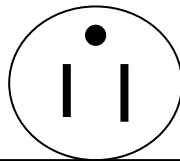
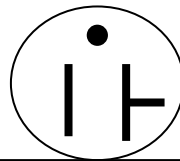
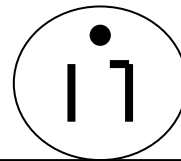
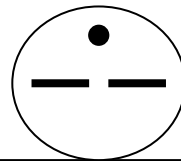
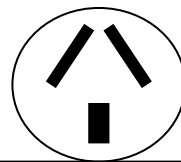
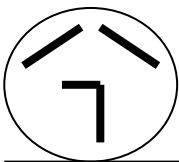
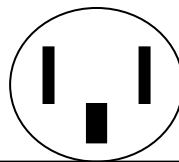
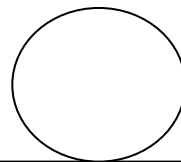
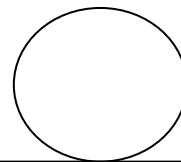
15A-125V
NEMA 1-15R15A-125V
NEMA 5-15R20A-125V
NEMA 5-20R30A-125V
NEMA 5-30R30A-250V
NEMA 6-30R30A-125/250V
NEMA 5-30R50A-125/250V
NEMA 10-50R50A-250V
NEMA 6-50R

If illustrations don't match what
you have, draw your receptacles

APPENDIX 3 TO ANNEX F

EMERGENCY GENERATOR INFORMATION
(Additional Equipment)

1	Facility Name:
2	Facility Address:
3	Facility Type: <input type="checkbox"/> EOC <input type="checkbox"/> Communications Ctr. <input type="checkbox"/> Medical Facility <input type="checkbox"/> Fuel Facility <input type="checkbox"/> Law Enforcement <input type="checkbox"/> Fire/Rescue Facility <input type="checkbox"/> EMS Facility <input type="checkbox"/> Water Pumping /Treatment <input type="checkbox"/> Wastewater Pumping/Treatment <input type="checkbox"/> Other (specify)
4	Facility Point of Contact: Phone:
5	Electrical Requirements: Kilowatts: _____ Volts: _____ Amperes: _____ . Phase: <input type="checkbox"/> Single <input type="checkbox"/> 3-Phase Wye <input type="checkbox"/> 3-Phase Delta <input type="checkbox"/> Other:
6	Fuel Available: <input type="checkbox"/> Gas <input type="checkbox"/> Diesel <input type="checkbox"/> Propane <input type="checkbox"/> Other:
7	Site Access: Site accessible for emplacing trailer-mounted unit? <input type="checkbox"/> Yes <input type="checkbox"/> No Site accessible for unloading/positioning skid-mounted unit? <input type="checkbox"/> Yes <input type="checkbox"/> No
14	Electrician On-site or Available: <input type="checkbox"/> Yes <input type="checkbox"/> No
16	Generator Receptacles Needed (indicate numbers and types; see illustrations below):

15A-125V
NEMA 1-15R15A-125V
NEMA 5-15R20A-125V
NEMA 5-20R30A-125V
NEMA 5-30R30A-250V
NEMA 6-30R50A-125/250V
NEMA 10-50R50A-250V
NEMA 6-50R

If illustrations don't match what you have, draw your receptacles

APPENDIX 3 TO ANNEX F**EMERGENCY GENERATOR INFORMATION
(Facility Assessment Worksheet)**

Facility Name: _____ Remarks: _____
 Location: _____
 City: _____ State: _____
 County/Municipality: _____
 Building Use: _____ Alt POC: _____
AGENCY CONTACT INFORMATION:
 Power(kW) Voltage Point of Contact: _____
 Agency: _____
 Pre-Assessment Phone: _____
 (User) site data Amperage Phase (1/3) FAX: _____
 E-mail: _____

ASSESSMENT DETAILS

Main Breaker # of Service
 Current: (Amps) _____ Drops _____
 Service Drop type: Transformer Mount:
 Site Voltage _____ Feeder Cable Size: _____ Overhead Pad
 Underground Pole
Backup/Existing Generator Information (if Applicable):
 Latitude (North) Longitude (West):
 Power(kW): _____ Voltage (V) _____
 Degrees: _____ Degrees: _____
 Internal Fuel
 Capacity: _____ Hours: _____ Minutes: _____ Minutes: _____
 Fuel Type: _____ Phase: _____ Seconds: _____ Seconds: _____

Needed Generator Information:

Power (kW): _____ N
 _____ W

Voltage: _____ Generator Connection Point:

Phase(s): _____

Configuration: _____

Assessment Remarks: Below, provide the materials required to mate the facility with the generator.

<u>BOM</u>	<u>Category</u>	<u>Description</u>	<u>QTY Required</u>	<u>Unit</u>
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APPENDIX 4 TO ANNEX F**UTILITY CONSERVATION MEASURES**

The utility conservation measures outlined in this appendix are suggested measures. The specific measures to be implemented should be agreed upon by the City and the utilities concerned.

I. Conservation Measures for Natural Gas**A. Step 1. Discontinue:**

1. Use of gas-fueled air conditioning systems except where necessary to maintain the operation of critical equipment.
2. All residential uses of natural gas, except refrigeration, cooking, heating, and heating water.
3. Use of gas-fueled clothes dryers.

B. Step 2. Reduce:

1. Thermostat settings for gas-heated buildings to 65 degrees during the day and 50 degrees at night.
2. Use of hot water from gas-fueled water heaters.

II. Conservation Measures for Electric Power**A. Step 1. Discontinue:**

1. All advertising, decorative, or display lighting.
2. Use of electric air conditioning systems except where necessary to maintain the operation of critical equipment.
3. Use of electric ovens and electric clothes dryers.
4. Use of all residential electric appliances, except those needed to store or cook food and televisions and radios.

B. Step 2. Reduce:

1. Reduce thermostat setting for electrically heated buildings to a maximum of 65 degrees during the day and 50 degrees at night.

2. Minimize use of hot water in buildings that use electric water heaters.
 3. Reduce both public and private outdoor lighting.
 4. Reduce lighting by 50 percent in homes, commercial establishments, and public buildings.
- C. Step 3. Cut off electricity to:
1. Non-essential public facilities.
 2. Recreational facilities and places of amusement such as theaters.
- D. Step 4. Cut off electricity to:
1. Retail stores, offices, businesses, and warehouses, except those that distribute food, fuel, water, ice, pharmaceuticals, and medical supplies.
 2. Industrial facilities that manufacture, process, or store goods other than food, ice, fuel, pharmaceuticals, or medical supplies or are determined to be essential to the response and recovery process.
 3. Office buildings except those that house agencies or organizations providing essential services.

III. Water Conservation Measures

- A. Step 1.
1. Restrict or prohibit outdoor watering and washing of cars.
 2. Close car washes.
- B. Step 2
1. Restrict or curtail water service to large industrial users, except those that provide essential goods and services.
 2. Restrict or prohibit use of public water supplies for irrigation and filling of swimming pools.
 3. Place limits on residential water use.

C. Step 3

1. Restrict or cut off water service to industrial facilities not previously addressed, except those that provide essential goods and services.
2. Restrict or cut off water service to offices and commercial establishments, except those that provide essential goods and services.

D. Step 4

1. Restrict or curtail residential water use.

ANNEX G**TERRORISM****I. PURPOSE****II. EXPLANATION OF TERMS**

- A. Acronyms
- B. Definitions
- C. References

III. SITUATION AND ASSUMPTIONS

- A. Situation
- B. Assumptions

IV. METHOD OF OPERATIONS

- A. General
- B. Prevention
- C. Detection, Notification and Classification of a Terrorist Event
- D. Response
- E. Coordination of Incident Management Activities
- F. Implementation of the Incident Command System
- G. Protective Actions
- H. Requesting External Assistance
- I. Phases of Management

V. ORGANIZATION AND ASSIGNMENT OF RESPONSIBILITIES

- A. Organization
- B. Assignment of Responsibilities
- C. General Response Checklist

VI. DIRECTION AND CONTROL**VII. ADMINISTRATION & SUPPORT**

- A. Reports & Records
- B. Preservation of Records
- C. Post-Incident Review

VIII. ANNEX DEVELOPMENT & MAINTENANCE

- A. Responsibility
- B. Schedule for Annex Updating
- C. Security Considerations - General Exemptions from Public Inspection

APPENDICES

- Appendix 1 Terrorist Incident Response Checklist
- Appendix 2 Background Information on Chemical, Biological, Radiological, Nuclear, Explosive Agents
- Appendix 3 Guidance for City Government Activities During a “Severe Risk of Terrorist Attack,” Code Red
- Appendix 4 Procedure for Management of Victims of a Terrorist Incident Involving Biological, Chemical or Radiological Materials
- Appendix 5 Notification of Regional Domestic Security Task Force

I. PURPOSE

- A. To establish operational concepts and to clarify roles and responsibilities to lessen probable confusion resulting from a threat of terrorism or an actual event.
- B. This Annex defines how the City of North Port will operate during the crisis and consequence management phases of anticipated or actual acts of terrorism.
- C. The Annex provides for coordinated integration and joint operations in accordance with Federal and State emergency management plans as well as related contingency plans.

II. EXPLANATION OF TERMS

A. Acronyms

ATTF	U.S. Attorney's Anti-Terrorism Task Force
CBRNE	Chemical, Biological, Radiological, Nuclear, Explosives
EMS	Emergency Medical Services
EOC	Emergency Operations Center
FBI	Federal Bureau of Investigation
FDEM	Florida Division of Emergency Management
FEMA	Federal Emergency Management Agency
IC	Incident Command
ICP	Incident Command Post
ICS	Incident Command System
JIC	Joint Information Center
JOC	Joint Operations Center
JTTF	Joint Terrorism Task Force
MACS	Multi-Agency Coordination System
NIMS	National Incident Management System
NRF	National Response Framework
NTAS	National Terrorism Advisory System
PPE	Personal Protective Equipment
SOG	Standard Operating Guidelines
UC	Unified Command
WMD	Weapon of Mass Destruction

B. Definitions

1. **Attack.** Sabotage or the use of bombs, chemical or biological agents, nuclear or radiological materials, or armed assault with firearms or other weapons by a terrorist or quasi-terrorist actor that causes or may cause substantial damage or injury to persons or property in any manner.

2. **Biological Agents.** Living organisms or the materials derived from them that cause disease in or harm to humans, animals, or plants, or cause deterioration of material. Biological agents may be used as liquid droplets, aerosols, or dry powders.
3. **Chemical Agents.** A substance with chemical properties that is intended for use in military operations to kill, seriously injures, or incapacitates people through its physiological effects. Excluded from consideration are riot control agents, and smoke and flame materials. The agent may appear as a vapor, aerosol, or liquid; it can be either a casualty/toxic agent or an incapacitating agent.
4. **Contamination.** The deposit of absorption of chemical or biological warfare agents (or conventional hazardous materials) on structures, areas, personnel, or objects
5. **Control Zones.** The geographical areas established to control a hazardous materials incident (including those involving CBRNE agents). The three zones most commonly used are the exclusion (hot) zone, contamination reduction (warm) zone, and support (cold) zone.
6. **Decontamination (Decon).** The action that is required to physically remove or chemically change contaminants from personnel and equipment. Decon is the process used to reduce the hazards of CBRNE agents to safe levels.
7. **National Response Framework (NRF).** The interdepartmental planning mechanism, developed under the leadership of the Department of Homeland Security (DHS), by which the Federal government prepares for a response to the consequences of catastrophic disasters. Federal planning and response are coordinated on a functional basis – known as emergency support functions – with designated lead and support agencies for each identified functional area.
8. **CBRNE Emergencies.** An actual or imminent set of conditions in which CBRNE agents are intentionally introduced within a specific operational area. These incidents can involve the release of warfare agents or the intentional release of industrial agents. Thus, such incidents are essentially deliberate Hazmat incidents and constitute a complex emergency
9. **Personal Protective Equipment (PPE).** Equipment and clothing required to shield or isolate personnel from the chemical, physical and biologic hazards that may be encountered at the site.

10. **Significant Threat.** The confirmed presence of an CBRNE device capable of causing a significant destructive or hazardous event, prior to actual injury or property loss.
11. **Terrorist Incident.** A violent act, or an act dangerous to human life, in violation of the criminal laws of the United States or of any State, to intimidate or coerce a government, in furtherance of political or social objectives.

FBI Categories:

- *Domestic* – groups or individuals whose terrorist activities are directed at elements of our government or population without foreign direction.
 - *International* – terrorist activity committed by groups or individuals who are foreign-based and/or directed by countries or groups outside the US or whose activities transcend national boundaries.
12. **Weapon of Mass Destruction (WMD).** (A) Any destructive device as defined in section 921 of 18 U.S.C., section 2332a, (which reads) any explosive, incendiary, or poison gas, bomb, grenade, rocket having a propellant charge of more than four ounces, missile having an explosive or incendiary charge more than one quarter ounce, mine or device similar to the above; (B) poison gas; (C) any weapon involving a disease organism; or (D) any weapon that is designed to release radiation or radioactivity at a level dangerous to human life.

C. References

1. FEMA, Guide for All-hazard Emergency Operations Planning (SLG-100).
2. US Department of Transportation/Transport Canada, Emergency Response Guidebook
3. Jane's Information Group, Jane's Chem-Bio Handbook

III. SITUATION AND ASSUMPTIONS

A. Situation

1. Acts of terrorism can occur without warning. The City of North Port, its governmental entities, its public and private institutions, its businesses, and its people may all be targets of terrorism.

2. Federal law dictates that all acts of terrorism planned or executed are subject to Federal jurisdiction. Federal laws assign the primary authority to the Federal government for prevention and response to acts of terrorism; local governments will provide initial response, supported by State and Federal resources as required.
3. Since terrorist acts may be violations of local, State, and Federal law, the response to a significant local terrorist threat or actual incident may include State and Federal response agencies.
4. In the event of a significant terrorist threat or incident, it is anticipated that regional, State and Federal resources will be requested in order to supplement local capabilities.
5. The presence of chemical, biological, radiological, nuclear, or explosive (CBRNE) agents may not be detected immediately. In the case of chemical, biological, or nuclear materials, they may not be discovered until sometime after casualties occur. There may be a delay in identifying the agent present and in determining the appropriate protective measures. Such agents may quickly dissipate or be persistent.

B. Assumptions

1. The Terrorism Annex could be activated based solely on a Homeland Security Advisory color change, without any specific threat information for Sarasota County or the City of North Port.
2. Public safety agencies of the City of North Port will be the “first responders” to the scene of a terrorist incident or the locations in the City where the impacts of the event are experienced.
3. A terrorist incident may be made clear to the responding organizations by the characteristics of the impacts or a declaration on the part of the perpetrators, or may be very difficult to initially detect and identify because of uncertainty as to the cause or extent of the situation.
4. The resources and/or expertise of local agencies in the City of North Port could quickly be depleted by a response to a major terrorist incident and its consequences. Extensive use of regional, State, and Federal resources and intrastate mutual aid agreements must therefore be anticipated.
5. Specialized resources, as well as those normally utilized in disaster situations, will be needed to support the response to a terrorist incident.

Such resources may not be in Sarasota County, the FDLE Region or in the State of Florida.

6. The Florida Department of Health will have a minimum of three Biosafety Level 3 laboratories available for analytical services to assist in the response to a terrorist event in Florida.
7. Resources from local, State, and Federal agencies, as well as from private organizations, will be made available on a timely basis upon request.
8. All State and local response agencies and organizations will establish and participate in a unified command structure at or near the scene, and the Emergency Operations Center of Sarasota County will be activated and staffed (if indicated by the size or scope of the incident).
9. Federal agencies with statutory authority for response to a terrorist incident, or for the geographic location in which it occurs or has impacted, will participate in and cooperate with the unified command structure established by response organizations from the City of North Port and Sarasota County.
10. A terrorist event will result in the timely activation of the City of North Port's and Sarasota County's Comprehensive Emergency Management Plans. When needed, and the Florida Division of Emergency Management (FDEM) will activate the State Comprehensive Emergency Management Plan (CEMP).
11. Responding agencies of the City of North Port and Sarasota County will have the supportive plans and procedures, as well as appropriately trained and equipped personnel, that may be needed for the general response operations related to management of the terrorist incident. This Annex assumes the resources and procedures for such related operations as hazardous material response, mass casualty incident management, law enforcement, search and rescue, and others will be in place to be utilized when needed during a terrorist incident.
12. For terrorist events involving weapons of mass destruction, there may be many casualties. Injured or ill victims will require specialized medical treatment, potentially including decontamination and medical facilities and may require establishing temporary medical operations in the field. Fatally injured victims may be numerous, and their bodies contaminated or infectious. Special mortuary arrangements are likely to be necessary.

13. Terrorist incidents may involve damage or disruption to computer systems, telecommunications networks, or Internet systems; disturbance to vital community networks for utilities, transportation, or communication; and/or could endanger the health and safety of the population at risk, interrupt emergency response operations, and result in substantial economic losses.
14. There will be very extensive media interest in a terrorist event and media management operations will require resources beyond those needed for other types of emergency management operations.
15. The City of North Port Police Department and Sarasota County Sheriff's Office are or will be subscribers to the Secure Florida Alert System (when available) and are on the FBI Law Enforcement Online (LEO) Network.
16. The City of North Port has taken proper precautions such as implementing "firewalls" and password access to their computer systems and have implemented the same reporting mechanism that was used during Y2K for cyber incidents.
17. The City of North Port is developing the capability to implement response and recovery operations for computer networks and databases disrupted by a cyber terrorist incident.
18. The 44th WMD Civil Support Team of the Florida National Guard is available for deployment to actual/suspected WMD events in a local jurisdiction. Travel time to Sarasota County from approval of the request of the State is approximately six hours.
19. Once notified of a suspected terrorist incident, the State Watch Office will make notifications specifically to the Florida Division of Law Enforcement (FDLE) and the Federal Bureau of Investigation (FBI).
20. It is possible that the use of a weapon of mass destruction, such as a biological agent, could occur resulting in widespread illness, fatalities, or environmental contamination without a readily defined incident scene. In this case emergency operations at the local level would be coordinated through the local emergency operations center. Response operations such as mass casualty management, environmental decontamination, and public information would be provided on a region-wide basis, with coordination being done through the RDSTF and the State Emergency Operations Center. The State EOC and Department of Health will conduct cross regional coordination. Sarasota County EOC will remain operational if the State or Regional EOC is activated for a local or regional event.

21. Receipt and distribution of Strategic National Stockpile will be in concert with current Florida Department of Health policies. Health policies will be coordinated with the Sarasota County Emergency Management and the Sarasota County Health Department.

IV. METHOD OF OPERATIONS

A. General

1. The organizational structure for emergency response operations is pursuant to NIMS, which employs two levels of incident management structures.
 - a. The Incident Command System (ICS) includes a core set of concepts, principles, and terminology applicable to single or multiple incidents regardless of their scope.
 - b. A Multi-Agency Coordination System (MACS) integrates a combination of facilities, equipment, personnel, procedures, and communications into a common framework, which allows for the coordination and support of incident management.
2. During a terrorist event, a MACS may be advisable. Central to this system is the Emergency Operations Center (EOC), which is the nucleus of all coordination of information and resources. The Incident / Unified Command (IC/UC) will manage and direct the on-scene response from the Incident Command Post (ICP). The City EOC will mobilize and deploy resources for use by the IC/UC, coordinate external resources and technical support, research problems, provide information to senior managers, disseminate emergency public information, and perform other tasks to support on-scene operations.
3. This Annex is implemented whenever there is evidence of a threat or a suspected terrorist incident. Otherwise, the normal actions outlined in the City of North Port Comprehensive Emergency Management Plan and Standard Operating Guidelines (SOG) for responding to and recovering from any emergency or disaster situation will remain in effect.

B. Prevention

1. Prior to the occurrence of a terrorist incident, there are intelligence functions that may take place. These will be the responsibility of appropriate law enforcement agencies (i.e., North Port Police Department

(NPPD), Sarasota County Sheriff's Office (SSO), Florida Department of Law Enforcement (FDLE) and the Federal Bureau of Investigation (FBI)), and will not be addressed in this annex.

- a. Lead Agencies
 - i. NPPD – Lead local law enforcement agency
 - ii. SSO – Lead County law enforcement agency
 - iii. FDLE – Lead State law enforcement agency
 - iv. FBI – Lead Federal law enforcement agency
- b. An IC/UC structure will be used to provide law enforcement direction and control during crisis management operations. A Joint Operations Center (JOC) may be established to coordinate law enforcement actions.
- c. NPPD will work in cooperation and coordination with the FBI exercising authority for managing the response at the incident site, additional coordination with other local, State or Federal agencies will be addressed as needed.
- d. Briefings of emergency management personnel and other key City officials will be conducted by NPPD throughout operations.

C. Detection, Notification and Classification of a Terrorist Event

1. Detection

Detection of an actual, suspected or threatened terrorist or cyber terrorist incident may occur through the following types of mechanisms:

- a. Law enforcement intelligence efforts
- b. Warnings or announcements by the perpetrators
- c. The characteristics of the event, such as an explosion or chemical recognition
- c. Witness accounts
- d. The medical or physical symptoms of victims

- e. Laboratory results from samples taken at the scene or from victims' bodies
- f. Monitoring of a community's morbidity and mortality on a routine basis
- g. Syndromatic Surveillance
- h. Unexplained disruption or failure of a computer network, telecommunications system or Internet service

In many cases, such detection most likely would be by City or County first responding units. Information regarding the event and its consequences would then be reported from the scene to the County Warning Point.

Should detection of the event be from a telephone call or other communication threatening a terrorist action or declaring that one has occurred, the County Warning Point will utilize existing procedures to initiate an investigation and make appropriate notifications, as indicated below.

Detection of a suspected terrorist event may be from a source other than the first arriving unit or a communicated threat or declaration, such as from monitoring of morbidity or mortality statistics in the county, reports from hospital emergency departments, laboratory results from incident victims or environmental sampling, etc. In such cases, the facility or individual recognizing the indications of a terrorist event would notify the County Warning Point, and follow-up notification would be made by the County Warning Point to the State Warning Point.

Regardless of the method of detection of a known or suspected terrorist event, within the meaning of this Annex, the Sarasota County Warning Point will be notified accordingly.

2. Classification (based on the National System)

Every known, suspected or threatened terrorist event occurring in Sarasota County or its municipalities will be classified in a manner consistent with Federal policy. The Sarasota County Warning Point will be informed of the classification and will, in turn, notify the incident commander and the County EOC, if activated.

As for in this Annex, each threat level provides for an escalating range of actions that will be implemented concurrently for crisis and consequence management. Specific actions will take place, which are synchronized to each threat level, ensuring that all agencies are operating jointly with consistent executed plans. Federal and State government will notify and coordinate with local governments, as necessary. These threat levels are described below:

In response to recent terrorist attacks both foreign and domestic, the Department of Homeland Security (DHS) has updated the National Terrorism Advisory System (NTAS). NTAS communicates threat information to the public, first responders, the private sector, transportation modes and other critical infrastructure sectors.

- BULLETIN -- Describes current developments or general trends regarding threats of terrorism.
- ELEVATED ALERT -- Warns of a credible terrorism threat against the United States.
- IMMINENT ALERT -- Warns of a credible, specific and impending terrorism threat against the United States.

The Department of Homeland Security, when warranted by conditions, may change the classification at any time. The State Warning Point will then notify or confirm notification of the change through the County Warning Point to local incident commander, the unified command, FDLE and the FBI.

The incident commander for the City of North Port, or Sarasota County will also notify the County Warning Point of one of the following two situations:

- State and/or Federal resources are requested to support local operations, or
- Local capabilities are deemed to be adequate for local crisis and consequence management response operations.

The County Warning Point will then notify the State Warning Point accordingly.

If the actual or potential consequences of the incident are such that county, State and Federal resources and assistance are likely to be needed,

these will be requested by the unified command through the county Emergency Operations Center in accordance with provisions of the City of North Port CEMP.

3. Notification

Upon receipt of notification that:

- a. The NTAS changes from Bulletin to Elevated Alert the State Warning Point will notify the County Warning Point and Sarasota County Emergency Management (SCEM). SCEM will disseminate this change and recommended protective actions to members of the Public Safety Advisory Group (PSAG).
- b. The NTAS changes from Elevated Alert to Imminent Alert, the State Warning Point will contact the County Warning and SCEM. SCEM will disseminate this change and recommended protective actions to members of the PSAG. The Emergency Management Chief will schedule a meeting to brief PSAG representatives on the current situation and will consider activating the County EOC.
- c. A known or suspected terrorist event has occurred, is occurring or may occur, the On-Duty Communications Supervisor of the County Warning Point will notify the State Warning Point, as well as county and municipal agencies in accord with existing procedures. Regardless of the source of the detection of a known, suspected or threatened terrorist event, pursuant to this annex, under all circumstances, the County Warning Point will immediately notify State Warning Point (SWP) that a terrorist incident may have occurred or has been threatened. The County Warning Point shall immediately notify the Emergency Management Chief, or his designee, following the notification to the SWP.

D. Response

Activities undertaken to deal with effects of a terrorist incident are conducted in essentially the same manner as the response for other emergencies or disasters. Post-incident activities, such as investigation, evidence gathering, and pursuit of suspects, will continue. The agency with primary jurisdictional authority over the incident designates the individual at the scene responsible for establishing command.

1. Emergency Management will coordinate consequence management and will interface with Sarasota County Emergency Management, Florida

Division of Emergency Management (FDEM) and FEMA. Field response will operate under an Incident / Unified Command (IC/UC) for initial emergency response, resolution of the life safety issues, and initial recovery actions.

2. Actions taken early primarily deal with life safety and incident stabilization.
3. Briefings of key City officials and response agencies will be conducted by Emergency Management throughout response and recovery operations.
4. If an incident involving terrorism has taken place where injuries and/or deaths have or may soon occur, all activities will be conducted under an IC/UC structure with priority given to life safety, rescue, and incident stabilization. Cooperation between functions will be critical to prevent compromise of other operations.
5. Possible indicators of a terrorist incident could be, but are not limited to:
 - a. Unexplained odors
 - b. Dead animals/birds/fish
 - c. Blisters/rashes
 - d. Mass or unusual casualties
 - e. Unusual pattern of casualties
 - f. Illness associated with a specific geographic area
6. Coordination of Local Medical Response to Biological Weapons Incidents

As the medical response to an incident involving biological agents must include the local medical community as a group, the County and State health departments as well as Federal health agencies directing the response should undertake to coordinate the efforts of local medical providers to ensure that a consistent approach to health issues is taken. Hence, concise information on the threat, recommendations on what should be done to combat it, and instructions on handling victims must be provided to all hospitals, clinics, nursing homes, home health care agencies, individual physicians, pharmacies, school nursing staffs, and other medical providers. The County health department will typically take the lead in coordinating the local medical response. They may request

assistance from local professional organizations in providing information to all members of the local medical community.

E. Coordination of Incident Management Activities

1. Law enforcement agencies involved in consequence management shall keep those agencies and/or departments responsible for response and recovery efforts informed of decisions made that may have implications on the placement of resources should it be necessary. Because of the sensitivity of law enforcement sources and methods it may be necessary to restrict dissemination of some information to selected emergency management and public health officials who have a need to know. Those individuals may have to carry out some preparedness activities surreptitiously.
2. Until law enforcement and emergency management personnel agree that investigation activities have been concluded, law enforcement personnel shall participate in incident command or EOC operations to advise those carrying out consequence management operations with respect to protection of the crime scene, evidence collection, and investigation results that may have bearing on emergency operations. FDLE and the FBI will normally provide personnel to participate in an IC/UC operation to coordinate State and Federal law enforcement assistance.

F. Implementation of the Incident Command System (ICS)

Refer to the Base Plan.

G. Protective Actions

1. Responders. Emergency personnel responding to a terrorist incident must be protected from the various hazards that a terrorist incident can produce. These include: blast effects, penetrating and fragmenting weapons, fire, asphyxiation, hazardous chemicals, toxic substances, radioactive materials, and disease-causing material. See the discussion of threat weapons and their effects in Appendix 3. Though the type of protection required varies depending on the hazard, there are three basic principles of protection that apply to all hazards: time, distance, and shielding.
 - a. Time. Emergency workers should spend the shortest time possible in the hazard area or exposed to the hazard. Use techniques such as rapid entries to execute reconnaissance or rescue and rotate personnel in the hazard area.

- b. Distance. Maximize the distance between hazards and emergency responders and the public. For chemical, radiological, and explosive hazards, recommended isolation and protective action distances are included in the *Emergency Response Guidebook* (ERG).
 - c. Shielding. Use appropriate shielding to address specific hazards. Shielding can include vehicles, buildings, protective clothing, and personnel protective equipment.
2. The Public. Protective actions for the public must be selected and implemented based on the hazards present and appropriate instructions and information provided to the public through usual means of warning and public information. Protective actions for the public may include:
- a. Evacuation.
 - b. Shelter-in-place.
 - c. Access control to deny entry into contaminated areas.
 - d. Restrictions on the use of contaminated foodstuffs, normally imposed by the Florida Department of Health Services (DOH).
 - e. Restrictions on the use of contaminated agricultural products before processing will normally be imposed by the Florida Department of Agriculture and Consumer Services. These are products destined for food use after processing.
 - f. Restrictions on the use of contaminated public water supplies, normally imposed by the Florida Department of Environmental Protection (FDEP).
 - g. For incidents involving biological agents, protective actions taken to prevent the spread of disease may include:
 - i. Isolation of diseased victims within medical facilities.
 - ii. Quarantines to restrict movement of people and/or livestock in specific geographic areas.
 - iii. Closure of schools and businesses.

- iv. Restrictions on mass gatherings, such as sporting events.

Such measures are normally recommended and imposed by public health authorities.

H. Requesting External Assistance

Refer to the Base Plan.

I. Phases of Management

This Annex follows a basic approach and acknowledges that most responsibilities and functions performed during an emergency are not specific.

1. Mitigation

- a. Establish guidelines for terrorist incident response
- b. Identify high-risk targets and their associated hazards
- c. Institute security programs for the high risk and most vulnerable areas
- e. Exchange information and intelligence on activities with the Joint Terrorism Task Force (JTTF) and other appropriate agencies.

2. Preparedness

- a. Conduct training sessions for other response personnel
- b. Ensure detection and monitoring equipment are available and operational
- c. Establish decontamination protocols
- d. Maintain medical and sampling supplies and equipment
- e. Maintain personal protective equipment (PPE)

3. Response

- a. Establish control zones for scene security, crowds, media and Hazmat operations.

- b. Conduct fire and rescue, hazardous materials, and law enforcement operations
 - c. Stage and deploy appropriate resources
 - d. Alert and/or activate medical strike teams
 - e. Establish effective communications with all response groups
4. Recovery
- a. Initiate community mental health services
 - b. Restore normal services

V. ORGANIZATION & ASSIGNMENT OF RESPONSIBILITIES

A. Organization

- 1. City departments and public safety agencies will continue to use a functional approach to solve problems and aid, as necessary.
- 2. While all emergency management agencies and emergency support functions may be involved in responding to a terrorist incident, certain agencies are anticipated to play a more active role in the event.

Because of the nature of terrorism, NPPD will act as the City's lead agency for coordinating local, mutual aid, State, and Federal response during acts of terrorism.

3. Intelligence and Prevention

Intelligence and prevention are primarily a law enforcement direction and control function at all levels of government and will be coordinated locally by NPPD.

4. Response and Recovery Operations

- a. Are performed in the same manner as any other operation conducted for an emergency or disaster in North Port.
- b. Emergency Management will coordinate the response and recovery with support provided from State and Federal government as required.

5. The coordinating agency for the Health and Medical function is the Sarasota County Health Department.

B. Assignment of Responsibilities

1. The Emergency Manager will be responsible for coordinating all EOC operations, as required.
 - a. Develop and maintain a resources database
 - b. Assist in identifying high risk targets and their associated hazards
 - c. Determine the vulnerabilities of the high-risk areas and their impact upon the population
 - d. Coordinate periodic exercises to test response
 - e. Develop and promote public awareness programs
 - f. Develop communication procedures
2. North Port Police Department
 - a. Assign liaison personnel to the EOC
 - b. Coordinate all law enforcement activities within the City
 - c. Coordinate with the JTTF, and all other law enforcement agencies
 - d. Develop awareness and prevention training programs for law enforcement personnel
 - e. Institute security programs for the high risk and most vulnerable areas
 - f. Conduct briefing sessions for emergency management and response personnel
 - g. Maintain terrorist activity information
 - h. Establish scene security
 - i. Provide traffic control, as necessary

- j. Notify appropriate Federal, State and County law enforcement agencies when activated
3. North Port Fire Rescue
- a. Assign liaison personnel to the Emergency Operations Center (EOC)
 - b. Coordinate all fire and EMS service activities within the City
 - c. Provide fire suppression, search, and rescue operations, including evacuation, as needed
 - d. Remain on scene with unsafe structures until the scene is rendered safe
 - e. Respond to medical emergency calls, establish triage if needed, provide emergency medical care to the injured, including advanced life support when appropriate
 - f. Transport sorted patients in a timely manner to the appropriate medical facility
 - g. Alert hospitals of mass casualty incident with suspected CBRNE agents so they may initiate protective action plans
 - h. Establish control zones, PPE requirements, decon procedures, containment of product, and product identification
 - i. Request activation of the Sarasota County Fire Department HMRT, as needed
 - j. Activate mutual aid, as needed
5. Sarasota County Health and Human Services (SCHHS)
- a. Assign liaison personnel to the EOC
 - b. Coordinate the City's Health and Medical infrastructure
 - c. Conduct epidemiological investigation
 - d. Alert hospitals of CBRNE incident so they may initiate protective action plans

- e. Conduct ongoing surveillance activities
 - f. Provide diagnostic and reference laboratory support for the community
 - g. Provide ongoing analysis of data to support decision-making during an event
- 6. Routine operations will be conducted in accordance to standard procedures and guidelines
 - 7. State and Federal support will be called upon when needed
 - 8. All mutual aid resources will function under the direction of the City and immediate control of their respective supervisors
- C. General Response Checklist - These steps are not in any specific order and may be performed by various individuals from various locations.
- 1. Be suspicious if any indicators are present and respond with heightened awareness
 - 2. Approach with caution from uphill and upwind
 - 3. Establish Command Post and initial perimeter, restrict entry, consider secondary devices, and treat as a potential crime scene
 - 4. Identify a safe staging area
 - 5. Establish command structure (fire, hazardous materials, law enforcement, emergency management, public health and medical)
 - 6. Establish appropriate level of personal protective equipment required
 - 7. Establish treatment plan for victims and decedents (include triage, treatment, transport and decon as appropriate)
 - 8. Make additional notifications (Mutual-aid, City departments, County, State, and Federal)
 - 9. Make protective action recommendations to the public

- a. Basic shelter-in-place guidance should be given for residents indoors located near the incident site.
- b. Quickly establish control of ingress and restrict egress from incident site to prevent contamination spread.
- c. Evacuation of non-injured/non-contaminated persons must include coordination with investigating law enforcement personnel.
- d. Disseminate guidance for persons in the area at the time of the event via media resources at earliest opportunity after agent identification.

10. Coordinate media

VI. DIRECTION & CONTROL

- A. The Incident Commander shall, pursuant to the CEMP and NIMS, provide general guidance for emergency operations, including the response to terrorist incidents. During periods of heightened terrorist threat or after an incident has occurred, the local EOC will be activated.
- B. The IC/UC, assisted by a staff sufficient for the tasks to be performed, will manage the emergency response at the incident site from an ICP. If terrorist attacks affect multiple widely separated facilities, separate incident command operations may be set up.
- C. If City resources are insufficient or inappropriate to deal with an emergency, the City may request assistance from other jurisdictions pursuant to mutual aid agreements or from organized volunteer groups. Mutual aid personnel and volunteers will normally work under the immediate control of their own supervisors. All response agencies are expected to conform to the general guidance provided by our senior decision-makers and carry out mission assignments directed by the IC/UC or the EOC.
- D. In a large-scale terrorist incident, significant assistance may be needed from other local governments, State agencies, and the Federal government. As these external resources arrive, they will be integrated into the operation consistent with the NIMS guidance.

VII. ADMINISTRATION AND SUPPORT

- A. Reports and Records

1. Situation Report. During emergency operations for terrorist incidents, a daily situation report should be prepared and distributed to the County EOC.

2. Records Relating to Emergency Operations

See Base Plan.

B. Preservation of Records

As terrorist often target government facilities, government records are at risk during terrorist incidents. To the extent possible, legal, property and tax records should be protected. If government records are damaged during the incident response, the EOC should be promptly advised so that timely professional assistance can be sought to preserve and restore them.

C. Post-Incident Review

See Base Plan.

VIII. ANNEX DEVELOPMENT AND MAINTENANCE

A. Responsibility

Each agency identified in section VI(B) of this Annex will develop SOGs that address assigned tasks. Emergency Management is responsible for reviewing this annex annually and updating as necessary.

B. Schedule for Annex Updating

This annex will be maintained in accordance with the following schedule:

1. The annex will be updated with each updating of the City's Comprehensive Emergency Management Plan.
2. The annex will be reviewed after each exercise and/or actual response to a terrorist event, and modified as necessary.
3. The annex will be reviewed and revised, if needed, after each of the following types of events:
 - a. A major change in applicable Federal or State laws, regulations, or policies,

- b. A major terrorist or cyber terrorist event impacting a jurisdiction in Sarasota County,
- c. The findings of ongoing vulnerability and needs assessments in Florida, and
- d. Major advances in applicable response technology and/or operational concepts
- e. Security Considerations - General Exemptions from Public Inspection

Certain security procedures and plans developed resulting from this Annex to the City of North Port Comprehensive Emergency Management Plan, may, and should be exempt from public inspection under F.S. Chapter 119.

APPENDICES

- Appendix 1 Terrorist Incident Response Checklist
- Appendix 2 Background Information on Chemical, Biological, Radiological, Nuclear, Explosive Agents
- Appendix 3 Guidance for City Government Activities During a “Severe Risk of Terrorist Attack,” Code Red
- Appendix 4 Procedure for Management of Victims of a Terrorist Incident Involving Biological, Chemical or Radiological Materials
- Appendix 5 Notification of Regional Domestic Security Task Force (RDSTF)

APPENDIX 1 TO ANNEX G**Terrorist Incident Response Checklist****I. INDICATORS**

- A. Is the response to a target hazard or target event?
- B. Has there been a threat?
- C. Are there multiple victims?
- D. Are responders victims?
- E. Are hazardous substances involved?
- F. Has there been an explosion?
- G. Has there been a secondary attack/explosion?

II. RESPONSE ACTIONS

- A. Be suspicious if any indicators are present and respond with heightened awareness
- B. Approach with caution from uphill and upwind
- C. Establish Command Post and initial perimeter, restrict entry, consider secondary devices, and treat as a potential crime scene
- D. Identify a safe staging area
- E. Establish command structure (fire, hazardous materials, law enforcement, medical, and emergency management)
- F. Establish appropriate level of personal protective equipment required
- G. Establish treatment plan for victims and decedents (include triage, treatment, transport and decon as appropriate)
- H. Make additional notifications (Mutual-aid, City departments, County, State, and Federal)

- I. Make protective action recommendations to the public
 - 1. Basic shelter-in-place guidance should be given for residents indoors located near the incident site.
 - 2. Quickly establish control of ingress and restrict egress from incident site to prevent contamination spread.
 - 3. Evacuation of non-injured/non-contaminated persons must include coordination with investigating law enforcement personnel.
 - 4. Disseminate guidance for persons in the area at the time of the event via media resources at earliest opportunity after agent identification.
- J. Coordinate media

These steps are not in any specific order and may be performed by various individuals from various locations.

III. RESPONSE RESOURCES

- A. Urban search and rescue teams for collapsed structures
- B. Mortuary support for mass fatalities
- C. Investigative resources
- D. Specialized pharmaceuticals
- E. Public health prevention programs
- F. Personnel support for quarantine operations

APPENDIX 2 TO ANNEX G

Background Information on Chemical, Biological, Radiological, Nuclear, Explosive Agents

I. PURPOSE

This Appendix to Annex G of the City of North Port CEMP is to provide background information regarding the CBRNE agents that could be involved in a terrorist incident in the City of North Port.

II. TYPES

A. Ballistics/Explosives

Ballistic injuries resulting from terrorist attacks are still the most common and have the highest “lethality index.” A determined individual or group of individuals armed with assault-type weapons can produce a high rate of casualties in a short period.

Table 1 - Lethality Index for Ballistic Injuries¹

Weapon	Fatalities	Nonfatal Injuries	Lethality Index*
Bullets			
Low Velocity	35	430	0.08
High Velocity	152	261	0.37
Fragmentation Munitions	5	33	0.13
Homemade Bombs	10	164	0.06
High explosive Devices	79	281	0.22
Hand Thrown missiles	0	304	0
*Lethality Index is the number of fatalities divided by the number of injuries and fatalities combined $[LI = \text{fatalities} / (\text{injuries} + \text{fatalities})]$.			
Information derived from Journal of the Royal Army Medical Corps			

Bombs are the most common weapons of terrorists. Bombs are easy to make from ordinary household materials and can be very effective. A fertilizer bomb blasted the Alfred P. Murrah Federal Building in Oklahoma City. When a bomb of this type explodes, it sends a shockwave in all directions and smashes into buildings blocks away. As this shock wave travels, a powerful vacuum forms behind it, sucking in the entire atmosphere that has been displaced by the original

¹ Owen-Smith MS. A computerized data retrieval system for the wounds of war: The Northern Ireland casualties. *J R Army Med Corps.* 1981; 127:31-54.

shockwave. The surrounding area is smashed a second time by the aftershock. All this takes less than a second. Materials in the way of these shockwaves become high velocity projectiles. Walls move away from the blast and then back toward the blast before finally crumbling. Floors and roofs defy gravity for a split second before collapsing to the ground. This can all be accomplished using common household substances.

Most fertilizer bombs, like the Oklahoma City bomb, generate blast waves that can exceed 6800 miles per hour. High-order military explosives, such as C4 and Semtex, can create blast waves almost three times as fast.

Table 2 - Mechanisms of Blast Injuries ²

Type of Blast Injury	Mechanism	Injuries	Diagnostic Procedures	Treatment
Primary	Injury from blast wave as it travels through the air or water	Pulmonary contusion Hollow viscous perforation (possibly delayed) Perforated eardrums	History and Physical examination Chest Radiograph Serial abdominal examination	Pulmonary toilet Ventilatory support Laparotomy as indicated
Secondary	Injury from primary and secondary missiles as they are propelled outward by the explosion	Penetrating missile injury Orthopedic injuries	History and physical examination Neurovascular evaluation of involved extremities Director skeletal radiographs	Fracture stabilization Debridement Tetanus prophylaxis Laparotomy or thoracotomy as indicated
Tertiary	Injury sustained when the casualty is	Closed head injury	History and physical examination	Neurosurgical intervention for intracranial mass lesions

² **Terrorism in America, An Evolving Threat:** Matthew S. Slater, MD; Donald D. Trunkey, MD; Archives of Surgery, Special Article B October 1997.

	propelled (displaced) through the air and then impacts onto a relatively fixed object	Cervical spine injury Orthopedic injuries	Cervical spine evaluation Computed tomography of the head as indicated Direct skeletal radiographs	Fracture Stabilization
Miscellaneous	Burn injuries, inhalation injuries, and injuries related to structural collapse	Burns Inhalation injury Crush syndrome Compartment syndrome	History and physical examination Creatine kinase level	Secure airway Fluid resuscitation Burn coverage
<i>Primary missiles are those derived from the bomb container itself. Secondary missiles are those generated from the surrounding blast environment (e.g. Glass and other building materials).</i>				

B. Nuclear/Radiation

Radiation is defined as high-energy particles or gamma rays that are emitted by an atom as the substance undergoes radioactive decay, which is the process in which a radioactive nucleus emits radiation and changes to a different isotope or element. The types of radiation are in the following forms of energetic particles:

Particles lose their energy by depositing it in the material they move through, whether that material is air, water, people, or lead. Radiation, regardless of intensity, has the potential to produce harmful effects on human beings, animals, and plant life. Background (natural) radiation poses little threat to our systems. However, serious health consequences can be expected if a person is subjected to large amounts of radiation. The types of radiation and their effects are as follows:

1. **Alpha** (particulate) radiation particles cannot penetrate the outer layer of skin. They can be stopped by thin layers of light materials (such as a sheet of paper) and pose no direct or external radiation threat. *However, they pose a serious health threat if inhaled or ingested.* Therefore, a respirator or the use of Self-Contained Breathing Apparatus (SCBA) is recommended. The range in air for alpha particles is 1 to 3 centimeters.
2. **Beta** (particulate) radiation particles can penetrate skin, but not vital organs (lungs, gastrointestinal tract, heart, etc.) and represent a hazard

both internally and externally. Beta radiation can be lethal depending upon the dose and length of time of exposure. It is easily shielded by aluminum. The range in air for beta particles is approximately 10 feet. Initial symptoms are itching and burning of the skin, with later symptoms that include reddening of the skin and more severe changes in pigmentation, hair loss, and sores.

3. **Gamma** (Energy) and **Neutron** radiation particles can penetrate through the body and represent a hazard both internally and externally. These rays have high energy and a short wavelength. Shielding against gamma radiation requires thick layers of dense materials, such as lead. Gamma and neutron radiation typically have a range in air of several hundred feet.

Table 3 - Nuclear Agents³

Agent	Particles	Planned Use	Potential for Terrorist Use	Mode of Contamination	Critical Body Site
Uranium 235 & 238	Alpha Beta Gamma	Reactor fuel Nuclear weapons	Nuclear weapons	Inhalation Skin Wound absorption	Bone
Plutonium 239	Alpha Gamma	Reactor fuel Nuclear weapons	Nuclear weapons	Inhalation Wound absorption	Bone
Cesium 137	Beta Gamma	Medical & Industrial radiation source	Radiation Poisoning	Inhalation Skin Gastrointestinal	Total Body
Iodine 131	Beta Gamma	Medical	Radiation Poisoning	Inhalation Skin Gastrointestinal	Thyroid
Cobalt 60	Gamma	Medical & Industrial radiation source	Radiation Poisoning	Inhalation Gastrointestinal	Gastro-intestinal

The main concern with radiation is that it is an invisible hazard. Unless the responding public safety agency has radiological detection equipment, or the nuclear material at issue is clearly marked and identified, there is a strong chance

³ **Adapted from** Textbook of Military Medicine.

that the initial identification of a radiological or nuclear hazard will go unnoticed. Although, there is no one piece of equipment available on the market to meet all detection requirements, there are separate detectors for each type of radiation. An additional concern would be the availability of protective clothing and breathing gear, in sufficient quantities, to protect first responders. If first responders are subjected to large amounts of radiation due to major radiation accidents or nuclear attack, they can expect serious consequences to their health. *It should be noted that individuals suffering from radiation injuries are NOT radioactive.*

Of importance is the dose or amount of radiation absorbed over a period of time. There are many terms used to measure the dose of radiation. One is the Roentgen Equivalent Man (REM), which is a unit of absorbed dose that takes into account the relative effectiveness of the radiation involved in causing health effects. Another measurement of the absorbed dose of radiation is known as rad. Sometimes rad measurements are referred to as Gray, which is the equivalent of 100 rad. In this document, health effects are expressed in rad.

1. 50 to 200 rad - Approximately 6 hours after exposure, the individual may have symptoms ranging from none to transient mild headaches. There may be a slight decrease in the ability to conduct normal activities. Less than 5 percent of individuals in the upper part of the exposure range will require hospitalization. Average hospital stay will be 45 to 60 days, with no deaths.
2. 200 to 500 rad - Approximately 4 to 6 hours after exposure, individuals will experience headaches, malaise, nausea, and vomiting. Symptoms are not relieved by antiemetics in the upper exposure range. Individuals can perform routine tasks, but any activity-requiring moderate to heavy exertion will be hampered for 6 to 20 hours. After this period, individuals will appear to recover and enter a latent period of 17 to 21 days. If individuals have received 300 rads or more, they will have large quantities of hair loss between 12 to 18 days after exposure. Following the latent stage, symptoms will return, requiring 90 percent of the personnel to be hospitalized for 60 to 90 days. Probably less than 5 percent of those at the lower dose range will die, the percentage increasing toward the upper end of the dose range.
3. 500 to 1,000 rads - Approximately 1 to 4 hours after exposure, severe and prolonged nausea and vomiting will develop that are difficult to control. Diarrhea and fever develop early in individuals in the upper part of the exposure range. Significant incapacitation is seen in the upper ranges. Initial symptoms last for more than 24 hours, then go into a latent period lasting 7 to 10 days. Following the latent stage, the symptoms return

requiring 100 percent of the individuals to be hospitalized. Of those in the lower range, 50 percent will die, the percentage increasing toward the upper range. All deaths occur within 45 days. The survivors require 90 to 120 days of hospitalization before recovery.

4. 1,000 rad or more - Less than 1 hour after exposure, individuals develop severe vomiting, diarrhea, and prostration. There is no latent period. All individuals require hospitalization and die within 30 days.

C. Biological Agents

Governments have used biological warfare as long as civilization has depended on agriculture. Today, various governments continue to research the development of poisonous toxins that are far more deadly than chemical warfare agents. Two of the earliest reported uses of toxins occurred in the sixth century BC: the Assyrian poisoning of enemy wells with rye ergot, and Solon's use of the purgative herb hellebore during the siege of Krissa.

The use of biological agents is the oldest weapon of the NBC triad. Biological agents are more deadly than chemical agents and occur in nature and are being artificially developed in the laboratory. Large numbers of naturally occurring poisons have also been examined to determine their value as warfare agents. These include Capsaicin (and extract of cayenne pepper and paprika), Ricin (a toxic substance found in the castor bean), and Saxitoxin (a toxic substance secreted by certain shellfish).

Table 7 - Biological Agent Quick Information Chart ⁴

Agent	Class	Transmission	Symptoms	Treatment
Anthrax (<i>Bacillus anthracis</i>)	Bacteria	Inhalation of bacillus or spores	Dyspnea Cyanosis Pulmonary edema Respiratory failure	Vaccination Antibiotics
Bubonic plague (<i>Yersinia pestis</i>)	Bacteria	Fleas	Fever Delirium Cutaneous lesions	Vaccination Antibiotics
Salmonella species	Bacteria	Ingestion	Gastrointestinal symptoms Fever	Antibiotics

⁴ **Terrorism in America, An Evolving Threat:** Matthew S. Slater, MD; Donald D. Trunkey, MD; Archives of Surgery, Special Article, October 1997.

Botulinum toxin (<i>Clostridium botulinum</i>)	Bacterial (Neurotoxin)	Inhalation Contact (skin wound)	Paralysis	Supportive
Gas gangrene (<i>Clostridium perfringens</i>)	Bacteria	Wound infection	Necrotizing Soft tissue infection	Antibiotics Surgical Debridement
Ebola	Virus (Filoviridae)	Body fluids	Fever Hemorrhage Convulsions	Supportive No specific treatment

1. Biological agents generally fall into one of three types:
 - a. Pathogens - Living, reproducing, disease-producing organisms.
 - i. Bacteria. Capable of reproducing outside living cells. Examples: anthrax, tularemia, bubonic plague, cholera, and typhoid fever.
 - ii. Viruses. Infective agents composed of DNA or RNA that can only reproduce inside living cells. Examples: Venezuelan equine encephalitis (VEE), yellow fever, smallpox, hemorrhagic fever (Marburg and Ebola), and human immunodeficiency virus (HIV).
 - iii. Rickettsia. Parasitic microorganisms whose diseases are transmitted by the bite of ticks, lice, and fleas. These parasites require a living host as opposed to bacteria. Examples: Rocky Mountain spotted fever, Q fever, and flea-borne typhus.
 - iv. Yeast and Fungi (Mycotoxins). Mycotoxins were allegedly used in aerosol form ("yellow rain") to produce lethal and non-lethal casualties in Laos (1975-1982), Kampuchea (1979-1981), and Afghanistan (1979-1981). Since the alleged victims were usually unprotected civilians or guerilla forces in remote jungle areas, it was extremely difficult to confirm the attacks or recover samples.

However, over 10,000 deaths have been attributed to the use of these agents in these three campaigns.⁵

- iv. Genetically-Engineered Pathogens. Through advanced biochemical techniques, pathogens are subject to enhancement to increase their utility. Examples: antibiotic-resistant bacteria, bacteria genetically altered to have advanced aerosol and environmental durability, immunologically altered viruses resistant to standard vaccines and not identifiable to classical serological means.
- b. Toxins - Non-living, poisonous chemical compounds produced through the metabolic activities of living organisms. Toxins are 1,000 times more lethal or effective than standard chemical agents. Examples: snake venom, scorpion venom, Ricin, Saxitoxin (produced by marine algae), and puffer fish venom.
- c. Endogenous Biological Regulators (EBR) - Chemical substances produced in the body to regulate various body functions such as muscle contractions, blood pressure, heart rate, temperature, and immune responses. Examples: hormones, adrenalin, and delta sleep-inducing peptide.

2. Use

The most practical method of initiating infection using biological agents is through the dispersal of agents as minute, airborne particles (aerosols). Finely divided particles of liquid or solid suspended in a gas are sprayed over a target where the particles may be inhaled. An aerosol may be effective for some time after delivery, since it will be deposited on clothing, equipment, and soil. When the decontaminated clothing is used later, or dust is stirred up, responding personnel may be subject to a secondary dispersal.

Biological agents may be able to use portals of entry into the body other than the respiratory tract. Individuals may be infected by ingestion of contaminated food and water or even by direct contact with the skin or mucous membranes through abraded or broken skin. This makes the use of protective clothing a must, along with protection of the respiratory tract through the use of a mask with biological filters or SCBA.

⁵ Jane's Chem-Bio Handbook. Frederick R. Sidell, MD; Dr. William C. Patrick, III; and Thomas R. Dashneill. Jane's Information Group, 1998. Page 147.

Exposure to biological agents, unlike chemical agents, may not be immediately apparent. Casualties may occur minutes or hours to days or weeks after an incident has occurred. The time required before symptoms are observed is dependent on the agent used. There are currently no effective monitoring devices available for first responders for use in determining whether they are involved in an incident involving biological agents, though work continues developing such devices. Often the first clue will come from blood tests, or by other means used by medical personnel, or by observing possible symptoms of people exposed in the area. Hazardous materials response teams and local FBI special response teams have field test kits and procedures to detect the presence of some biological agents such as anthrax.

Some clues may be present that could be indicators that an NBC incident involving biological agents has taken place:

- a. Unusual numbers of sick or dying people and animals are present. For example, all the birds that are usually present at outside trash bins are dead; no insect sounds, etc.
- b. Reported illness reflects an unusual or impossible agent for the geographic area or there is an unusual distribution of the disease (that is, the casualties are aligned with the wind direction outdoors).

Biological attacks will be different from natural outbreaks of disease. For example, a steady stream of patients presents to medical facilities instead of the usual peaks and valleys. Or the illness may occur in an unusual environment or time of year (such as cases of anthrax showing up where none have occurred before).

Early warning and rapid identification of biological agents is of primary importance. This warning can sometimes be supplied by intelligence sources, but early warning is not usually available.

3. Some of the more common or anticipated biological weapons are as follows:
 - a. **Anthrax** is an acute infectious disease caused by the spore-forming bacterium *bacillus anthracis*. It occurs most frequently in cattle, goats, and sheep that acquire spores from direct contact with contaminated soil. Humans usually become infected through contact with, ingestion of, or inhalation of anthrax spores from infected animals or their products (like goat hair). Human-to-

human transmission has not been documented. Following are sample guidelines for responding to a WMD threat involving anthrax.⁶

1. Anonymous caller indicating a WMD threat (including anthrax)
 - a. Law enforcement response including, Department of Health, local authorities, State Watch Office, and FBI.
 - b. Fire department/hazardous materials response not recommended unless device or substance is found
 - c. Routine law enforcement investigation.
 - d. Investigative actions during this response may include:
 - Information gathering at the scene
 - Building evacuation/search following local protocol
 - Taking control of the building ventilation system may be warranted, but only if based upon investigative findings.
 - Attention should be focused on appliances or devices foreign to the surroundings.
 - Included should be an assessment of the building ventilation system to rule out forced entry and tampering.
 - Protective equipment should not be required unless hazards or risks are indicated.
 - Investigations like a telephonic bomb threat.

⁶ Adapted from National Domestic Preparedness Office, Special Bulletin Number 6. January 12, 2000.

- e. Suspicious findings during investigation should initiate a public safety response including:
 - Fire/EMS/hazardous materials
 - EOD team.
 - Notifications per local plan which should include local and state health departments.
- 2. Potential WMD device located
 - a. Follow local protocols for risk assessment and evaluation of potential explosive devices. Included in the response should be:
 - Law enforcement including local authorities, State Watch Office, and FBI.
 - Fire/EMS/hazardous materials.
 - EOD team.
 - Local and state health departments
 - b. If explosive device is not ruled out, coordinate efforts with local/regional EOD authority and notify FBI Bomb Data Center (BDC).
 - c. If explosive device is ruled out:
 - Evaluate for potential chemical, biological, or radioactive filler.
 - If radioactive filler appears to be present, follow plans for requesting additional assistance, to include Department of Health, Bureau of Radiation Control.
 - If no hazardous materials appear to be present, response continues as a law enforcement investigation.

- d. Device with potential chemical or biological filler or supplement.
 - Follow local and FBI ERT protocols for documentation of the crime scene.
 - Contain the package following recommendations from a hazardous materials authority. FBI will assure notification of FBI/HMRU.
 - Options include double bagging, steel cans, poly containment vessels, or utilization of a hazardous materials over-pack.
 - Control the material as evidence and follow plan for laboratory analysis.
 - e. Potential release of WMD material from a device.
 - Control the ventilation system.
 - Follow protocols for a hazardous materials incident.
 - Evaluate the extent of contamination.
 - Evacuation of affected areas and decontamination procedures should be selected based on an incident and risk assessment.
 - Provide medical attention following the recommendations from the local/regional public health medical authority.
 - Control and/or isolate the hazard.
 - Treat as a hazardous materials crime scene.
 - FBI will request assistance from FBI/HMRU.
3. Specific situations - envelope with potential threat of anthrax, letter opened, and material present.

- a. Public safety response including local authorities, State Watch Office, and FBI.
 - b. Contain the package following recommendations from a hazardous materials authority.
 - Options include double-bagging, steel cans, poly containment vessels, or utilization of a hazardous materials over-pack.
 - Control the material as evidence and follow plan for laboratory analysis.
 - c. Provide medical attention/decontamination following the recommendations from the local/regional public health medical authority.
 - Evaluate the extent of contamination.
 - Evacuation of the affected area and decontamination procedures should be selected based on an incident hazard and risk assessment.
 - Generally, medical prophylaxis and decontamination have not been indicated except for washing hands with soap and warm water.
4. Specific Situations - envelope with potential threat of anthrax, letter opened, and no specific material present.
- a. Law enforcement response including local authorities, State Watch Office, and FBI
 - Fire department/EMS/hazardous materials response not recommended unless suspicious material is found or individuals are presenting symptoms.
 - b. Handle the package following local and FBI ERT protocols

- Double bag the material and place in a suitable container such as an evidence paint can.
 - Control the material as evidence and follow plan for laboratory analysis.
 - c. No medical attention/decontamination is necessary unless symptoms are present, although local public health authorities should be notified.
 - d. Handle as a law enforcement investigation.
5. Specific situations - envelope with potential threat of anthrax, letter not opened.
- a. Law enforcement response including local authorities, State Watch Office, and FBI.
 - Fire department/hazardous materials response not recommended unless unsuspicious material is found.
 - b. Handle the package following local and FBI ERT protocols.
 - Double bag the material and place in a suitable container such as evidence paint can.
 - Control the material as evidence and follow plan for laboratory analysis.
 - c. No medical attention/decontamination is necessary.
 - d. Handle as a law enforcement investigation.

Note: Per the CDC, hand washing is sufficient for those who have touched the envelope and letter. Decontamination or prophylaxis is not warranted.

- b. **Smallpox** - The last reported case in the world was in 1977, and the last case in the U.S. was in 1949. This devastating disease, for which

there is no therapy, has a 30% mortality rate and commonly leaves survivors blind or seriously scarred. Smallpox is spread by aerosol or droplets and has an incubation period of 14 days. Initial symptoms resemble the flu but are followed by a rash which, unlike chicken pox, evolves with lesions in identical stages of evolution. The disease is infectious only during the rash phase. The major mechanisms of disease control are isolation (quarantine) and vaccination. Vaccination up to 4-5 days after exposure may prevent mortality.

Vaccination is confounded by two problems: first, the national stockpile is not currently sufficient for more than several million people. The second problem is adverse reaction to the vaccination (occurs with a frequency of 3 per million--40% of these cases are fatal and the rest usually have residual neurologic problems).

This disease has historically been the most feared in medicine and now represents a highly attractive form of biological weapon. Smallpox is attractive as an agent of bioterrorism in part because abandonment of vaccine programs has resulted in near universal vulnerability to smallpox.⁷

D. Chemical Agents

Chemical agents are defined as any chemical substance intended to kill, seriously injure, or incapacitate humans due of its physiological effects. They are compounds that, through their chemical properties, produce lethal or damaging effects on man.

Persistency is an expression of the duration of effectiveness of a chemical agent. The level of persistency is used to describe the tactical use of chemical agents and should not be used as terms to technically classify the agent:

Non-persistent Agents - Remain in the target for a relatively short period. The hazard, predominately vapor, will exist for minutes or, in exceptional cases, hours after dissemination of the agent. As a rule of thumb, non-persistent agent duration will be less than 12 hours.

Persistent Agents - Remain in the target area for longer periods of time. Hazards from both vapors and liquids may exist for hours, days, or even weeks after dissemination of the agent. As a rule of thumb, persistent agent duration will be greater than 12 hours. There are many factors that will affect the persistency of chemical agents:

⁷ D.A. Henderson, Director, Johns Hopkins Center for Civilian Biodefense Studies, reviewed.

1. **Type of Agent** - Different agents have various consistencies or viscosity with similarities ranging from rubbing alcohol to motor oil and will evaporate or dissipate at approximately the same rate.
2. **Amount of Agent** - Different amounts and dispersal methods used (aerosol, splash) also determine the persistency of an agent.
3. **Terrain** - The terrain will also affect the duration of an agent (open area, vegetative, urban, soil composition).
4. **Weather** - Wind, temperature, humidity, solar radiation, and precipitation all impact on the duration of an agent.

Types of Chemical Agents

The menu of chemical agents is enormous as there are agents typically used by the military, agents found in industry, agents concocted in clandestine labs, and combination agents (more than one chemical agent combined for dual effects).

It would be impossible to put together a complete list of all possible chemical agents and their possible combinations, but it is feasible to list a group of chemical agents that have more likelihood for being used in the field by terrorist agents. This list is presented in symptom logic order:

- a. Nerve Agents
- b. Blister Agents
- c. Choking Agents
- d. Blood Agents
- e. Incapacitating Agents
- f. Vomiting Agents
- g. Compound/Mixed Agents
- h. Irritant or Tear Gas

These agents are further described in more detail in the following pages.

Table 4 - Chemical Agent Quick Information Chart ⁸

Class	Examples	Mechanism	Symptoms	Treatment
Nerve Agents	Tabun, Sarin, Soman, VX, malathion, parathion, sevin	Inhibition of acetylcholine-esterase	Weakness Salivation Miosis Paralysis Hypoxia	Atropine 2 - Pralidoxime
Vesicants (Blister Agents)	Mustard Gas, Lewisite, Nitrogen Mustard Gas	Alkylation	Eye inflammation or upper respiratory tract irritation	Decontamination
Choking Agents	Phosgene, Diphosgen	Variable	Tearing, coughing, Dyspnea Pulmonary edema	Supportive
Cyanide (Blood Agents)	Hydrogen cyanide (AC), Cyanogen halides (cyanogen chloride)	Form stable complexes with metallo-porphyrins	Hypoxia	Nitrites
Incapacitating Agents	Quinuclidinyl benzilate Cannabinols Barbituates	Variable	Central nervous system alterations	Physostigmine

E. Nerve Agents

Nerve agents acquired their name because they affect the transmission of nerve impulses in the nervous system. All nerve agents belong chemically to the group of organo-phosphorus compounds. They are stable, easily dispersed, highly toxic, and have rapid effects both when absorbed through the skin and via respiration.

All these nerve agents produce the same basic physiological effect: they act upon enzymes at the myoneural (muscle-nerve) junction, causing immediate convulsions, paralysis, and death. They can enter the body either through the lungs or the skin and are deadly in very small quantities.

Nerve agents may be absorbed through the skin, respiratory tract, gastrointestinal tract, and the eyes. However, significant absorption through the skin takes a period of minutes, and prompt medical treatment and decontamination are imperative and sometimes quite successful.

1. Physical and Chemical Properties

⁸ Adapted from; Terrorism in America, An Evolving Threat; Matthew S. Slater, MD; Donald D. Trunkey, MD; Archives of Surgery, Special Article, October 1997.

The most commonly mentioned nerve agents are listed below⁹:

The "G" series of nerve agents include **Tabun (GA)**, **Sarin (GB)**, and **Soman (GD)**. These military nerve agents are generally volatile and will evaporate at approximately the same rate as water. As a liquid, these substances are heavier than water and will sink. As a vapor, they are heavier than air and will tend to sink to the lowest level (like basements and subways).

VX is a persistent military nerve agent that does not evaporate readily and is significantly heavier than air. Its primary contact hazard is as a liquid.

Parathion and Malathion are commercial pesticides. They are quickly metabolized in the body and cause effects like those of nerve agents. However, they are significantly less toxic.

Sevin (carbaryl) is a commonly used insecticide that is absorbed by ingestion and through the skin and eyes. Carbamates cause similar effects as nerve agents. However, unlike the organophosphate compounds, the toxic effect is not permanent. After several hours, the carbamate will spontaneously leave the system. This should be considered in victim care and medical treatment.

2. Mechanism of Action

A characteristic of nerve agents is that they are extremely toxic and that they have very rapid effect. The nerve agent, either as a gas, aerosol, or liquid enters the body through inhalation or through the skin. Poisoning may also occur through consumption of liquids or foods contaminated with nerve agents. The route for entering the body is of importance for the period required for the nerve agent to start having effect. It also influences the symptoms developed and, to some extent, the sequence of the different symptoms. Generally, the poisoning works faster when the agent is absorbed through the respiratory system than via other routes.

Poisoning takes longer when the nerve agent enters the body through the skin. Since the first symptoms do not occur until 20-30 minutes after the initial exposure, immediate decontamination is essential. The poisoning process may be rapid, however, if the total dose of nerve agent is high.

⁹ Jane's Chem-Bio Handbook. Frederick R. Sidell, MD; Dr. William C. Patrick, III; and Thomas R. Dashneill. Jane's Information Group, 1998. Pages 32-52.

3. Symptoms

The most identifiable characteristic of nerve agent exposure is the extreme constriction of the iris (miosis) causing pinpoint pupils. Other characteristic symptoms include increased production of saliva, a running nose, and a feeling of pressure on the chest. Short-range vision also deteriorates and the victim feels pain when they try to focus on an object nearby. This is usually accompanied by headache. More unspecific symptoms are tiredness, slurred speech, hallucinations, and nausea.

Exposure to a higher dose leads to more pronounced symptoms. Tightening of the chest and dramatic mucous membrane secretions (eyes, nose, and mouth) lead to coughing and difficulty in breathing. Discomfort in the gastrointestinal tract may develop into cramps and vomiting. Involuntary discharge of urine and defecation may also occur. Symptoms, like twitching, from the skeletal muscles are very typical. If the poisoning is moderate, this may express itself as muscular weakness, local tremors, or convulsions.

When exposed to a high dose of nerve agent, the muscular symptoms are more pronounced. The victim may suffer convulsions and lose consciousness. To some extent, the poisoning process may be so rapid that earlier mentioned symptoms may never have time to develop. Muscular paralysis caused by nerve agents also affects the respiratory muscles, which is the direct cause of death. Consequently, death caused by nerve agents is a kind of death by suffocation.

Table 5 - Effects of Nerve Agents in Humans ¹⁰

Organ or System	Effect
Eye	Meiosis (pinpoint pupils), conjunctival injection; pain in or around eye; complaints of dim or blurred vision
Nose	Dramatic mucous discharge (Rhinorrhea)
Mouth	Increased salivation
Pulmonary Tract	Tightness of chest (Bronchoconstriction) and increased secretions, cough; shortness of breath; on exam: wheezing, rales, rhonchi
Gastrointestinal Tract	Increase in secretions and motility; nausea, vomiting, diarrhea; complaints of abdominal cramps, pain
Skin and Sweat Glands	Sweating

¹⁰ Adapted from: Recommended therapy for casualties of nerve agents; Textbook of Military Medicine Part I: Warfare, Weapons, and the Casualty; Medical Aspects of Chemical and Biological Warfare, Office of the Surgeon General, Department of the Army, United States of America: 1997, page 145: #97-22242.

Muscular	Fasciculations (“rippling”), local or generalized; twitching of muscle groups, flaccid paralysis; complaints of twitching, weakness
Cardiovascular	Decrease or increase in heart rate; usually increase in blood pressure
Central Nervous System	<i>Acute effects of severe exposure:</i> loss of consciousness, convulsions (or seizures after muscular paralysis), depression of respiratory center to produce apnea <i>Acute effects of mild or moderate exposure:</i> forgetfulness, irritability, impaired judgment, decreased comprehension, a feeling of tenseness or uneasiness, depression, insomnia, nightmares, difficulties with expression

Table 6 - Recommended Therapy for Casualties of Nerve Agents ¹¹

Exposure Route	Exposure Category	Signs and Symptoms	Therapy
Inhalation (Vapor)	Minimal	Pin-point pupils with or without nasal discharge; reflex nausea and vomiting	<5 min of exposure: 1 MARK I kit >5 min of exposure*: observation
	Mild	Pin-point pupils; nasal discharge; mild difficulty breathing; reflex nausea and vomiting	<5 min of exposure: 2 MARK I kits >5 min of exposure: 0 or 1 MARK I kit, depending on severity of difficulty in breathing
	Moderate	Pin-point pupils; nasal discharge; moderate to severe difficulty breathing; reflex nausea and vomiting	<5 min of exposure: 3 MARK I kits + diazepam >5 min of exposure: 1 - 2 MARK I kits
	Moderately Severe	Severe difficulty breathing; gastrointestinal or neuromuscular signs	3 MARK I kits; standby ventilatory support; diazepam

¹¹ Adapted from: Recommended therapy for casualties of nerve agents; Textbook of Military Medicine Part I; Warfare, Weapons, and the Casualty; Medical Aspects of Chemical and Biological Warfare, Office of the Surgeon General, Department of the Army, United States of America: 1997, page 167: #97-22242.

	Severe	Loss of consciousness; convulsions; flaccid paralysis; breathing stops	3 MARK I kits; ventilatory support; suction; diazepam
Dermal (Liquid on Skin)	Mild	Localized sweating, twitching	1 MARK I kit
	Moderate	Gastrointestinal signs and symptoms	1 MARK I kit
	Moderately Severe	Gastrointestinal signs plus, respiratory or neuromuscular signs	3 MARK I kits; standby ventilatory support
	Severe	Same as for severe vapor exposure	3 MARK I kits; ventilatory support; suction; diazepam
<i>*Casualty has been out of contaminated environment during this time</i>			

F. Blister / Mustard Agents

These are chemical agents that affect the eyes, respiratory tract, and skin. Blister agents initially cause irritation of the eyes (and respiratory tract, if inhaled), erythema (reddening of the skin), then blistering or ulcerations, followed by systemic poisoning. There are three types of blister agents: mustards, arsenicals, and urticants.

Mustard is usually classified as a blistering agent owing to the wounds caused by this substance resembling burns and blisters. However, blister agents also cause severe damage to the eyes, respiratory system, and internal organs. The effect of mustard agent is delayed and the first symptoms do not occur until 2-24 hours after exposure. Lewisite and phosgene oxime, however, produce immediate pain on whatever part of the body meets the liquid or vapor, such as the eyes or skin.

1. Physical and Chemical Properties

Mustard “gas” is a liquid that is much heavier than water and its vapor is heavier than air. It has an odor of mustard, onions, or garlic that is usually detected when concentrations are close to toxic levels. Mustard can be absorbed into the body through the eyes, the skin, and the airways within seconds of contact.¹²

2. Symptoms

There are no immediate physical signs of mustard exposure. The first sign of exposure to mustard is usually redness of the skin. Over a period of hours small blisters appear and gradually combine to form larger blisters. Irritation and

¹² Jane's Chem-Bio Handbook. Frederick R. Sidell, MD.; Dr. William C. Patrick, III; and Thomas R. Dashneill. Jane's Information Group, 1998. Pages 63-74.

redness are usually the first effects in the eyes. Victims may complain of not being able to see; this is usually due to swelling and inflaming eyelids.

Signs of damage to the upper airways may include sinus pain, irritation of the nose, a sore throat, or a hacking cough. If more than a minimal amount is inhaled symptoms may include voice changes, with hoarseness or loss of voice. If large amounts are inhaled it can lead to damage of the lower airways producing shortness of breath and a severe productive cough. The shorter the onset time of these lower airway effects, the more threatening the diagnosis. Survival is unlikely if these symptoms appear earlier than 4 hours after exposure. Absorption of a large amount will also damage the bone marrow. However, these effects are not evident for approximately 3-5 days.

3. Antidotes & Treatments

There is no treatment or antidote that can affect the basic cause of mustard agent injury. Therefore, the most important measure is to rapidly and thoroughly decontaminate the patient with soap and water. Eyes are rinsed with water or a physiological salt solution for at least five minutes. A casualty should remain under observation since no signs or symptoms occur within the first few hours.

Medical treatment may include antibiotics and local anesthetics to relieve pain. Despite treatment, inflammation and light sensitivity in the eyes may remain for long periods.

G. Cyanides/Blood Agents

Cyanide produces clinical effects by causing cell death. It does so by entering each contaminated cell of the body and poisoning the mechanism that uses oxygen. Oxygen enters the body through the lungs and is carried by the blood to the cells. Cyanide prevents the cells from using the oxygen and they suffocate.

The body can destroy small amounts of cyanide and leave no effects on the body. Large amounts will affect the brain or central nervous system. The brain and central nervous system are dependent on oxygen and most effects of cyanide poisoning are those caused by a lack of oxygen in the brain. Exposure to a large amount will cause a sudden loss of consciousness, followed by convulsions. After 3-5 minutes breathing will stop. Death will usually occur within 10 minutes.

H. Incapacitating / Irritating Agents

Riot control agents such as CS, CN, CR, and pepper spray are commonly used in the civilian world. These agents are solids that are usually dispersed in a liquid spray. There are minor differences between riot control agents, however, the effects are similar: they cause pain or burning on exposed mucous membranes and skin.

Tearing, reddening, and closing of the eyes usually accompany burning in the eyes. If these substances are inhaled, there will be a difficulty in breathing and tightening in the chest. Skin may also become irritated and burn. The effects of these agents begin within seconds of contact and decrease as the casualty moves to clean air. It is rare for these agents to produce serious harm to a casualty, unless disseminated in a forceful manner.

I. Compound/Mixed Agents

The possible mixing of chemical agents presents an additional concern to first responders in that it will be difficult to identify (by symptoms alone) which type of chemical agent is being used.

APPENDIX 3 TO ANNEX G

Guidance for City Government Activities During a “Severe Risk of Terrorist Attack,” Code Red

- A. The following planning guidance will be used whenever the U.S. Department of Homeland Security places the nation under a Severe Risk of Terrorism Attack (Red). The information provided will serve as a guide and is not intended to be all-inclusive. The following scenarios have been developed as potential threats.
1. A credible threat to the City of North Port (R1)
 2. A credible threat to Sarasota County. (R1)
 3. A credible threat to FDLE Region 6. (R2)
 4. A credible threat to the State of Florida. (R3)
 5. A credible threat to the United States. (R4)
- B. Notification: Following notification of a change in threat condition from Alert to Imminent from the Department of Homeland Security, the Federal Emergency Management Agency (FEMA) will broadcast this threat condition to the State Warning Point in Tallahassee. The State Warning Point will disseminate the change in threat conditions to the Sarasota County Sheriff’s Office – Communications and the Sarasota County EOC. During non-duty hours, the SSO will contact the County Emergency Management Chief. Sarasota County Emergency Management will forward the threat change with recommended protective actions to the City Emergency Management Director, who will re-transmit to City employees via e-mail.
- C. Organizational Responsibilities:

Emergency Management	R1	R2	R3	R4	R5
Activate Emergency Operations Center to Level 2 utilizing	X	X	X		
Establish Citizen Information Line (Phone Bank)	X	X	X		
Consider the Issuance of a State of Local Emergency	X				
Obtain Project Number from Finance Department and disseminate the number to all City agencies for use in documenting all personnel & operating costs pertinent to the event	X	X	X		
Ensure provisions for the establishment of an alternate Emergency Operations Center have been considered	X	X			
Monitor all National News Networks for current information.	X	X	X	X	

Monitor intelligence from other law enforcement agencies.	X	X	X		
Property Management - Security	R1	R2	R3	R4	R5
Consider 24-hour staffing of Government Security Center.	X	X	X		
Consider restricting traffic / parking outside of a 300 perimeter for specified government buildings	X	X	X		
Ensure all exterior security cameras are working properly	X	X	X	X	
Coordinate with the North Port Police Department for increased patrols at specific government facilities.	X	X	X	X	
Consider increasing the frequency of security inspections of government building exteriors	X	X	X		
Ensure all fuel tanks serving back-up generators are full	X	X	X		
Consider verifying the contents of all shipments & deliveries to all government buildings	X	X	X		
Remove external trash containers and dumpsters that are within 100 feet of buildings	X	X	X		
Manager's Office	R1	R2	R3	R4	R5
Consider the cancellation of night meetings in government buildings	X	X			
Consider the reduction in hours of operation for non-essential government services	X				
Consider recommending the cancellation of public events such as concerts, sports events, etc.	X	X			
Clerk's Office - Mail Distribution	R1	R2	R3	R4	R5
Consider "out of building" mail & package screening	X	X	X	X	
Consider verifying the contents of all shipments and deliveries to government buildings	X	X	X		
Utilities – Water and Wastewater	R1	R2	R3	R4	R5
Consider increasing the frequency of testing for contaminants at each water facility	X	X	X	X	
Public Works - Fleet Management	R1	R2	R3	R4	R5
Ensure that all tanks at City-maintained fueling centers are full.	X	X	X		
Public Information Officer	R1	R2	R3	R4	R5
Consider establishing a Joint Information Center (JIC) to include all Fire, Law Enforcement, Utilities and Public Works PIOs	X	X	X		

Information Technology	R1	R2	R3	R4	R5
Consider increasing the frequency of system back-ups to more than once per day	X	X	X		
Department Directors	R1	R2	R3	R4	R5
Consider restricting specific areas of government buildings to authorized personnel	X	X	X	X	

Verify for accuracy all emergency contact numbers of critical staff members	X	X	X	X	
Consider placing all critical staff members on call for emergency response	X	X	X		
Check emergency supplies and, if necessary, re-stock for a minimum of 72 hours	X	X	X		
Consider storing a three-day supply of potable water and non-perishable food at work sites	X	X			
Ensure that all personnel and operating costs pertinent to the potential terrorism threat are documented	X	X	X		
Consider the provision of escorts for visitors in secure / sensitive areas	X	X	X		
Ensure that all government vehicles necessary for emergency response have at least ½ tank of fuel	X	X	X		
Ensure that City-issued ID cards are visibly worn by all employees while on duty	X	X	X	X	
Assist Property Management with the implementation of all security measures	X	X			
Individual Employee Responsibilities	R1	R2	R3	R4	R5
Report suspicious activities and call 9-1-1	X	X	X	X	
Expect delays, searches of purses & bags, and restricted access to public buildings	X	X	X	X	
Expect traffic delays and restrictions	X	X	X	X	
Take personal security precautions	X	X	X	X	
Avoid crowded public areas and gatherings	X	X	X	X	
Keep emergency supplies accessible. Maintain ½ tank of fuel in personal vehicles	X	X	X		
Be suspicious of persons taking photos of critical facilities or asking detailed questions about physical security arrangements	X	X	X	X	
Monitor local and world events	X	X	X	X	
Verify contents of all shipments & deliveries	X	X	X		
Assist neighbors and co-workers	X	X	X	X	
Update personal / family disaster plan to include emergency contact information	X	X	X	X	
Limit travel	X	X	X		
Create an emergency contact list for each family member to carry	X	X	X	X	
Be familiar with emergency exits when inside buildings	X	X	X	X	
When off-duty, maintain contact with your supervisor to determine status of work	X	X	X		
Carry your City-issued identification with you	X	X	X	X	

APPENDIX 4 TO ANNEX G**Procedure for Management of Victims of a Terrorist Incident
Involving Biological, Chemical or Radiological Materials****I. PURPOSE**

This document is an Appendix to the Terrorism Incident Response Annex of the City of North Port Comprehensive Emergency Management Plan. It provides guidance for City emergency response officials on the management of victims potentially contaminated or infected by biological, chemical or radiological agents released during a terrorist incident.

II. REMOVAL OF CASUALTIES/FATALITIES

Designated and properly protected response personnel will extricate victims who are unable to move themselves outside of the hot or warm zones. The extrication of victims will be done in accordance to either standard or specialized triage practices. Obvious fatalities will be left in place pending the activation and arrival of the Medical Examiner's Team and/or Disaster Mortuary Operational Response Team (D-MORT).

III. DECONTAMINATION OF CASUALTIES

The standard hazardous material decontamination procedure will be followed. If it is determined that an alternate decontamination method is needed due to a contaminant, the on-scene Medical Officer in Charge, Poison Control, CHEMTREC, local hazardous materials response team, Department of Health and/or the military will be consulted.

Decontamination (decon) is to proceed as soon as possible, based on three considerations:

1. Whether a person or an article is contaminated;
2. The type and physical property of the contaminant (gas, liquid, or solid); and
3. The medical condition of the victim (triage).

In all cases, as much contamination as possible should be left in the Hot Zone. Priority must be given to the decontamination of persons. Generation of diluted contaminant (due to flushing or any other action) requires the capture and confinement of that material, whenever possible. In decontamination, time is of the essence, the longer that a person remains in contact with a hazardous material, the greater the absorption of the contaminant by that person. Quick decontamination of victim(s) is the goal of first responders. The most effective decontamination time is within 1 to 2 minutes after

exposure. The simple removal of the victims' clothing can effectively remove much of the contaminants.

All decontamination actions conducted by first responders will be carried out using the appropriate personal protection equipment (PPE) as determined by the senior Hazardous Materials Officer on-scene or by the appropriate Standard Operating Procedures (SOPs). ***In the event of gas or vapor contamination, the simple removal of the outer layer of clothing on the victim may be sufficient decontamination.*** If further, or more thorough, decontamination is necessary, it will be performed in the following three stages:

1. Gross decontamination involves the safe removal of the victim from the contaminated environment, complete removal of the victims' clothes, and a complete head to toe rinse with the appropriate solution (usually plain water or a combination of water and soap.)
2. Secondary decontamination involves more thorough washing of the victim in a head to toe fashion possibly using a decontamination solution, which is then followed by a complete rinsing.
3. Definitive decontamination is carried out by a series of washes and rinses until such time that it is certain that all contaminants have been removed from the victim. Definitive decontamination will usually take place at a medical facility.

First responding units arriving at a suspected terrorist attack will position their apparatus and equipment in an up-wind position and prepare to set up a drench decontamination corridor using on-board appliances and water supply, if necessary. If and when possible, first-in engine or aerial companies should connect to an appropriate hydrant and conduct a forward lay to provide a supply line to guarantee an uninterrupted water supply to adequately perform gross decontamination operations and anticipate the initial elements of a decontamination corridor. In the absence of a hydrant, a secondary source of water must be located, drafting operations should be considered, and the appropriate tanker apparatus should be deployed.

IV. TRIAGE OF CASUALTIES

Triage will be coordinated by the Medical Officer and may be highly specialized to the extent of the type of agent involved and its level/method of exposure in comparison to the victim's injuries. Otherwise, triage will be performed in accordance with the Simple Triage and Rapid Treatment (S.T.A.R.T) method. Most Florida fire/rescue/EMS departments have adopted this Mass Casualty Incident (MCI) triage method. Every local fire department should have START kits on their first response apparatus as part of their standard equipment inventory.

START is a tag system designed to assess a large number of victims rapidly and can be used by all personnel regardless of their medical training. The initial triage is accomplished by the assessment of respiratory rate, perfusion, and mental status. Triage ribbons/tags are used to identify the priority of the patients.

- **RED - First Priority** – Immediate
- **YELLOW - Second Priority** – Delayed
- **GREEN - Third Priority** – Ambulatory
- **BLACK - Deceased**

Secondary triage is performed on all patients during the treatment phase in the medical sector. During this phase patients can be up-graded or downgraded depending upon the dynamics of their injuries.

V. TREATMENT OF CASUALTIES

The reality of an incident of large proportions has shown that victims will leave the scene and either walk to or find a rapid transport to a medical facility--usually the facility closest to the incident site. The danger in this is that victims may be contaminated with an agent that could then contaminate other people, vehicles, and medical facilities that will, in turn, increase the number of casualties and overwhelm the facility. Emergency personnel on scene should plan to have a staging area for victims. Local medical facilities will be contacted as soon as possible for them to prepare an exterior triage and decontamination area to ensure the safety of their staff and facility. Medical and other personnel will be apprised of conditions that may develop over time in case patients develop complications later. Patients who exhibit suspect symptoms will be treated by established protocols.

VI. ISOLATION AND QUARANTINING OF THE INJURED AND EXPOSED

The criteria and procedures for isolating/quarantining the injured and other exposed people who cannot be safely extracted, pending arrival of appropriate assistance, should be addressed in the local fire/rescue department's procedure manuals. Usually the first arriving unit will perform the initial size-up. An approximation of the number of victims and MCI level will be announced. Special needs such as isolation or quarantining exposed victims will be determined at this point. Incident command and a staging area will be established.

Most fire department hazardous materials operating policies require that the area be isolated and entry denied to all personnel until the material(s) has/have been identified. Protective clothing and equipment necessary to operate safely in the affected area must be utilized. Decisions regarding long-term quarantining of the community for highly contagious biological agents will be made by Sarasota County Emergency Management in consultation with the County Health Department, State Health Department, and the Centers for Disease Control and Prevention (CDC).

VII. TRANSPORT OF VICTIMS

Victims should be decontaminated at the scene prior to transportation. Transportation of decontaminated patients to the appropriate facilities will follow the Standard Protocols for a Mass Casualty Incident. In-place, on-scene, temporary sheltering of victims may be deemed necessary while receiving facility resources are stabilized. Coordination with other County, State, and Federal resources will be conducted through the Florida Division of Emergency Management.

VIII. STOCKS OF AVAILABLE ANTIDOTES

To treat a large-scale contamination, three approaches should be taken:

1. The Regional Domestic Security Task Force has stockpiled antidotes available for distribution to field responders and local hospitals. Local hospitals may also be able to provide rescue trucks with antidotes, depending upon the antidote and required amount.
2. Second, additional supplies may be available from State and/or Federal sources, but these sources must be pre-identified and pre-planned prior to an incident. Additional antidotes may be available from surrounding Veterans Administration Medical Centers, Fire/Rescue Supply Bureaus, EMS supply bureaus, and local pharmaceutical distribution warehouses.
3. Finally, through activation of National Disaster Medical Services (NDMS), additional resources can be requested.

Appendix 5 to Annex G

Notification of Regional Domestic Security Task Force

When the City is affected by a suspected terrorist situation, the incident or unified command structure will request additional assistance from the County EOC. When the County EOC appears at risk of exhausting all local resources or determines local responders need additional resources, a request for additional assistance will be made through the County EOC to the State Warning Point in State EOC.

The State EOC will notify the ESF 16 emergency coordinating officer, the Florida Department of Law Enforcement (FDLE), who in turn will notify their Regional Operations Center(s) to notify the Regional Domestic Security Task Force (RDSTF) and to place them on alert.

The RDSTF's primary role in the response phase is to coordinate the use of the Domestic Security Response Teams. Its mission is to support the local incident command structure and not to assume command and control of the incident. However, if the County requests such command and control support, then the Task Force may coordinate the activation of a separate overhead Incident Command System team to handle this operation in coordination with the State EOC, these teams will be made up of emergency service personnel trained in the ICS positions needed to assume command and control operations.

Request for Assistance & Response:

Once the initial call for additional resources has been made, all requests for Domestic Security Response Team assistance will be coordinated with the Regional Domestic Security Task Force Coordinator through the County EOC. Initial requests for resources may be verbal as response conditions dictate, but must be followed with a written request utilizing forms contained in the State Comprehensive Emergency Management Plan for requesting mutual aid resources. The requesting jurisdiction will complete the forms, assuring that an explanation of the mission to which those resources will be assigned is included. The Regional Domestic Security Task Force Coordinator will facilitate the verbal or written request through the County EOC to the State EOC for processing. The Regional Domestic Security Task Force Coordinator, in consultation with the task force chair and/or co-chair and the State and County EOC, will determine the appropriate level of response by the Domestic Security Response Teams to the request. If determined that one or more of these teams are necessary, then the Regional Domestic Security Task Force Coordinator will activate other task force members to facilitate resource mobilization and deployment. The State EOC will provide the Regional Domestic Security Task Force Coordinator with the State Mission Number(s) through the County EOC.

The appropriate task force liaison will then notify the activated resources as soon as practicable and provide the resource supervisor (leader) with the following information regarding the mission:

- The State assigned mission number
- The location and directions of travel to the staging area at the scene of the incident
- The point of contact either at the incident scene or at the affected jurisdiction's EOC
- The cell phone number, radio frequency or telephone number where the point of contact can be reached
- A brief size-up of the incident that is being responded to
- The primary mission objective and any special instructions
- 24-hour contact numbers for the response liaisons to allow team supervisor the ability to submit daily situation reports and maintain any necessary emergency communications.

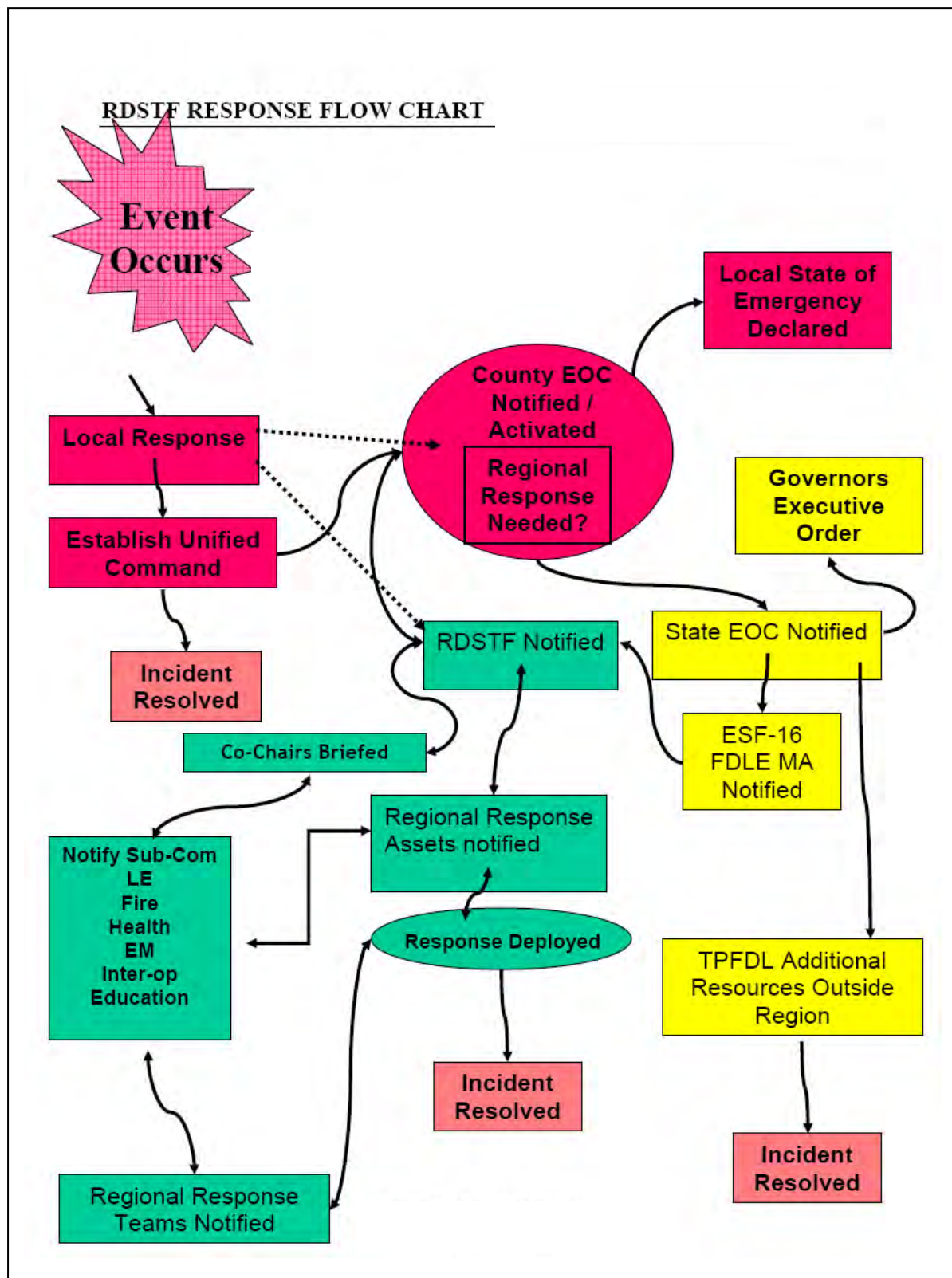
The Regional Domestic Security Task Force Coordinator or liaison will also furnish an approximate estimated time of arrival at the assigned staging area. This information will be sent to the affected County EOC and the State EOC. The Regional Domestic Security Task Force Coordinator will be responsible for tracking these resources within the region, using standardized forms for ordering resources and forms compliant with the state and Federal guidelines governing mutual aid.

Regional Response Template Quick Reference Guide

1. Event occurs in the County without warning; public safety response and unified command established.
2. County Emergency Operations Center (EOC) activated and notifies State Warning Point.
3. Unified Command requests additional resources from County EOC. (Local Mutual Aid exhausted)
4. County EOC responds with resources (declares local State of Emergency, if necessary).
5. County EOC evaluates need for State support, and makes request to State EOC if needed.
6. State EOC notifies ESF-16, FDLE notifies Regional Operations Center, Regional Director (RD) notifies RDSTF leadership team, RDSTF Team placed on stand-by/alert.

7. County EOC contacts RDSTF for a courtesy call Situation Report (SITREP).
8. Task Force (TF) Coordinator contacts local impacted county Emergency Management Director to establish communications and obtain current SITREP and immediate needs.
9. If the affected jurisdiction struggles to control the event and requests command and support, RDSTF will coordinate activation of separate overhead ICS team in coordination with State EOC through a request from the County EOC.
10. RDSTF will serve a regional coordinator role for the State Command and State EOC.
11. TF Coordinator notifies the following liaisons; Fire-Rescue Chair, EMS Chair, Law Enforcement Chair, Health/Medical Chair, SERT Liaison, PIO Chair, Education Chair, and Interoperability Chair. TF provides SITREP.
12. TF Coordinator in consultation with TF Chair/co-chair and State and County EOC, will determine which regional response teams to deploy based on requests received (as time allows, a written request utilizing the forms in State CEMP for requesting mutual aid is completed by requesting jurisdiction) and notify response teams to mobilize and deploy.
13. TF Coordinator to obtain a State Mission Number(s) from State EOC. Advise TF Liaisons with mission number and all details necessary for response to staging area. Response teams use TPFDL principles and concepts for deployment and response standards.
14. Coordination of out of Region resources will be conducted by TF Coordinator, State EOC, and TF Chair/Co-chair from the requesting and responding regions.
15. TF Liaison notify appropriate activated resources as soon as possible and provide resource supervisor (Team Leader) with necessary response information (mission number, location and direction travel, Point of Contact (POC) on scene or at County EOC, contact information for the POC, brief size-up of incident, primary mission objective and any special instructions, 24 hour contact numbers for the response liaisons for team supervisor to submit daily SITREPS and maintain necessary communications).
16. TF Coordinator provides approximate time of arrival of resources to staging area to County and State EOC.

17. TF Coordinator responsible for tracking resources within the region using standardized forms for ordering resources and forms compliant with State and Federal guidelines governing mutual aid agreements (TPFDL).
18. Unless otherwise specified, all regional task force resources deployed will respond to the affected jurisdiction within two hours. A deployment form will be provided to appropriate task force liaison that will provide information to the State EOC.
19. When RDSTF Response Team is deployed, the respective liaison will assure team supervisor (leader) maintains the following information until deployment is complete; appropriate ICS forms and SITREPS, contact lists, equipment/supplies inventory lists, expense activity forms.
20. Task force to determine if affected jurisdiction can maintain logistical support and service needs of activated teams. If additional logistical support is needed, RDSTF Coordinator will appoint forward liaison to serve as link between County EOC and State EOC.



ANNEX H

DAM FAILURE

I. PURPOSE

II. EXPLANATION OF TERMS

- A. Acronyms
- B. References

III. SITUATION AND ASSUMPTIONS

- A. Situation
- B. Assumptions

IV. METHOD OF OPERATIONS

- A. General
- B. Phases of Management

V. ORGANIZATION AND ASSIGNMENT OF RESPONSIBILITIES

- A. Organization
- B. Assignment of Responsibilities

VI. ADMINISTRATION & SUPPORT

- A. Reports & Records
- B. Preservation of Records
- C. Post-Incident Review

VII. ANNEX DEVELOPMENT & MAINTENANCE

- A. Responsibility
- B. Schedule for Annex Updating
- C. Security Considerations - General Exemptions from Public Inspection

APPENDICES

Appendix 1 Inundation Maps

I. PURPOSE

To facilitate the evacuation of downstream residents or notification of the public in the event of an imminent or impending dam failure. City officials should be prepared for reacting to unlikely but potential failure conditions at the Peace River Reservoir #2. By pre-planning the coordination of actions by the Dam Owner, the Peace River Manasota Regional Water Supply Authority, and responsible emergency management officials, timely notification, warning and evacuation can occur which will save lives and minimize property damage.

II. EXPLANATION OF TERMS

A. Acronyms

1. EAP - Emergency Action Plan
2. FDEP - Florida Department of Environmental Protection
3. MSL - Mean Sea Level
4. PRMRWSA - Peace River Manasota Regional Water Supply Authority

B. References

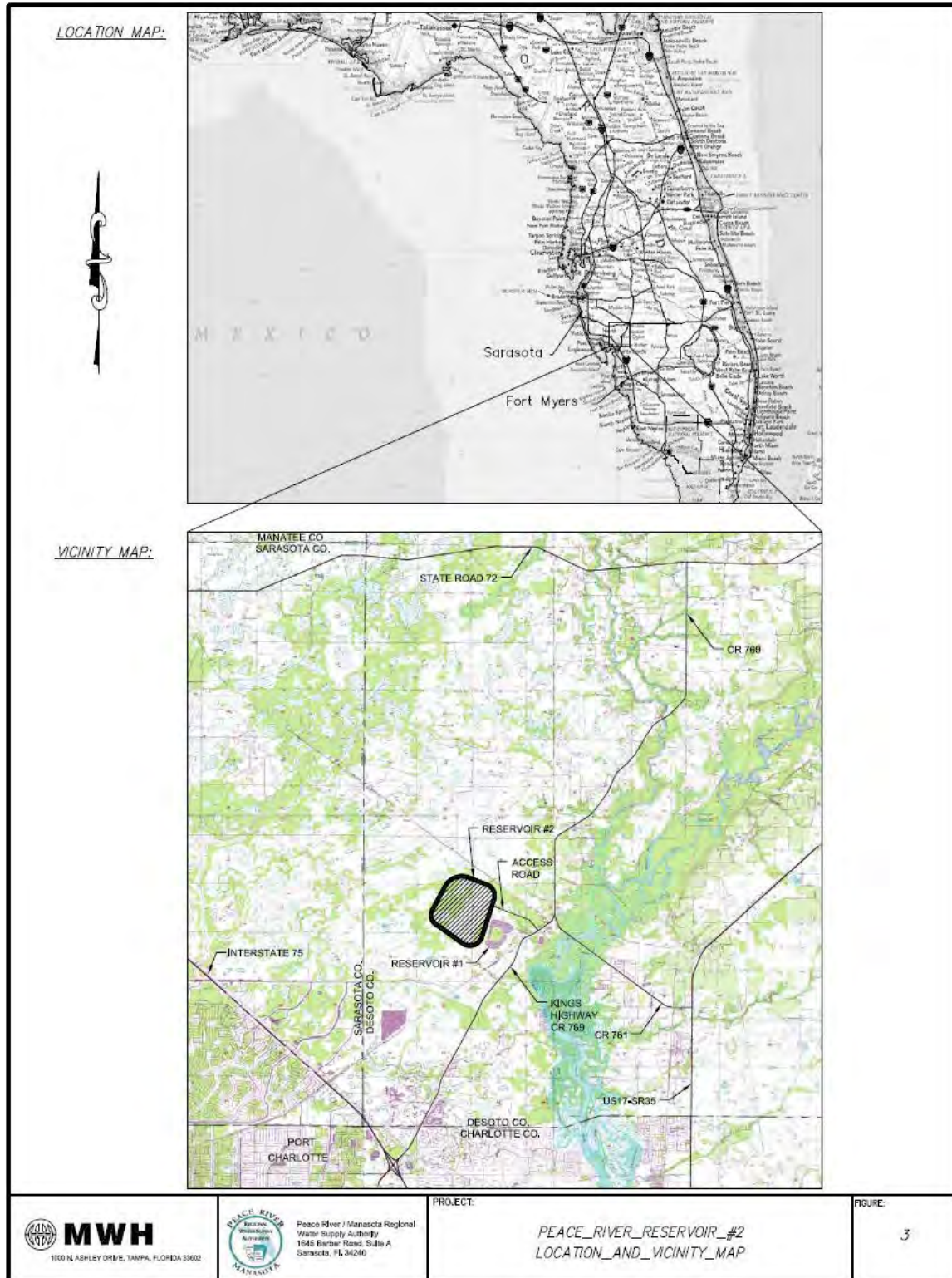
1. City of North Port Comprehensive Emergency Management Plan, Annex D - Flood Warning and Response
2. Peace River/Manasota Regional Water Supply Authority Reservoir, Emergency Action Plan (henceforth referred to as the EAP)

III. SITUATION AND ASSUMPTIONS

A. Situation

1. Location of Reservoir

Reservoir #2, can be accessed from the west by traveling approximately 6.5 miles northeast on Kings Highway (CR 769) from the I-75 interchange (Milepost 170) east of Port Charlotte, Florida; turn left (northwest) on a gated unpaved road that goes directly to the Reservoir #2 inlet structure. Keys for the lock on the gate are available from the Knox Box at the gate. Note that this road is in the inundation area, and may be flooded.



2. Description of Reservoir

Peace River Reservoir #2 is an off-stream, above-ground reservoir that provides 18,412 acre-feet (6-billion gallons) of normal operating raw water storage for water supply to the PRMRWSA. PRMRWSA's Reservoir #1 is primarily a below-grade reservoir with approximately 2,000 acre-feet (625 million gallons) of storage located east of Reservoir #2.

Reservoir #2 is located within R.V. Griffin Reserve, an area bounded by:

- An abandoned railroad grade to the north;
- Reservoir #1 to the east;
- An old railroad grade and a residential area to the south; and,
- Undeveloped platted land to the west.

Site access is from Kings Highway to a perimeter road at the exterior toe of the embankment. The site access road extends from an intersection at King's Highway near the main entrance to the water treatment plant following an alignment approximately 100 feet north of Reservoir #1. A control gate located at the main entrance will provide security for the project site. Additionally, a perimeter fence around the reservoir will be constructed to restrict access to non-authorized personnel.

Reservoir #2 is a mostly above-ground impoundment surrounded by an earthen embankment consisting of compacted fill with a geosynthetic membrane water retaining core. A soil-bentonite slurry (cutoff) wall is constructed to limit seepage underneath the embankment, and extends from the geosynthetic membrane to an underlying low permeability clayey soil layer. In addition, an internal drain is installed to intercept potential seepage through the embankment. A perimeter drain at the downstream toe of the embankment will collect and convey seepage, from the embankment and foundation, to seepage outlets located around the perimeter of the embankment.

The normal maximum operating water level in the reservoir will be approximately 26 feet above the natural ground level (or 61.8 feet above MSL). Water will be pumped into Reservoir #2 through a submerged inlet structure. Releases from Reservoir #2 will be controlled by a gated outlet structure with an overflow spillway to Reservoir #1. The raw water source is Peace River. Water is pumped from the River via the raw water pump

station, through two 48-inch pipelines, which connect to a 66-inch supply pipeline that discharges into Reservoir #2.

B. Assumptions

1. Dam breach analyses were performed for development of this EAP. Dam-breach studies are designed to evaluate a severe hypothetical failure of the dam under a range of assumed concurrent conditions. The evacuation areas shown on EAP Figure 2 reflect the specific failure assumptions considered in the dam breach analyses. The assumptions were selected to give a “worst-case” scenario of downstream flooding for a selected reservoir condition, which would be maximum reservoir water level, and an extreme wet-weather inflow condition and an overflow failure.
2. The Peace River Reservoir #2 (Reservoir #2) project area is relatively flat with no well-defined stream/river channel, and consists of a fully encircling embankment. With an approximately 4-mile long embankment, the location of a hypothetical breach could occur at any location along the embankment. Most dam breaches occur at penetrations through the embankment (e.g. filling or outlet pipes), or at foundation defects. Therefore, model simulations included dam breach modeling at six locations around the perimeter. Flood inundation modeling of the dam breach was performed for six different locations around the dam, and the Inundation Maps showing the assumed breach location and the maximum theoretical flood wave depth, are provided in Appendix 1. Two of the modeled breach locations consisted of the pipe penetrations (the inlet pipe and the outlet/spillway pipe) through the embankment.
3. Foundation defects that are unknown cannot be predicted. The four other breach locations were selected based on proximity to population areas and to provide coverage at each of the primary compass directions (North, NE, South, SE, West, and East). Since the location of a hypothetical breach cannot be predicted, a composite map of the results for the six breach locations, presenting the hypothetical extent of inundation is shown as an evacuation map on EAP Figure 2. The evacuation map illustrates the time of arrival for the leading edge of a dam breach flood wave, time to 1-foot flood depth. An actual failure of the dam could result in different downstream flooding. Therefore, this map should serve as a guide for warning and evacuation, but should not replace the judgment and local experience of emergency management officials.

IV. METHOD OF OPERATIONS

A. General

1. In general, any release from the Reservoir is a flooding event, and would be managed per City of North Port Comprehensive Emergency Management Plan, Annex B - Flood Warning and Response.

B. Phases of Detection

1. Step 1 Emergency Condition Detection - This step describes the detection of an unusual or emergency event. Information is provided herein to assist the Dam Owner in determining the appropriate emergency level for the event. Unusual or emergency events may be detected by:
 - a. Observations at or near the dam by PRMRWSA or other government personnel (local, state, or federal), landowners, visitors to the dam, or the public. All reports of an unusual or emergency event should be verified by the Dam Owner.
 - b. Evaluation of instrumentation data
 - c. Forewarning of conditions which may cause an unusual event or emergency event at the dam (for example, a severe weather or hurricane forecast)
 - d. Sinkholes in or near the embankment
2. Step 2 Emergency Level Determination - After an unusual or emergency event is detected and verified, the EAP Officer is responsible for classifying the event into one of the following three levels:
 - a. Emergency Level I - Urgent; dam failure is imminent or in progress:
 - i. This is an extremely urgent situation when a dam failure is occurring or obviously is about to occur and cannot be prevented. Flooding will occur downstream of the dam. The appropriate Emergency Operations Center(s) should be contacted immediately so emergency services can begin evacuations of all at-risk people and close roads as needed.

ii. Examples of Emergency Level 1 Events:

- Rapid flow rate increase with cloudy discharge from existing seepage area(s) near the dam
- Rapid flow rate increase with cloudy seepage or evidence of significant, active, and continuing material movement from the drain system outfall(s)
- Sudden or rapidly progressing slides of the embankment slopes
- Overtopping flow not eroding the embankment slope; reservoir level expected to rise
- Overtopping flow eroding the embankment slope
- Detonated bomb that has resulted in damage to the dam or appurtenances
- Damage to dam or appurtenances that has resulted in uncontrolled water release
- Earthquake resulting in uncontrolled release of water from the dam

b. Emergency Level II - Potential dam failure situation, rapidly developing:

- i. This situation may eventually lead to dam failure and flash flooding downstream, but there is not an immediate threat of dam failure. The appropriate Emergency Operations Center(s) should be notified of this emergency and placed on alert. The Dam Owner should closely monitor the condition of the dam and periodically report the status of the situation to the Emergency Operations Center(s) and FDEP Dam Safety Engineer.

- ii. If the dam condition worsens and failure becomes imminent, the appropriate Emergency Operations Center(s) must be notified immediately of the change in the emergency level to evacuate the people at risk downstream.
- iii. The Owner's Engineer of Record for the dam and the FDEP Dam Safety Engineer should be contacted to evaluate the situation and recommend remedial actions to prevent failure of the dam. The Dam Owner should initiate remedial repairs (note local resources that may be available – See EAP Appendix C-5). Time available to employ remedial actions may be hours or days.
- iv. This emergency level is also applicable when discharge from the outlet-works/spillway has, or is expected to result in flooding of downstream areas where people near the channel could be endangered. Emergency services should be on alert to initiate evacuations or road closures if the flooding increases.
- v. Examples of Emergency Level 2 Events:
 - The reservoir level has reached El. 67.0 and is experiencing high winds.
 - New seepage areas with cloudy discharge or increasing flow rate
 - Rapidly enlarging sinkhole
 - Cracks in the embankment with seepage
 - Un-verified bomb threat that, if carried out, could result in damage to the dam
 - Damage to dam or appurtenances that has resulted in seepage flow
 - Earthquake resulting in visible damage to the dam or appurtenances

- c. Level III - Monitoring; Operation & Maintenance Condition; Non-emergency incident; unusual event; slowly developing situation:
- i. This situation is not normal but has not yet threatened the operation or structural integrity of the dam, but possibly could if it continues to develop, and/or a general state of monitoring exists during the hurricane season.
 - ii. The condition of the dam should be closely monitored, especially during storm events, to detect any development of a potential or imminent dam failure situation. The appropriate Emergency Operations Center(s) should be informed if it is determined that the conditions may possibly develop into a more serious condition that may require emergency actions.
 - iii. Examples of Level III Events:
 - A hurricane is expected to make landfall near the project site
 - New wet spots on the face of the dam, and the toe of the dam
 - New soft spots on the face of the dam
 - New seepage areas in or near the dam
 - Observation of new sinkhole in reservoir area or on embankment
 - Erosion gully in embankment slope of 3 feet or deeper below grade.
 - New cracks in the embankment greater than 1-inch wide without seepage
 - Visual movement/slippage of the embankment slope

- Instrumentation readings beyond predetermined values
- Damage to dam or appurtenances with no impacts to the functioning of the dam
- Modification to the dam or appurtenances that could adversely impact the functioning of the dam
- Measurable earthquake felt or reported on or within 50 miles of the dam

3. Step 3 Notification and Communication Notification:

After the emergency level has been determined, people on the notification flowcharts (See EAP Page 2) shall be notified immediately.

a. Emergency Level I - Urgent; dam failure is imminent or in progress:

- i. The EAP Officer should immediately contact the appropriate Emergency Operations Center(s) and communicate that dam failure is imminent or in progress and the potentially flooded area must be evacuated (see Page 2). The following actions should be taken:

- Call the Emergency Operations Center and use the following message to describe the situation:

"This is an emergency. This is (identify yourself; name, position). Peace River Reservoir #2, located on Kings Highway, is failing. The failure is occurring at the (North, NE, South, West, East) portion of the reservoir. All potential inundation area residents must be evacuated immediately. Repeat, Peace River Reservoir #2 is failing; evacuate inundation area residents immediately. This is not a test.

We have activated the Emergency Action Plan for this reservoir and are currently under Emergency Level I. Reference the inundation map in your copy of this Emergency Action Plan.

*I can be contacted at the following number
_____. If you cannot reach me,
please call the following alternative number
_____."*

- Do whatever is necessary to bring people in immediate danger to safety (anyone on the dam, or within the inundation area). See EAP Appendix A and Appendix B.
 - Keep in frequent contact with the Emergency Operations Center(s) to keep them up-to- date on the condition of the dam. They will tell you how you can help handle the emergency.
 - If all means of communication are lost and can't quickly be re-established: (1) try to get to another radio or telephone that works, or (2) Send a PRMRWSA representative to the DeSoto County Fire Station 2 on Highway 761 near Kings Highway to summon help and re-establish communications. If these means fail, handle the immediate problems as well as you can, and periodically try to reestablish contact with the EAP Officer and emergency services.
- ii. The following pre-scripted message may be used as a guide for the Emergency Operations Center staff to communicate the status of the emergency with the public:

"Attention: This is an emergency message from (Your Name and Title). Listen carefully. Your life may depend on immediate action.

Peace River Reservoir #2 located along Kings Highway is failing. Repeat. Peace River Reservoir #2 is failing. Serious flooding will result. If you are in or near this area, evacuate immediately. Do not travel on (names of roads or highways) or return to your home to recover your possessions. You cannot outrun or drive away from the flood wave. Evacuate immediately."

Repeat message.

b. Emergency Level II - Potential dam failure situation; rapidly developing:

i. Any PRMRWSA employee observing a potential situation, or receiving word of such must contact the EAP Officer immediately and describe the situation. If the EAP Officer cannot be reached the following designees, in order of responsibility, shall assume all responsibilities of the EAP Officer:

- PRMRWSA Environmental Affairs Coordinator
- PRMRWSA Water Resources Director

ii. The EAP Officer, or their designee, will contact the Dam Owner's Engineer of Record the appropriate Emergency Operations Center(s) and the FDEP Dam Safety Officer, describe the situation, and request technical assistance on the next steps that should be taken. The following message may be used to help describe the emergency situation to the emergency management personnel:

"This is (identify yourself; name, position). We have an emergency condition at Peace River Reservoir #2, located along Kings Highway. We have activated the Emergency Action Plan for this dam and are currently under Emergency Level 2.

We are implementing predetermined actions to respond to a rapidly developing situation occurring at the reservoir. Please prepare to evacuate the inundation area.

Reference the inundation maps in your copy of the Emergency Action Plan.

We will advise when this situation is resolved or if the situation gets worse.

*I can be contacted at the following number _____.
If you cannot reach me, please call the following alternative number _____."*

- c. Level III - Monitoring; Operation & Maintenance Condition; Non-emergency incident; unusual event; slowly developing situation:

The following actions should be taken:

1. The Dam Owner shall identify the situation.
2. The Dam Owner should contact the Dam Owner's Engineer of Record, describe the situation, and request technical assistance on appropriate steps that should be taken.
3. The Dam Owner should notify FDEP Dam Safety Officer of the situation.

V. ORGANIZATION AND ASSIGNMENT OF RESPONSIBILITIES

A. Organization

B. Assignment of Responsibilities

1. Peace River Manasota Regional Water Supply Authority - Dam Owner
 - a. Daily monitoring and management of Reservoir # 2.
 - b. Respond to observed or reported conditions, incidents, or unusual events to detect if an existing or potential emergency exists (See Step 1 - Event Detection, above).
 - c. When an emergency event is detected immediately contact the EAP Officer.
 - d. Immediately notify the personnel in the order shown on the notification flow chart for the appropriate emergency level.
2. Peace River Manasota Regional Water Supply Authority - Emergency Action Plan Officer(s)
 - a. Serve as the primary contact person responsible for coordination of all emergency actions.
 - b. When an emergency event is detected, immediately determine the emergency level (see Step 2 - Emergency Level Determination, above).

- i. Emergency Level I: Urgent; Dam failure is imminent or in progress
 - ii. Emergency Level II: Potential dam failure situation; Rapidly developing
 - iii. Level III: Monitoring; Operation & Maintenance; Non-emergency incident Unusual event; Slowly developing situation
 - c. During Level III conditions
 - i. Monitor conditions
 - ii. Arrange repairs as needed
 - d. Immediately notify the personnel in the order shown on the notification flow chart for the appropriate emergency level.
 - e. Respond to specific requests from the Emergency Operation Center(s) to help minimize the impacts of an emergency event.
 - f. Provide updates of the situation to the Emergency Operations Center(s) to assist them in making timely and accurate decisions regarding warnings and evacuations.
 - g. Provide leadership to assure the EAP is reviewed, understood, and updated annually and copies of the revised EAP are distributed to all who received copies of the original EAP.
 - h. Facilitate exercise of the EAP as necessary to ensure the effectiveness of the EAP and emergency response.
 - i. Participate in annual review and update of the EAP.
- 3. City of North Port
 - a. Emergency Management
 - i. Maintain communication with media.
 - ii. When an Emergency Level I situation occurs:

- Initiate warnings and order evacuation of people at risk downstream of the dam.
 - Carry out the evacuation of people and close roads within the evacuation area (See Appendix A for Inundation Maps).
 - Alert the public of the emergency.
- iii. When an Emergency Level II situation occurs:
 - Prepare emergency management personnel for possible evacuations that may be needed if an Emergency Level I situation occurs.

VI. ADMINISTRATION & SUPPORT

A. Reports and Records

1. Situation Report. During emergency operations, a daily situation report should be prepared and distributed to the County EOC.
2. Records Relating to Emergency Operations

See Base Plan.

B. Preservation of Records

If government records are damaged during the incident response, the EOC should be promptly advised so that timely professional assistance can be sought to preserve and restore them.

C. Post-Incident Review

See Base Plan.

VII. ANNEX DEVELOPMENT & MAINTENANCE

A. Responsibility

The Dam Owner is responsible for review and update of their emergency response plan on an annual basis. North Port Emergency Management will be the Plan-holder for the City and will participate in plan review and exercises.

B. Schedule for Annex Updating

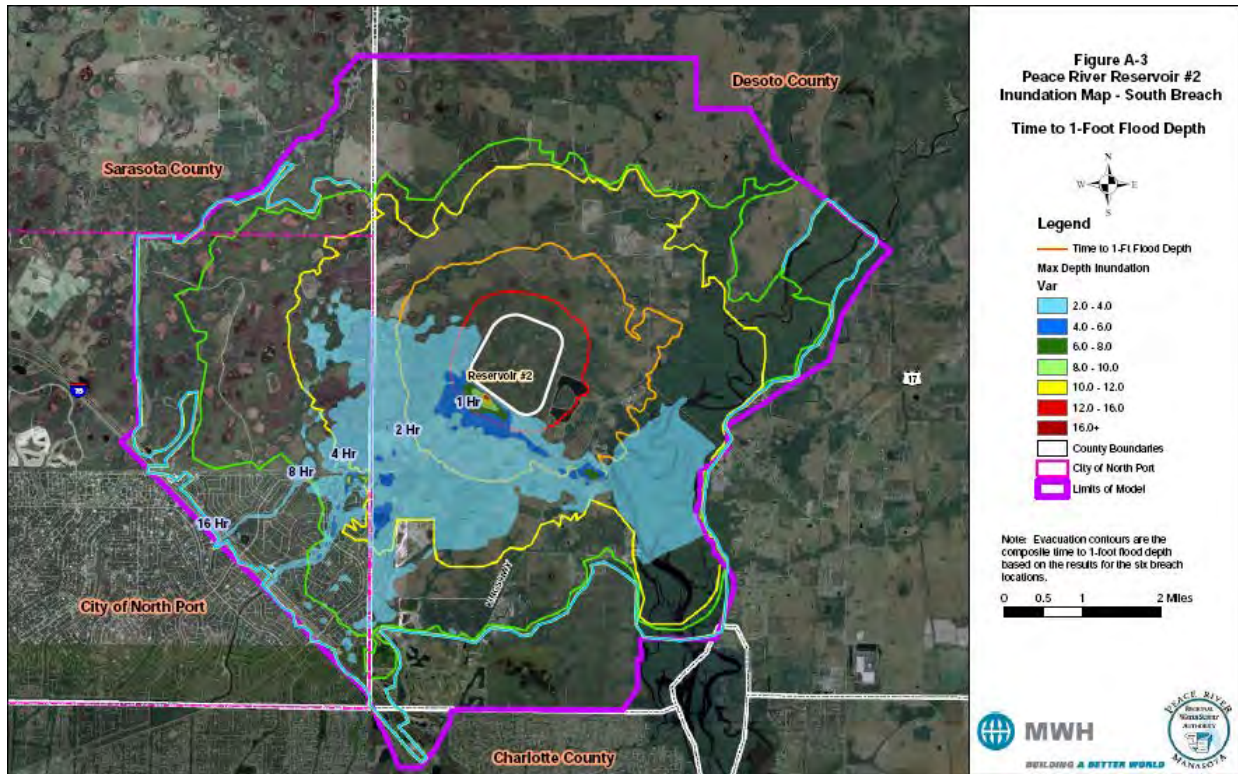
This annex will be maintained in accordance with the following schedule:

1. The annex will be updated with each updating of the City's Comprehensive Emergency Management Plan.
2. The annex will be reviewed after each exercise and/or actual response to a dam-related emergency event and modified as necessary.
3. The annex will be reviewed and revised, if needed, after each of the following types of events:
 - a. A major change in applicable Federal or State laws, regulations, or policies,
 - b. The findings of ongoing vulnerability and needs assessments in Florida, and
 - c. Major advances in applicable response technology and/or operational concepts

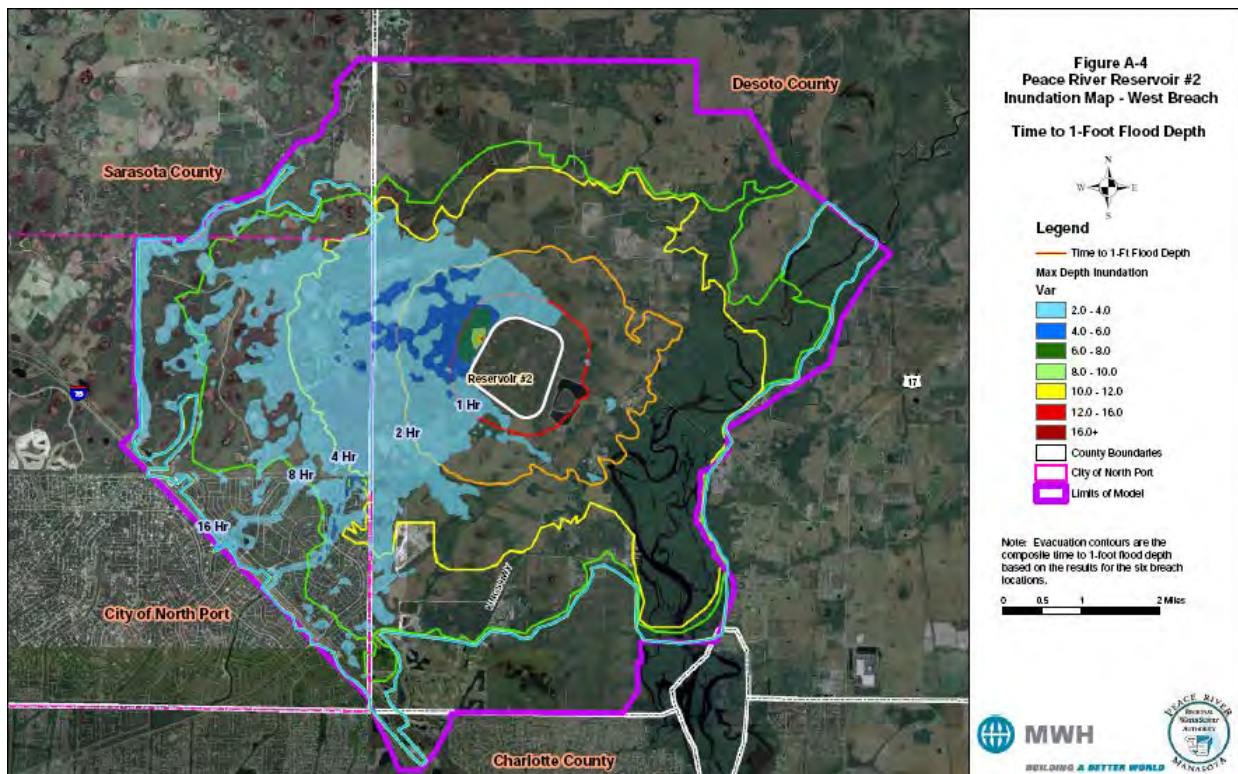
C. Security Considerations - General Exemptions from Public Inspection

Certain security procedures and plans developed resulting from this Annex to the City of North Port Comprehensive Emergency Management Plan may be exempt from public inspection under Florida Statutes Chapter 119.

Inundation Map - South Breach



Inundation Map - West Breach



ANNEX I

COLD WEATHER EMERGENCY SHELTERING

I. PURPOSE

II. DEFINITIONS

III. SITUATION AND ASSUMPTIONS

- A. Situation
- B. Assumptions

IV. METHOD OF OPERATIONS

- A. General
- B. Phases of Management

V. ORGANIZATION AND ASSIGNMENT OF RESPONSIBILITIES

- A. Organization
- B. Assignment of Responsibilities

VI. ADMINISTRATION & SUPPORT

- A. Reports & Records
- B. Post-Incident Review

VII. ANNEX DEVELOPMENT & MAINTENANCE

- A. Responsibility
- B. Schedule for Annex Updating

I. PURPOSE

This document outlines measures for the City of North Port and its community partners to coordinate public and private resources when outside temperatures pose an immediate danger to the life and health of unsheltered people, especially families and those living with medical or mental health conditions that render them more vulnerable in inclement weather.

Experiences in other communities demonstrate that it is best for a group of community members and organizations to lead and organize – hosted at a non-governmental facility. The City of North Port is prepared to help in ways it can (e.g., inspections in a timely manner, etc.), but it will take the community to create and implement a cold weather shelter.

While the objective of the Plan is to safeguard the lives of vulnerable homeless families and individuals by providing temporary shelter during inclement weather conditions that pose a threat to those living without adequate shelter, all applicable City and State health and safety codes and regulations remain in effect and must be followed. The Plan allows some exemptions from zoning regulations, but not health and safety codes and regulations.

II. DEFINITIONS

- A. Freeze Watch is issued when there is a potential for significant, widespread freezing temperatures within the next 24-36 hours.
- B. Freeze Warning is issued when significant, widespread freezing temperatures are expected.
- C. Frost Advisory is issued when the minimum temperature is forecast to be 33° to 36° F on clear and calm nights during the growing season.
- D. Wind Chill Advisory is issued when wind chills of -5° F to -19° F are expected.
- E. Wind Chill Warning is issued when wind chills of -20° F or lower are expected.

III. SITUATION AND ASSUMPTIONS

- A. Situation
 - 1. Although infrequent, Sarasota County does experience freezing and near-freezing weather during wintertime. Since 1956, per the National Weather Service Tampa Bay Office, the area has seen an annual average of 4.7 days with minimum temperature equal to or below 32° F.

2. There exists a population of homeless persons in North Port. Some may be transients, whereas others may be residents of the City who have been displaced from their home. Community members who serve meals responded to this question, indicating that persons who are homeless are spread out over the 104 square miles of the City. There is an established network among persons in the community who are homeless, and they can get out the word quickly.
3. Sarasota County Emergency Management is responsible for “Risk Shelters,” which include hurricanes. Local government (cities and counties) traditionally do not operate cold weather shelters.
4. The Salvation Army expands services for the homeless during cold weather emergencies. The shelters in the City of Sarasota and Port Charlotte open earlier and admit non-traditional clients.
5. Churches in North Port, Englewood, and Venice have operated cold weather shelters but they are subject to change.
 - a. Englewood – St. David’s
 - b. Venice – Center of Hope
 - c. North Port- New Hope

B. Assumptions

1. Any facility that develops a shelter agreement with Red Cross, including their training, will be covered under their liability.
2. Red Cross can provide the training and some of the equipment.

IV. METHOD OF OPERATIONS

A. General

1. When the outside temperature reaches 40° F (freeze watch advisory) or below (by ambient or wind-chill measure) as measured the National Weather Service, churches located within or adjacent to the City of North Port may act as temporary cold weather shelters. The Plan is in effect until the outside temperature reaches 33° F or above.
 - a. Hours of operation are from 6:00 p.m. to 7:00 a.m.; however, that is at the facility’s discretion.

2. While initiation of The Plan may exempt designated churches from certain zoning regulations:
 - a. Facilities must be surveyed by the Red Cross.
 - b. The facilities must be inspected by North Port Fire Rescue for a change in occupancy type.
 - c. Volunteers and paid staff must be adequately trained (as determined by the Red Cross).
 - d. The plan and protocols for churches shall include provisions limiting use of their facilities as a temporary cold weather shelter for homeless families and individuals who are not under the influence of alcohol or controlled substances not prescribed to the individual.
 - e. The facilities must meet any additional requirements deemed necessary by the City.
3. While official notification from the City is not necessary to initiate the plan, the Emergency Management Coordinator will develop and maintain a contact list for those City Departments and Community Partners affected by initiation of The Plan. This process has been employed so City Departments and Community Partners can coordinate their efforts.

C. Phases of Management

1. Preparation (*prior to weather event*)
 - a. The City will engage the faith-based and community organizations to participate in the providing of temporary shelter services. An orientation will be delivered to participating shelter provider organization on the Severe Weather Shelter Response Plan. The shelter will provide site location, contact information, shelter capacity, hours of intake, shelter amenities, and population to be sheltered (e.g. – singles, families with children). The Service Provider Organization Directory will be updated.
 - b. The Shelter shall contact North Port Emergency Management requesting to be added to the email distribution of the National Weather Service forecast updates. Shelter provider organization will provide an email address to receive the National Weather Service forecast and will monitor the weather for activation.

- c. North Port Emergency Management will add the shelter contact information to the email distribution.
- d. Prior to use, a facility to be approved:
 - i. Survey – basic information on site and conformity to standards.
- 2. Response (*during weather event*):
 - a. The shelter provider organization will review North Port Emergency Management weather updates received via email, the National Weather Service Forecast Office, and/or weather updates available on local TV/Radio broadcasts. Shelters will determine when their facility will open to provide shelter services to the homeless.
 - b. The shelter provider organization, upon determination to open as a shelter, shall conduct a review of the site checklist with a facility representative.
 - c. The shelter provider organization(s) forwards a copy of their facility information via email (preferred) to the volunteer program coordinator.
 - d. The volunteer program coordinator shall retransmit the information to the Sarasota County Call Center.
 - e. Sarasota County Call Center manager will distribute shelter information to staff and post on the SCGOV.net website.
 - f. Program Coordinator will compile a list of shelter sites with amenities and distribute the information to:
 - i. Sarasota County and North Port non-emergency dispatch for relay to law enforcement and fire/EMS agencies in the County/City.
 - The North Port Police Department should be notified if an inebriated individual requests shelter in a designated temporary cold weather shelter located in a church.
 - ii. Shelter provider organizations.

- iii. Sarasota County and City of North Port Emergency Management.
 - f. Feeding would be provided by the shelter provider organization.
- 3. Deactivation (*following weather event*):
 - a. The shelter provider organization monitors weather updates and determines when to terminate shelter services (list date and time of closure) and forward via email (preferred) to the volunteer program coordinator.
 - b. The volunteer program coordinator shall retransmit the information to the Sarasota County Call Center.
 - c. Sarasota County Call Center Manager will advise Call Center staff that the shelter is closing and remove data from the website.
 - d. The volunteer program coordinator will update list of shelters to reflect deactivation and distributes information to:
 - i. Sarasota County and North Port non-emergency dispatch for relay to law enforcement and fire/EMS agencies in the county.
 - ii. Shelter provider organizations.
 - iii. Sarasota County and City North Port Emergency Management.
 - d. The shelter provider organization, upon determination to close, shall conduct a re-review of the site checklist with a facility representative.

V. ORGANIZATION AND ASSIGNMENT OF RESPONSIBILITIES

A. Organization

- 1. See City's Base Plan.

B. Assignment of Responsibilities

- 1. Emergency Management – alerts Red Cross and community as to cold weather warning, or incident requiring an open shelter.

2. North Port Police – As resources are available, can transport individuals to cold weather shelter in North Port and surrounding communities.
2. Red Cross – Red Cross helps establish temporary emergency shelters, which are used for events, such as cold weather and fire evacuation, and “post” shelters which are used to help after an event such as a hurricane. Training of volunteers (become a Red Cross volunteer), shelter survey and agreement.
3. North Port Community Health Action Team (CHAT) -- Maintain schedule of church availability.
4. Facility
 - a. It is up to facility if they store cots
 - b. Work with volunteer coordinator to staff
5. Volunteers
 - a. Identify Volunteer Program Coordinator
 - b. Create Contact List
 - c. Receive Red Cross Training and volunteer status

VI. ADMINISTRATION & SUPPORT

A. Reports & Records

1. Shelter providing organizations shall transmit shelter counts to the volunteer program coordinator who should then prepare a report for transmission to City and County Emergency.
2. Records of facility use (e.g., agreements, inspections, counts, etc.) shall be provided to the volunteer program coordinator by each shelter. Records will be maintained for a minimum of one year.

B. Post-Incident Review

1. An after-action report should be prepared by the volunteer program coordinator after each exercise and/or actual response to a cold weather event.

VII. ANNEX DEVELOPMENT & MAINTENANCE

A. Responsibility

Each agency identified in this Annex will develop Standard Operating Guidelines that address assigned tasks. North Port Emergency Management is responsible for reviewing and updating this annex as necessary.

B. Schedule for Annex Updating

This annex will be maintained in accordance with the following schedule:

1. The annex will be updated with each revision of the City's Comprehensive Emergency Management Plan.
2. The annex will be reviewed after each exercise and/or actual response to a cold weather event, and modified as necessary.
3. The annex will be reviewed and revised, if needed, after each of the following types of events:
 - a. A major change in applicable Federal or State laws, regulations, or policies,
 - b. The findings of ongoing vulnerability and needs assessments in North Port and Sarasota County.

ANNEX J**HAZARDOUS WEATHER RESPONSE****I. INTRODUCTION**

- A. General
- B. Scope and Purpose
- C. Assumptions

II. RESPONSE ORGANIZATION

- A. General
- B. Responsibilities

III. METHOD OF OPERATION

- A. General
- B. Extreme Cold/Freeze
- C. Thunderstorm/Lightning/Tornado
- D. Drought
- E. Tropical Storm/Hurricane

IV. REIMBURSEMENT**V. TRAINING AND EXERCISES**

I. Introduction

- A. General: This Annex establishes a framework through which the City of North Port ("City") may prevent or mitigate the impacts of, prepare for, respond to, and recover from non-flooding/tropical conditions that could adversely affect the health, safety, and general welfare of City residents and guests. This Annex details each weather hazard that can affect the City and our response from the level of Emergency Operations Center activation perspective.
- B. Purpose & Scope
 - 1. The purpose of this Annex is to describe the unique response/recovery procedures for hazardous weather events. This Annex describes the most frequent weather phenomena that can affect the City.
 - 2. The weather hazards addressed in this Annex are:
 - a. Extreme Cold/Freeze.
 - b. Thunderstorm/Lightning/Tornado.
 - c. Drought.
 - d. Tropical Storm/Hurricane. (See Annex K, Tropical Cyclone Response, for greater detail.)
- C. Assumptions
 - 1. The City will usually receive advanced warning about the onset of hazardous weather conditions but not necessarily the severity or impact location. When hazardous weather information from the National Weather Service or the Florida Division of Emergency Management is received by the Emergency Management Department, it will be transmitted to Weather Spotters, critical facilities, and other governmental agencies.
 - 2. The Emergency Operations Center ("EOC") will not be activated pre-event for most hazardous weather conditions, except for Tropical Storms & Hurricanes.

II. The Response Organization

- A. General: Most responses to weather events will be by on-duty forces. The response to a hazardous weather event will depend on reports from the public

and governmental entities. For major hazardous weather events, the response organization will be as described in the Base Plan, with the Emergency Management Division serving as Lead Agency for pre-event activities and Neighborhood Development Services leading post-disaster recovery activities.

B. Responsibilities

1. As the situation warrants, the Emergency Management Division will:
 - a. Be the Lead Agency responsible for this Annex as well as all pre-event hazardous weather activities;
 - b. Monitor the weather and activate the warning system(s) described in the Base Plan;
 - c. Contact Sarasota County Emergency Management regarding shelter openings;
 - d. Activate the EOC;
 - e. Request the activation of the City Call Center; and
 - f. Request the City Manager declare a State of Local Emergency pursuant to F.S. 252.38(3)(a)(5).
2. Should a disaster occur, Neighborhood Development Services will be Lead Agency for damage/impact assessment and Recovery Operations.
3. The Department of Public Works will close roads and barricade as necessary.
4. The North Port Police Department will assist with evacuation and transportation operations.
5. Emergency Services (Police & Fire) will provide damage/impact assessment.
6. Local Response: In addition to on-duty forces, specialized teams may be needed to assist in the response, such as: CERT, City volunteers, and Skywarn Spotters.

III. Method of Operation

- A. General: When the EOC is activated, the Response Organization will be organized and operate under the Incident Command System as outlined in the Base Plan. This section will address unique activities corresponding to a specific hazardous weather event.
- B. Extreme Cold/Freeze: Extreme cold and freezes are relatively infrequent events in the City. The main threats from these events are to the lives/health of people with insufficient shelter. This part of the plan is implemented when temperatures are expected to drop below 40 degrees, including wind chill, for at least two hours. There is no EOC activation anticipated. Additional information on this type of event is contained in Annex I – Cold Weather.
 - 1. Level Three, Monitoring Phase.
 - 2. The Emergency Management Division will monitor weather conditions, coordinate the opening of homeless shelters, and disseminate the opening of shelter information to the media and the public.
- C. Thunderstorm/Lightning/Tornado: Severe thunderstorms, which have lightning and the potential for tornadoes, are frequent in the City during the summer and fall months. The EOC is not likely to be activated beyond a Level Three, unless an EF-1 tornado, or greater, occurs somewhere in the City resulting in loss of life and/or property; in which case the EOC will be in a post-disaster type operation. The main activity for City government is to maintain contact with the Weather Service Office and disseminate weather warnings/updates via communication systems as addressed in the Base Plan.
 - 1. Level Three, Monitoring Phase. The Emergency Management Division will monitor the storm system's potential and disseminate the information to those most affected via means identified in the Base Plan.
 - 2. Level Two, Partial Activation.
 - a. The Emergency Management Division will:
 - (1) Activate the City Call Center based on the impact of the event;
 - (2) Provide on-going situation reporting to the County;

- (3) Maintain contact with the Weather Service and disseminate weather updates and other information to the media and public; and
 - (4) Request shelter openings as needed.
 - b. Neighborhood Development Services will:
 - (1) Provide a liaison to the EOC post-disaster impact; and
 - (2) Assume Lead Agency responsibilities for damage assessment and Recovery Operations.
 - c. North Port Police Department will:
 - (1) Provide a liaison to the EOC as requested; and
 - (2) Coordinate traffic activities
 - d. The Public Information Officer will activate the Crisis Communication Plan in the EOC upon the Incident Commander's request.
- 3. Level One, Full Activation. This level of activation would occur if a catastrophic F-3 tornado, or greater, impacted lives and property within the City. Should this, occur, all actions described in the Base Plan will occur.
- D. Drought: The main hazard with drought is the extreme reduction of the water level in wells. In these situations, well services are usually so far behind in drilling new wells that governmental intervention is needed to keep people in their homes. An associated hazard with drought is the possibility of sinkholes. No EOC activation is anticipated.
 - 1. Level Three, Monitoring Phase.
 - a. The Emergency Management Division will:
 - (1) Monitor activities related to the drought, participate in conference calls with the County, and closely coordinate remedial activities such as water rationing information dissemination to the public.

- (2) Recommend the City Manager declare a State of Local Emergency in order to take prudent action as necessary to ensure the health, safety, and welfare of the community.
 - b. Florida Department of Health: The City may provide private well water testing when the situation warrants.
- E. Tropical Storm/Hurricane: Because this City is a coastal community, these storms have the greatest potential for loss of life and catastrophic property losses. For that reason, the EOC will be activated at some level during the course of this type of threatening weather.
 - 1. Level Three, Monitoring Phase.
 - a. When a tropical system directly threatens the State of Florida, a series of activities occur consisting of conference calls, frequent public service announcements, etc.
 - b. All governmental agencies will implement their Pre-Storm Checklists.
 - 2. Level Two, Partial Activation.
 - a. Preparedness actions will be accelerated and department managers will establish operations in the EOC.
 - b. The Public Information Officer will activate the Crisis Communication Plan in the EOC upon the Incident Commander's request.
 - 3. Level One, Full Activation.
 - a. Between 48 and 36 hours before the Onset of Tropical Storm-force winds, evacuation decisions will be made. All of City government will be operating from the EOC. This phase will continue through the threat period into the beginning portion of Recovery operations, not going beyond two weeks.
 - b. The City Manager, in consultation with department directors, will decide on closing or limiting City business and/or services and recommend cancellation of other public social events.

- c. The Emergency Management Division will:
 - (1) Recommend the City Manager declare a State of Local Emergency in order to take prudent action as necessary to ensure the health, safety, and welfare of the community;
 - (2) Disseminate warning information and situation reporting to the media and the public;
 - (3) Determine and coordinate area evacuation operations; and
 - (4) Coordinate recovery operations with the County.
- d. The North Port Police Department will:
 - (1) Support shelter operations security; and
 - (2) Assist with evacuation operations, including denying reentry to evacuation area(s).

IV. Reimbursement and Finance

As stipulated in the Base Plan.

V. Training and Exercises

- A. General: Training to support hazardous weather operations is on-going and recurring. The State of Florida and FEMA provide a variety of training courses, as well as Independent Study Courses, at no expense to the individual. The Emergency Management Division can develop a tailored training program for any agency desiring the service.
- B. Training Program Development & Implementation: The Base Plan provides a chart outlining the recommended training. Other/new training offerings will be disseminated via the Emergency Management Division to all City departments.
- C. Training Exercise: The City participates in the State of Florida's Annual Hurricane Exercise conducted in the spring. City departments are encouraged to conduct their own tabletop exercises, especially when procedures and/or equipment change.

ANNEX K**TROPICAL CYCLONE RESPONSE****EXECUTIVE SUMMARY****I. INTRODUCTION**

- A. General
- B. Scope and Purpose
- C. Assumptions

II. RESPONSE ORGANIZATION

- A. General
- B. Response Organization
- C. Responsibilities

III. METHOD OF OPERATION

- A. General
- B. Level 3, Monitoring Phase
- C. Level 2, Partial Activation
- D. Level 1, Full Activation
- E. Resources

IV. PUBLIC INFORMATION and INFORMATION FLOW**V. REIMBURSEMENT****VI. TRAINING AND EXERCISES**

EXECUTIVE SUMMARY

This Annex addresses the role of local government in providing the necessary support to the City of North Port (“City”) in its responsibilities in responding to and recovering from the effects of a hurricane or tropical cyclone event.

The City’s Emergency Management Division has the overall responsibility to update and coordinate this Annex with other response and support agencies. The Annex is a living document, being reviewed and updated at least annually and at the end of each hurricane or tropical cyclone exercise or event. It is presently divided into the following four Sections:

Section I – Introduction: Provides the purpose, scope, and planning assumptions used to prepare the Annex.

Section II – The Response Organization: Identifies the various levels of support that may be provided through the Emergency Operations Center (“EOC”) structure. It describes the circumstances under which the various agencies will unify under a single command structure in preparing for, responding to, recovering from, and mitigating the effects of a hurricane by the components of governmental agencies. This Section also addresses the delegation of authority during a hurricane or tropical cyclone event.

Section III – The Concept of Operation: Presents the guidelines that will be used to make key decisions during a hurricane or tropical cyclone event, as well as Pre- and Post-Disaster Operations and Activities.

Section IV – Public Information and Information Flow: Provides the information, notification, and warning process for hurricane and tropical cyclone activities to the public, governmental agencies, and Sarasota County.

Section V – Reimbursement: Identifies how the City shall recover funds expended during a Presidentially-declared disaster.

Section VI – Exercises and Training: Identifies how City personnel shall prepare for hurricanes and tropical cyclone events.

I. INTRODUCTION

- A. General: This Annex identifies the actions that may be taken by the governmental agencies within the City while preparing for, responding to, and recovering from a hurricane or tropical cyclone event.
- B. Purpose: The City's Emergency Management Division has the overall responsibility for coordination of support in response to a hurricane or tropical cyclone event in the City. The Emergency Management Division will update and coordinate with other response and support agencies.
- C. Scope: This Annex addresses hurricanes and tropical cyclone events that affect the City. The purpose of the response is to protect lives, property, and mitigate the effects of the storm/event.
- D. Assumptions:
 - 1. The City Manager is responsible for preparing for, responding to, and recovering from the damaging effects a hurricane or tropical cyclone event has on the residents of the City following the declaration of a State of Local Emergency pursuant to F.S. 252.38(3)(a)(5).
 - 2. Once under a Declaration , the Sarasota County Emergency Management will order evacuations as necessary to protect the public.
 - 3. The City's resources will be overwhelmed by the direct hit of any category of hurricane or tropical cyclone event and will require mutual aid, State, and Federal assistance to recover from the effects of the disaster.

II. RESPONSE ORGANIZATION

- A. General: This Section describes the organization to be used in coordinating the City's departments in support of the response during a hurricane or tropical cyclone event. It describes the Unified Command Structure the various agencies will work under in responding to and recovering from a hurricane or tropical cyclone event. It addresses the circumstances under which the City will support other jurisdictions in Sarasota County and the State of Florida in response to a hurricane or tropical cyclone event.

B. Response Organization:

1. Local: Using the principles of the National Incident Management System (NIMS), the EOC's team is organized as described in the Base Plan. This team will direct implementation of response and recovery activities.
2. County: The City will provide liaisons to the Sarasota County Multi-Agency Coordination Center (MACC) to coordinate the sharing of information and resource requests between the City and County.

C. Responsibilities:

1. As the situation warrants, the Emergency Management Division will:
 - a. Monitor storm development, keeping governmental agencies and the public informed about the potential impact;
 - b. Participate in local and National Weather Service conference calls;
 - c. Activate the EOC to the level appropriate for the threat;
 - d. Monitor the operation and determine when to request the City Manager declare a State of Local Emergency pursuant to F.S. 252.38(3)(a)(5); and
 - e. Act as the Functional Lead for each Incident Management activity at the EOC for the City Manager; i.e. Operations, Planning/Intelligence, Administration, and Logistics.
2. **Department Directors: Directors will prepare their personnel and organizations for the hurricane or tropical cyclone event and staff positions within the EOC as required by the Response Manager.** When requested, directors will make City assets available for deployment to other areas of Sarasota County or the State of Florida. Asset sharing will be done through the Sarasota County Multi-Agency Coordination Center to ensure proper tracking and accounting.

III. METHOD OF OPERATIONS

- A. General: This section of the Annex presents guidelines that can be used to make key decisions during the event. These decisions will be based on experience, the best evaluation of the current situation, and the forecast for the near future. All hurricane and tropical cyclone event responses will fall under the umbrella of the Incident Command System. Since a hurricane or tropical cyclone event is a disaster that can be seen approaching, general phases of activity are defined based on the anticipated arrival of tropical storm force winds. Guidelines for the three levels of activation (Monitoring, Partial, and Full) are presented below:
- B. Level 3, Monitoring Phase: The Emergency Management Division will:
 - 1. Monitor the weather system;
 - 2. Participate in/initiate conference calls with Sarasota County and the National Weather Service;
 - 3. Regularly transmit warning and preparedness information through all communications media;
 - 4. Brief the department directors; and
 - 5. Prepare to activate the EOC.
- C. Level 2, Partial Activation: The City's EOC may be activated to a Level 2 based on a variety of considerations.
 - 1. Request to **issue a State of Local Emergency**: When appropriate and for the following factors, the Emergency Management Division will request the City Manager declare a State of Local Emergency pursuant to F.S. 252.38(3)(a)(5):
 - a. Evacuation(s) ordered by Sarasota County and/or decision by the County to activate to a Level 2;
 - b. Closing down/reducing "normal" governmental operations;
or
 - c. Expending City monies in response to the threat of a hurricane or tropical cyclone event.

2. Department Directors will initiate their preparations using the Departmental Pre-Storm Checklist to ensure all necessary tasks are completed.
 3. Staffing the City's **EOC**: Once the City's EOC has gone to Level 2, the following agencies will maintain a presence in the EOC while it is activated:
 - a. Division of Public Works;
 - b. Fire Rescue Department;
 - c. Department of Public Utilities;
 - d. North Port Police Department; and
 - e. The City's Public Information Officer.
- D. Level 1, Full Activation: The Emergency Management Division Guidelines to Fully Activate the City's EOC are as follows.
1. The Emergency Manager, in consultation with the City Manager, will make the decision of when to activate the City's EOC to a Level 1. The following factors may be used in the decision-making process:
 - a. When a response to the hurricane or tropical cyclone event requires the resource and/or logistical support from a majority of the City's Incident Command Functions; and
 - b. When the threat of a hurricane or tropical cyclone event necessitates evacuations that require resource support from neighboring counties.
 2. City's Employee Shelter Activation: When the EOC becomes fully activated due to the threat of a hurricane or tropical cyclone event and a major evacuation is anticipated, the City Manager may direct the opening of an Employee Shelter so that the dependents of City employees may have a safe place to stay.
- E. Resources: All resource requests will be coordinated through the Logistics Section.

IV. PUBLIC INFORMATION and INFORMATION FLOW

- A. General: This Section provides how information will be shared during the activation of the City's EOC. The Public Information Officer has the responsibility to establish a mechanism that efficiently provides and disseminates information to the public. The City Manager will appoint a Lead Public Information Officer who will facilitate the logistical support and orientation for all Public Information Officers working in the City's EOC. (See Appendix G – Crisis Communication and Public Information Plan.)
- B. Unified Public Information: When the County Emergency Operations Center is activated (Level 2 or 1) the City's Public Information Officer will coordinate information and media releases with Sarasota County to ensure consistent messaging across all formats.
- C. Information Flow:
 - 1. Hurricane and tropical cyclone event Response Activity:
 - a. The Emergency Manager will notify the Sarasota County Multi-Agency Coordination Center of any significant activities that develop.
 - b. The Public Information Officer will notify the EOC Manager of any significant activities that develop; such as the following:
 - (1) Lives and/or property imminently jeopardized;
 - (2) Evacuation issues/problems;
 - (3) Injuries or deaths related to the hurricane or tropical cyclone event; or
 - (4) Road closures to major thoroughfares.
 - 2. Situation Report **Information:** The Plans Section Chief will produce situation reports on a frequency and format consistent with ICS Planning and with the needs and requirements of the Sarasota County Multi-Agency Coordination Center.

V. REIMBURSEMENT (See Base Plan, Section VI.)

- A. When anticipating a Presidential Declaration of a Major Disaster that includes Sarasota County, and the City encounters any damage to its infrastructure or expends funds for emergency protective measures or debris removal, the City shall apply to the federal government for reimbursement consistent with the Stafford Act and its applicable regulations.
- B. Complete and accurate accounts of emergency expenditures and obligations, including personnel and equipment costs, must be maintained. The Finance Department will create project and payroll codes to track all costs.
- C. Following a hurricane or tropical cyclone event, the City's Emergency Management Division will coordinate with all departments and volunteers to compile costs and proper documentation needed for reimbursement under Public Assistance procedures. A member of the City's Finance Department, Emergency Management Division, and pertinent department officials must be involved with the reimbursement application process with FEMA. The Finance Department, and other City departments as necessary, will coordinate the submission of payroll reports to FEMA; individual departments will be responsible for equipment, materials, and contracts.

VI. EXERCISES AND TRAINING (See Base Plan, Section IV, Subsections C and D.)

- A. The City will develop and conduct emergency management oriented exercises and participate in similar exercises conducted by other government entities.
- B. Exercises shall be drawn from existing plans/procedures to evaluate their ability to meet the goals and objectives.
- C. Exercises shall be evaluated, and an After-Action Review/Improvement Plan will be created to draw-on strengths and identify areas for improvement.
- D. The Emergency Management Division will work with department directors to identify generic and task-specific training opportunities for operations related to hurricane and tropical cyclone events.
- E. All training shall be consistent with NIMS/ICS principles.

CITY OF NORTH PORT
COMPREHENSIVE EMERGENCY MANAGEMENT PLAN
APPENDICES

- A. EMERGENCY ORDINANCE OF A STATE OF LOCAL EMERGENCY**
- B. INCIDENT COMMAND SYSTEM GENERAL GUIDANCE AND POSITION MISSION STATEMENTS**
- C. CITY OF NORTH PORT RESOLUTION 06-R-10 IMPLEMENTING NIMS**
- D. CITY OF NORTH PORT RESOLUTION 01-R-44 ADOPTING THE STATEWIDE MUTUAL AID AGREEMENT**
- E. CITY OF NORTH PORT RESOLUTION 2016-R-02 ADOPTING THE SARASOTA COUNTY UNIFIED LOCAL MITIGATION STRATEGY**
- F. CITY OF NORTH PORT RESOLUTION 2019-R-10 ADOPTING THE COMPREHENSIVE EMERGENCY MANAGEMENT PLAN AS THE FORMAL GUIDE FOR THE CITY OF NORTH PORT'S EMERGENCY MANAGEMENT ACTIVITIES**
- G. CRISIS COMMUNICATIONS AND PUBLIC INFORMATION**
- H. DEBRIS MANAGEMENT**

APPENDIX A**EMERGENCY ORDINANCE DECLARING
A STATE OF LOCAL EMERGENCY**

AN ORDINANCE OF THE CITY OF NORTH PORT, FLORIDA, DECLARING A STATE OF LOCAL EMERGENCY, GRANTING TO THE CITY MANAGER OR DESIGNEE THE AUTHORITY TO TAKE ACTIONS IN ACCORDANCE WITH FLORIDA STATUTES SECTION 252.38(3)(a), AND SUSPENDING STANDARD PROCEDURES FOR THE PROCUREMENT OF GOODS AND SERVICES NECESSARY TO ADDRESS THE DECLARED EMERGENCY CAUSED BY THE THREAT POSED BY [ENTER EVENT]; PROVIDING FOR FINDINGS; PROVIDING FOR DURATION; PROVIDING FOR CONFLICTS; PROVIDING FOR SEVERABILITY; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, [ENTER EVENT] poses an immediate danger to the public health, safety, or welfare to the City of North Port, Florida and its residents; and

WHEREAS, these circumstances constitute an emergency which warrant the adoption of this ordinance under the procedures provided in the Charter of the City of North Port, Section 7.02 - Emergency Ordinance; and

WHEREAS, the City Commission has, by a vote of at least four members of the Commission, deemed the adoption of this ordinance as necessary for the immediate preservation of the public health, safety, and welfare of the City.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COMMISSION OF THE CITY OF NORTH PORT, FLORIDA, AS FOLLOWS:

SECTION 1 – FINDINGS:

- 1.01. The above recitals are hereby ratified and confirmed as being true and correct and are incorporated herein by reference.

SECTION 2 – DECLARATION OF EMERGENCY AND EMERGENCY PROCEDURES:

- 2.01 The City Commission of the City of North Port, Florida hereby declares a state of local emergency due to [EVENT], an emergency affecting the City.
- 2.02 The City Commission of the City of North Port, Florida hereby authorizes the City Manager or the City Manager's designee the power and authority set forth in Florida Statutes Section 252.38(3)(a), and to take any and all action of a temporary nature deemed necessary during this state of emergency.
- 2.03 The City Commission of the City of North Port, Florida hereby determines that this emergency necessitates the waiver of the general procedures and formalities required by law pertaining to the City Manager's procurement of goods and services requiring emergency action, notwithstanding the provisions of Chapter 2, Code of the City of North Port, Florida. Procurements should be made

with the greatest degree of competition that circumstances will permit.

SECTION 3 – DURATION:

- 3.01 This ordinance shall remain in effect until it expires by operation of law or until the emergency conditions no longer exist as determined by the City Manager

SECTION 4 – CONFLICTS:

- 4.01 In the event of any conflict between the provisions of this ordinance and any other ordinance or portions thereof, the provisions of this ordinance shall prevail to the extent of such conflict.

SECTION 5 – SEVERABILITY:

- 5.01 If any section, subsection, sentence, clause, phrase, or provision of this ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such provision shall be deemed a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining portions hereof.

SECTION 6 – EFFECTIVE DATE:

- 6.01 This ordinance shall take effect immediately after adoption by the City Commission of the City of North Port, Florida.

Read in its entirety in a public session this _____ day of _____ 20__.

PASSED and ADOPTED by the City Commission of the City of North Port, Florida public session this _____ day of _____ 20__.

CITY OF NORTH PORT, FLORIDA

MAYOR

ATTEST:

CITY CLERK

APPROVED AS TO FORM AND CORRECTNESS:

CITY ATTORNEY

APPENDIX B**INCIDENT COMMAND SYSTEM GENERAL GUIDANCE AND
POSITION MISSION STATEMENTS****General Guidance for ICS Personnel**

1. On receiving your incident assignment, be certain you clearly understand the location you are to report to and the time you are expected to begin in the incident assignment.
2. On your arrival, check in with the appropriate supervisor or “check-in” location if you have been given a telephone number to call upon arrival.
3. In the event you are working in the EOC, request a copy of the EOC Activation SOP if you are not furnished one. Ask questions if you are not certain what your duties are. Request a briefing.
4. Use clear “open text” when communicating on the telephone or in written memoranda, such as multi-part message forms or Situation Reports. This means that you should not use codes, signals or jargon.
5. Acquire any office materials you may need, such as multi-part message forms or note pads.
6. Accountability of personnel is critical. Remember the principal of Unity of Command that each person is reportable to only one supervisor. Each supervisor is responsible for the accountability of those they supervise.
7. Continuously brief subordinates relative to new information you have received which pertains to their activities.
8. Advise the Incident Commander, Section Chief, or your supervisor, when personnel have accomplished their last mission and are available for new tasking.
9. Complete, maintain, or forward forms and reports as necessary.
10. Brief your subordinates about potential demobilization so they can prepare to conclude their necessary reports and activities in a timely manner.
11. Notify your subordinates when they can demobilize. Receive a final accountability report for all personnel, and advise the Incident Commander or your supervisors when you subordinates have demobilized and the status of personnel.

POSITION MISSION STATEMENT FOR Incident Commander

Location:	On scene of the Incident or at North Port EOC.
Recommended Staffing:	<p>First arriving officer-in-charge (OIC) until relieved by Higher Authority</p> <p>North Port City Manager or his designated representative which may include the North Port Emergency Management Director.</p>
Activation:	Any situation which in the judgment of the on-scene ranking OIC requires the utilization of the ICS due to the concern for public safety, the safety of response personnel at the scene, and effective management of the incident.
Responsibilities:	The Incident Commander is ultimately responsible for all incident activities including the development and implementation of strategic decisions and the utilization of extended resources. This individual must process information to and from the primary Section Chiefs and Staff operating within their span of control.

General Procedures:

- Arrive at the scene, or EOC, and establish command. Obtain an incident briefing from the OIC or previous incident commander.
- Assess the incident and conduct an initial strategy briefing with the current operation command personnel.
- Select and activate ICS elements as needed.
- Brief the Command Staff and Section Chiefs
- Participate in the preparation and authorize implementation of the *Incident Action Plan*.
- Determine needs, make command decisions, and related the needs/decisions to the Command Staff and Section Chiefs.
- Coordinate primary staff activities.
- Manage overall incident.
- Approve requests for and utilization of extended resources.
- Brief the City Manager, or their designated representative, relative to on-going operations and significant changes in the situation.
- Authorize release of information to the news media.
- Obtain briefings from the Section Chiefs, Command Staff and other representatives as appropriate.
- Ensure that the *Incident Status Form* (work sheet) is utilized and completed.
- Obtain information on environmental concerns.

- Review the progress of the incident and channel organizational efforts toward the highest priority tasks.
- Insure that safety procedures and disciplines are practiced and maintained by all personnel.
- Approve the demobilization plan and oversee the return to normal operations.
- Participate in and approve a final incident summary, media briefing, reports and other documentation.
- Assure that historical records are transferred to the City Clerk for final custody.
- Accumulates after actions reports from those involved in the incident and develops a list of Lessons Learned, and transmits to all involved City departments, and external agencies. If appropriate make recommended changes to the North Port Comprehensive Emergency Management Plan.

POSITION MISSION STATEMENT FOR Incident Command Aide

Location:	Command Post or North Port EOC
Recommended Staffing:	Any qualified individual appointed by the Incident Commander
Reports to:	Incident Commander
Activation:	When deemed necessary by the Incident Commander to assist with maintaining paperwork, records or communications or to assist the incident commander.
Purpose:	The Aide provides administrative and operational assistance to the IC, manages the command area and processes information that does not require the attention of the IC. This position requires a person with knowledge of the City's various departmental operating responsibilities and procedures, applicable ICS tactics and strategy and command terminology. This position may formulate decisions and issue directives to a level that has been designated by the IC.

General Procedures:

- Establish and secure the EOC area. If necessary, obtain assistance from the City of North Port Police Department.
- Obtain initial briefing and assignments from the IC.
- Initiate and maintain the IC worksheet. Log all pertinent information, or if a Historian is present, direct such information to the Historian for appropriate entries.
- Assist with the research and analysis of resource and reference materials as necessary to assist the IC or Command Staff.
- Operate various communications systems as needed. Relay command directives from the Incident Commander to the Command Staff and Section Chiefs as needed.
- Disseminate and assist in the processing of information both upward and downward as needed.
- Anticipate the needs of the IC and be prepared to respond accordingly.
- Assist the PIO by relating current incident information.
- Assist the liaison officer with management of representatives from other agencies.
- Observe operations and make suggestions and recommendations to the IC.
- Contributes to the development of an After-Action Report with Lessons Learned.

POSITION MISSION STATEMENT FOR Liaison Officer

Location:	On the Scene at the Command Post or the North Port EOC
Recommended Staffing:	Any Qualified Individual Appointed by the Incident Commander
Reports to:	Incident Commander
Activation:	When a separate point of contact is needed due to the number of agencies represented on an incident. A liaison may also be furnished to the Sarasota County EOC for coordination during a county-wide or multiple county incident.
Purpose:	The Liaison Officer is a member of the Command Staff selected to serve as point of contact for other agencies to assist in communications and coordination with such.
Responsibilities:	The coordination of inter-agency activities and to assure communications exists between the City of North Port and other levels of emergency response, such as: Sarasota County, the State of Florida, Florida National Guard and/or Federal government.

General Procedures:

- Obtain initial in-briefing from the Incident Commander.
- Serve as a Point of Contact for assisting, coordinating and communicating with other agency representatives.
- Identify agency representatives for each response organization and establishing a means of communications with them.
- Attempt to limit communications with other agencies to one point of contact per agency to avoid confusion and unnecessary duplication of effort.
- Respond to all requests for agencies for special needs assistance.
- Respond to requests from North Port Incident Commander for any inter-agency contacts.
- Monitor the incident operations to identify current or potential inter-agency needs or problems.
- Maintain an on-going list of response involvement, such as personnel, equipment and mutual aid supplies from other agencies involved in the response effort. Maintain a list of activities which other agencies are currently involved in.
- Participate in planning meetings by providing status, limitations and capabilities of other agencies involved in the response effort.
- Upon agency request, provide specific information about the incident relative to: Operational Activities Anticipated During of Activities.
- Status of agency personnel involved in the operations Expected demobilization schedule

- If required to do so, be prepared to serve as a liaison from the City of North Port to other organizational EOCs.
- Serve a point of contact from North Port to the other organization Communicate information and requests between the organizations.
- Coordinate actions with the other agency on behalf of the North Port Incident Commander
- Contributes to the development of an After-Action Report with Lessons Learned.

**POSITION MISSION STATEMENT FOR
Public Information Officer**

Location:	At the Scene or in the North Port EOC
Recommended Staffing:	Any individual appointed by the Incident Commander
Reports to:	Incident Commander
Activation:	At the discretion of the IC for any incident of such significance that news media attention is attracted and assistance is required.
Purpose:	The PIO is the focal point for the official release of information to the news media.
Responsibilities:	The PIO is the contact person for media representatives. Coordinates release of all incident information.

General Procedures:

- Establishes and maintains a media gathering area, schedules regular news briefings and news conferences if deemed necessary and helpful.
- Issues news releases and gathers factual background information for the news media.
- Ensures the accuracy of information and shall remain knowledgeable of current incident information, operations and status.
- Is sensitive to misinformation or rumors developing within the media or public, and develops plans to correct the misinformation or rumors.
- Obtains initial in-briefing from the IC.
- Begins to log and track incident information.
- Establishes a media area which offers safety to the media from hazards created by the incident. Requests law enforcement assistance as needed.
- Meets with arriving media to give them an initial in-briefing. Provides on-going updates based on information from the IC.
- Seeks photo opportunities for the news media and facilitates their ability to take pictures.
- Serves as escort as needed.
- Conducts briefings and news conferences for the media, releasing only information and does not speculate in response to media inquiries.
- Responds to media requests for background information and updates.
- Updates the IC on information released to the news media and request which have been received by the media.
- Files all media news releases with reports.
- Corrects misinformation and/or rumors developing within the media or public at large.
- Seeks media support in furnishing correct information to the public when rumors have

- been identified.
- Arranges and organizes adequate staff, equipment and facilities to support the PIO functions
- Contributes to the development of an After-Action Report with Lessons Learned.

POSITION MISSION STATEMENT FOR Safety Officer

Location:	On Scene or the North Port EOC
Recommended Staffing:	Any trained Individual Appointed by the Incident Commander
Reports to:	Incident Commander
Activation:	When in the opinion of the Incident Commander personnel may be operating in any type of hazardous environment or when potentially dangerous operation.
Purpose:	To ensure that all personnel at the scene are operating in as safe a manner as possible, consistent with current standards and practices.
Responsibilities:	The Safety Officer is the member of the Command Staff with the foremost responsibility for the safety of personnel operating at the scene. The Safety Officer will continuously monitor and assess situations for unsafe or hazardous conditions and will develop countermeasures for assuring the safety of personnel.

General Procedures:

- Obtain an in-briefing from the IC relative their duties, responsibilities and current situation.
- Identify hazardous situation associated with the incident.
- Participate in planning meetings to advise the IC and operations Chief relative to personnel safety.
- Exercise emergency authority to halt and/or prevent unsafe acts.
- Conduct initial accident investigations that have occurred within the incident area.
- Establish safety assistants or seek specialized input as needed.
- Contributes to the development of an After-Action Report with Lessons Learned.

**POSITION MISSION STATEMENT FOR
Logistics Section Chief**

Location:	Incident Scene or North Port EOC
Recommended Staffing:	Ranking Qualified Officer Available
Reports To:	Incident Commander
Activation:	Any incident requiring resource move-ups or mutual aid
Purpose:	To provide management of facilities, services, equipment and supplies. Coordinates move-ups or mutual aid support.
Responsibilities:	Acquires, secures and maintains adequate inventories to support incident response activities. Will provide for the personal service needs of all personnel operating at the incident.

General Procedures:

- Obtain initial in-briefing from the Incident Commander.
- Plan for the organization of the Logistics Section and determines the need for additional personnel and resources.
- Assigns tasks and locations to Logistical Section personnel.
- Participates in the preparation of the incident action plan.
- Identifies current and anticipated future service and support requirements for the planned and expected operations.
- Coordinates with the Planning Chief regarding anticipated future resource needs.
- Reviews and provides input for the Communications Plan, Traffic Plan and Medical Plan, if needed.
- Identifies and provides support requirements for the personnel operating at the incident.
- Coordinates and processes requests for additional resources.
- Ensures move-ups or mutual aid requests are made when needed.
- Establishes secondary staging areas as needed.
- Prepares for the return of mutual aid equipment during demobilization.
- Develops a Logistics Section Demobilization Plan.
- Contributes to the development of an After-Action Report with Lessons Learned.

POSITION MISSION STATEMENT FOR Operations Section Chief

On the Scene in Forward Area, the Command Post, or the North Port EOC

Recommended Staffing:	Ranking Qualified Officer Available, designated by Command
Reports to:	Incident Commander
Activation:	On any incident which taxes the span of control of the Incident Commander
Purpose:	Encompasses most incident mitigation activities. This includes all task oriented Divisions/Groups participating in the incident scene.
Responsibilities:	Is a member of the General Staff, organizes the initial incident control activities and subsequent implementation of the incident action plan.

General Procedures:

- Obtains an initial in-brief from the Incident Commander
- Establishes Branches and Divisions/Groups as needed to initiate operation control measures
- Begins development work on the incident action plan needed for initial and immediate control of the incident
- Supervises operational aspects of the incident and the Branches or Divisions/Groups associated with that function
- Determines the need for and requests additional resources
- Advises the Incident Commander of special concerns or requirements that may impact the development of an extended incident action plan
- Makes tactical decisions and changes to the operation on an immediate basis if needed.
- Assembles and disassembles Strike Teams/Task Forces
- Assigns a Rehabilitation Officer and ensures that a remote area is established for this activity
- Establishes and maintains Staging Areas as needed and assigns a staging officer to maintain the staging area.
- Prepares a final summary of activity and demobilization report to be submitted to the Incident Commander
- Contributes to the development of an After-Action Report with Lessons Learned.

**POSITION MISSION STATEMENT FOR
Planning Section Chief**

Location:	On the incident scene or the North Port EOC
Recommended Staffing:	Ranking Qualified Officer Available
Reports to:	Incident Commander
Activation:	When the incident has reached a magnitude in which the Incident Commander cannot effectively forecast the future action plan due to the incident size, constraints on the IC, or complexity.
Purpose:	To coordinate the preparation of the incident action plan, advises the command of potential operational impacts, and maintains alternative strategies for potential and possible incident developments. The Planning Section serves as the clearing house for analysis of incoming information.
Responsibilities:	Develops and maintains the incident action plan. Collects and obtains information relative to the incident, identifies special resources as indicated by need, and provides vital information such as weather data, environmental data, special equipment needs to the Incident Commander.

General Procedures:

- Obtains initial in-briefing from the Incident Commander.
- Identifies additional staffing, equipment and supply needs.
- Identifies requirements for documentation.
- Identifies specific environmental issues.
- Continuously receives new or updated information for analysis regarding resources, weather and other incident related matters.
- Prepares and coordinates Command Staff meetings to outline the incident action plan.
- Prepares a written Incident Action Plan for the Incident Commander.
- Monitors the incident progress, updates and modifies the Incident Action Plan as needed.
- Assists with evacuation and sheltering plans as needed, or assumes this responsibility in the absence of a Relocation Officer.
- Provides the Incident Commander with special interest information such as weather predictions, weather changes, environmental concerns and critical resource shortages.
- Provides plans for demobilization and incident termination.
- Writes the final Incident Summary for approval by Incident Commander
- Contributes to the development of an After-Action Report with Lessons Learned.

**POSITION MISSION STATEMENT FOR
Administration/Finance Section Chief**

Location:	As designated by the Incident Commander
Recommended Staffing:	Any qualified individual designated by the Incident Commander
Reports to:	Incident Commander
Activation:	When in the judgment of the Incident Commander the position is required to manage financial and administrative issues due to the magnitude or complexity of the incident.
Purpose:	To assure that financial documentation is maintained in compliance with municipal state and Federal requirements. To maximize the opportunities for financial reimbursement and to perform necessary administrative services to allow the Incident Commander and the Command and general Staffs to focus on incident management.
Responsibilities:	Tracks the use of reserve personnel and internal resources for overtime costs. Coordinates all extraneous costs incurred relative to the incident involving personnel, equipment, supplies and contract services. Documents line of duty injury reports, damage to or destruction of equipment. Assuring that appropriate Federal guidelines are followed to seek reimbursement.

General Policies:

- Obtains initial in-briefing from the IC.
- Plans the Administration/Finance Section organization and determines the need for staffing.
- Assigns work locations and preliminary work tasks to section personnel
- Participates in the preparation of the Incident Action Plan.
- Identifies any special financial needs for the incident.
- Coordinates personnel-hours tracking and recall of off-duty personnel.
- Ensures prompt financial payment and insurance claims processing relative to personal injuries.
- Maintains daily contact with County, State and Federal agencies involved in the incident management relative to administrative and financial matters.
- Contributes to the development of an After-Action Report with Lessons Learned.

**POSITION MISSION STATEMENT FOR
Branch Director**

Location:	On Scene or any prescribed location by Command
Recommended Staffing:	Ranking Qualified Officer Available
Reports To:	Operations or Logistics Section Chief or Incident Commander, as appropriate
Activation:	When multiple City departments are working the same general incident location and coordination is needed, or when the span of control requires that Section Chiefs need to establish a level of management between themselves and response personnel.
Purpose:	Provide coordination, direction and control to operational staff activities within a specific function or geographic location. Functional areas may include: Operations Section - Public Safety, Human Services, and Infrastructure; Logistics Section - Services and Supply.
Responsibilities:	Directs and maintains the continuity of functions occurring within the prescribed functional or geographic area of responsibility. Maintains communications with the Operations Section Chief/Incident Commander concerning specific needs and on-going activities at their site.

General Procedures:

- Obtains initial in-briefing from the Incident Commander or Operations Section Chief
- Coordinates the activities of personnel assigned to the Branch in carrying out the incident control activities.
- Reviews assignments with field personnel as necessary.
- Updates the Operations Chief or Incident Commander on changes in conditions that will affect the plan of action in their sector.
- Coordinates activities with other Branch Directors or Group Supervisors through the Operations Section Chief or Incident Commander.
- Determines the need for and requests additional personnel, supplies, equipment, contract services or other resources as needed to accomplish the mission.
- Makes recommendations to the Operations Section Chief or Incident Commander relative to changes in the action plan and initiates critical decisions relative to immediate actions as needed.
- Contributes to the development of an After-Action Report with Lessons Learned.

**POSITION MISSION STATEMENT FOR
Group / Division Supervisor**

Location:	As Needed for Task Completion
Recommended Staffing:	Ranking Qualified Officer Available
Reports to:	Operations Section Chief, Branch Director, or Incident Commander
Activation:	When a need exists to assign multiple departmental units to a specific task.
Purpose:	To provide supervisory support to the Unit-level resources regardless of the functional area or geographic location of the response personnel involved. Group/Division may be located within a Branch in the Operations Section.
Responsibilities:	Provides direction and control to resources assigned to the Group to coordinate their operations with other Groups or Divisions. Assures the work unit is efficient and effective in the performance of its mission by maximizing the use of resources.

General Procedures:

- Receives initial in-brief from the Operations Section Chief or the Incident Commander to determine the action plan and identify the companies which are to be assigned to the Group.
- Determines the safety of the work area and assures that crews have appropriate safety or protective equipment, and that such equipment is properly used.
- Conduct on-going analysis of the current situation, develop an operating plan, and make appropriate assignments to accomplish the mission. Adjusts the operating plan as needed.
- Coordinate with other Division or Group Supervisors to ensure that a mutually supporting effort is being conducted.
- Requests additional personnel and other resources as needed to accomplish the mission.
- Ensure scene integrity so that evidence is preserved for subsequent investigation should such be required.
- Contributes to the development of an After-Action Report with Lessons Learned.

**POSITION MISSION STATEMENT FOR
Staging Area Manager**

Location:	As designated near the scene or a remote location
Recommended Staffing:	Any Qualified and Trained Individual Appointed by Command
Reports To:	Incident Commander or Operations Section Chief
Activation:	When Command determines that a staging area must be established to provide adequate resources to the incident operations or when resources are being assembled in a resource pool for a special or future need.
Purpose:	To manage the personnel, vehicular and equipment resources in a manner which will help prevent congestion at the incident scene; to create a pool of resources and manage resource distribution.
Responsibilities:	Locate and maintain an area that allows for an effective retrieval of personnel, equipment, and supplies. Fulfill resource requests from the Operations Section Chief or Incident Commander. Maintain a sufficient pool of resources to support operations.

General Procedures:

- Obtains an initial in-briefing from the Incident Commander or Operations Section Chief.
- Functions as a member of the Operations Staff advising the Operations Section Chief or Incident Commander of potential resource requirements and shortages.
- Fulfills resource requests from the Operations Section Chief or Incident Commander. Directs units of where to report, who to report to, and their anticipated assignment.
- Ensures that resources are pre-positioned in such a way as to expedite their response to the incident scene.
- Coordinates with law enforcement to ensure access from the staging area to the incident scene.
- Maintains accountability for the dispatching of mutual aid resources.
- Positions resources to coordinate team/task force later use
- Prepares a demobilization plan for the Staging Area and directs demobilization activities when appropriate.
- Contributes to the development of an After-Action Report with Lessons Learned.

APPENDIX C**CITY OF NORTH PORT RESOLUTION 06-R-10 IMPLEMENTING NIMS****City of North Port****RESOLUTION NO. 06-R-10**

A RESOLUTION OF THE CITY OF NORTH PORT, FLORIDA IMPLEMENTING THE NATIONAL INCIDENT MANAGEMENT SYSTEM (NIMS) AS THE CITY OF NORTH PORT'S INCIDENT MANAGEMENT SYSTEM; PROVIDING FOR CONFLICTS; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE

WHEREAS, in Homeland Security Directive (HSPD)-5, the President directed the Secretary of the Department of Homeland Security to develop and administer a National Incident Management System (NIMS), which would provide a consistent nationwide approach for federal, state, local and tribal government to work together more effectively and efficiently to prevent, prepare for, respond to, and recover from domestic incidents, regardless of cause, size or complexity; and

WHEREAS, the collective input and guidance from all federal, state, local and tribal homeland security partners has been, and will continue to be, vital to the development, effective implementation and utilization of a comprehensive NIMS; and

WHEREAS, it is necessary that all federal, state, local, and tribal emergency agencies and personnel coordinate their efforts to effectively and efficiently provide the highest levels of incident management; and

WHEREAS, to facilitate the most efficient and effective emergency management it is critical that the federal, state, local, and tribal organizations utilize standardized terminology, standardized organizational structures, interoperable communications, consolidated action plans, unified command structures, uniform personnel qualification standards, uniform standards for planning, training and exercising, comprehensive resource management, and designated incident facilities during emergencies and disasters; and

WHEREAS, the NIMS standardized procedures for managing personnel, communications, facilities, and resources will improve the City's ability to utilize federal funding to enhance local readiness, maintain first responder safety, and streamline the incident management processes; and

WHEREAS, the Incident Command System components of NIMS are already an integral part of various incident management activities throughout the City, including all public safety and emergency response organization programs; and

WHEREAS, the National Commission on Terrorism Attacks (9-11 Commission) recommended adoption of a standardized Incident Command System,

RESOLUTION NO. 06-R-10

NOW THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION, OF THE CITY OF NORTH PORT, FLORIDA, TO WIT:

SECTION 1

- 1.01 Hereby mandates the National Incident Management System (NIMS) to be utilized for all incident management in the City of North Port.
- 10.2 The City Manager shall coordinate, or designate coordination of, required NIMS training for all required City officials and/or employees with overall emergency management responsibilities; employees with overall emergency management responsibilities through delegation; and employees primarily involved in emergency planning.

SECTION 2 CONFLICTS

- 2.01 If there is any conflict between this Resolution and any other resolution or ordinance, or portions thereof, the provisions of this Resolution shall prevail to the extent of such conflict.

SECTION 3 SEVERABILITY

- 3.01 If any section, subsection, sentence, clause, phrase or portion of this Resolution is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining portions.

SECTION 4 EFFECTIVE DATE

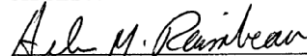
- 4.01 This Resolution shall take effect immediately upon execution by the Chair.

PASSED AND DULY ADOPTED by the City Commission of the City of North Port, Florida this 23rd day of January, 2006.

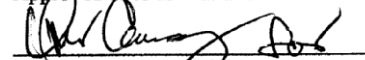
CITY OF NORTH PORT, FLORIDA


RUE S. BERRYMAN
COMMISSION CHAIR

ATTEST:


HELEN M. RAIMBEAU, CMC
CITY CLERK

Approved as to format and correctness


ROBERT K. ROBINSON
CITY ATTORNEY

APPENDIX D**CITY OF NORTH PORT RESOLUTION 01-R-44
ADOPTING THE STATEWIDE MUTUAL AID AGREEMENT****City of North Port****RESOLUTION NO. 01-R-44****A RESOLUTION OF THE CITY OF NORTH PORT,
FLORIDA, ADOPTING A STATEWIDE MUTUAL AID
AGREEMENT, PROVIDING FOR SEVERABILITY; AND
PROVIDING AN EFFECTIVE DATE.**

WHEREAS, THE State of Florida is vulnerable to a wide range of disasters that are likely to cause the disruption of essential services and the destruction of the infrastructure needed to deliver those services; and

WHEREAS, such disasters are likely to exceed the capability of any one local government to cope with the disaster with existing resources; and

WHEREAS, such disasters may also give rise to unusual technical needs that the local government may be unable to meet with existing resources, but that other local governments may be able to offer; and

WHEREAS, the Emergency Management Act, as amended, gives the local governments of the State, authority to make agreements for mutual assistance in emergencies and through such agreements ensure the timely reimbursement of costs incurred by the local governments which render such assistance.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF NORTH PORT, FLORIDA, TO WIT:

SECTION 1. Acceptance. We the governing body of the City of North Port and its Municipal Districts by means of this Resolution accept and authorize signing of the Statewide Mutual Aid Agreement, attached hereto as Exhibit A.

SECTION 2. Severability. If any section, subsection, sentence, clause, phrase or portion of this Resolution is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct and independent provision and such holding shall not affect the validity of the remaining portions.

RESOLUTION NO. 01-R-44

SECTION 3. Effective Date. This Resolution shall take effect upon its adoption by the city Commission.

PASSED AND DULY ADOPTED by the City Commission of the City of North Port, Florida, this 23rd day of July, 2001.

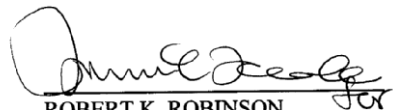
CITY OF NORTH PORT, FLORIDA


RUE S. BERRYMAN
Commission Chairperson

ATTEST:


DORIS J. BRIGGS
City Clerk

Approved as to form and correctness:


ROBERT K. ROBINSON
City Attorney

Page 2 of 2

APPENDIX E

CITY OF NORTH PORT RESOLUTION 2016-R-02 ADOPTING THE SARASOTA COUNTY UNIFIED LOCAL MITIGATION STRATEGY

Resolution No. 2016-R-02



City of North Port

RESOLUTION NO. 2016-R-02

A RESOLUTION OF THE CITY OF NORTH PORT, FLORIDA, ADOPTING THE 2016 SARASOTA COUNTY UNIFIED LOCAL MITIGATION STRATEGY, WITH THE NORTH PORT FLOODPLAIN MANAGEMENT PLAN ANNEX, AS THE FORMAL GUIDE FOR THE CITY OF NORTH PORT'S HAZARD MITIGATION AND FLOODPLAIN MANAGEMENT ACTIVITIES IN ACCORDANCE WITH PUBLIC LAW 106-390, THE FEDERAL DISASTER MITIGATION ACT 2000 (44 CFR §201.6), AND THE FLORIDA ADMINISTRATIVE CODE RULE 9-G22; PROVIDING FOR CONFLICTS; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, City of North Port is subject to hazards including, severe weather, hurricanes, tornadoes, floods and wildfires and the City faces potential damage to life, property, natural resources and the local economy; and

WHEREAS, the Sarasota County Unified Local Mitigation Strategy Work Group is comprised of staff of Sarasota County Government; the Cities of North Port, Sarasota, and Venice; the Town of Longboat Key; Sarasota County School Board; and Sarasota Memorial Hospital, and community members is open for participation to any and all interested parties; and

WHEREAS, a City of North Port Community Rating System Work Group has also been formed to review and update the Floodplain Management Plan and is comprised of key City Department and community representatives, with the City's Stormwater Manager as the work group coordinator (City planner as an alternate) and those meetings are open for participation to any and all interested parties; and

WHEREAS, the Work Groups have identified these local hazards and have assessed County- and City-wide vulnerability and risk to these hazards, ultimately identifying and prioritizing mitigation initiatives that would reduce local vulnerability; and

WHEREAS, The Sarasota County Unified Local Mitigation Strategy and the North Port Floodplain Management Plan annex represents the City of North Port's commitment to reduce vulnerability and risks from all hazards, while it serves as a policy guide as resources are committed toward reducing the effects of all hazards, and is required of all communities

Resolution No. 2016-R-02

participating in the Community Rating System program through which provides flood insurance discounts through the National Flood Insurance Program; and

WHEREAS, initiatives identified, based upon established and accepted criteria, on the Unified Local Mitigation Strategy Project Lists are given greater consideration by State-managed funding programs, including but not limited to the Hazard Mitigation Grant program, the Flood Mitigation Assistance Program, the Pre-Disaster Mitigation Competitive Grant Program, Communities Trust, Community Development Block Grant, Coastal Partnerships Initiative; and

NOW THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF NORTH PORT, FLORIDA, THAT:

SECTION 1

- 1.01 The foregoing "WHEREAS" clauses above are hereby ratified as true and correct, and incorporated herein by reference.
- 1.02 The Sarasota County Unified Local Mitigation Strategy, with the North Port Floodplain Management Plan Annex, is adopted as the formal guide for the City of North Port's hazard mitigation and floodplain management activities.
- 1.03 The City Manager or his designee is authorized to apply for funding to support these activities.

SECTION 2 CONFLICTS

- 2.01 If there is any conflict between this Resolution and any other Resolution or Ordinance, or portions thereof, the provisions of this Resolution shall prevail to the extent of such conflict.

SECTION 3 SEVERABILITY

- 3.01 If any section, subsection, sentence, clause, phrase or portion of this Resolution is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining portions.

Resolution No. 2016-R-02

SECTION 4 EFFECTIVE DATE

4.01 This Resolution shall take effect immediately upon execution by the Chair.

PASSED AND DULY ADOPTED by the City Commission of the City of North Port, Florida this
9th day of February, 2016

CITY OF NORTH PORT

By: Jacqueline Moore
Jacqueline Moore
Mayor

ATTEST:

By: Helen M. Raimbeau
Helen Raimbeau, MMC
City Clerk

Approved as to form and legal sufficiency:

By: Mark Moriarty
Mark Moriarty
City Attorney

APPENDIX F**CITY OF NORTH PORT RESOLUTION 2019-R-10 ADOPTING THE COMPREHENSIVE EMERGENCY MANAGEMENT PLAN AS THE FORMAL GUIDE FOR THE CITY OF NORTH PORT'S EMERGENCY MANAGEMENT ACTIVITIES****City of North Port****RESOLUTION NO. 2019-R-10**

A RESOLUTION OF THE CITY OF NORTH PORT, FLORIDA, ADOPTING THE 2018 REVISIONS TO THE CITY OF NORTH PORT, FLORIDA COMPREHENSIVE EMERGENCY MANAGEMENT PLAN AS THE FORMAL GUIDE OF THE CITY OF NORTH PORT'S EMERGENCY MANAGEMENT ACTIVITIES; INCORPORATING RECITALS; PROVIDING FOR CONFLICTS; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, the 2019 revisions to the City of North Port's Comprehensive Emergency Management Plan (the "Plan"), attached hereto as Exhibit "A" and incorporated herein by reference, provide a detailed description of the hazards, consequences, emergencies, or disasters that may be generated by natural, technological, or manmade causes within the City, as well as the processes to follow in the event of such hazards, consequences, emergencies, or disasters occurring within the City; and

WHEREAS, because the City of North Port has implemented an emergency management program, Rule 27P-6.010, Florida Administrative Code, requires that a Comprehensive Emergency Management Plan be developed, submitted to, and adopted by the City Commission; and

WHEREAS, the Sarasota County Department of Emergency Management has reviewed and determined that the City's 2019 Plan revisions comply with the established criteria as required by Rule 27P-6.010, Florida Administrative Code; and

WHEREAS, as it has been determined that the City's 2019 Plan revisions are in compliance with the terms of Chapter 27P-6, Florida Administrative Code, Rule 27P-6.010(8), Florida Administrative Code, requires that the Plan be adopted by resolution before it becomes effective; and

WHEREAS, the City's 2019 Plan revisions apply to City agencies and resources, assign lead and support responsibilities for City agencies and personnel that coordinate with the emergency support functions outlined in the County and State plans, and interface with plans of contiguous jurisdictions, regional municipalities, and State plans; and

WHEREAS, the City Commission of the City of North Port, Florida, finds that it serves the public health, safety, and welfare of the citizens of the City to adopt the 2019 revisions to the City of North Port's Comprehensive Emergency Management Plan as presented.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF NORTH PORT, FLORIDA, AS FOLLOWS:

SECTION 1 – INCORPORATION OF RECITALS

- 1.01 The recitals outlined above are incorporated by reference as findings of fact as if expressly set forth herein.

SECTION 2 – RESOLUTION

- 2.01 The City Commission adopts the 2019 revision to the City of North Port Comprehensive Emergency Management Plan as the formal guide for the City of North Port's emergency management activities.

SECTION 3 – CONFLICTS

- 3.01 In the event of any conflict between the provisions of this Resolution and any other resolution or portions thereof, the provisions of this Resolution shall prevail to the extent of such conflict.

SECTION 4 – SEVERABILITY

- 4.01 If any section, sentence, clause or phrase of this Resolution is for any reason held to be invalid or unconstitutional by any court of competent jurisdiction, such provision shall be deemed a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining portions hereof.

SECTION 5 – EFFECTIVE DATE

- 5.01 This Resolution shall take effect immediately upon adoption by the City Commission of the City of North Port, Florida.

PASSED and DULY ADOPTED by the City Commission of the City of North Port this ____ day of _____ 201__.

CITY OF NORTH PORT, FLORIDA

CHRISTOPHER HANKS
MAYOR

ATTEST:

KATHRYN WONG
CITY CLERK

APPROVED AS TO FORM AND CORRECTNESS:

AMBER L. SLAYTON
CITY ATTORNEY

APPENDIX G

CRISIS COMMUNICATION AND PUBLIC INFORMATION



City of North Port, Florida

Crisis Communications and Public Information Plan

TABLE OF CONTENTS

- i. Record of Changes
- I. Introduction
 - A. Purpose
 - B. Scope
 - C. Consistent with the National Incident Management System
- II. Objectives of the Plan
- III. Organization and Responsibilities
 - A. Organization
 - B. Crisis Communications Team Representatives
 - C. Convening the Crisis Communications Team
 - D. Location
- IV. Response
 - A. Implementation
 - B. Immediate Response
 - C. Secondary Response
 - D. Approvals of outgoing information
 - E. The End of the Crisis
 - F. After-Action Review
- V. Training and Plan Maintenance
 - A. Spokesperson Training
 - B. Updating
 - C. Exercising

Appendices

- A. Emergency Notifications Scripts
- B. Joint Information Center Toolkit

I. INTRODUCTION

A. Purpose

The City of North Port's Crisis Communications Plan outlines the roles, responsibilities and protocols that will guide the City in promptly sharing information with all of City's audiences during an emergency or crisis. This plan is a part of City of North Port's Comprehensive Emergency Management Plan, adopted by the City Commission of the City of North Port and administered by the Emergency Manager.

For the purposes of this plan, a crisis is defined as a significant event that prompts significant, often sustained, news coverage and public scrutiny and has the potential to impact the City. A crisis could be precipitated by an emergency or a controversy. An emergency is a fire, hurricane, crime or other event that presents a threat and typically involves a response from police, fire or emergency medical personnel. A controversy better describes events such as a protest.

B. Scope

The audiences for this plan include City staff, residents, commerce, visitors, the media, national and international publics, and state and federal officials.

C. Consistent with the National Incident Management System

The City of North Port has adopted the National Incident Management System (NIMS), to include the Incident Command System (ICS) as the standard by which "no-notice events/incidents and pre-planned events will be organized and managed. Based on ICS guidance, and City protocols, ICS may be implemented at any level of emergency, for any situation, and by any qualified individual. The use of ICS includes all the standardized forms approved by the National Wildfire Coordinating Group, or the NIMS Integration Center of the US Department of Homeland Security.

II. OBJECTIVES OF THE PLAN

Our guiding principle will be to communicate facts as quickly as possible, updating information regularly as circumstances change, to ensure the safety of the City and the continued operation of essential services. Our efforts to be simultaneously accurate and quick may mean that some communications are incomplete. We accept this, knowing that how we communicate in an emergency or a crisis will affect public perceptions of the City. Honesty and speed are the most effective means to avoid lasting impact to the institution and widespread second-guessing by the public, which expects immediate access to accurate information. A good offense is the best defense.

At the same time, we realize that in a crisis, people will likely expect us to have more information than we may have. That makes it imperative to speak with accuracy about what we know and not to speculate about details we do not know.

We will use multiple mediums to reach as many of our population as possible with accurate, timely information. This is especially important in the first hours and days of an emergency or a crisis. Our goal is to be open, accountable and accessible to all audiences, while also being mindful of legal and privacy concerns.

The objectives of this Plan are to establish and assign the public information functions for emergency or disaster activations. The public information plan is designed to inform and educate the public about hazards, threats to public safety, and risk reduction through various media. The public information plan provides for timely and effective dissemination of information to protect public health and safety, including response to public inquiries and rumors. Protocols are in place to interface with public officials and VIPs. Procedures include a process for obtaining and disseminating public information materials in alternative formats.

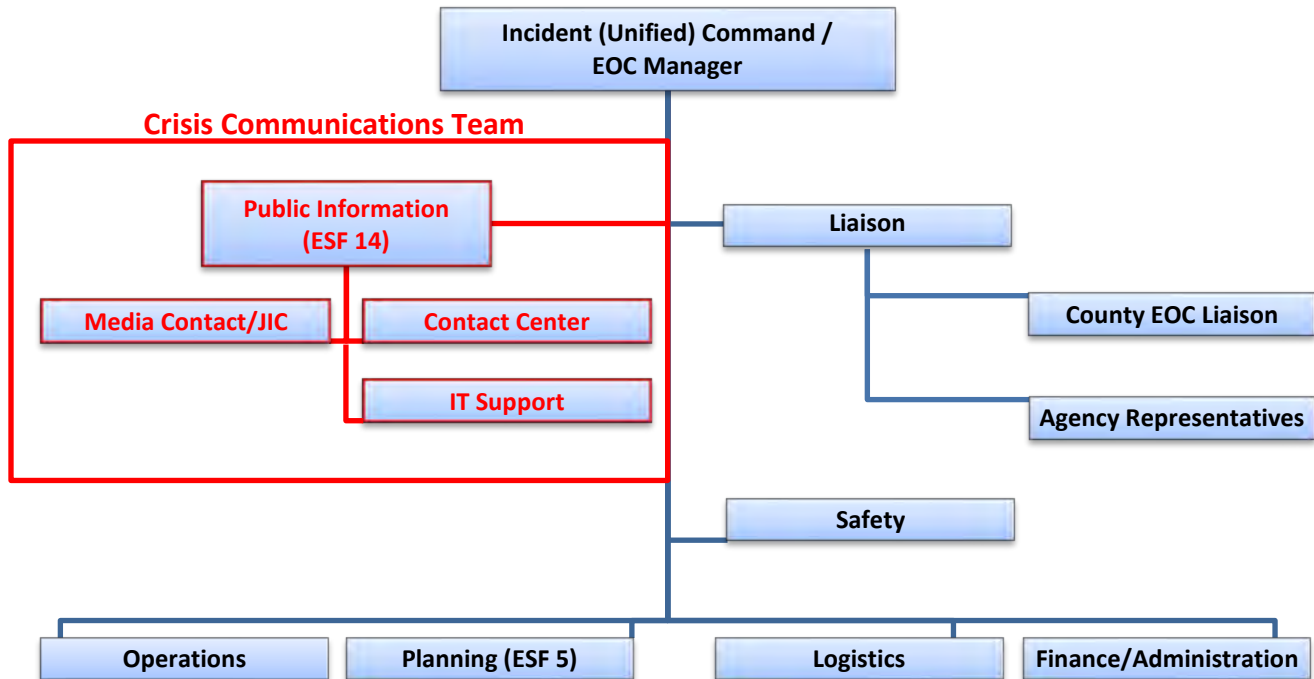
The emergency public information capability includes:

- a central contact facility for the media (i.e., Joint Information Center);
- pre-scripted information bulletins;
- method to coordinate and clear information for release;
- capability of communicating with special needs and diverse populations;
- protective measures guidelines; and
- designated and trained spokesperson(s) who have been qualified to deliver the City's message, appropriate to hazard and audience.

III. ORGANIZATION AND RESPONSIBILITIES

A. Organization

1. The Public Information Officer (PIO) position is established within the Incident Command System Organization as part of the Incident Commander's Command Staff. The City Manager shall appoint the PIO(s) for an event, crisis, or disaster.
2. The PIO is responsible to:
 - a. Provide a two-person successor list to Emergency Management Director.
 - b. Assemble and manage the Crisis Communications Team and function within the Emergency Operations Center.
 - c. Establish and operate a Joint Information Center (JIC) and Contact Center near the EOC, collecting information in the EOC, and from field unit PIOs. The JIC will be composed of PIO elements from each responding department/agency to include but not limited to City, State and Federal agencies.
 - d. Organize, schedule and manage media briefings regarding actual emergency preparedness, response, and recovery operations.
 - e. Prepare and disseminate emergency public information materials incidental to an emergency operation.
 - f. During and following an emergency, serve as the single official point of contact between City government and all media representatives.
 - g. Coordinate public information releases and rumor items with spokespersons for emergency response organizations and representatives of County, State and Federal governmental agencies as may be on scene in any official capacity.
 - h. Assist the essential services in developing and disseminating post-disaster health and safety instructions for the reoccupation of evacuated areas and storm damaged homes.



B. Crisis Communications Team Staffing

1. Public Information Officer, City Manager's Office
2. Community Outreach Manager, City Manager's Office
3. Customer Service Coordinators from Public Works and Utilities Departments
4. Information Technology support
5. Others as needed
 - Communicators for Contact Center
 - Field PIOs
 - Writers
 - JIC Facility Manager
 - Media Handlers

The City Manager or his/her designee will add or authorize the addition of other team members as appropriate under the circumstances and availability of staff.

C. Convening the Crisis Communications Team

The Crisis Communications Team will convene when the City Manager declares a Level 1 Emergency (the most severe category that presents significant risk to the

community) or has requested to assess communication needs for Level 2 or Level 3 emergencies. The City Public Information Officer or his/her designee will contact each member by phone and/or email to convene immediately.

Given the urgency of rapid communications, the City's Public Information Officer (PIO) or his/her designee has the authority to begin acting immediately, in consultation with the City Manager or his/her designee, until a broader decision can be made about how the City should proceed.

Also, the Public Information Officer may identify a potential crisis or controversy that is not an immediate emergency and assemble the Crisis Communications Team to prepare a communications strategy – again, as part of a coordinated City response.

Depending on the nature of the emergency or crisis, it may not be possible for the Emergency Leadership Team or their designees to convene prior to the timely notification. Once the Emergency Leadership Team meets and can determine whether the City is facing an emergency, execution of this plan can be adjusted accordingly.

D. Location

The Crisis Communications Team headquarters for most crises will be City Hall Room 243. The City PIO will maintain stocks of press packets, press identification badges, parking passes, and copies of this plan.

Since this room has limited conference capabilities, it may be replaced with another facility in the event of an extended crisis or emergency. The primary back-up location is the George Mullen's Activity Center (GMAC) or Morgan Family Community Center (MFCC). The team may move its headquarters to GMAC or MFCC in several circumstances, including technical limitations at City Hall or a need to be near the news media if they are set up at the disaster scene.

IV. RESPONSE

A. Implementation

The Crisis Communications Team will implement some, or all, of the steps outlined below based on circumstances, coordinating with the Emergency Leadership Team. Throughout a crisis, the team will meet frequently to review changing facts, assess whether key messages are reaching audiences and determine whether strategies need to change. The success of this plan rests on open and frequent communications among the City's Emergency Leadership Team and the Crisis Communications Team.

Contact information for leadership and communication officials is included in documents located on the City government's network P: drive.

- Team Contact List
- Senior Administrators
- Crisis Communications Team

Also, the document Checklist for Crisis Communications includes phone and mobile phone numbers and e-mail addresses for key communications personnel tasked with providing initial response.

In an emergency, our goal is to issue our first communication to key City audiences within 30 minutes of notification of the event, with regular updates as needed. Some situations may require even faster initial communications.

B. Immediate Response

The team will carry out these initial tasks immediately:

1. Convene the Crisis Communications Team for any Level 1 emergency.
2. Send management memo as appropriate.
3. Send media alert as appropriate.
4. Convene other communicators for emergency call center or other needs.

C. Secondary Response

Once the Crisis Communication Team convenes, the following tasks will be carried out by this team:

1. **Designate a secretary** who can maintain meeting notes, to-do lists, information files on the ongoing crisis and other items.
2. **Review and write down known facts** – those that can and cannot be released to the public — and determine whether a response is needed, and if that response is needed for all the City's key audiences. These facts will be used to fill in pre-scripted templates (see appendix) for news releases, text messages and other items that have already been developed. It is critical as the situation changes for new fact sheets to be developed.
3. **Develop several key messages** that will be included in all City communications.

One message typically will address what the City of North Port is doing to ensure the safety of community members. Identify protective measures

guidelines to be taken to provide the public with essential information on evacuation, sheltering, sheltering special needs populations and pet sheltering. [Examples: public messages that include instructions for tornadoes (i.e., sheltering in center of home), mosquito-borne illnesses (i.e., using repellent, wearing clothing that covers arms and legs), etc.] Another may need to be forward-looking and address what we are doing to make sure the crisis, or a problem with our response, doesn't happen again. Determine methods for obtaining and disseminating public information materials in alternative formats (e.g., flyers/ brochures/ handouts; internet; phone/CodeRED; or print, radio or television broadcast).

All the messages should evolve as circumstances change but will always aim to restore and maintain confidence and calm, balancing a sense of concern with resolve and action. Sample messages are included in the approved pre-scripted templates (see appendix). It is critical that City Emergency Leadership Team have copies of the most recent news releases and other messages so everyone is clear on what is being shared with the public.

4. **Determine who will act as spokespeople** – the City Manager will be the public face of the City, while the PIO will run briefings and handle media questions between such formal press gatherings. One or more members of the Crisis Communications Team may communicate key messages specific to their department.
5. **Update CityofNorthPort.com website** is paramount. Consideration should be made for written translations for the foreign-speaking residents of the City. The Team should keep in mind that the parties interested in the information will not always be solely residents and should be aware that seasonal residents and out-of-state family members may also need to be apprised of on-going emergency events.
6. **Open the Contact Center** to handle phone calls using a script developed from the key messages, facts and frequently asked questions (FAQs) the Crisis Communications Team has developed or have been obtained from the Sarasota County Contact Center.
 - a. Staff would initially come from customer service personnel from Utilities, Neighborhood Development Services and Public Works Departments. Supplemental staff may come from other departments.
 - b. Assign staff or volunteer to greet visitors at City Hall reception desk.

- c. Calls to City Hall's main number, 941-429-7000, would be forwarded to the Contact Center.
- 7. **Develop communications for the City Manager**, as appropriate. The City Manager will be tasked with keeping the City Commissioners informed and up-to-date with the latest key messages. The PIO will be responsible for generating and reviewing communications, including correspondence, e-mail messages, talking points, speeches or op-eds, in consultation with the appropriate members of the Crisis Communications Team. The PIO will then provide the City Manager the communications for distribution.
 - 8. **Coordinate with Sarasota County Communications (ESF-14) and the Charlotte County Public Information Office**, to ensure a consistent message between jurisdictions and to obtain a copy of their frequently-asked questions (FAQs) from their Contact Centers. Attend meetings, via conference call or in-person, as necessary and available.
 - 9. **Establish a Joint Information Center (JIC)** for the centralization of media personnel. The JIC will be composed of Public Information Officer (PIO) elements from each responding department/agency to include but not limited to City, State and Federal. This center will release public preparedness, response, recovery, and mitigation information, as well as certain information on the disaster or emergency at hand such as shelter information, danger zones, and open or closed businesses. The JIC will establish a schedule for press briefings and release other information as needed.
 - a. It is the City's normal practice to permit news reporters and photographers to have open access to the City facilities for conducting interviews after they check in with the Public Information Officer. However, during crisis situations the PIO or his/her designee will determine if access needs to be restricted to avoid disruption to essential services and programs.
 - b. If that determination has been made, then news reporters and photographers will first be directed to a staging area at City Hall. During a severe crisis or in severe weather, the media area may be moved to the Mullen's or Morgan Centers. The PIO may also use other rooms for press events, as needed. The PIO will be responsible for opening this facility, bringing needed supplies (including identification badges, parking passes, media guidelines and press packets) and determining a schedule for 24-hour staffing. (See appendices for JIC Toolkit)

- c. Where practical, pool cameras can be set up for television journalists to share.
 - d. The PIO will coordinate press conferences and related media advisories, as needed. If the emergency requires the opening of a JIC, the PIO will coordinate equipping this center with such items as tables, chairs, podium, sound system, etc. Some emergencies may require that the JIC remain open 24 hours a day for an indefinite period. Should that occur, the City Manager has the authority to use communicators from around City government for staffing. In such a situation, no single person can or should be expected to work around the clock. Rather, the City Manager or his/her designee must tap and empower other communicators to assist with managing the facility and answering media requests.
 - e. The PIO shall arrange for a hearing-impaired interpreter to translate briefings to the deaf and hard-of-hearing community. Consideration should be made for a live or written translation for the Ukrainian and Russian residents of the City.
 - f. A security officer should be assigned to the JIC to prevent access to other parts of the building.
10. **Assign a staff member to monitor media, social media, and online coverage** to anticipate any problems in the way information is flowing to the news media and on the Internet. Summaries of relevant coverage will be provided to the City's Emergency Leadership and Crisis Communications Teams on at least a daily basis, or more frequently as needed.
11. **Schedule media briefings**, a minimum of one media briefing per day, to be held at a time when the information can have the best possible media/public exposure. The PIO shall brief staff members or officials that are requested to speak at the media briefings.
12. **Coordinate all VIP visits** and tours and chaperon them. The PIO will arrange briefings or meetings for visiting dignitaries, and provide the media with information regarding all visits and tours by dignitaries. If visiting dignitaries or public officials visit the EOC, the media shall be allowed access to them upon approval by the Incident Commander and the EOC Manager.
13. **Media Access to the EOC** shall be restricted unless approval is received from the Incident Commander and the EOC Manager. If permission is granted, media shall be escorted always by a member of the PIO team.

14. **Evaluate how to help our community recover**, return to normal and, if needed, regain faith in City government after the trigger event of the crisis is over, in coordination with the City Emergency Team. This may include the need for town hall meetings, letters from the Mayor expressing sympathy, detailed plans to prevent another such crisis, etc. The Community Outreach Manager shall manage this activity.

D. Approvals of outgoing information

Typically, the City uses a collegial approach of multiple approvals before communications pieces, including emails and news releases, are distributed. That system will not work in a crisis. Seconds matter in a crisis, and we will be judged by how quickly we share information with key audiences.

As a matter of policy, the City is committed to trying to meet these expectations. It recognizes the need for unusually crisp decision-making during a crisis to enable rapid, accurate communication in coordination with the institution's broader process. Pre-scripted templates have been approved in advance by City leadership and legal counsel to expedite the approval process during a crisis (see appendices). **Final approval for all communications rests with the Incident Commander or his/her designee.**

E. The End of the Crisis

The City Manager will determine when an emergency has ended and routine communications processes can resume. The decision to declare the emergency over will trigger a review of how the crisis was handled and how communications can improve.

F. After-Action Review

Within 10 days of the end of the event, assess how this plan functioned, address any needed updates and recognize the work of partners whose help was invaluable (i.e., assistance from communicators from other departments/agencies).

Coordinate the review of communications and information with the Emergency Manager who would be preparing the event's After-Action Report and Improvement Plan.

V. TRAINING AND PLAN MAINTENANCE

A. Spokesperson Training

The PIO and Emergency Manager will work together in identifying training opportunities for those selected as City or department spokespersons. At a minimum, spokespersons shall complete the following training programs:

- FEMA, IS-700: Introduction to the National Incident Management System (NIMS)
- FEMA, IS-702: NIMS Public Information
- FEMA, ICS-100: Introduction to the Incident Command System
- FEMA, ICS-200: Basic Incident Command System
- FEMA, ICS-300: Intermediate Incident Command System
- FEMA, G-290: Basic Public Information Course

Resource and time-permitting, spokespersons should complete the following programs:

- Texas A&M Engineering Extension Service, MGT-318: Public Information in an All-Hazards Incident
- National Disaster Preparedness Training Center, PER-300: Social Media for Natural Disaster Response and Recovery

Training records shall be maintained by the Human Resources Division.

As part of this process, the PIO will schedule media training sessions for senior administrators and key team members. After the initial session to train all key officials, sessions will be scheduled annually for people who are new to the Emergency Leadership Team, the Emergency Management Team or the Crisis Communications Team. Every two years, all members will attend a refresher course in media training.

Media training also will be necessary for certain officials who are neither part of the Emergency Leadership Team nor the Crisis Communications Team. The PIO will develop a list of such officials and offer media training on an annual basis.

B. Updating

Annually, this plan will be reviewed and updated as necessary.

The PIO will update phone lists for members of the Emergency Leadership Team and Crisis Communications Team. The PIO will oversee updates and improvements to email lists for internal audiences and updates of media lists and fact sheets.

C. Exercising

The City will conduct an annual drill of emergency management with participation by members of the Emergency Leadership Team. The crisis communications plan will be tested at these times with participation by members of the Crisis Communications Team.

The City, resources permitting, will also conduct at least one test annually of the CodeRED communication tools, which include email, text messaging, website, and phone line.

Appendix G1

Emergency Notifications Scripts

General Guidelines:

- Text messages may not be longer than (140) characters. They may also be used as social media posts.
- E-mail and voice mail messages should generally be the same message.
- There are two categories of notices for text messaging: Emergency and Urgent Situation.
 - **Emergency** – An incident or condition, expected or unexpected, that threatens life or safety and requires immediate action.
 - **Urgent Situation** – An incident or condition that does not pose an immediate threat to life or safety, but that is of a nature where timely receipt of information or instructions may directly affect the well-being of the recipient.
- Keep in mind the principles of public information officers: Be First, Be Right, and Be Credible. In other words, make sure the messages are timely, accurate, and useful.
- Each message should consist of the following three components:
 - Alerting (Attention management) – calling the user’s attention to the issue at hand
 - Informing (Information transfer) – what is happening, and what the user should and should not do
 - Reassuring (Affective or emotional payload) – be aware of the degree of sensitivity as to the audience.

Pre-scripted Messages

TEST

This is a test of City of North Port emergency alert system. If you have received this in error, send email to (individual).

This is a test of City of North Port Emergency Notification Service. This is only a test. In the event of an actual emergency, you would be given brief details and directed to visit the Web at (Emergency Website) for more information and instructions. If you have received this message in error or have difficulty with the transmission of this call, please send email to (individual). Thank you for participating in the City of North Port Alert Emergency Notification System.

ACTIVE SHOOTER /ARMED INTRUDER/SHELTER IN PLACE

Text Message/Social Media Post

EMERGENCY: A suspect with a weapon is (at location). Go to the nearest room and lock door. Follow authorities' instructions.

E-mail Message

City of North Port EMERGENCY! There is a suspect with a [type] weapon (at location). [Shots have been fired.] If you are on site, go into the nearest available room and lock the door. If you are not on (at location), stay away. THIS IS NOT A TEST! Wait for the all clear notification from City of North Port officials.

Voicemail Message

This is [name and title] with an EMERGENCY alert from City of North Port. There is a suspect with a [type] weapon (at location). [Shots have been fired.] If you are on site, go into the nearest available room and lock the door. If you are not (at location), stay away. THIS IS NOT A TEST! Wait for the all clear notification from City of North Port officials.

BIOLOGICAL THREAT

Text Message/Social Media Post

EMERGENCY: City received a biological threat. Prepare to evacuate. Follow authorities' instructions.

E-mail Message

City of North Port EMERGENCY! A biological threat has been received (at location). If you are near the area, prepare immediately for possible evacuation. Listen for instructions from City of North Port officials and follow them quickly and carefully. For additional information and updates go to (Emergency Website)

Voicemail Message

This is [name and title] with an EMERGENCY alert from City of North Port. We have received a biological threat that we deem credible. If you are near (at location), prepare immediately for possible evacuation. Listen for instructions from City of North Port officials and follow them quickly and carefully.

BOMB THREAT

Text Message/Social Media Post

ALERT: City received a bomb threat (at location). Evacuate. Follow authorities' instructions.

E-mail Message

City of North Port EMERGENCY! A bomb threat has been received (at location). If you are near (at location), prepare immediately for possible evacuation. Listen for instructions from City of North Port officials and follow them quickly and carefully. For additional information and updates go to (Emergency Website)

Voicemail Message

This is [name and title] with an EMERGENCY alert from City of North Port. We have received a bomb threat that we deem credible. If you are near (at location), prepare immediately for possible evacuation. Listen for instructions from City of North Port officials and follow them quickly and carefully. For additional information and updates go to (Emergency Website)

BOMB FOUND

Text Message/Social Media Post

EMERGENCY: A bomb has been found (location). Prepare to evacuate. Follow authorities' instructions.

E-mail Message

City of North Port EMERGENCY! A bomb has been found on the (location) in the [building]. Avoid the area, prepare immediately for possible evacuation. Listen for instructions from City of North Port officials and follow them quickly and carefully. Repeat, a bomb has been found (at location). For additional information and updates go to (Emergency Website)

Voicemail Message

This is [name and title] with an EMERGENCY alert from City of North Port. A bomb has been found (at location). Avoid the location, prepare immediately for possible evacuation. Listen for instructions from City of North Port officials and follow them quickly and carefully. Repeat, a bomb has been found in the (location). For additional information and updates go to (Emergency Website)

CIVIL DISTURBANCE*Text Message/Social Media Post*

EMERGENCY: A violent disturbance is occurring (location). Leave the area. Follow authorities' instructions. (135)

E-mail Message

City of North Port EMERGENCY! A violent disturbance has broken out (location). There is a risk of danger to participants and bystanders. For your own safety, leave the area. If you are not in the area, stay away. Follow instructions from City of North Port officials. For additional information and updates go to (Emergency Website)

Voicemail Message

This is [name and title] with an EMERGENCY alert from City of North Port. A violent disturbance has broken out (at location). There is a risk of danger to participants and bystanders. For your own safety, leave the area. If you are not in the area, stay away. Follow instructions from City of North Port officials. For additional information and updates go to (Emergency Website)

CHILD ABDUCTION*Text Message/Social Media Post*

IMPORTANT: A child has been abducted from (at location). For information on the suspect or child go to (Emergency Website)

E-Mail

A child has been abducted from (at location). Call 9-1-1 if the following suspect or child is seen: [type description of suspect and child]

Voice Mail

A child has been abducted from (at location). Call 9-1-1 if the following suspect or child is seen: [Give description of suspect and child]

EARTHQUAKE*Text Message/Social Media Post*

ALERT: An earthquake has occurred. Evacuate all buildings (at location) and remain outside until further notice.

E-mail message

Emergency! An earthquake has just occurred. For your safety, evacuate all buildings (at location). Remain outside for further information. We will provide updates as we receive more information. For additional information and updates listen to NOAA weather radio.

Voicemail message

This is [name, title] with an emergency alert from City of North Port. An earthquake has just occurred. For your safety, evacuate all buildings (at location). Remain outside for further information. We will provide updates as we receive more information. For additional information and updates listen to NOAA weather radio.

EVACUATION

This is the City of North Port. Officers are responding to a report of **(problem)** at **(location)**. Calmly evacuate the building using all available exits. Move away from the building. **(Repeat message three times)**

Problem Resolved: This is the City of North Port. The incident at **(location)** has been resolved and it is safe to return to normal activity. **(Repeat message three times)**

Building Evacuation to a specific direction

This is the City of North Port. Officers are responding to a report of **(problem)** at **(location)**. Calmly evacuate the building. Avoid **(location)**. Go to **(direction/landmark)**. **(Repeat message three times)**

Problem Resolved: This is the City of North Port. The incident at **(location)** has been resolved and it is safe to return to normal activity. **(Repeat message three times)**

EXPLOSION

Text Message/Social Media Post

EMERGENCY: There has been an explosion (at location). Prepare to evacuate. Follow authorities' instructions. (120)

E-mail Message

EMERGENCY! There has been an explosion (at location). If you are in the immediate vicinity, you should evacuate as instructed to by City of North Port officials. If you are not in the area, avoid the area so that emergency units can work unimpeded. Follow instructions from City of North Port officials.

Voicemail Message

This is [name and title] with an EMERGENCY alert from City of North Port. There has been an explosion (at location). If you are in the building or in the vicinity, you should evacuate as instructed to by City of North Port officials. If you are not in the area, you should keep at a safe distance so that emergency units can work unimpeded. Follow instructions from City of North Port officials.

FIRE

Text Message/Social Media Post

ALERT! There is a fire (at location). Evacuate. If you are not in the area, stay clear of the area.

E-mail Message

City of North Port EMERGENCY! A fire has been reported (at location), if you are in the [building], evacuate immediately. If you are not in the area, stay clear so that emergency units and firefighters can work unimpeded. Follow instructions from City of North Port officials.

Voicemail Message

This is [name and title] with an EMERGENCY alert from City of North Port. A fire has been reported (at location). If you are in the (at location), evacuate immediately. If you are not in the area, stay clear of the (at location) so that emergency units and firefighters can work unimpeded. Follow instructions from City of North Port officials.

FLOODING*Text Message/Social Media Post*

EMERGENCY: (At location) is currently flooding. Avoid the area. Monitor NOAA weather radio.

E-mail message

(Affected location) is currently flooding. If you are in the area, seek higher ground immediately. For additional information and updates listen to NOAA weather radio.

Voicemail message

This is [name, title] with an emergency alert from City of North Port. (Affected location) is currently flooding. If you are in the area, seek higher ground immediately. For additional information and updates listen to NOAA weather radio.

GAS LEAK*Text Message/Social Media Post*

ALERT: There is a gas leak and threat of fire (at location). Extinguish all flammable items. Follow authorities' instructions. (129)

E-mail Message

City of North Port EMERGENCY! There is a gas leak (at location) posing a threat of fire from accidental ignition. If you are in the vicinity, immediately extinguish any burners or other flames and prepared to evacuate. If you are not in the area, stay away. Follow instructions from City of North Port.

Voicemail Message

This is [name and title] with an EMERGENCY alert from City of North Port. There is a gas leak in (at location). It poses a threat of fire from accidental ignition. If you are in the vicinity, immediately extinguish any burners or other flames and prepared to evacuate. If you are not in the area, stay away. Follow instructions from City of North Port officials.

HAZARDOUS MATERIALS

Text Message/Social Media Post

ALERT! There has been a hazardous release (at location). Prepare to evacuate. Follow authorities' instructions. (127)

E-mail Message

City of North Port EMERGENCY! There has been a release of a hazardous material (at location). If you are near the are leave now, all others stay away from this location so that emergency units and hazmat teams can work unimpeded. Follow instructions from City of North Port officials.

Voicemail Message

This is [name and title] with an EMERGENCY alert from City of North Port. There has been a release of a hazardous material (at location). If you are in the area leave now, all others stay away from this location so that emergency units and hazmat teams can work unimpeded. Follow instructions from City of North Port officials.

More Details

At approximately (time) today, a potentially hazardous material was released on the City of North Port in Building "?". As a result, building "?" is being evacuated while City of North Port officials are conducting a thorough investigation.

Occupants of Building "?" should take shelter in (location here) until further notice. All other members of the community should avoid the area. Building "?" will be re-opened once it is determined that the building is safe for occupancy. An update will be posted on this site at (time).

HOSTAGE INCIDENT

Text message/Social Media Post

ALERT– A hostage incident is unfolding in (at location). Evacuate immediately and avoid this area.

ISOLATED SHOOTING / STABBING EVENT, SUSPECT NOT IN CUSTODY

Text message/Social Media Post

City of North Port Alert: A [shooting/stabbing] has occurred (at location). A suspect is NOT in custody, Shelter in place. See email for more information. (138)

Email message

City of North Port Alert: A [shooting/stabbing] incident occurred [approximate time] at (at location). Police are on the scene and investigating. A suspect is NOT in custody. If you are (at location), go into the nearest room and lock door, if you are not (at location) stay away. Contact

9-1-1 if you see anything suspicious or have information on the case. Wait for the all clear form City of North Port officials.

Voicemail message

This is [name, title] with an emergency alert from City of North Port. A [shooting/stabbing] incident occurred [approximate time] (at location). Police are on the scene and investigating. A suspect is NOT in custody. If you are (at location), go into the nearest room and lock door, if you are not (at location) stay away. Contact 9-1-1 if you see anything suspicious or have information on the case. Wait for the all clear form City of North Port officials. For additional information and updates go to (Emergency Website)

ISOLATED SHOOTING / STABBING EVENT, SUSPECT IN CUSTODY

Text message/Social Media Post

ALERT: A [shooting/stabbing] has occurred at [building]. A suspect is in custody. Police are on scene.

Email message

City of North Port Alert: A [shooting/stabbing] incident occurred [approximate time] at [building location]. Police are on the scene investigating. This appears to be an isolated incident and a suspect is in custody. Even so, please be cautious and contact the Police at 9-1-1 if you see anything suspicious or have information regarding the crime.

Voicemail

This is [name, title] with an emergency alert from City of North Port. A [shooting/stabbing] incident occurred [approximate time] at [building location]. Police are on the scene investigating. This appears to be an isolated incident and a suspect is in custody. Even so, please be cautious and contact 9-1-1 if you see anything suspicious or have information regarding the crime.

LIGHTNING

Text Message/Social Media Post

EMERGENCY: Electrical storm! Lightning is striking on or near (location). Stay inside and away from metal objects.

E-mail Message

City of North Port EMERGENCY! Electrical storm lightning is striking on or near (location). Stay inside and away from metal objects until the storm has stopped. Monitor a NOAA weather radio.

Voicemail Message

This is [name and title] with an EMERGENCY alert from City of North Port. A major electrical storm with powerful and frequent lightning strikes is hitting City of North Port. Seek cover, stay away from metal objects, and remain inside until the storm has stopped. listen to NOAA weather radio.

MICRO BURST

Text Message/Social Media Post

EMERGENCY: Micro Burst! Micro Bursts are striking (at location). Stay inside and away from doors and windows.

E-mail Message

City of North Port EMERGENCY! Micro Bursts are striking (at location). Stay inside and away from doors and windows until the storm has stopped. For additional information and updates listen to NOAA weather radio.

Voicemail Message

This is [name and title] with an EMERGENCY alert from City of North Port. A major storm with powerful and frequent Microbursts is hitting City of North Port. Seek cover, stay away from doors and windows, and remain inside until the storm has stopped. For additional information and updates listen to NOAA weather radio.

MISSING PERSON

ALERT: (Individual) has been reported missing. Contact 9-1-1 with any information.

SEVERE WEATHER

ALERT: A Severe Weather report indicates potential impact to (at location). Monitor NOAA weather radio.

SEVERE ACCIDENT

City of North Port ALERT severe accident has occurred (at location). Check (City of North Port website) and email.

SHELTER IN PLACE

This is the City of North Port. Officers are responding to a report of **(problem)** at **(location)**. Get to a safe place and take precautions until given the all clear. **(Repeat message three times)**

Problem Resolved: This is the City of North Port. The incident at **(location)** has been resolved and it is safe to return to normal activity. **(Repeat message three times)**

STRUCTURAL FAILURE

City of North Port ALERT. A structural failure occurred in _____. Evacuate immediately and avoid this area. Check (Emergency Website) for further details.

SUSPICIOUS PACKAGE

City of North Port ALERT. A suspicious package found (at location). Evacuate immediately and avoid this area.

SUSPICIOUS PERSON

City of North Port ALERT. Police are checking a suspicious person around (at location). Find a secure location, lock doors, and stay away from windows.

TORNADO*Text Message/Social Media Post*

ALERT: A tornado warning has been issued for City of North Port. Listen to NOAA weather radio for more details.

E-Mail Message

City of North Port Alert: A tornado warning has been issued for the City of North Port. A tornado warning means that a tornado has been sighted on the ground and you should take immediate action to take cover. Stay away from windows, doors and walls that face the building's exterior.

- Go to a shelter area, such as a basement or the lowest level in the building;
- If there is no basement, go to the center of an interior room on the lowest level (closet, interior hallway) away from corners, windows, doors and outside walls;
- Put as many walls as possible between you and the outside;
- Get under a sturdy table and use your arms to protect your head and neck
- Do not open the windows.

If a tornado hits and you sustain injuries, or witness others being injured, call 9-1-1.

If the tornado warning is extended or lifted, an update will be posted at (Emergency Website)

Voice Mail Message

This is a City of North Port Alert emergency message for the City of North Port. A tornado warning has been issued until (time) today. A tornado warning means that a tornado has been sighted on the ground and you should take immediate action to take cover. For more details and updates listen to NOAA weather radio.

UNKNOWN SITUATION*Text Message/Social Media Post*

ALERT: Police are investigating an incident (at location). Please avoid the area. See email for more information (126)

E-mail Message

City of North Port EMERGENCY! Police are investigating an incident (at location). Please avoid the area. As we learn more information, we will provide further updates. Again for your safety avoid (at location) until you have been advised its All Clear.

Voicemail Message

This is [name and title] with an EMERGENCY alert from City of North Port! Police are investigating an incident (at location). Please avoid the area. As we learn more information, we will provide further updates. Again for your safety avoid (at location) until you have been advised its All Clear.

WILDFIRE EVACUATION

Text Message/Social Media Post

ALERT: There is a fast moving wildfire near the City. If you are (at location), evacuate immediately to (location).

E-mail Message

City of North Port Emergency! There is a fast moving wildfire near City of North Port. Evacuations have been ordered. If you are on (at location), evacuate immediately to (location). If you are not in the area, stay away.

Voicemail Message

This is [name and title] with an emergency from City of North Port. There is a fast-moving wildfire near City of North Port. Evacuations have been ordered. If you are (at location), evacuate immediately to (location). If you are not in the area, stay away.

WATER or SEWER FAILURE

ALERT: A water/sewer failure has occurred in (at location). The area is temporarily closed until the area is safe for re-entry.

More Details

At approximately (time) today, a water/sewer failure occurred (at location) in the City of North Port. The area will be closed until the area is safe for re-entry. An update will be posted on this site at (time). The City of North Port appreciates your patience, cooperation and understanding during this incident

ALL CLEAR

Text Message/Social Media Post

ALL CLEAR: The situation is all clear, see you email for more information. (87)

E-mail Message

Will need to be written real time after event to include summary of event and any safety tips (if applicable)

Voicemail Message

This will be written real time after event include summary of event and any safety tips (if applicable)

Warning – General Incident

1. The [County/City] Emergency Management [Office/Department] has issued the following warning for those who live, work, or are visiting in [County/the City]
2. An emergency involving [County/city] is currently in progress at: *[Describe location by reference to facility name (if known), street and cross street, other geographic features (rivers, rail lines, etc.), and neighborhood name where appropriate]*
3. Emergency personnel are currently responding to this incident and local officials are monitoring the situation. To keep yourself safe and avoid impeding the emergency response, please avoid this area until further notice.
4. To repeat, an emergency involving [County/City] is currently in progress at: *(Repeat location in 2 above)*. Please avoid this area.
5. Do not call [911] for information about the emergency. Instead, stay tuned to this station for additional official information.

Warning – Road/Facility Closure

1. The City of North Port Emergency Management has issued the following warning for those who live, work, or are visiting in the City of North Port.

2. It has been necessary to close certain local streets and highways due to:

- ☐ flooding
- ☐ heavy accumulations of snow and ice
- ☐ fire / explosion
- ☐ incident involving hazardous materials
- ☐ Other:

3. As of _____ today, the following roads have been closed by law enforcement officials:

Street or Route _____

At or Between _____

Please avoid these routes.

4. ☐ If you must travel, use alternate routes, such as:

5. ☐ We recommend that you refrain from driving and remain at home due to the extremely bad travel conditions.

6. ☐ In addition, the following facilities have been closed due to the emergency situation:

7. Again, the roads and streets that have been closed are: *(Repeat list in 3 above)*

8. Please stay tuned to this station for additional information on the current emergency.

Warning - Shelter-in-Place

1. The City of North Port Emergency Management has issued the following warning for those who live, work, or are visiting in the City of North Port.
2. There has been an accidental release of hazardous material that is affecting a portion of the local area. People in the following area must take protective measures:
3. If you are located in this area, do the following immediately in order to protect yourself:
 - A. Go inside your home, workplace, or the nearest building that appears to be reasonably airtight and stay there. Take your pets with you.
 - B. Close all doors, windows, and any fireplace dampers.
 - C. Turn off any heating or cooling system that draws in air from the outside.
 - D. Keep your radio on and tuned to receive emergency announcements and instructions
 - E. Gather items that you may need to take with you if you are advised to evacuate.
4. People traveling in vehicles should seek shelter in the nearest airtight structure. If a suitable structure is not immediately available, travelers should roll up car windows, close air vents, and turn off the heater or air conditioner until they reach a suitable building.
5. If shelter is not immediately available, keep a handkerchief, towel, or damp cloth snugly over your nose and mouth until you get indoors.
6. (If school is in session.)
☐ Students at the following school(s) are taking shelter at their schools:

Parents should not attempt to pick up students at school until the hazardous situation is resolved and they are advised it is safe to do so.

☐ Students at the following school(s) [have been/are being] evacuated to other facilities:

Parents should not attempt to pick up students from schools that have been evacuated. Local officials will provide information on where to pick up school children as soon as it is available.
7. If you know of any neighbors or co-workers with hearing or language problems or functional and access needs, please advise them of this message.
8. Please do not call [911] or local emergency officials for information. Stay tuned to this station for additional information.

Special News Advisory – Pre-Evacuation

1. The City of North Port Emergency Management has issued the following warning for those who live, work, or are visiting in the City of North Port.
2. Due to the threat of [_____], it may be necessary for people who live, work or are visiting in the certain local areas to evacuate in the near future. This area(s) that may be at risk include:
3. Evacuation is NOT being recommended at this time. Local officials will advise you if evacuation is necessary. However, you should be prepared to evacuate if needed. To prepare, you should:
 - A. Assemble the following emergency supplies:
 - Clothing for your family for several days
 - Bedding, pillows, and towels
 - Prescription medicines & spare eyeglasses
 - Soap and toiletries
 - Baby food and diapers
 - Your address book or list of important telephone numbers
 - Your checkbook, credit cards, and cash
 - Your driver's license and identification cards
 - A portable radio and flashlight.
 - B. You should also:
 - Gather suitcases, boxes, or bags to hold your emergency supplies.
 - Be prepared to secure your home or office and your property before you depart.
 - Ensure your car is in good shape and you have adequate fuel.
 - Decide where you will go if you must evacuate. Decide with relatives or friends or consider making hotel or motel reservations.
4. ☐ Potential evacuation routes from the area(s) at risk include:
5. ☐ Potential evacuation routes from the area(s) at risk are described in:
6. If you know of any neighbors or co-workers with hearing or language problems or functional and access needs, please advise them of this message. And if you have neighbors or co-workers who do not have transportation, offer to assist them if you can.
7. We want to emphasize that this is a PRECAUTIONARY message about possible evacuation. Evacuation is NOT being recommended now.

8. Keep your radio or TV on and listen for further information about this situation. Please do not call [911] or local emergency officials for information as this ties up telephone lines needed for emergency operations.

Warning Message – Urgent Evacuation

1. The City of North Port Emergency Management has issued the following warning for those who live, work, or are visiting in the City of North Port.
2. Due to [] that [threatens/is affecting a portion of the local area, the [County Judge/City Mayor] recommend that people in the following area evacuate immediately to protect their health and safety:

3. Recommended evacuation routes from the area(s) at risk include:

4. Be sure to take essential items such as:

- prescription medicines
- eyeglasses
- identification cards
- checkbook
- credit cards
- valuable papers

Do not delay your departure to collect other belongings.

5. Take your pets with you, but make sure you bring a leash, crate, or cage for them. Some shelters will not accept pets.
6. If you have no means of transportation or if you are physically unable to evacuate on your own, ask a neighbor to assist you.
7. If you know of any neighbors or co-workers with hearing or language problems or functional and access needs, please advise them of this message. And if you have neighbors or co-workers who need help or do not have transportation, offer to assist them if you can.
8. Repeating, local officials recommend the people in the following area(s) evacuate now:
(Repeat the area description in paragraph 2 above.)
9. Please do not use your telephone except to report a true emergency. Stay tuned to this station for more information and instructions from local officials.

Warning Message – Mandatory Evacuation

1. The [The City of North Port Emergency Management has issued the following warning for those who live, work, or are visiting in the City of North Port.
2. Due to [___], the City Commission of the City of North Port, under Florida law, has ordered that people evacuate immediately the following area to protect their health and safety and the health and safety of possible rescuers:
3. Recommended evacuation routes from the area(s) at risk include:

4. Be sure to take essential items such as:

- prescription medicines
- eyeglasses
- baby supplies
- personal care items
- identification cards
- checkbook and credit cards
- valuable papers

Listen to this station for more information on what you need to take with you. Secure your home before you depart.

5. Take your pets with you, but make sure you bring a leash, crate, or cage for them. Remember some shelters will not accept pets
6. Decide where you will stay until the emergency is resolved. Staying with relatives or friends or in a hotel or motel is a good choice.
7. If you can't stay with friends or relatives or find a motel room, listen to this station for more information on the locations of public shelters.
8. If you have no means of transportation or if you are physically unable to evacuate on your own, ask a neighbor to assist you.
9. If you know of any neighbors or co-workers with hearing or language problems or functional and access needs, please advise them of this message. And if you have neighbors or co-workers who need help or do not have transportation, offer to assist them if you can.
10. Repeating, local officials, under Florida law, are ordering the people in the following area(s) to evacuate immediately: *(Repeat the area description in paragraph 2 above.)*

11. Please do not use your telephone except to report a true emergency. Stay tuned to this station for more information and instructions from local officials.

Special News Advisory – Supplemental Evacuation Information

1. The City of North Port Emergency Management has issued the following warning for those who live, work, or are visiting in the City of North Port.
2. Due to the threat of [____], local officials have recommended that people who live, work or are visiting in the following areas evacuate to protect their health and safety:
3. Use the following evacuation routes: [list evacuation routes]
4. You should take the following emergency supplies with you:
 - clothing for your family for several days
 - bedding, pillows, and towels for each family member
 - prescription medicines & spare eyeglasses
 - soap and toiletries
 - baby food and diapers
 - address book or list of important telephone numbers
 - checkbook, credit cards, and cash
 - driver's license and identification cards
 - portable radio and flashlight, with extra batteries
5. Plan where you will stay until the emergency is resolved. Staying with relatives or friends or in a hotel or motel is a good choice.
6. If you cannot find another place to stay, temporary public shelters will be/have been opened at:
7. Take your pets with you, but make sure you bring a leash, crate, or cage for them as well as pet food.
8. Secure your property before you depart. Shut off all appliances, except refrigerators and freezers. Lock all doors and windows.
9. Expect travel delays on evacuation routes. If you have a substantial distance to drive, you may want to take drinks and ready-to-eat food in your car in case you are delayed.
10. If you have no means of transportation or if you are physically unable to evacuate on your own, ask a neighbor to help you.
11. If you have neighbors or co-workers, who need help or do not have transportation, offer to assist them if you can.

12. If you know of any neighbors or co-workers with hearing or language problems or functional and access needs, please advise them of this message.
13. Please do not use your telephone except to report a true emergency. Stay tuned to this station for more information and instructions from local officials. If you missed some of the information in this advisory, it will be broadcast again soon.

Special News Advisory – School & Public Facilities

1. The City of North Port Emergency Management has issued the following warning for those who live, work, or are visiting in the City of North Port.
2. The current emergency involving [] has affected the operation of the number of local facilities. This advisory is intended to provide you an update on the status of schools, hospitals, nursing homes, and other key facilities.
3. ☐ All local public schools have been closed.
4. ☐ The following schools have been closed and students [are being/have been] returned to their homes:
5. ☐ The following schools have been evacuated and their students relocated to other facilities:

School Students relocated to:

- ☐ Parents should pick up their children at these host facilities.

6. ☐ The following hospitals and nursing homes have been evacuated and their patients relocated to other facilities:

Facility Patients relocated to:

7. ☐ The following government offices, parks, recreation areas, and other public facilities have been closed:
8. Please stay tuned to this station for more information and instructions from local officials.
9. ☐ And please refrain from using the telephone unless you have a true emergency.

Appendix G2

Joint Information Center Toolkit

News Release Procedures

Procedures:

- News releases come from the Lead PIO and agency PIOs.
- All news releases are sent through the PIO.
- All news releases are to be approved by the Incident Commander.

The Lead PIO and staff are responsible for news releases throughout the course of the incident. These releases should provide a comprehensive, “big-picture” view of the incident and meet the JIC goals established by the Lead PIO.

Agency PIOs can release their own specific information. They can send out their own news releases, or incorporate their information into a Lead PIO release.

Agency PIOs can do their own releases if their information is time sensitive and can’t wait for a Lead PIO release to be compiled. A separate news release also can be done if the information is extensive or better served if it is a stand-alone release. For instance, the American Red Cross might choose to have a listing of blood donation locations included in a Lead PIO release, but may want to do a longer, stand-alone release about severe blood shortages.

Agency PIOs who issue separate releases are encouraged to use the template. This template provides for agency PIOs having their agency’s title displayed prominently at the top of the release but maintains JIC uniformity to let the news media know the news release is coming from the JIC.

The Lead PIO office and agency PIOs should have them approved by their director and the Incident Commander. Once the news release is ready to be issued to the news media, the writer records the news release on the Release Log maintained by the PIO. This will assign a number to the news release. The PIO will take care of distribution.

News Conferences

General Objectives and Aides:

- Adhere to the talking points.
- Avoid making conference political.
- Utilize the checklist.

When dealing with multiple agencies during an event, it's important to make sure all agencies have a voice in the news conferences without bogging it down with endless speakers and politics. News agencies attend/cover a news conference if pertinent information is offered.

It's essential to plan news conferences well in advance. The JIC should have established basic goals when first formed, and it's important to ensure the news conferences are focusing on those goals.

Basic talking points should be established and stressed up front. Talking points should address the questions foremost in the public's mind and focus on public safety. The talking points should be communicated to all speakers and speakers should be encouraged to stay on message.

Checklist: Opening a JIC**Steps taken by Lead PIO, Assistant Lead PIOs, and JIC Facility Manager**

- ☐ Determine who is the Lead PIO.
- ☐ Determine the JIC location.
- ☐ Assign a JIC Facility Manager (contact Property Maintenance)
- ☐ Ensure the chosen location is available and usable.
- ☐ Send PIO call-out. Include in message where to meet and who to call for more information.
- ☐ Check/assemble supplies and equipment.
- ☐ Test equipment. Are phones and faxes working, etc.?
- ☐ Maintain roster of responding PIOs and other support personnel.
- ☐ Assign PIOs and other personnel to roles as applicable.
- ☐ Once a majority of PIOs are present, hold a situation assessment briefing.
- ☐ Announce to the news media that the JIC is operational.
- ☐ First news release lists JIC personnel, phone and fax numbers etc.

Recommended Items for a PIO “Go Kit”

The following items are recommended for stocking an Agency PIO’s “Go Pack.”

- Agency identification
- Business cards
- Lap top computer (with battery, charger, AC plug) and broadband card
- Smartphone (with charger, AC plug, car charger)
- 800 MHz radio with charger
- Flashlight with batteries
- Inverter (for car accessory outlet)
- Office supplies (pads of paper, folders, pens, pencils, sharpener, stapler, staples, paper clips, tape, scissors, markers, etc.)
- Contact lists (for news media and your agency) and your agency’s news release templates in the following forms:
 - On hard drive of lap top
 - In memory stick
 - Hard copies
- Map Book
- Rain/weather gear
- Safety vest
- Basic personal grooming/hygiene supplies
- Waterproof container to pack it all in

JIC Technology and Equipment

- Printer
- Printer paper
- Flash drive or disks/CDs
- JIS plan and other such file resources
- Copies of various forms and checklists, etc.
- Extra notebooks, pens and pencils
- Blank nametags or something for news media credential IDs
- Corkboard and/or dry erase board
- Thumbtacks, dry erase markers, eraser
- Tape
- Sticky Pads
- Clipboards
- Paperclips, binder clips, rubber bands
- Markers
- Scissors
- Stapler
- Surge protector/power strip and extension cord

[illegible]

Information for inclusion in JIC news release

From: Agency Name

POC: Agency PIO

Date and Time Submitted to Lead PIO office: Jan 1, 2009, 1:30 p.m.

LEAD PIO OFFICE NOTES FOR WHEN RELEASE IS COMPLETE:

Release number this information was included in: List
any changes that were made:

AGENCY PIO NOTES TO LEAD PIO OFFICE:

Include here notes/directions for the Lead PIO office news release writer.

TEXT FOR RELEASE:

Put the text of what you want put in the news release here exactly as you would like to see it published so that the news release writer can just copy and paste.

Checklist: Holding a News Conference

- Decide who needs to be present by determining the types of questions that need to be answered. (If no new information is available, do not hold a news conference/briefing.)
- Take deadlines for print/broadcast media and other community events into consideration when scheduling a conference (as a guideline, no later than 3 p.m. for print publications or evening news, no later than 9 p.m. for nightly news).
- Notify news media of time, location and topic of the briefing/conference.
- If possible, include visual aids such as large, colorful maps, photos, etc. (If possible, have visual aids available online for download.)
- Attempt to hold informational portion of the conference to less than 30 minutes and provide ample time to answer news media questions.
- At the end, announce time and location of next news conference.

Room set-up: (Contact Property Maintenance)

- Rows of chairs with wide aisles between them.
- Raised stage areas in the back of the room for photographers.
- Raised stage in front of room complete with podium and possibly a table and chairs for speakers.
- No white background behind stage. Use a color and decorate with plants.
- Visible Web site address and JIC signage/logo.
- Appropriate lighting and sound system.
- Provide water and glasses for speakers.
- Provide easy ins and outs for speakers. (Use security if necessary.)

Speaker tips:

- Arrange speakers in order of appearance.
- Prepare speakers on angles/types of questions they may be asked.
- Discuss how to transition between speakers.
- Discuss management of questions and timeframe.

News Media Inquiry (Intake Form)

No. _____ (in order received)

Date: _____

Time: _____ A.M./P.M.

Inquiry Received from: _____ (person)

Phone: _____

E-mail: Reporter/Editor with: _____ (organization)

Deadline:

Question/Inquiry:

Response:

Is follow-up needed? _____ If so, when? _____

Notes:

First 48 Hours Checklist

Critical First Steps After Verification

Notification

1. Ensure your leadership is aware of the emergency and that they know you are involved. ☐
2. Use your crisis plan's notification list to ensure all of the communication chain of command is aware and know you are involved. ☐
3. Give leadership your first assessment of the emergency from a communications perspective and inform them of the next steps you are taking. ☐
4. Use the internal communication system (e-mail) to notify employees that their agency is involved in the response and that updates will follow. Ask for their support. ☐

Coordination

1. Contact local, State, and Federal partners now. ☐
2. If potential criminal investigation, contact FBI counterpart now. ☐
3. Secure spokesperson as designated in the plan. ☐
4. Initiate alert notification and call in extra communication staff, per the plan. ☐
5. Connect with the Joint Information Center-make your presence known. ☐

Media

1. Be first: Provide a statement that your agency is aware of the emergency and is involved in the response. (Use the Template for Pre-scripted, Immediate Response to Media Inquiries.) ☐
2. Be credible: Give directions to media about when and where to get updates from your agency. ☐
3. Be right: Start monitoring media for misinformation that must be corrected now. ☐

Media

1. Trigger your public information number operation now if you anticipate the public will be seeking reassurance or information directly from your organization. (You can adjust hours of operation and number of call managers as needed.) ☐
2. Use your initial media statement as your first message to the public. ☐
3. Ensure your statement expresses empathy and acknowledges the public's concern about the ☐
4. Give the pre-cleared facts you have, and refer the public to other information sites, as appropriate. ☐
5. Remind the public that your agency has a process in place to mitigate the crisis. ☐
6. Start monitoring public calls to catch trends or rumors now. ☐

Partners/Stakeholders

1. Send a basic statement to partners (the same as to the media) to let them know you are thinking about them. ☐
2. Use prearranged notification systems. ☐
3. Engage leadership to make important first phone calls, based on your plan, to partners and key stakeholders to let them know your agency is responding. ☐

Incident Situation Summary

Date and time:

Location:

Nature of incident:

Estimated number of victims:

Potential or critical infrastructure involved:

Evacuation status:

Response status:

Protective measures initiated: Lead

Agency:

Incident Verification

It is important to verify the initial reports of an incident and to make sure that you have correct information. Verified information is a critical factor in making appropriate decisions regarding the incident.

Have all the facts been received? (to the best of your knowledge?)

Did the information collected come from formal, credible sources such as a local, state, or federal agency?

Do you have similar reports about the incident from more than one source?

Is the information from different sources consistent?

Is the characterization of the event plausible?

If necessary, was information clarified through subject matter experts?

If you can answer “yes” to these key checkpoints, you have completed the key steps to verifying the situation.

Note: Verification is not a function for just one person. It requires input from a variety of sources.

Message Development for Emergency Communication

Step 1: Consider the following general factors

- A. Target audience(s) (e.g., general public, health providers):
- B. Purpose of messages (e.g., give facts/update, respond to media):
- C. Method of delivery (e.g., TV interview, press release):

Step 2: Consider the six basic emergency message components

- A. Expression of empathy:
- B. Clarifying facts (Who: What: Where: When: Why: How:)
- C. What we don't know:
- D. Process to get answers:
- E. Statement of commitment:
- F. Referrals (for more information):
- G. Next scheduled update:

Step 3: Decide what are the three most important message topics for you to cover

- A. 1.
- B. 2.
- C. 3.

Step 4: Develop a complete key message for each of your three message topics

TOPIC 1:

Complete message:

Additional supporting facts (if any): Soundbite:

TOPIC 2:

Complete message:

Additional supporting facts (if any): Soundbite:

TOPIC 3:

Complete message:

Additional supporting facts (if any): Soundbite:

Step 5: Check your messages for the following and revise, if needed

- ☐ Positive action steps
- ☐ Honest/open tone
- ☐ Applied risk communication
- ☐ Test for Clarity
- ☐ Use simple words, short sentences
- ☐ Avoid jargon
- ☐ Avoid humor
- ☐ Avoid extreme speculation
- ☐ Avoid judgmental phrase

JIC Equipment and Supplies Checklist

Equipment	Location	How to obtain it
Fax machine (preprogrammed for broadcast fax releases to media and partners)		
Computers (on LAN designated for partners and media)		
Laptop computers		
Printers for every computer		
Copier (and backup)		
Several tables		
Smartphones		
Visible calendars, flow charts, bulletin boards, easels		
Designated personal message board		
Small refrigerator		
Paper		
Color copier		
A/V equipment		
Portable microphones		
Podium		
TVs with cable hookup		
DVD/CD		
Paper shredder		
Copier toner		
Printer ink		
Paper		
Pens		

Equipment	Location	How to obtain it
Markers		
Highlighters		
Erasable markers		
UPS/FedEx/USPS supplies		
Sticky Notes		
Tape		
Notebooks		
Poster board		
Standard press kit folders		
Formatted computer disks		
Color-coded everything (folders, inks, etc.)		
Baskets (to contain items not ready to be thrown away)		
Organizers to support your clearance and release system		
Expandable folders (indexed by alphabet or days of the month)		
Staplers (several)		
Paper punch		
Three-ring binders		
Organization's press kit or its logo on a sticker		
Colored copier paper (for door-to-door flyers)		
Paper clips (all sizes)		

Template for Pre-scripted, Immediate Response to Media Inquiries

Use this template if the media is “at your door” and you need time to assemble the facts for the initial press release statement. Getting the facts is a priority. It is important that your organization not give in to pressure to confirm or release information before you have confirmation from your management and field staff, emergency operations center, etc.

The purpose of this initial press statement is to answer the basic questions: who, what, where, when. This statement should also provide whatever guidance is possible at this point, express the association and administration’s concern, and detail how further information will be disseminated. If possible, the statement should give phone numbers or contacts for more information or assistance. Remember that this template is meant only to provide you with guidance. One template will not work for every situation.

The following are responses which give you the necessary time to collect the facts. Use the Template for Press Statement for providing an initial press release statement after the facts are gathered. NOTE: Be sure you are first authorized to give out the following information.

If on Phone to Media:

- We’ve just learned about the situation and are trying to get more complete information now. How can I reach you when I have more information?
- All our efforts are directed at bringing the situation under control, so I’m not going to speculate about the cause of the incident. How can I reach you when I have more information?
- I’m not the authority on this subject. Let me have (name) call you right back.
- We’re preparing a statement on that now. Can I fax it to you when it’s ready?
- You may check our Web site for background information, and I will fax/e-mail you with the time of our next update.

If in person at incident site or in front of press meeting:

- This is an evolving emergency and I know that, just like we do, you want as much information as possible right now. While we work to get your questions answered as quickly as possible, I want to tell you what we can confirm right now:
- At approximately (time), a (brief description of what happened).
- At this point, we do not know the number of (persons ill, persons exposed, injuries, deaths, etc.).
- We have a (system, plan, procedure, operation) in place for just such an emergency and we are being assisted by (police, FBI, DHS) as part of that plan.
- The situation is (under) (not yet under) control and we are working with (local, State, Federal)

authorities to (contain this situation, determine how this happened, determine what actions may be needed by individuals and the community to prevent this from happening again).

- We will continue to gather information and release it to you as soon as possible. I will be back to you within (amount of time, 2 hours or less) to give you an update. As soon as we have more confirmed information, it will be provided.
- We ask for your patience as we respond to this emergency.

Notes: Depending on the incident, immediate protective measures may need to be provided. Consider using an expression of empathy, if appropriate.

FOR IMMEDIATE RELEASE

CONTACT: (name of contact)

PHONE: (number of contact)

Date of release: (date)

Headline—Insert your primary message to the public

Dateline (your location)—Describe the current situation in two or three sentences.

Insert a quote from an official spokesperson demonstrating leadership and concern for victims. “ ”

Insert actions being taken.

List actions that will be taken.

List information on possible reactions of the public and ways citizens can help. Insert a quote from an official spokesperson providing reassurance. “ ”

List contact information, ways to get more information, and other resources.

List information on possible reactions of the public and ways citizens can help.

Insert a quote from an official spokesperson providing reassurance. “ ”

List contact information, ways to get more information, and other resources.

NEW INFORMATION:

- Bulleted list of the new facts not previously reported.
- Bulleted list of the new facts not previously reported.
- Bulleted list of the new facts not previously reported.

BACKGROUND:

- Bulleted list of facts previously reported of the incident.

- Bulleted list of the facts previously reported.
- Bulleted list of the facts previously reported.

NEXT UPDATE

Time and date of the next press release update and/or press conference.

Contact Center Call Tracking**Time of call:** a.m./p.m.**Nature of call:***Specific information contained in stock materials:*

Clarify recommendations

Current status of the incident

Hot topic 1

Hot topic 2

Request for referral:

For more information

For medical attention

Other

Feedback to agency:

Complaint about specific contact with agency

Complaint about recommended actions

Concern about ability to carry out recommended action

Report additional information on incident

Rumor or misinformation verification (briefly describe)

Outcome of Call:

Reassured caller based on scripted information

Referred caller to:

Expert outside the department

Personal doctor or healthcare professional (if health related)

Red Cross or other nongovernment organization

FEMA or State emergency management agency

Other

Action needed:

None

Return call to: Caller's name:

Telephone number: _____ Gender: M / F

Return call urgency:

Critical (respond immediately)

Urgent (respond within 24 hours)

Routine

Call taken by:

Date:

PIO Roster and Contact Information

Name	Agency	Phone Number	E-Mail	Comments

APPENDIX H

DEBRIS MANAGEMENT

TABLE OF CONTENTS

- i. [FOREWORD](#)
- ii. [ACRONYMS USED IN THIS DOCUMENT](#)
- iii. [TERMS USED IN THIS DOCUMENT](#)

- I. [LOCAL, STATE AND FEDERAL DISASTER RESPONSE ACTIONS](#)
 - A. Natural Disasters
 - B. Local Disaster Response Actions
 - C. State Disaster Response Actions
 - D. Federal Disaster Response Actions
 - E. Disaster Declaration Process
 - F. Federal Response Framework
 - G. FEMA Debris Mission Response Actions
 - H. FEMA Debris Eligibility Criteria
 - I. FEMA Building Demolition Criteria

- II. [PRE-DISASTER PLANNING](#)
 - A. Identifying Potential Types and Amounts of Debris
 - B. Identifying Temporary Debris Storage and Reduction Sites
 - C. Mutual Aid Agreements

- III. [DEBRIS MANAGEMENT STAFF ORGANIZATION AND RESPONSIBILITIES](#)
 - A. Debris Management Staff Organization
 - B. General Debris Staff Responsibilities
 - C. Building and Engineering Staff Responsibilities
 - D. Public Information Management

- IV. [METHOD OF OPERATIONS](#)
 - A. Phase I: Emergency Roadway Debris Clearance
 - B. Phase II: Debris Removal and Disposal Responsibilities
 - C. Debris Issues Requiring Close Coordination
 - D. Recycling

V. CONTRACTING PROCEDURES

- A. Contracting Office Responsibilities
- B. Contracting Procedures for Immediate Response (Phase I)
- C. Contracting Procedures for Recovery Operations (Phase II)
- D. Unit Price and Lump Sum Contracts
- E. Contract Monitoring Responsibilities

VI. SPECIAL DEMOLITION AND DEBRIS REMOVAL SITUATIONS

- A. Private Property Demolition and Debris Removal
- B. Mobile Home Park Debris Removal
- C. Debris Removal Contracts

VII. TEMPORARY DEBRIS STORAGE SITE OPERATIONS AND VOLUME REDUCTION METHODS

- A. Temporary Debris Storage Sites
- B. Household Hazardous Waste
- C. Commercial, Agricultural and Industrial Hazardous and Toxic Waste
- D. Volume Reduction Methods

VIII. TEMPORARY DEBRIS STORAGE AND REDUCTION SITE ENVIRONMENTAL CONSIDERATIONS

- A. Air Quality Monitoring
- B. Site Closeout Procedures
- C. Ash, Soil and Groundwater Testing

APPENDICES

- [Appendix A](#) USACE Hurricane Debris Estimating Model
- [Appendix B](#) Privately-Owned Roads in the City of North Port
- [Appendix C](#) Right of Entry Agreement onto Private Property
- [Appendix D](#) Federal-Aid Roads in North Port
- [Appendix E](#) Aerial View of the FDEP Pre-Approved Temporary Debris Storage and Reduction Site
- [Appendix F](#) Aerial View of The City of North Port
- [Appendix G](#) FDEP Temporary Debris Storage and Reduction Site Pre-Approval Letter
- [Appendix H](#) Health and Safety Supplement
- [Appendix I](#) FEMA Letter of Plan Approval

i. FOREWORD

Each year, local officials from hundreds of communities are faced with the task of removing debris caused by natural disasters. In the past 20 years alone, over 700 major disasters have been declared by the President to facilitate Federal assistance to communities struck by hurricanes, tornadoes, floods, earthquakes, wild fires and other natural disasters.

In some cases, debris clearance, removal and disposal actions can be accomplished quickly using community resources augmented by assistance from neighboring communities, State agencies and contractor resources. In many other cases, however, the damage and debris are so extensive that a comprehensive debris clearance, removal and disposal management plan is required to efficiently and effectively control the operations.

The City of North Port developed this document to provide guidance to community leaders in planning, mobilizing, organizing and controlling a large-scale debris clearance, removal and disposal operation. Although this manual has been developed for large-scale debris clearance, removal and disposal operations, portions of all sections can be utilized on smaller operations. The sections are arranged to enable the reader to progress in a logical manner from one planning element to another. It is recommended that the sections be read consecutively because information presented in one section will be helpful in understanding materials presented in subsequent sections. The guide does not address the removal or disposal of material and products from institutional, commercial, recreational, industrial or agricultural sources that contain certain chemicals as defined by the U.S. Environmental Protection Agency to be toxic, flammable, corrosive or reactive.

This Plan will be reviewed on an annual basis to ensure compliance and consistency with local, State and Federal regulations.

ii. ACRONYMS USED IN THIS DOCUMENT

C&D	Construction and Demolition
DMTF	Debris Management Task Force
DOT	Department of Transportation
DPW	Department of Public Works
DRM	Disaster / Operations Recovery Manager
EOC	Emergency Operations Center
EPA	[U.S.] Environmental Protection Agency
ER	Emergency Relief
ESF	Emergency Support Function
FCO	Federal Coordinating Officer
FEMA	Federal Emergency Management Agency
FDEM	Florida Division of Emergency Management
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FHWA	Federal Highway Administration
GAR	Governor's Authorized Representative
GIS	Geographic Information System
HHW	Household Hazardous Waste
NRF	National Response Framework
PA	Public Assistance
PIO	Public Information Officer
SCO	State Coordinating Officer
SHPO	State Historic Preservation Office
SWM	Department of Solid Waste Management
TDSRS	Temporary Debris Storage and Reduction Site
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture

iii. TERMS USED IN THIS DOCUMENT

Chipping - Reducing wood related material by mechanical means into small pieces to be used as mulch or fuel. Chipping and mulching are often used interchangeably.

Debris - Scattered items and materials broken, destroyed, or displaced by a natural disaster. Example: trees, construction and demolition material, personal property.

Debris Clearance - Clearing the major road arteries by pushing debris to the roadside to accommodate emergency traffic.

Debris Removal - Picking up debris and taking it to a temporary storage site or permanent landfill.

Debris Disposal - Placing mixed debris and/or residue from volume reduction operations into an approved landfill.

Department of Public Works (DPW) - Department typically responsible for clearing debris from the roads and rights-of-way.

Force Account Labor - State or local government employees engaged in debris removal activities.

Garbage - Waste that is regularly picked up by the Department of Solid Waste Management. Example: food, plastics, wrapping, papers.

Hazardous Waste - Material and products from institutional, commercial, recreational, industrial and agricultural sources that contain certain chemicals with one or more the following characteristics, as defined by the Environmental Protection Agency: 1) Toxic, 2) Flammable, 3) Corrosive; and/or 4) Reactive.

Household Hazardous Waste (HHW) - Used or leftover contents of consumer products that contain chemicals with one or more of the following characteristics, as defined by the Environmental Protection Agency: (1) Toxic, (2) Flammable, (3) Corrosive and/or (4) Reactive. Examples of household hazardous waste include small quantities of normal household cleaning and maintenance products, latex and oil based paint, cleaning solvents, gasoline, oils, swimming pool chemicals, pesticides, propane gas cylinders.

Hot Spots - Illegal dump sites that may pose health and safety threats.

Mutual Aid Agreement - An understanding between communities and States obligating assistance during a disaster.

National Response Framework - A document developed to facilitate the delivery of all types of Federal response assistance to States following a disaster. It outlines the planning assumptions, policies, concept of operations, organizational structures and specific assignments and agencies in providing Federal response assistance to supplement the State and local response efforts.

Recycling - The recovery and reuse of metals, soils and construction materials that may have a residual monetary value.

Rights-of-Way - The portions of land over which a facility, such as highways, railroads, or power lines are built. Includes land on both sides of the highway up to the private property line.

Scale/Weigh Station - A scale used to weigh trucks as they enter and leave a landfill. The difference in weight determines the tonnage dumped and a tipping fee is charged accordingly.

Storage Site - A location where debris is temporarily stored until it is reduced in volume and/or taken to a permanent landfill.

Sweeps - The number of times a contractor passes through a community to collect all disaster-related debris from the rights-of-way. Usually limited to three passes through the community.

Tipping Fee - A fee based on weight or volume of debris dumped that is charged by landfills or other waste management facilities to cover their operating and maintenance costs.

Trash - Non-disaster related yard waste, white metals, or household furnishings placed on the curbside for pickup by local solid waste management personnel. A resident must call for pickup. Not synonymous with garbage.

United States Army Corps of Engineers (USACE) - A component of the U.S. Department of the Army which is responsible for constructing and maintaining all military bases and other government-owned and controlled entities. The USACE may be used by FEMA when direct Federal assistance, issued through a mission assignment, is needed.

White Goods – Discarded household appliances such as refrigerators, freezers, air conditioners, heat pumps, ovens, ranges, washing machines, clothes dryers, and water heaters. Many white goods contain ozone-depleting refrigerants, mercury, or compressor oils.

White Metals - Household appliances, such as refrigerators, freezers, stoves, washers and dryers.

I. LOCAL, STATE AND FEDERAL DISASTER RESPONSE ACTIONS

This section provides an overview of local, State and Federal disaster response actions available following a debris-generating natural disaster. Detailed information on the declaration process and eligibility criteria is contained in the Public Assistance Guide, FEMA publication 322.

A. Natural Disasters

1. Hurricanes - The damaging forces of hurricanes and tropical storms include high-velocity winds (up to 150 miles per hour or higher in gusts), storm surge and wave action. The most severe damage frequently occurs in the shore lands adjacent to the ocean. The resultant debris consists primarily of trees; construction materials from damaged or destroyed structures, personal property and sediment. Although the greatest concentration of debris will be located along the shoreline, flooding and tornadoes spawned by hurricanes can cause damage and leave extensive amounts of natural and manmade debris far inland.
2. Tornadoes - Damage from tornadoes is caused by high-velocity rotating winds. The severity of the damage depends on the velocity of the tornado funnel and the length of time the funnel is on the ground. Tornado debris consists primarily of trees, construction materials from damaged or destroyed structures and personal property. Damage is generally confined to a narrow path, which can be up to ½ mile wide and from 100 yards to several miles long.
3. Floods - Damage to structures from flooding is caused either by inundation or high velocity water flow. Structural damage is usually limited to the floodway and the floodplain area immediately adjacent to the river. Heavy structural damage may result from high velocity waters in mountainous areas or failure of a flood control project, such as a dam or levee. Flood debris consists of sediment, wreckage, personal belongings and sometimes hazardous materials deposited on public and private property. Additionally, heavy rains and floods may produce landslides; in such cases, debris consists primarily of soil, gravel, rock and some construction materials.
4. Earthquakes - Damage to structures is caused by shockwaves and earth movements along fault lines. Secondary damage, such as fires and explosions, may result from the disruption of utility systems. Debris consists of building materials, personal property and sediment caused by landslides.

4. Wildfires - Debris from wildfires consists of burned out structures, cars and/or other metal objects, ash and charred wood waste. Large-scale loss of ground cover may lead to mudslides, resulting in clogged drainage structures and possible damage to homes and bridges.

B. Local Disaster Response Actions

1. The City of North Port is the first to respond to a disaster. Response efforts are first directed to activities that protect lives, public health and safety, such as evacuations, sheltering, firefighting, utility restoration and clearing roads of debris. These response efforts may be accomplished with local force account labor and equipment, contractors, volunteers and assistance from adjacent communities.
2. The City of North Port has a Comprehensive Emergency Management Plan (CEMP) which identifies key staff members and their responsibilities for managing and controlling debris clearing, removal and disposal operations. This staff will be immediately activated whenever a natural disaster occurs. Staff members will document the critical decisions made in response to the disaster and provide the debris manager and local, State and Federal officials with a clear plan of action. The debris clearing, removal and disposal operations may extend for weeks or months and insufficient documentation of the evolving plan could cause confusion and inefficiency.
3. Safety assessments will be conducted to identify necessary lifesaving actions, assess the magnitude of damage and determine if additional resources are needed from other local governments and the State. Safety assessments shall be conducted in accordance with State/local health and safety standards/requirements.
4. This Debris Management Plan will divide the City into sectors to assess the extent of debris. Sector boundaries can be determined based on the following criteria:
 - a. Type of debris (structural, trees, sediment and mixed)
 - b. Location of debris
 - c. Volume of debris (large versus small)
 - d. Land use (residential, business, agricultural)

- e. Location of existing and potential temporary storage and volume reduction sites
 - f. Location of existing and potential permanent disposal sites (public and/or private landfills)
5. The damage assessment team will then investigate the damaged areas by sector to record the extent of damage and to identify specific assistance requirements. Damage assessment teams will also estimate the amount and composition of debris observed in each sector and annotate the locations on community maps.
6. The debris staff will initiate actions to assess the availability of local, State, Federal and other resources to provide immediate and long-term assistance. Experience has shown that resources will not be used effectively unless work assignments and cleanup priorities are coordinated and controlled by the debris manager (Solid Waste Manager). The designated local debris manager will have total responsibility and authority for managing the debris cleanup operation. The following are examples of local, State, Federal and other resources available for cleanup activities:
- a. Local Government - The City of North Port maintains equipment, such as trucks, rubber tire loaders, graders, chippers, chain saws, small cranes, dozers and backhoes with experienced operators who can be used to open roads and remove debris. Temporary hires may be added to provide additional labor and equipment operators for 24-hour-a-day operations, if needed. The principal advantage to using local government force account equipment and operators is their lower cost and flexibility in assignment. This equipment generally represents the only resources the community can immediately commit to an emergency debris clearance and cleanup operation.
 - b. Mutual Aid Agreements - A Mutual Aid Agreement is an agreement among neighboring communities (and possibly States) to provide assistance to one another in time of need. The operators and equipment of neighboring communities can be used to quickly augment local force account resources and have many of the same advantages.
 - c. State Agencies - The National Guard, Florida Department of Transportation (FDOT) and Florida Department of Environmental Protection (FDEP) have equipment and personnel that may provide limited assistance on a short-

term basis. The FDOT is normally responsible for debris clearance and removal on State roads. This assistance may be obtained by contacting the Florida Division of Emergency Management (FDEM) through the Sarasota County Emergency Operations Center (EOC).

- d. Volunteers - Historically, volunteers have played a significant role in large-scale debris removal operations. Volunteer organizations can assist private property owners or provide financial assistance in the removal of debris from private property. Additionally, community organizations, such as civic clubs, student groups and neighborhood organizations have proven to be a tremendous community resource in past disasters. To provide for maximum utilization of these resources, community leaders will be prepared to organize volunteer groups and keep the debris management staff informed of their activities. They will document the number of volunteers, the type of work performed and the hours worked. Sponsoring organizations will ensure that personnel are properly equipped and that common sense safety precautions are followed.
- e. Federal Agencies - The U.S. Army Corps of Engineers (USACE) may be able to respond for up to 10 days without a Presidential Declaration. Additionally, the Federal Highway Administration (FHWA) and the National Resource Conservation Service (NRCS) may provide grant assistance to State and local governments for debris clearing, removal and repair of roads on the designated Federal Aid System and clearing debris from canals.
- f. Contractors - Labor and equipment for debris clearance, removal and disposal will be available from local contractors. Following a major disaster, emergency contracts can be executed to augment local force account resources.
- g. Immediately following a disaster, engineering personnel on the debris management staff will explore alternative courses of action and update the existing Debris Management Plan based on the initial safety assessment, available resources and any new information. The updated plan can be hand-written initially and later converted to a more formal document.

- h. Maps of the affected area will be annotated to identify damaged sectors, locations of key facilities and disposal sites and distributed with the updated Debris Management Plan. Information will also be entered into a Geographic Information System (GIS) database, if available.

C. State Disaster Response Actions

1. When the response efforts appear to be beyond the capability of the City, Sarasota County normally provides the next level of assistance by declaring a State of Emergency. Florida Division of Emergency Management typically evaluates the disaster situation and provides advice to the Governor on the availability of State resources that could assist local efforts. State resources may consist of the FDOT, the Florida Department of Health, the FDEP and the National Guard. These State resources can assist the City in its immediate response efforts, including debris clearance, removal and disposal activities.

D. Federal Disaster Response Actions

1. The Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93288, as amended, was enacted into law in 1988. It is the centerpiece of the Federal Disaster Relief Programs that are managed by the Federal Emergency Management Agency (FEMA).
2. When a disaster occurs and a locality has responded to the best of its ability but is or will be overwhelmed by the magnitude of the damage, it turns to the State for help. The Governor, after examining the situation, may direct that the State's Emergency Plan be executed. If it is evident that the situation is or will be beyond the capabilities of local and State resources, the Governor may request that the President declare that an emergency or major disaster exists in the State under the authority of the Stafford Act.
3. While the request is being processed, local and State government officials will not delay in taking actions to respond to whether there will be Federal assistance. Commensurate with the supplemental nature of Stafford Act assistance, the Federal share of eligible recovery expenses for declared disasters is normally limited to 75% of eligible costs.

E. Disaster Declaration Process

1. The request for a declaration must come from the Governor or Acting Governor. Before sending a formal request letter to the President, the Governor will request that FEMA conduct a joint preliminary safety assessment (PDA) with the State to verify actual damages and estimate the amount of supplemental assistance that may be needed. After this assessment is complete and if the Governor believes that Federal assistance is necessary, the Governor sends the request letter to the President, through the Regional Director of the appropriate FEMA Region. The request is reviewed by the Regional Director and forwarded with a recommendation to the Director of FEMA who, in turn, makes a recommendation to the President. The President makes the decision whether or not to declare a major disaster or emergency. After the initial declaration, the person designated by the Governor as the Governor's Authorized Representative (GAR) may make requests for additional areas to be eligible for assistance or for additional types of assistance as deemed necessary.
2. After a declaration is made, FEMA will designate the area eligible for assistance and the types of assistance available. With the declaration, a Federal Coordinating Officer (FCO) is appointed who is responsible for coordinating all Federal disaster assistance programs administered by FEMA, other Federal departments and agencies and voluntary organizations. At the same time, the Regional Director or one of his/her staff will be appointed as the Disaster Recovery Manager (DRM), who is responsible for managing the FEMA assistance programs. The same person most often holds these two titles (FCO and DRM). Similarly, the State Coordinating Officer (SCO) and the GAR are generally the same person.

F. National Response Framework

1. The National Response Framework (NRF) is implemented to coordinate the overall delivery of Federal assistance to disaster victims. The plan is organized functionally by Emergency Support Functions (ESF). Each ESF is composed of a lead or primary agency and supporting agencies grouped together to deliver specific services and resources. Delivery of assistance under the Framework is flexible to best meet the unique needs of each disaster. Under the NRF, emergency assistance is provided either by Federal agencies under their own authorities, or under reimbursable mission assignments from FEMA.

G. FEMA Debris Mission Response Actions

1. In catastrophic disasters, FEMA can provide direct Federal assistance to support local and State governments in performing some of the activities related to debris clearance, removal and disposal. The response capabilities of the local and State governments must be clearly exceeded before this level of assistance can be provided. The work that can be performed under this authority is limited to emergency work and debris removal under Sections 402(4), 403 and 407 of the Stafford Act. The assistance will be subject to the cost-sharing provisions as specified in the FEMA-State Agreement. The grantee will reimburse FEMA for the appropriate non-Federal share of the cost of the work, including any administrative costs of the performing Federal agency. According to Florida Statutes Chapters 119 and 257, the Applicant must retain records up to five years after the close of the contract.
2. Following a Presidential Declaration, FEMA may elect to use its mission assignment authority to have the USACE contract for and manage debris clearance, removal and disposal operations. At the County-level, the debris and removal mission assignment is coordinated by Emergency Support Function #3 (ESF #3), Engineering and Public Works liaison officer. Within the structure of the City EOC, the Debris Management Team Leader, through the Public Works Group Supervisor, will be responsible for all functions of debris management.
3. The Debris Management team will meet regularly with FEMA, FDEM, and Sarasota County officials to collect and coordinate information necessary to accomplish the assigned mission.
4. ESF #10, Hazardous Materials liaison officer from the County, will also be included in all debris planning to coordinate the cleanup, transportation and disposal of hazardous materials.

H. FEMA Debris Eligibility Criteria

1. FEMA Public Assistance (PA) funds may be used for debris clearance, removal and disposal operations. Debris that may be eligible for clearance, removal and disposal includes trees, sand and gravel, building wreckage, vehicles and personal property. The debris must be a direct result of the declared event, must occur within the designated disaster area and must be the responsibility

of the applicant at the time of the disaster. Debris removal may be eligible when it:

- a. Eliminates immediate threats to lives, public health and safety;
 - b. Eliminates immediate threats of significant damage to improved public or private property; and/or
 - c. Ensures economic recovery of the affected areas to the benefit of the community-at-large.
2. Debris Removal from Public Property - In general, debris that is on public property must be removed to allow continued safe operation of governmental functions and, therefore, is eligible under one of the first two criteria. However, not all public property clearance is necessarily eligible. Debris that is blocking streets and highways is a threat to public health and safety because it blocks passage of emergency vehicles or it blocks access to emergency facilities such as hospitals. Debris in a stream or flood channel may cause flooding from a future storm. If such flooding would cause an immediate threat of damage to improved property, removal of the debris only to the extent necessary to protect against an event that could reasonably be expected to occur within five years may be eligible. On the other hand, removal of fallen trees in a forested or wilderness area is not normally eligible.
3. Debris Removal from Private Property - Debris on private property (to include privately-owned roads and gated communities) is treated somewhat differently. Debris removal from private property is the responsibility of the individual property owner or homeowners' association, aided by insurance settlements and assistance from volunteer agencies. Most insurance policies, such as, homeowner, fire and extended coverage policies, have specific coverage for debris removal and demolition of heavily damaged structures. FEMA assistance is generally not available to reimburse private property owners for the cost of removing debris from their property; however, an eligible local or State government may pick up and dispose of disaster-related debris placed at the curb by those private individuals. The extent and duration of this type of work is carefully controlled. FEMA, State and local officials will agree on a time frame during which pick-up from the curb will be eligible for PA funding.

If the debris on private business and residential property is so widespread that public health, safety, or the economic recovery of the community is threatened, the actual removal of debris from the

private property may be eligible. In such situations, the work normally must be done or be contracted for by an eligible applicant, and a Right-of-Entry Agreement must be in-place to permit access onto private property.

4. Debris Removal from Drainage Structures - Debris removal from certain drainage structures may have to meet the following criteria:
 - a. Reservoirs - Removal of disaster-related debris from reservoirs may be eligible if evidence is provided to FEMA that the reservoirs were regularly cleaned prior to the disaster and the pre-disaster level can be established. In addition, removal of debris that poses an immediate threat of clogging or damaging intake or adjacent structures may be eligible.
 - b. Natural Streams - Debris removal from natural streams normally is not eligible for assistance. Only debris that causes a threat to lives or public health and safety or damage to improved property from an event that could be reasonably expected to occur within five years is eligible. Any work in natural streams must also be closely reviewed and monitored to minimize undesirable environmental effects. This type of work will often require a Clean Water Act Section 404 permit from the USACE. The Natural Resources Conservation Service also has the authority to clear streams of debris.
 - c. Engineered Channels and Debris Basins - Debris removal from engineered channels, lined or unlined and debris basins may be eligible. Knowing the pre-disaster level of debris in the channel or basin is required in determining the amount of disaster-related debris. Such facilities must also have had a regular schedule of debris removal to be eligible for clearance.
5. Debris Removal from Roads and Highways - Debris may be removed from roads and highways, including the travel lanes, roadside ditches and drainage structures and the maintained right-of-way.
 - a. Federal Highway Administration's (FHWA) Emergency Relief (ER) Program provides financial assistance to States to repair or reconstruct national highways that are damaged by natural disasters or catastrophic failures from

an external cause. This funding speeds the restoration of major highways following a disaster. Only highways that are normally eligible for under FHWA's Federal Aid Highway Program are eligible for assistance from the FHWA ER program. While ER funds repairs to "Federal Aid" eligible highways, the Federal Emergency Management Agency (FEMA) addresses all other disaster-damaged roads and public infrastructure.

The City of North Port has a number of Federal-Aid roads (See Appendix D) which require special attention for debris clearance. Eligible debris clearance criteria includes: the restoration of essential traffic along Federal-Aid roads (first push), the first pass collection of debris on Federal-Aid roads, minimize the extent of damages to public property, or protect a remaining facility from further damages. Documentation and Reimbursement requirements differ from those used by FEMA. The Detailed Damage Inspection Reports must be used, and to receive full reimbursement for debris removal activities, all work must be completed within 180 days.

Debris clearance and removal from roadways not under the jurisdiction of the FHWA-ER program may be reimbursable under FEMA's Public Assistance program.

- b. Privately-Owned Roads (See Appendix B) - FEMA will not reimburse expenses incurred for debris clearance, removal or disposal from privately-owned roads (to include gated communities), with the following exceptions: (1) The applicant must provide documentation stating that disaster-generated debris on private property in the designated area constitutes an immediate threat to life, public health, and safety, and (2) the applicant has legal responsibility to remove debris from private property through the Right-of-Entry Agreement (Appendix C).
- i. In 2008, the City has adopted an ordinance which, during a declared emergency, authorizes the City to enter onto privately-owned roads and into gated communities, and collect debris to ensure public health and safety (See City of North Port Codes, Article IV, Disaster Debris Management).

6. Debris Removal from Recreational and Wilderness Areas
 - a. The removal of debris from public parks and recreational areas used by the public is eligible when it affects public health or safety or proper utilization of such facilities.
 - b. Hazardous trees within a naturalized area of public parks or golf courses that are unstable and leaning into the areas used by the public are eligible for removal only, not replacement. Normally, trees requiring removal are flush cut at the ground. Hazardous limbs are also eligible for removal. Hazardous limbs are defined as limbs greater than two inches in diameter that are still hanging in the tree and are threatening a public-use area, such as a trail, sidewalk, road, or golf cart path.
 - c. Generally, stump removal is not considered eligible for reimbursement, except if the stump itself is determined to be a hazard, as when the tree has been uprooted. When eligible, stump removal is accomplished by the least expensive means.
 - d. A tree with more than 50% of the tree crown destroyed or damaged, a split trunk, or broken branches that expose the heartwood, or a tree that has been felled or uprooted is eligible for removal, especially if it is in a location approximate to or within public-use areas. If the applicant chooses to attempt to save a tree that has any of the conditions described above that justify its removal, the expense is the applicant's.
 - c. Removal of debris that does not pose a health or safety threat in wilderness or forested areas of these facilities is not eligible for FEMA reimbursement.

I. FEMA Building Demolition Criteria

1. FEMA Public Assistance (PA) funds may be used for demolition and removal of resulting debris under the authority of Section 403, Essential Assistance, of the Stafford Act. This section allows for the demolition of unsafe structures that pose an immediate threat to life, property, or public health and safety.
2. Health and Safety - The primary responsibility for demolition of unsafe structures lies with the owner. Most insurance policies have

a clause that provides payment for demolishing houses damaged beyond repair. The applicant must certify that no insurance exists that would pay for the demolition, the owner is not capable of paying for such work and there is no opportunity to recoup the cost from the owner. If permission for demolition is not provided, the applicant must follow legal condemnation. The applicant must obtain right of entry and hold harmless agreements prior to start of the work. The ownership of the property remains in the hands of the original owner.

- a. All properties must be reviewed in accordance with environmental, historic and other Federal laws being provided for the demolition. The State will provide each applicant with a demolition checklist that must be completed and returned by the applicant prior to any actual demolition of the property.
- b. The checklist will contain a list of items with which the applicant must comply prior with demolition. These items include verification that the applicant has obtained right of entry and hold harmless agreements and investigated insurance coverage and liens. The applicant will also be provided forms pertaining to historic preservation, environmental, hazardous materials and wetland/floodplain requirements. The applicant must sign and return these forms indicating he/she has read them and understands that it is his/her responsibility to ensure full compliance with all local, State and Federal rules and regulations.
- c. The applicant must provide FEMA with a copy of the bid specifications, final property list and bid results prior to demolition. FEMA reviews the bid specifications to ensure that the specifications contain the proper scope of eligible work.
- d. Once all necessary information has been received and reviewed, FEMA will notify the State that they have no objection to the applicant's proceeding with the demolition of the properties identified in the demolition bid. The State provides the applicant with written authorization to proceed with the demolition project.
- e. Eligible work under health and safety demolition is limited to the demolition and removal of structures that may

represent an immediate threat to public health and safety. An inspection team may inspect each facility to make a determination on the structural integrity of the unit and review the reports of the applicant's building inspector. Structures that are in danger of collapse, thus representing an immediate threat to life and safety, are documented and recommended as eligible for demolition.

- f. Other eligible project descriptions under the health and safety category may include cleaning septic systems, backfilling basements, capping wells, clearing debris and any other actions to mitigate an immediate threat to public health and safety.
- g. Items such as slabs on grade, driveways, fences and structurally sound buildings normally are not eligible for demolition under the public health and safety category because they do not represent an immediate threat to public health and safety.
- h. At the completion of the project, the State notifies FEMA that the applicant's demolition has been completed. A joint FEMA/State team inspects the applicant's demolition sites to ensure full compliance with the project description identified in the report form.
- i. Eligible costs may include any cost incurred by the applicant to complete the demolition project. Costs for monitoring and managing demolition and removal activities are eligible costs. Necessary costs of requesting, obtaining and administering the grant assistance, however, are covered by the Sub grantee Administrative Allowance and are not identified separately as eligible costs.

See the Public Assistance Guide, FEMA publication 322, for more information on the Sub-grantee Administrative Allowance.

- 3. Archaeological Sites or Historic Structures - listed on the National Register of Historic Places or potentially eligible must be reviewed by the State Historic Preservation Officer (SHPO) prior to any demolition. Information and forms outlining the necessary step-by-step procedures to obtain SHPO approval will be provided to the applicant by the State. It is the applicant's responsibility to obtain SHPO approval before demolishing any possible historic structures

or performing ground disturbing activities. Costs associated with the applicant's obtaining SHPO clearance may be eligible.

- a. Each structure must be inspected for hazardous materials, such as asbestos or lead-based paint, prior to actual demolition of the structure. Normally, a representative of the applicant, such as a building inspector or fire marshal, will conduct a preliminary inspection of each structure. If hazardous materials are determined to exist in the structure, the applicant will contract with a certified asbestos or lead-based paint inspector. If the inspection report indicates the presence of asbestos material or lead-based paint, a certified abatement contractor must remove the material prior to demolition. Costs associated with asbestos and lead-based paint inspections, asbestos abatement and third party air monitoring may be eligible.
4. Attractive Nuisance - Private structures that are found to be structurally sound but require extensive repair are normally not eligible for demolition. The primary responsibility for securing the structures until repairs are completed lies with the owners. The applicant must certify that the structure is a health and safety threat to the public if the owners have no insurance or are not capable of paying for such work.
 - a. The applicant must obtain rights of entry and hold harmless agreements prior to start of the work.
 - b. Eligible work under this category is limited to securing the perimeter of the structure to prevent entrance into the structure and may include fencing, where necessary. FEMA can provide funding for materials (plywood or fencing) and labor as part of the project description to secure the structures from access. This funding meets the required need to protect life and safety.
5. Health Hazard - The project description on the report may include the cost of cleaning or removing items such as household hazardous waste (HHW), debris, food, chemical hazardous waste, freezers and refrigerators that may contain Freon and other items that may represent a health hazard.
 - a. The applicant must certify that no insurance exists that would pay for such work, the owner is not capable of paying for such work and there is no opportunity to recoup the cost

from the owner. The applicant must obtain rights of entry and hold harmless agreements prior to start of the work.

II. PRE-DISASTER PLANNING

Major natural disasters can generate enormous volumes of debris in short periods of time. Debris clearance, removal and disposal operations must be implemented quickly to expedite recovery operations and to protect public health and safety of the local population. However, the speed of initial debris clearance, removal and disposal operations depends upon the depth of pre-disaster planning by City, County and State emergency managers.

A. Identifying Potential Types and Amounts of Debris

1. Before selecting temporary debris storage and reduction sites, it is necessary to identify the areas that may be subject to widespread devastation (such as parks, tree-lined streets, orchards, groves, nurseries, mobile home parks and residential, commercial and industrial areas) and the types and amounts of resultant debris. The types and amounts of debris can be forecast on a land-use basis (such as rural, urban, industrial, or mixed use) and by examining historic records. For example, if an area has not been affected by a major storm for a long period of time, a dense tree canopy may have developed, which will result in a large amount of vegetative debris following a major storm.
2. In addition, the U.S. Army Corps of Engineers (USACE) Emergency Management staff has developed a modeling methodology designed to forecast potential amounts of hurricane-generated debris using actual data from Hurricanes Frederic, Hugo and Andrew. The estimated quantities produced by the model have a predicted accuracy of $\pm 30\%$. The primary factor used by the model is the number of households in a developed urban/suburban area. The other factors are cubic yards of debris generated per household, vegetative cover, commercial density and precipitation.

B. Identifying Temporary Debris Storage and Reduction Sites

1. All activities associated with massive debris clearance, removal and ultimate disposal operations depend upon the availability of suitable temporary debris storage and reduction sites. Identifying these potential sites before a major natural disaster will expedite debris removal and subsequent volume reduction and disposal actions. The Public Works Director and staff will work closely with other City, County and State officials to develop and maintain

current listings of potential debris storage and reduction sites in areas prone to natural disasters. Pre-disaster site selection teams will include local officials who are familiar with the area. The teams will also consult and coordinate with local residents, conservation agencies and environmental groups, if possible, to help identify potential problems. Considerations for evaluating potential temporary debris storage and reduction sites include the following:

- a. Use public lands first to avoid costly leases. Pre-designated sites will be on public property and consist of between 50-100 acres, depending on anticipated needs. Consider locations with respect to noise, traffic and the environment. Use private land only if public sites are unavailable.
- b. When selecting public or private sites consider pre-existing conditions that will have to be restored upon site closeout. Have attorneys review leases for private land to avoid extensive damage claims upon site closeout.
- c. The required size of the site will depend on the expected volume of debris to be collected and planned volume reduction methods. As a general rule, larger sites mean fewer sites and, hence, easier site closeout. However, larger sites may create logistical problems.
- d. Environmentally sensitive areas (such as wetlands, areas with endangered animal and plant species, critical habitats, well fields and surface water supplies and historic/archaeological sites) will be avoided. However, if use of such areas is unavoidable, procedures for temporary waivers will be developed. Consult and coordinate with local residents, conservation agencies, environmental groups and agencies and the State Historic Preservation Office (SHPO).
- e. Public acceptability is largely dependent upon the activities planned for the site. Smoke from burning, around-the-clock light and noise from equipment operation, dust and traffic are tolerated early in the disaster, but may have to be curtailed later. Whenever possible, avoid locating near residential areas, schools, churches, hospitals and other such sensitive areas. Notify citizens early about planned site activities and possible ramifications.

- f. Look for sites with good ingress/egress to accommodate heavy truck traffic.
- g. Consider adjusting traffic signals to accommodate projected truck traffic on critical haul routes.
- h. Identify nearby landfills and determine their present debris capacity and logistical capabilities. Also include any State-to-State or county-to-county agreements.
- i. Identify recycling possibilities, such as timber agreements, mulch and chip disposal in the agriculture community and fuel sources for incinerators or heating. Recycling success will depend on the types of debris and the local recycling environment.
- j. Review local and State ordinances on such items as tarps and tailgates on trucks, traffic control, truck priority, curfew, defining roadway rights-of-way and load limits. coordinate with responsible agencies to develop waiver procedures to expedite emergency operations.
- k. Clearly show critical routes and priorities for clearing debris on local maps. Target emergency routes for City, County, State or Federal clearance efforts. GIS will be used as an efficient mapping tool, if available.
- l. The following questions will help to identify and prioritize appropriate sites based on local requirements and conditions.
 - i. Potential Site Ownership
 - Are public lands available?
 - Are private land lease terms long enough?
 - Are private land lease terms automatically renewable?
 - Does the private land lease include a landscape restoration agreement?
 - ii. Potential Site Size
 - Is the site large enough to accommodate the planned debris storage and/or reduction methods?

- Will the site configuration allow for an efficient layout?

iii. Potential Site Location

- Does site have good ingress/egress?
- Does site have good transportation arteries?
- Does site have open, flat topography?
- Does site have wetlands? If unavoidable, require the contractor to flag the area and establish buffers and/or sediment barriers.
- Does site have public water supplies, including well fields and surface waters?
- Does site have threatened and endangered animal and plant species?
- Does site have threatened and endangered species' critical habitats?
- Does site have rare ecosystems?
- Does site have historic sites?
- Does site have archaeological sites?
- Does site have sensitive surrounding land use, such as residential, school and church?

2. To ensure the City has a site where debris may be temporarily stored in the immediate aftermath of a storm, one temporary debris storage and reduction site (TDSRS) has been designated, and received pre-approval by the Florida Department of Environmental Protection (FDEP). The following is a list of the City's pre-approved TDSRS. See Appendix G for pre-approval letters:

- a. Greenland Street Golf Course

C. Negotiating Mutual Aid Agreements

1. Mutual aid agreements will be negotiated and in place prior to a disaster. Mutual Aid providers normally consist of local and county Departments of Public Works from around the State under the Statewide Mutual Aid Agreement. These departments usually offer their assistance in the form of equipment and personnel. All requests for mutual aid will be placed through the Sarasota County EOC.
2. The mutual aid agreement will outline the responsibilities of each party, including the types of costs that will be reimbursed. To ensure that mutual aid providers adhere to the agreements, the

Public Works Director will assign coordinators to monitor each provider. The coordinators will be responsible for tracking the type of work performed and type of equipment used by each mutual aid provider.

3. To be eligible for FEMA assistance, reimbursement by the receiving party must not be conditioned on receipt of FEMA assistance.

III. DEBRIS MANAGEMENT STAFF ORGANIZATION AND RESPONSIBILITIES

This section provides guidelines for debris management staff organization and defines the key responsibilities involved in pre- and post-disaster planning and information management.

A. Debris Management Staff Organization

1. The size and composition of City staff organized to deal with debris clearance, removal and disposal issues will depend on the magnitude of the disaster and the size of the community. A pre-disaster debris planning staff may be quite small; however, following a major disaster, additional staff members may be required. The City debris staff will be comprised of full-time personnel supplemented with personnel from other staffs and agencies. It is essential that prospective staff members have as much training as possible and interface with other agencies responsible for debris clearance, removal and disposal activities, such as the Florida Department of Transportation (FDOT), Federal Emergency Management Agency (FEMA) and the U.S. Army Corps of Engineers (USACE), prior to any anticipated disaster.

City staff will be comprised of personnel to perform the following generic functions:

- a. Administration - Housekeeping supplies, equipment, funding and accounting.
- b. Contracting and Procurement - Bidding requirements, advertisements for bids, instructions to bidders and contract development.
- c. Legal - Contract review, rights of entry permits, community liability, indemnification, condemnation of buildings, land acquisition for temporary staging and reduction sites, site closure/restoration and insurance.

- d. Operations - Supervision of government and contract resources and overall project management.
- e. Engineering and Public Works - Detailed safety assessments, identification of project tasks, assignments of tasks, preparation of cost estimates, scopes of work and specifications for debris contracts.
- f. Public Information - Coordination of press releases, maintenance of contacts with local organizations, individuals, the media and drafting of public notices for debris clearance, removal and disposal operations.

B. General Debris Staff Responsibilities

1. Primary response personnel will be alerted before the disaster and deployed either before or immediately after the disaster. If possible, they will remain part of the debris management staff throughout the disaster cleanup to maintain continuity during the debris clearance, removal and disposal operations. The staff will develop disposal plans either in advance or concurrently with the removal efforts.
2. The Department of Public Works Operations Manager will be responsible for coordinating all removal and disposal activities. The staff will need to coordinate closely with all City, County, State and Federal agencies responsible for disaster response and recovery operations. They may also need to contract removal and disposal services and develop requests for additional assistance from FEMA. They must be prepared to react to evolving needs and available technologies.
 - a. The Operations Manager must be able to assess debris based on:
 - i. Quantities and types.
 - ii. Rural, urban and/or agricultural locations.
 - iii. Number of private homes, mobile homes, public facilities and commercial establishments damaged or destroyed.
 - iv. Miles of roads affected, categorized by type, such as rural, urban and/or expressways.
 - v. Quantity and types of household hazardous wastes.

- b. The Operations Manager and debris staff will be prepared to take the following actions:
 - i. Develop a reliable initial assessment of the disaster's magnitude. This will enable decision-makers to assess human and material requirements for responding to the debris disposal situation.
 - ii. Coordinate with local procurement agencies to establish a contracted work force capable of expeditiously removing the debris.
 - iii. Identify the need to consult with an environmental or historic preservation specialist to assure that legal requirements in these areas are met.
 - iv. Evaluate damaged utility systems, structurally unstable buildings, and other heavily damaged public facilities and determine if they will be expeditiously repaired, deactivated, barricaded or removed. Activities involving these facilities will be structures that constitute a public health and safety threat may be deferred if access to the area can be controlled.
 - v. Develop a Debris Management team using City personnel to monitor the debris removal activities. This will allow the Solid Waste Manager and debris staff to obtain accurate information about the progress of the debris removal operation. The field inspection team becomes the debris manager's "eyes and ears" in the field. The cost for personnel to monitor debris removal activities is reimbursable.
 - vi. Conduct daily update briefings with key debris managers and other officials. Ensure that all debris clearance, removal and disposal actions are reviewed and approved by the local debris manager.
 - vii. Ensure that a debris staff representative attend all briefings to resolve any coordination problems between County, State and Federal debris removal efforts and City debris removal and disposal efforts.
 - viii. Coordinate with City police and FDOT to ensure that traffic control measures expedite debris removal activities.
 - ix. Develop a traffic control plan. Traffic control devices will not be allowed to return to normal operations until all debris operations have been completed. Debris clearance and removal activities must be

- given priority at every major intersection to ensure efficient and timely debris operations.
- x. Establish and maintain direct coordination with other City, County and State officials and their staffs with regard to priorities and areas of responsibility. Finally, the debris staff must be able to inform the public in understandable terms of the magnitude of the disaster and about actions the public must take.

C. Building and Engineering Staff Responsibilities

1. The debris management staff will have access to qualified engineering expertise to assess the full scope of the debris clearance, removal and disposal effort. The City may need to hire a local engineering firm if the Public Works' Engineering Division staff is heavily involved with the repair and replacement of publicly-owned facilities damaged by the disaster.
2. The Building Department and Engineering Division within the Department of Public Works will need the following personnel:
 - a. Inspectors to inventory the type and amount of debris within the disaster area.
 - b. Engineers to plan the work for maximum efficiency and to develop the government debris clearance, removal and disposal cost estimate.
 - c. Contract specialists and draftspersons to prepare contract scopes of work and/or specifications. Engineering personnel perform tasks such as the following:
 - i. Define the project scope, if the This is done by specifically defining the disaster area in which work is to be the debris to be removed and disposed of for that area.
 - ii. Determine if the existing landfills have sufficient capacity for the expected volume of debris from the preliminary safety assessment.
 - iii. Consider using pre-identified temporary storage sites for reducing the volume of debris by incinerating, grinding and/or recycling to reduce the impact on landfill sites.
 - iv. If sufficient landfill capacity is not available, identify alternative landfill sites.

- d. The engineering staff might be required to develop scopes of work and specifications if local contractors are used for debris clearing, removal and disposal operations. The following factors will be considered because they will affect overall contract costs:
 - i. Truck Size - Smaller trucks require more trips for a given volume of debris, which increases the driver's time, fuel cost, maintenance and depreciation cost.
 - ii. Length of Haul - The longer the haul, the greater time required to reach the disposal site, which increases costs for labor and equipment.
 - iii. Traffic Conditions - Hauling over heavily traveled streets and roads also increases labor and equipment costs.
 - iv. Roadway Conditions - Poor roadway conditions, such as potholes, unpaved surfaces and deteriorated pavement, increase maintenance costs as well as operational costs.
 - v. Temporary/Permanent Site Access - Single lane unpaved access roads increase cost because of delays caused by restrictions for allowing loaded and empty trucks to pass. In addition, poor weather conditions may make the access road impassable.
- e. Once the above factors are considered, the limits of the disaster area can be clearly defined. For debris contracting and debris management purposes, the boundaries of the disaster area will be delineated on a map. The map will identify the work area or areas to be included in the contract. If multiple contracts are used, this element of contract preparation is extremely important to ensure that the contractors remain in their assigned work areas. The establishment of the work area is also important to identify key items, such as ingress and egress routes to the debris removal area, location of utilities and distance to temporary staging and reduction sites or permanent landfill sites.
- f. A quantitative estimate is extremely important to clearly identify to contractors the scope of work they are being asked to perform. This estimate will also assist in preparing project cost data.
- g. Quantity estimates, or "takeoffs," will be made in the units that are going to be used in establishing contract line-item

prices. Units will be selected based on the method that will be used to verify pay quantities for work under the contract. For debris removal, units are normally "cubic yards," "tons," or "each." Therefore, if a contractor is to be paid for the volume of material removed from a work site by approximate measurement of that volume, the unit will be cubic yards. If it is more convenient to pay the contractor by weighing the trucks used to haul the material to a disposal site, the units will be by weight (tons). If the contractor is to be paid by the number of items removed from the project site (i.e., trees, damaged vehicles, etc.), the unit will be established as "each." Because it is difficult in most debris operations to estimate the weight of material to be removed, the general rule is to use volume and number measurements. An estimate of length, width and height of the material can approximate the volume of debris in question. The amount of material to be removed and the accuracy desired in the estimate will determine the procedures used for this volume measurement. For a large-scale disaster, marking the area on a scaled map and approximating an average height can derive an approximate quantity estimate. When developing quantity estimates, inspectors will be instructed to note the type and location of the debris.

- h. The next step is to develop unit cost data after the quantity, location and type of the debris within the disaster area has been established. Several sources exist that may assist in determining the proper unit price to be used once the project scope has been defined and contract type selected. Many nationally published cost data reports do not take into account the abnormal conditions encountered by contractors in debris operations. They also do not account for the increase in cost due to a disaster or emergency situation. The following sources will be able to provide current cost data necessary to develop the unit price estimate:
 - i. Area engineering and construction firms.
 - ii. Local public works departments.
 - iii. FDOT and Florida Forest Service. The development of a government estimated unit price includes many variables. Factors that influence the unit price are the type of debris, method of removal, distance to

the disposal site, routes to the disposal site, permitting requirements and work-site limitations.

- i. The safety assessment report will provide the engineering staff with information that addresses all items to be included in the government cost estimate. These items will include the actual work that may be required to accomplish the specific tasks.
- j. The individuals performing the government cost estimate will put themselves in the place of the contractor who is being asked to submit a price for the work. This is very important in a disaster situation, where there might be a considerable variety of factors affecting the contractor's pricing. After the cost estimate is prepared, the scope of the project can be defined and the type of contract selected.
- k. The engineering staff will have an understanding of FEMA debris eligibility criteria and be aware that FEMA will only reimburse "reasonable costs" associated with debris clearance, removal and disposal actions. Moreover, plans must include a means to monitor the contractor's activities and certify the accuracy of the amount of debris handled.

D. Public Information Management

- 1. Public Information Officer (PIO) - A full-time public information specialist will be assigned to work with the debris management staff. This specialist will be responsible for coordination with other public information agencies to keep the public informed on all debris removal activities and schedules. Immediately after a disaster and continually throughout the removal and disposal operation, this person will arrange public notification of all ongoing and planned debris clearance, removal and disposal activities. Notification will include information bulletins, hotline responses, public service announcements for radio and television, handbills, door hangers and newspaper notices in the language(s) prevalent in the affected communities. Provision will be made to compensate for disruption of normal means of mass communication caused by power outages following a major natural disaster.
- 2. Public Participation - Public notices will emphasize actions that the public can perform to expedite the cleanup process, such as the following:

- a. Separating flammable and nonflammable debris.
 - b. Segregating household hazardous waste.
 - c. Placing debris at the curbside.
 - d. Keeping debris piles away from fire hydrants and valves.
 - e. Reporting locations of illegal dump sites or incidents of illegal dumping.
 - f. Segregating recyclable materials.
3. Important Debris Removal Activities - The public will be kept informed of the following debris removal activities and regulations:
 - a. Debris pick-up schedules.
 - b. Disposal methods and ongoing actions to comply with State and Environmental Protection Agency regulations.
 - c. Disposal procedures for self-help and independent contractors.
 - d. Restrictions and penalties for creating illegal dumps.
4. Questions from the Public - The information officer will develop a means of responding to debris removal questions from the press and local residents. Questions that might be asked include the following:
 - a. What is the pick-up system?
 - b. What is the schedule of pick-up in my area?
 - c. Who will pick-up and how can I contact the operator?
 - d. Will I separate the different debris materials and how?
 - e. How do I handle household hazardous waste?
 - f. What if I am elderly or infirm?

IV. METHOD OF OPERATIONS

This section discusses how the City will implement a large-scale debris clearance, removal management by dividing the operation into two phases. Phase I consists of clearing the debris that hinders immediate lifesaving actions and that poses an immediate threat to public health and safety. Phase II consists of removing and disposing the debris that hinders the orderly recovery of the community and poses less immediate threats to health and safety. The entities responsible for implementing the strategy will be identified in advance.

A. Phase I: Emergency Roadway Debris Clearance

1. The City EOC will identify in advance which routes are essential to emergency operations. This will allow them to direct local efforts and to target areas for possible State/Federal assistance.
2. The Public Works Director and staff will be aware of City, County and State agencies' capabilities to provide service for emergency roadway debris clearance. Available resources will include the following:
 - a. Municipal force account workers and equipment.
 - b. Florida Department of Transportation (FDOT) workers and equipment.
 - c. Local contractors hired by the City.
3. The Public Works Department Solid Waste and Operations Divisions will be responsible for debris clearance activities. These divisions have the necessary personnel, equipment and contracting experience.
4. A day before a foreseeable disaster, the Solid Waste portion of the debris management plan will be put into effect. Solid Waste and Operations will disperse vehicles throughout the area to minimize the risk of vehicle damage. Anticipated supplies and equipment necessary to complete the work will be purchased or rented. A strategy will be developed to clear all designated emergency roads using all available local force account labor and equipment, military personnel, mutual aid providers and local contractors.
5. Following a disaster, the top priority is to clear major arterial roads, including roads leading to health care facilities. The Public Works Director will organize participants based on personnel and equipment and assign each of them responsibility for certain roadways. At least one lane will be cleared on each arterial, major and secondary road as soon as possible. Available public property will be identified for use as temporary storage areas, with preference to locations that would be less expensive to restore, such as open fields and parks.
6. Debris may include tree blow-down and broken limbs; yard trash such as outdoor furniture and trash cans; utility poles, power, telephone and cable television lines, transformers and other electrical devices; building debris, such as roofs, sheds, block walls

and chimneys; and personal property, such as clothing, appliances, boats, cars, trucks and trailers.

7. In Phase I, roadway debris is quickly moved to the side of the road to provide access into devastated areas. No attempt is made to remove or dispose of the debris, only to provide clear access routes to allow for:
 - a. Movement of emergency vehicles.
 - b. Law enforcement.
 - c. Resumption of critical services.
 - d. Safety assessment of critical public facilities and utilities.
8. The requirements for City services increase dramatically following a major natural disaster. Therefore, after emergency access will be provided to emergency care centers, and police and fire stations, the next priority is to open access to other critical infrastructure, such as schools, municipal buildings, water treatment plants, and wastewater treatment plants.
9. The difficulty of assessing the amounts and types of debris to be removed from key routes slows the deployment of the right mix of equipment and labor, especially when contracting for additional resources. Moreover, local equipment and labor capabilities could be limited. Therefore, the City will be prepared to execute Time and Material (i.e., equipment rental) contracts during Phase I operations. They allow the flexibility to respond to local hot spots at a reasonable cost. Time and Material contracts for services will be very limited in scope and duration. For example, a local construction company may be awarded a Time and Material contract as a stop-gap measure to clear debris from the right-of-way until the contracted debris removal companies are fully mobilized under unit price contracts.

See Section V for additional information on contracting procedures.

B. Phase II: Debris Removal and Disposal Responsibilities

1. The initial roadside piles of debris created during Phase I will become the dumping locations for additional yard waste and other storm-generated debris. Therefore, a private contractor may be required to perform the final disposal of all disaster-related debris from the rights-of-way or storage and reduction sites. The contract will cover hauling and disposal of debris at an approved landfill. If

local contractors are used, the area will be divided into definable sectors for control purposes and bids solicited based on the sectors and the estimated cubic yards of debris in each. Contractors are then responsible for hauling debris from the public rights-of-way to assigned temporary storage areas or approved landfills.

C. Debris Issues Requiring Close Coordination

1. The Public Works Director and debris staff will be faced with a monumental task of coordinating removal of debris that represents a significant health and safety hazard to the community. Expedient removal of debris from in front of residents' homes becomes a high priority because it is a positive sign that recovery actions are underway and expedites the replacement of key utilities located along public rights-of-way.
2. The following issues will require close coordination when removing debris from public rights-of-way:
 - a. Curbside Separation - Good curbside separation is critical in the early stages of cleanup. However, even when the homeowner takes time to separate flammable, nonflammable and other hazardous debris, many contractors place everything into the truck or push the curbside debris to a cul-de-sac or an intersection and load it there. Therefore, contractor performance will be closely monitored, with emphasis being placed on curbside sorting. This monitoring will pay dividends in the long run because good sorting will make the final disposal much faster and cheaper.
 - b. Monitoring Contractor Activities - To ensure that contract haulers are in compliance with their contract, the City has contracted with a company to perform debris monitoring services. The monitors will be responsible for initial load tickets where trucks are loaded and verifying the estimated amount of debris hauled at the temporary storage area or landfill. Solid Waste officials will provide overall supervision. The contractor must provide a notarized listing of the measured bed size in cubic yards and license plate number of all trucks to be used to move debris upon award of the contract.
 - i. Once a truck is loaded with debris at the work site, the site monitor will fill out a load ticket, which

usually consists of one white original copy and two carbon copies (yellow and pink). The load tickets issued by the monitors are the basis for debris contractor payment.

ii. Each ticket will include the following information:

- Preprinted ticket number.
- Contract number.
- Prime Contractor's name.
- Date.
- Truck number.
- Truck capacity in cubic yards.
- Load size, either cubic yards or tons.
- Truck driver's name.
- Debris classification.
- Burnable
- Non-burnable
- Mixed
- Other
- Zone/Sector.
- Dumpsite location.
- Loading time (from work site).
- Dumping time (at disposal site).
- Loading site monitor.
- Dumping site monitor.

c. The load ticket copies will be processed in the following manner:

- i. White copy - The pickup site monitor will fill in the date, truck number, contractor and departure time and sign the ticket. The pickup site monitor will keep the white copy and give the other two copies to the driver.
- ii. Yellow copy - On arrival at the disposal facility, the driver will give both the yellow and pink tickets to the disposal site monitor. The disposal site monitor will fill out the arrival time, estimate the amount of material on the truck in cubic yards and sign the ticket. The disposal site monitor keeps the yellow ticket.

- iii. Pink copy - This copy will be returned to the driver, who then provides it to the contractor.
 - d. At the end of each day, the white and yellow copies will be submitted to Solid Waste personnel, who will match and compare the tickets. These procedures can be modified to meet local requirements.
 - e. The Federal Emergency Management Agency (FEMA) will reimburse only reasonable costs. Therefore, it is essential that the City be responsible for monitoring debris clearance, removal and disposal activity and be prepared to certify the accuracy of the amounts of debris hauled.
3. Special Monitoring Issues

The issues described below highlight the need for Solid Waste officials to closely monitor large contracted debris clearance, removal and disposal activities. The issues focus on some of the problems associated with major debris disposal contracts and justifies the need to monitor activities at local temporary storage and reduction sites and at final disposal landfill sites. Many of the questionable actions can be attributed to human error or they may be deliberate attempts to defraud the Federal government. In either case, it is essential that Public Works Department contracting officials work closely with FEMA to ensure that contractor's perform the services required and that the services are performed at a reasonable cost.

- a. Site delays - Delays in moving debris and traffic problems on adjacent highways can be caused by the need to establish initial tare weights for each truck going across the landfill site's scale. Tare weights will be established using other scales, if available, before debris hauling begins.
- b. Overweight or unsafe trucks - FDOT enforcement officers will be available to issue fines for overweight vehicles and/or obvious safety hazards.
- c. Tipping fees - Vehicles other than those under contract to the DPW and USACE will be required to pay the normal tipping fee at the landfill. Commercial containerized haulers will not be allowed to dump for free because they normally include the tipping fee as part of their overall costs.

- d. Excessively wet debris - Local site monitors will monitor temporary storage area loading sites to ensure that contractors do not add excessive amounts of water to debris prior to loading. This practice will add unnecessary weight to the load, resulting in overpayment based on weight. Minimal amounts of water may be necessary to keep down dust.
- e. Excessive dirt and sand - Local site monitors will monitor storage area loading sites to ensure that contractors do not add excessive amounts of non-debris related dirt and sand. Excavating dirt and sand from a site will add unnecessary weight to the load, resulting in overpayment based in weight and will add to the cost of site restoration. Some minimal dirt pickup is unavoidable.

D. Recycling

The City of North Port shall recycle debris to the greatest extent possible. Local site monitors will identify opportunities for the City to recover materials from disaster debris for beneficial uses. The salvage value for various recyclable or reusable debris materials depends on the regional recycling markets and the City will consider selling disaster debris for a salvage value to offset the cost of eligible debris removal work by the revenues received from the sale of the debris.

V. CONTRACTING PROCEDURES

This section highlights the procedures necessary to contract additional private debris clearance, removal and disposal resources and services. Contracting for labor and equipment may be necessary if the magnitude of the emergency debris clearance, removal and disposal operation is beyond the capabilities of local force account or contracted resources, State resources, mutual aid agreements and volunteer labor and equipment. The Public Works Director and staff will be familiar with contracting procedures, as they will be required to define specific debris removal tasks and recommend specific contract types based on the magnitude of the debris clearance, removal and disposal operation and the site clearance and restoration requirements.

To ensure the availability of qualified contractors in the immediate aftermath of a disaster, when appropriate resources are scarce, the City has competitively bid, reviewed and awarded debris clearance and removal contracts with three privately-owned companies, and a single contract for debris monitoring. These

contracts will be reviewed, extended/or re-bid on a three-year cycle. During the current contracting cycle, the following contractors have been pre-qualified:

Debris Removal

- CrowderGulf (Primary)
- TAG Grinding Services, Inc. (Secondary)
- AshBritt, Inc. (Tertiary)

Monitoring:

- Rostan Solutions (Primary)
- Thompson Consulting Services (Secondary)

A. Contracting Office Responsibilities

The City's Purchasing Division will have key personnel available to develop, process and administer debris clearance, removal and disposal contracts. The responsibilities entail the following actions:

1. Determine the type and method of contracting needed to satisfy specific debris clearance, removal and disposal requirements of an unusual and compelling urgency.
2. Solicit bids, evaluate offers, award contracts and issue notices to proceed with all contract assignments.
 - a. To ensure objectivity and fairness in selection of a contractor, bidders may be rated by criteria to reflect their qualifications for Disaster Experience, Financial Strength, Operational Plan, and Compensation Schedule.
3. Supervise the full acquisition process for service and supply contracts and the oversight of contract actions to ensure conformance to regulatory requirements.
4. Coordinate with the Public Works Department.
5. The Emergency Operations Center and Public Works Department must take care to avoid the solicitation of assistance from the general public and giving the impression that compensation will be provided for such assistance. Such instances would be considered by FEMA as a request for volunteer resources and treated in that manner. In addition, there are a number of other issues involved with such a solicitation, including licensing, bonding, insurance, the

potential for the communities to incur liability in the event of injury or death, supervision and certification of work done.

B. Contracting Procedures for Immediate Response (Phase I)

Most State procurement regulations allow for abbreviated contract procedures when the Governor declares a State of Emergency. In emergency situations, City Code authorizes the waiver of certain procurement regulations, and grants the City Manager signature authority on contracts to a specified dollar amount.

Although normally not an ideal alternative, the Time and Material (i.e., equipment rental) contract is an acceptable method of contracting during Phase I. Under this type of contract, the contractor is paid on the basis of time spent in accomplishing a particular task. The contract will be set on an hourly basis for the equipment and operator because Phase I debris operations involve primarily equipment usage. Work orders will be issued for a particular piece of equipment and operator for a set number of hours. To ensure competitive bidding, hourly rates will be solicited from several contractors. Additionally, for simplicity, bid requests will specify that the hourly rate includes the operator, fuel, maintenance and repair. This will greatly simplify bookkeeping, auditing and monitoring of the work.

1. A Time and Material contract will clearly state that:
 - a. The price for the equipment applies only when the equipment is operating.
 - b. The hourly rate includes the operator, fuel, maintenance and repair.
 - c. The community reserves the right to terminate the contract at its convenience.
 - d. The community does not guarantee a minimum number of hours.
 - e. The contract has either a dollar ceiling or a not-to-exceed number of hours clause.
2. Time and Material contracts will be limited to a maximum of 70 hours of actual emergency debris clearance work and will be used only after all available City and State government equipment has been committed. Time and Material contracts for debris clearing, hauling and/or disposal will be terminated once the designated not-to-exceed number of hours is reached. On occasion, Time and Material contracts may be extended for a short period when

absolutely necessary, for example, until appropriate Unit Price contracts have been prepared and executed.

3. Supervision of Time and Material contracts is extremely important. Work inspection reports will be prepared each day. These reports will clearly state the amount of work accomplished that day in quantitative terms, such as the number of cubic yards of debris hauled, the type and number of trucks used and the number of hours worked.
4. Load tickets may be used if debris is being hauled based on cubic yards under a Time and Material contract as a way of checking contractor efficiency. Solid Waste inspection personnel will verify certification of work performed and copies of the inspection reports will be furnished to the contractor to expedite the submittal of invoices for payment.

C. Contracting Procedures for Recovery Operations (Phase II)

It will become readily apparent during Phase I whether the magnitude of the debris clearance, removal and disposal operation is within the capabilities of local force account, mutual aid agreements, State and limited contract resources. If it is determined that the situation is beyond the capabilities of existing resources, immediate action must be taken to develop an organization to administer and manage Phase II recovery operations using contractors.

The primary factors influencing Phase II recovery operations are the composition and volume of debris, the size of the area of debris concentration, the location of temporary storage and volume reduction sites, the location of public or private landfill disposal sites, the need for private property debris removal and requirement for site closure and restoration.

D. Unit Price and Lump Sum Contracts

1. Unit Price and Lump Sum contracts are recommended after the immediate response phase.
2. Cost plus percentage-of-cost contracts and contingency contracts are not eligible for FEMA reimbursement and will not be used.
3. A contract proposal will always be structured to encourage prompt performance of the work; however, the proposal will not, by its

requirements, place heavy or unusual risk factors on the contractor. Such risk will be reflected in higher bids.

4. Unit Price Contract - The unit price contract uses construction units and prices for these units to develop line item costs and total contract cost. The unit price contract is used when the scope of work is difficult to define and is based on estimated quantities. It will be noted that the total "bottom line" of the contract could increase or decrease depending upon the accuracy of the final unit quantity. For this reason, it is as important to properly estimate units as it is to estimate unit cost. Change orders to adjust the estimated bid quantity to that quantity actually removed may be issued during or at the end of the contract.
 - a. The advantage of the unit price contract is that the scope of work can be easily increased or decreased, because unit pricing for the work accomplished is established at the time of the bidding process. The contract also provides line items for the contractor to list all charges associated with the work, thereby taking the guesswork out of the contractor's bidding procedure. The units used in the unit price contracts will be as accurately estimated as possible; otherwise, the final amount of the contract could be significantly different from the contract bid received at the bid opening.
 - b. Unit Price Contract Verification - Proper and efficient management of a temporary storage and reduction site or landfill disposal site is essential with unit price contracts because the site becomes the focal point for quantity verification for payment.
 - i. Well-organized and managed inspection stations will be established near the entrance of the site. When the contract unit trucks as they enter the site. If the contract unit of measurement is cubic yards, inspection stands will be built for the inspection of loaded trucks.
 - c. Payment under a unit price contract is normally made on the basis of load tickets. The following procedures will be followed when using load tickets:
 - i. Load tickets will be treated as accounting forms.

- ii. A work site supervisor will examine all contract trucks leaving a designated contract area and record the following information on the load ticket:
 - Preprinted ticket number
 - Contract number
 - Prime Contractor's name
 - Date
 - Truck number
 - Truck capacity in cubic yards
 - Load size, either cubic yards or tons
 - Truck driver's name
 - Debris classification
 - Burnable
 - Non-burnable
 - Mixed
 - Other
 - Zone/Sector
 - Dumpsite location
 - Loading time (from work site)
 - Dumping time (at disposal site)
 - Loading site monitor
 - Dumping site monitor
- d. To expedite filling out the form, all contract trucks will have the contractor's name or initials, the truck number and the measured capacity of the truck, as determined by a government representative, clearly visible on both sides of the vehicle.
- e. The work site monitors will retain one copy of the form, which is returned to the operations office and give two copies to the truck driver after completing the initial information.
- f. The temporary storage and reduction site or disposal site monitor will estimate the volume of debris and note arrival time and volume in cubic yards on the load ticket. The truck driver will keep one copy and the site monitor will keep the other. The site monitor's copy will be returned to the operations office to be matched against the work site inspector's copy for pay verification. The truck driver's copy is the basis of contract billings.

- [illegible]

requires the contractor to conduct a one-time pass to remove all debris from the curbside and deposit it at the local landfill for a fixed fee.

- ii. Pass Method Example - Debris will be placed at the curbside as homeowners repair their homes over a 3-week period. The scope of work requires the contractor to conduct a minimum of three passes throughout the community during the 3-week period (one pass per week) and deposit the debris at the local landfill for a fixed fee.

E. Contract Monitoring Responsibilities

1. The Public Works Director will assign a debris staff member to work directly with other City officials in developing and monitoring debris clearance, removal and disposal contracts. The following will be considered when developing and monitoring local debris removal and disposal contracts:
 - a. Existing landfill capacities
 - b. Tipping fees
 - c. Scale house operations
 - d. Private commercial haulers
 - e. Law enforcement
 - f. Ingress/egress to site
 - g. Site logistics
 - h. Truck weight restrictions
 - i. Highway and bridge weight restrictions
 - j. Household hazardous waste
 - k. Hazardous and toxic waste
 - l. Mixed debris
 - m. Construction and demolition debris
 - n. Ash
 - o. Traffic control
 - p. Illegal dumping
 - q. Environmental issues
 - r. Site closure/restoration requirements
2. Contract Administration - This term is generally used to encompass all of the activities that will take place after a contract is awarded and work commences. Contract administration ensures that the contract is performed as agreed.

3. Monitoring Performance - Continuous monitoring of all activities of a contractor promotes satisfactory performance. In evaluating a contractor's performance, primary interest is in the progress toward completion of the services called for and the financial status of the contract. It is important that the contract provide for submission of reports and payment estimates to aid in evaluating the contractor's progress. In lieu of progress reports, frequent visits to the job sites can be a productive method of monitoring performance.
4. Contract Modification - During the administration of the contract, modifications may be necessary to provide contractual coverage for situations that develop after the contract is awarded. All modifications will be in writing to protect the interests of both parties. The contract will contain a clause that permits the Contracting Officer to make changes unilaterally within the scope of the contract, subject to an equitable adjustment of the contract price.
5. Inspection - The City of North Port will maintain an inspection and control system under their own supervision to ensure that the work being performed complies with the terms of the contract. In addition to load ticketing, the inspection and control process will consider the following factors:
 - a. Bond requirements
 - b. Insurance requirements
 - c. Rights-of-way and indemnification
 - d. Mobilization of proper equipment
 - e. Posting of permits
 - f. Contractor personnel safety standards
 - g. General public safety standards
 - h. Completion schedules
 - i. Clearance procedures
 - j. Demobilization procedures
 - k. Site closure/restoration procedures
6. Acceptance and Payment - Final inspection and the method of interim and final payments are part of the general conditions of the contract. The following will be set forth in the original specification or other contract documents:
 - a. Parts of or all of the work will be accepted only after verification through the inspection process that the work

was performed in accordance with the standards stipulated in the contract.

- b. If the contract period is less than one calendar month, normal payment will be made in one total sum. In the event the authorized work tenure exceeds a period of one month, provisions can be made to make progress payments to the contractor at least monthly.
7. Closing Out Contracts - A contract is complete when all of the services or items called for have been delivered or performed and accepted. The contract is not administratively complete, however, until all actions taken in compliance with the contract have been properly documented and final payment has been made.

VI. SPECIAL DEMOLITION AND DEBRIS REMOVAL SITUATIONS

This section provides guidance on private property demolition and removal of debris from mobile home parks and waterways that may present a health and safety hazard.

A. Private Property Demolition and Debris Removal

1. Although flood insurance policies do not provide coverage for debris removal, most homeowner, fire and extended coverage insurance policies have specific coverage for debris removal from private property and for demolition of heavily damaged structures.
2. Demolishing or securing remaining structures that threaten the health and safety of adjacent residents will be the responsibility of the owner or local government; however, experience has shown that unsafe structures will remain because of lack of insurance, absentee landlords, or understaffed and under-equipped local governments. Consequently, ensuring the demolition of these structures may become the responsibility of the local Public Works Director and staff, which requires complete cooperation of numerous local and State government officials and may require resources from any or all of the following:
 - a. Tax office
 - b. Local law and/or code enforcement agencies
 - c. State Historic Preservation Office
 - d. Environmental contractors qualified to remove asbestos and lead-based paint

- e. Field teams to photograph and document the sites before and after demolition. Health and Safety program requirements contained in 29 and 40 CFR will be adhered to with respect to hazardous waste. When removing any suspected hazardous waste workers will only work in well-ventilated areas, wear chemical protective clothing and evacuate the area if a chemical odor is noticed.
- 3. Demolition of private property will present significant coordination problems. The checklist shown below identifies key tasks that local officials will perform before the structure is approved for demolition. To expedite the overall effort, many of the tasks will be conducted concurrently.
- 4. Private Property Documentation Checklist
 - a. Obtain copies of all ordinances that authorize the community to condemn privately-owned structures. The authority to condemn privately-owned structures might be different from the authority for the demolition of publicly owned structures.
 - b. Coordinate use of adjacent lands, easements and rights-of-way necessary for accomplishing the approved work.
 - c. Implement laws that reduce the time it takes to go from condemnation to demolition.
 - d. Obtain copies of all applicable permits required for demolition of subject structure(s).
 - e. Document the age of the structure to determine if eligible or on the National Registration of Historic Places with the SHPO.
 - f. Obtain copies of pertinent temporary well-capping standards.
 - g. Obtain executed right-of-entry and hold harmless agreements that have been signed by the owner and by renter, if rented. Right-of-entry will indicate any known intent by owner to rebuild to ensure foundation and utilities are not damaged. If these agreements are not executed, document reason(s).
- 5. Agreement example
 - a. Use radio, public meetings and newspaper ads to give notice to property owners and their renters to remove personal property in advance of demolition.

- b. Document name of owner on the title, the complete address and legal description of the property and the source of this information.
- 6. Document name of renter, if available
 - a. Ensure property will be vacated by demolition date.
 - b. Provide written notice to property owners that clearly and completely describe the structures designated for demolition. Additionally, provide a list that identifies related structures, trees, shrubs, fences and other items to remain on the respective property.
 - c. Notify mortgagor of record.
 - d. Provide the property owner the opportunity to participate in the decision on whether the property can be repaired.
 - e. Determine the existence and amount of insurance on the property prior to demolition.
 - f. Specify procedures to determine when cleanup of a property is completed.
- 7. Private Property Inspection Checklist
 - a. Coordinate all pertinent site inspections with local, State and Federal inspection team(s). Identify asbestos and lead-based paint materials prior to demolition.
 - b. Notify the owner and/or renter of all site inspections.
 - c. Verify that all personal property has been removed from private structure(s).
 - d. Immediately prior to demolition, verify that the building is unoccupied.
 - e. Ensure that the property is properly posted.
 - f. Obtain a clear, concise and accurate property description and demolition verification.
 - g. Include a Public Health official on the demolition inspection team.
 - h. Evaluate the structural integrity of the building and also demonstrate "imminent and impending peril" to public health and safety caused by the structure.
 - i. Make arrangements to remove and transport all asbestos and lead-based paint materials to a permitted facility prior to building demolition.
 - j. Obtain photographs of the property and verify the address. Provide additional photographs of the property taken immediately prior to and following demolition.

8. Private Property Utilities Checklist
 - a. Locate, mark, turn off and disconnect all water and sewer lines.
 - b. Locate, mark, turn off and disconnect electrical, telephone and cable television services.
 - c. Locate, mark, turn off and disconnect gas service.
9. Private Property Demolition and Debris Removal Checklist - The following actions will require close coordination when removing debris from demolished buildings on private property:
 - a. Ensure that buildings have been properly condemned according to local ordinances.
 - b. Ensure that right-of-entry and hold harmless agreements are properly executed.
 - c. Ensure that local officials remove any legal residents or squatters from the building before demolition and debris removal begins.
 - d. Ensure that buildings identified for demolition are properly inspected to verify that they are unsafe, cannot be repaired and present a hazard to the community.
 - e. Ensure that the inspection team includes a structural engineer and a hazardous materials specialist. Any household hazardous waste, such as paints, oils, cleaning supplies and pesticides that are found will be removed prior to demolition. Houses that contain asbestos or lead-based paint will be demolished and debris removed according to current environmental regulations under a separate contract.
 - f. Local code enforcement officers will accompany the contractor to ensure that they do not tear down the wrong house. The responsibility is on the community to identify the correct structure.
 - g. Demolition work and debris removal will be coordinated with utility companies to ensure that all services are turned off.

B. Mobile Home Park Debris Removal

1. Post-Disaster Requirements - Hurricanes and tornadoes can cause severe damage to mobile homes and create extensive amounts of mixed debris confined to relatively small areas. The following are examples that comprise mixed debris:

- a. Tree blow-down
 - b. Out buildings
 - c. Screened porches
 - d. Mobile home frames
 - e. Personal property, such as clothing, food and furniture
 - f. Appliances, such as stoves, refrigerators, washers and dryers
 - g. Household cleaners and paints
 - h. Propane and oxygen tanks
 - i. Gasoline, oil and lubricants
 - j. Automobiles, trucks and boats
 - k. Bicycles and lawn mowers
 - m. Utility hookups
2. Local mobile home parks will be surveyed and arrangements will be made with park owners for City resources or contractors to clear the parks of debris. The Public Works Director and staff will need to closely coordinate the cleanup activities and enforce condemnation procedures. Legal, health and safety concerns will have an important impact on the debris removal activities.
3. Planning Issues - Prior to a major natural disaster, local officials will do the following:
 - a. Develop generic scopes of work for debris removal.
 - b. Identify sites suitable for temporary storage of mobile home debris.
 - c. Prioritize mobile home parks for debris removal.
 - d. Develop a set of procedures to be followed that will combine debris removal activities and utility repair/replacement at mobile home parks into a single operation.
4. Documentation Checklist - City officials will provide the following documentation:
 - a. Copies of the local ordinance authorizing condemnation of mobile home parks. Condemnation for health issues is associated with prolonged exposure of trailer contents to the natural elements.
 - b. A copy of the local government resolution with appropriate recitals required to support adoption or enactment of ordinances to condemn, demolish and remove mobile home park contents.

- c. Maps showing easements and rights-of-way access to the property.
 - d. Documentation signed by the mobile home park owner and mobile home owner that holds the local, State or Federal government free from liability for damage caused by the requested work and indemnifies the local, State or Federal government against any claims arising from such work.
 - e. Documents allowing right-of-entry to the mobile home parks.
 - f. Notice to individual mobile home owners to remove items of personal property in accordance with local ordinances.
 - g. Documentation providing the names of mobile home parks and of mobile home park owners, complete addresses and legal descriptions of the properties and limits, if any, of debris clearance to occur within the parks. Additional materials will include plats of the mobile home parks and any information about existing utilities.
 - h. Standards for capping all utilities.
 - i. All applicable permits necessary for any demolition work in the mobile home park.
5. Inspection Prior to Debris Removal - City officials will perform the following actions:
- a. Ensure that the mobile home park will be vacated prior to the removal of any debris from the site.
 - b. Describe clearly and completely the extent of debris removal required within the mobile home park. Specify any structures, other than mobile homes, that are to be removed.
 - c. Locate and estimate amount of household hazardous waste within the park and ensure that appropriate procedures are established for separation and removal of such materials prior to debris removal. Household hazardous waste typically found on-site includes cleaning supplies, propane tanks, paint cans, paint thinners, pesticides, refrigerators and freezers. A qualified environmental contractor will be hired to ensure proper removal and disposal of asbestos, lead-based paint and other commercial, agricultural or industrial hazardous waste.
 - d. Conduct initial inspections of the mobile home park with representatives from the local government, public health office, building and zoning office, real estate office and other State and Federal officials.

- e. Ensure that the contract scope of work reflects findings of the field inspection.
 - f. Ensure that the mobile homes are unoccupied.
 - g. Ensure that the property is posted in accordance with local regulations and that mobile home owners have removed their personal property.
 - h. To avoid subsequent disputes, ensure that any agreement made with the mobile home park owner is in writing.
 - i. Obtain photographic documentation of mobile home sites prior to commencement of work.
 - j. Have organic and perishable materials removed from the site.
6. Mobile Home Park Utilities - City officials will accomplish the following actions:
- a. Consider whether using heavy equipment will cause further damage to existing utilities.
 - b. Be responsible for turning off utility services, such as water, telephone, electricity, natural gas and propane gas.
 - c. Flag septic tank locations prior to debris removal. Special care must be given to protect septic tanks during debris removal operations.

C. Debris Removal Contracts

1. Contracts will include provisions for the following:
- a. Provide that all private automobiles are stored in a specific location within the park to be retrieved later by the owners.
 - b. Provide salvage rights to the contractor for materials remaining on-site at the time of debris removal where beneficial to the government.
 - c. Require flagging of existing utilities prior to debris removal.
 - d. Use rubber tire vehicles and backhoe with grapple attachments to protect existing utilities.
 - e. Require the contractor to phase debris removal operations to allow utility repair and or replacement to begin immediately after an area has been cleared. Navigation Hazard Removal
2. Coordination - Damage to publicly-owned marinas caused by a major natural disaster can include abandoned sunken boats and other debris that may impede navigation. The Public Works Director and staff will coordinate with the U.S. Coast Guard, Florida

Fish and Wildlife Commission, legal counsel, contractors specializing in marine salvage operations, commercial divers and certified surveyors to ensure that navigation hazards are removed safely and efficiently.

VII. TEMPORARY DEBRIS STORAGE SITE OPERATIONS AND VOLUME REDUCTION METHODS

The preparation and operation of a temporary debris storage and reduction site are usually left to the contractor. However, the Public Works Director and debris staff will understand how a temporary debris storage and reduction site is set up and operated. This information will be extremely valuable in developing ultimate disposal plans, keeping local government officials and the public informed on debris clearance, removal and disposal operations and ensuring compliance with various regulations. This section provides guidelines on temporary site operations, the handling of household hazardous waste and the volume reduction methods in priority of recycling, , chipping, grinding and incineration.

A. Temporary Debris Storage Site

1. Site Preparation - The topography and soil/substrate conditions will be evaluated to determine best site layout. When planning site preparation, think of ways to make site closure and restoration easier. For example, if the local soils are very thin, the topsoil can be scraped to bedrock and stockpiled in perimeter berms. Upon site closeout, the uncontaminated soil can be re-spread to preserve the integrity of the tillable soils.
2. Site Operations - Lined temporary storage areas will be established for ash, household hazardous waste, fuels and other materials that may contaminate soils and groundwater. Plastic liners will be placed under stationary equipment such as generators and mobile lighting plants. These actions will be included as a requirement in the contract scope of work.
 - a. If the site is also an equipment storage area, fueling and equipment repair will be monitored to prevent and mitigate spills of petroleum products and hydraulic fluids. Include clauses in the contract to require immediate cleanup by the contractor.
 - b. Be aware of and lessen the effects of operations that might irritate occupants of neighboring areas. Establishment of a

- buffer zone can abate concerns over smoke, dust, noise and traffic.
- c. Consider on-site traffic patterns and segregate materials based on planned volume reduction methods.
 - d. Operations that modify the landscape, such as substrate compaction and over excavation of soils when loading debris for final disposal, will adversely affect landscape restoration.
 - e. Debris removal and disposal will be viewed as a multi-staged operation with continuous volume reduction. There will be no significant accumulation of debris at temporary storage sites. Instead, debris volume will be constantly reduced and residue sent to recyclers, incinerators or a landfill in that priority.
3. Baseline Data Collection - Private land and public land used as debris storage and reduction sites will be returned to its original condition following site closeout. Baseline data are essential to document the condition of the land before it is used as a debris storage and reduction site. As soon as a site is selected, the Public Works Director and staff will work closely with County and State officials to develop baseline data. The following actions will be taken to develop baseline data on all selected sites:
- a. Videotape and Photograph the Site - Thoroughly videotape and/or photograph (ground or aerial) each site before any activities begin and periodically update video and photographic documentation to track site evolution.
 - b. Document Physical Features - Notations about existing structures, fences, culverts, irrigation systems and landscaping can help evaluate possible damage claims made later.
 - c. Sample Soil and Water - Random soil samples can be easily collected prior to volume reduction activities. More time-consuming groundwater sampling can be done soon after operations commence. Household hazardous waste, ash and fuel storage areas will be sampled prior to site setup. Advance planning with community and State environmental agencies can establish requirements, chain of custody, acceptable collection methods, certified

laboratories and test parameters. If in-house assets are not available, consider establishing an off-the-shelf contract with an environmental consulting firm that can respond rapidly.

- d. Sketch Site Operation Layout - Periodically map or sketch activity locations so that areas of concern can be pinpointed later for additional sampling.
- e. Document Quality Assurance Issues - Document contractor operations that will have a bearing on site closeout, such as petroleum spills at fueling sites, hydraulic fluid spills at equipment breakdowns, contractor installation of water wells for stock pile cooling or dust control, discovery of household hazardous waste in debris and details on any commercial, agricultural or industrial hazardous and toxic waste storage and disposal.
- f. Plan Environmental Remediation - Final restoration of the landscape must be acceptable to the landowner. Therefore, plan the landscape restoration as early as possible, preferably incorporating a basic plan in the lease. Come to an agreement with the landowner prior to occupancy to establish reasonable expectations of site conditions upon site closeout.
- g. Baseline Data Checklist - The following is a suggested baseline data checklist:
 - i. Before activities begin
 - Take ground or aerial video/photographs.
 - Note important features, such as structures, fences, culverts and landscaping.
 - Check with the State Historic Preservation Officer to determine if any structures identified are listed on or eligible for the National Register of Historic Places.
 - Take random soil samples.
 - Take water samples from existing wells.
 - Check the site for volatile organic compounds.
 - ii. After activities begin

- Establish groundwater monitoring wells.
 - Take groundwater samples.
 - Take spot soil samples at household hazardous waste, ash and fuel storage areas.
- iii. Progressive updates
- Update videos and photographs.
 - Update maps and sketches of site layout.
 - Update quality assurance reports and fuel spill reports.

B. Household Hazardous Waste

1. Pre-Disaster Planning - The Public Works Director and staff are aware of the effects that household hazardous waste can have on the overall debris clearance, removal and disposal mission. Pre-disaster planning will include having professional hazardous waste response teams assigned ahead of time to provide assistance in identifying and disposing of household hazardous waste.
 - a. Household hazardous waste generated by a natural disaster may consist of common household cleaning supplies, pesticides, motor oil, lubricants, transmission and brake fluid, gasoline, anti-freeze, paints, propane tanks, oxygen cylinders and auto/marine batteries. Household hazardous waste may become mixed with other debris, requiring close attention throughout the debris clearance, removal and disposal process.
 - b. White goods are defined as discarded household appliances such as refrigerators, freezers, air conditioners, heat pumps, ovens, ranges, washing machines, clothes dryers, and water heaters. Many white goods contain ozone-depleting refrigerants, mercury, or compressor oils. The Clean Air Act prohibits the release of refrigerants into the atmosphere, and requires that certified technicians extract refrigerants from white goods before they are disposed of or recycled. Some States also require certified technicians to extract compressor oils before disposing of or recycling white goods. Applicants should follow all Federal, State, and local requirements concerning ozone-depleting refrigerants, mercury, or oils. Documentation of proper disposal may be required for Public Assistance grant consideration.

- c. The Public Works Director and staff will implement the following pre-disaster planning actions:
 - i. Assign trained hazardous waste response teams to collect, sort, store and dispose of excessive quantities of household hazardous waste.
 - ii. Have emergency hazardous waste contracts in place or prepare generic scopes of work that can be fine-tuned with minimal effort for removal and disposal of accumulated household hazardous waste.
 - iii. Coordinate with County, State and Federal regulatory agencies concerning possible regulatory waivers and other emergency response requirements.
- 2. Removal and Disposal Operations - Household hazardous waste items will be segregated at curbside or brought to a designated drop-off site. Specially trained field technicians can identify dangerous product constituents, segregate incompatible chemicals and properly store or pack the waste for transportation to a facility specially permitted to accept hazardous waste. The following actions are required to ensure that household hazardous waste items are removed and disposed of safely:
 - a. Where possible, separate household hazardous waste from other debris before removal. Arrange for salvageable household hazardous waste materials to be collected and segregated based on their intended use.
 - b. Properly trained environmental contractors or emergency response personnel will remove industrial, commercial or agricultural hazardous and toxic waste.
 - c. Maintain contact with regulatory agencies to ensure cleanup actions meet County, State and Federal regulations.
 - d. Complete household hazardous waste identification and segregation before any demolition work begins.
 - e. Qualified environmental contractors will remove any questionable debris that may be contaminated by household or commercial hazardous waste.
 - f. Regular demolition contractors can remove uncontaminated debris.
- 3. Special Handling at Temporary Storage Sites - A separate storage area for household hazardous waste materials, contaminated soils

and contaminated debris will be established at each site. The household hazardous waste storage site will be lined with an impermeable material and bermed to prevent contamination of the groundwater and surrounding area. Household hazardous waste materials will be removed from the temporary storage area and disposed of by a qualified environmental contractor in accordance with County, State and Federal regulations.

C. Commercial, Agricultural and Industrial Hazardous and Toxic Waste

1. Removal and disposal of large quantities of commercial, agricultural and industrial hazardous and toxic waste, such as asbestos, lead-based paint, pesticides, or fertilizers, may require the use of professional hazardous and toxic waste contractors. A contractor's inspection team will do the following:
 - a. Establish contacts with County, State and Federal regulatory agencies.
 - b. Interview tenants and building owners.
 - c. Assess sites to document potential commercial or agricultural hazardous and toxic waste problems.
 - d. Search buildings to establish potential hazards, such as asbestos, lead-based paint and underground tanks.
 - e. Prioritize problems based on risk to human health and safety.

D. Volume Reduction Methods Listed by Priority

1. Volume Reduction by Recycling - Recycling will be considered early in the debris clearance, removal and disposal operation because it may present an opportunity to reduce the overall cost of the operation. Metals, wood and soils are prime candidates for recycling.
 - a. Hurricanes and earthquakes may present opportunities to contract large-scale recycling operations and achieve an economic return from some of the prime contractors who exercise their initiative to segregate and recycle debris as it arrives at the storage and reduction sites.
 - b. Specialized contractors will be available to bid on disposal of debris by recycling, if it is well sorted. Contracts and monitoring procedures will be developed to ensure that the recycling contractors comply with County, State and Federal environmental regulations.

- c. Residue that cannot be recycled, such as cloth, plastic, mattresses, rugs and trash, will be shredded to reduce volume before being sent to a landfill for final disposal.
- d. The following materials are suitable for recycling:
 - i. Metals - Hurricanes and tornadoes can cause extensive damage to mobile homes, sun porches and green houses. Most of the nonferrous and ferrous metals are suitable for recycling. Metal maulers and shredders can be used to shred trailer frames, trailer parts, appliances and other metal items. Ferrous and non-ferrous metals are separated using an electromagnet and then sold to metal recycling firms.
 - ii. Soil - Cleanup operations using large pieces of equipment pick up large amounts of soil. The soil is transported to the temporary combined with other organic materials that will decompose over time. Large amounts of soil can be recovered if the material is put through some type of screen or shaker system. This procedure can produce significant amounts of soil that can either be sold or recycled back into the agricultural community. It is more expensive to transport and pay tipping fees at local before moving the material. Shakers can be used to remove dirt from mixed debris. The cover material or sold to the agricultural community.

In agricultural areas where chemical fertilizers are used heavily, recovered soil may be too contaminated for use on residential or existing agricultural land. Monitoring and testing the soil may be necessary to ensure that it is not contaminated with chemicals. If the soil is not suitable for any agricultural use and is a risk to the public health, it may be used as cover material at a landfill.
 - iii. Construction Materials - Construction and demolition waste is material generated in the demolition of disaster damaged structures and facilities. This waste stream includes concrete,

asphalt, gypsum, wood waste, glass, red clay bricks, clay roofing tile and asphalt roofing tile. Much of this material can be recycled, if recycling contractors are readily available.

- iv. Wood - Clean, woody debris can be ground, chipped, shredded, or removed by timber operations or pulpwood cutters.
2. Volume Reduction by Grinding and Chipping - Hurricanes, tornadoes and ice storms may present the opportunity to employ large-scale grinding and chipping operations as part of the overall debris volume reduction strategy. Hurricanes can blow away scarce topsoil in the agricultural areas and cause extensive tree damage and blow-down. This two-fold loss, combined with local climatic conditions, may present an opportunity to reduce clean, woody debris into suitable mulch that can be used to replenish the topsoil and retain soil moisture.
- a. The economic feasibility of grinding and chipping woody debris must be studied carefully. The cost of chipping and grinding is basically equal to that of incineration; however, there are significant differences in volume reduction. Incineration, for example, reduces the volume approximately 95%, leaving only an ash residue for disposal. Chipping and grinding reduces the volume on a 4-to-1 ratio (four cubic yards is reduced to one cubic yard) or by 75%. For chipping and grinding to be feasible, the 25% of volume remaining must have some benefit or use. The ability to use the recycled wood chips as mulch for agricultural purposes or as fuel for industrial heating or in a cogeneration plant helps to tip the economic scale toward chipping and grinding. Because of shallow topsoil conditions in some locations, mulch is a desirable product. In other locations, however, the mulch may become nothing more than a landfill product. The Public Works Director and staff will work closely with local environmental and agricultural groups to determine if there is a market for mulch.
 - b. There are numerous makes and models of grinders and chippers on the market. When contracting, the most important item to specify is the size of the mulch. If the grinding operation is strictly for volume reduction, size is not important; however, mulch to be used for agricultural

purposes must be of a certain size and virtually free of paper, plastic and dirt.

- c. Grinders are ideal for use at debris storage and reduction sites because of their high volume reduction capacity. However, there is a need for a large area to hold the resulting mulch. Ingress and egress to the site is also an important consideration. Finally, properly locating the grinders is critical for noise and safety considerations.
- d. The following specifications will provide a mulch product that is suitable for agricultural purposes:
 - i. The average size of wood chips produced will not exceed four inches in length and ½ inch in diameter.
 - ii. Production output will average 100 to 150 cubic yards per hour when debris is moderately contaminated with plastic and dirt and feeding operations are slow and 200 to 250 cubic yards per hour for relatively clean debris. Note that this is not machine capability; this is contractor output or performance capability.
 - iii. Chips or mulch will be stored in piles no higher than 15 feet and located so as not to hinder hauling operations.
 - iv. Contaminants are all materials other than wood products and will be held to 10% or less for the mulch to be acceptable.
 - v. Plastics will be eliminated completely. To help eliminate contaminants, root rake loaders will be used to feed or crowd materials to the chipper or grinder. Bucket-loaders tend to scoop up earth, causing excessive wear to the grinder or chipper. Hand laborers will remove contaminants prior to feeding the grinders. Shaker screens will be used when processing stumps with root balls or when large amounts of soil are present in the woody debris. The separated soil can also be recycled back to the agricultural community.
- e. Brush chippers are ideal for use in residential areas, orchards, or groves. The damaged and uprooted trees present significant problems if they are pushed to the right-of-way to wait for eventual pick-up and transport to storage and reduction sites. In addition, the use of on-site chippers

allows the material to be used as mulch in the area where it is chipped, thereby saving the cost of transporting it.

3. Volume Reduction by Incineration - There are several incineration methods available for volume reduction. Each method will be considered in developing a volume education strategy. The appropriate State regulatory agencies (e.g., Department of Environmental Protection and Florida Forest Service) will be contacted to acquire all respective permits for burn authorizations when using this option as a reducing technique. This will include permits for the disposal of all products of incineration.
4. Uncontrolled Open-Air Incineration - The least desirable method of volume reduction is uncontrolled open-air incineration because it lacks any type of environmental control. However, in the haste to make progress, local officials and/or independent landowners may employ this method early in a disaster. Uncontrolled open-air incineration will be closely monitored to ensure that only clean, woody debris is incinerated.
5. Controlled Open-Air Incineration - Controlled open-air incineration is a cost-effective method for reducing clean, woody debris in rural areas. Incineration of clean woody debris presents little environmental damage and the local agricultural community can use the resulting ash as a soil additive. Local agricultural extension personnel will be consulted to determine if the resulting ash can be recycled as a soil additive. The controlled open-air incineration option will be terminated if mixed debris enters the waste stream.
6. Air Curtain Pit Incineration - Air curtain pit incineration offers an effective means to expedite the volume reduction process while substantially reducing the environmental concerns caused by open-air incineration. The air curtain incineration method uses a pit constructed by digging below grade or building above grade (if a high water table exists) and a blower unit. The blower unit and pit comprise an engineered system that must be precisely configured to function properly.
 - a. The blower units deliver air at predetermined velocities and capacities. The blower unit must have adequate air velocity to provide a "curtain effect" to hold smoke in and to feed air to the fire below. A nozzle 20 feet long will provide air at a velocity of over 120 miles per hour and will deliver over 20,000 cubic feet of air per minute to the fire. The air traps smoke and small particles and re-circulates them to

enhance combustion, which reaches over 2,500 degrees Fahrenheit. Manufacturers claim that combustion rates of approximately 25 tons per hour are achievable while still meeting emission standards.

- b. Specifications and statements of work will be developed to expedite the proper use of the system. Before awarding a contract, the Public Works Director and staff need to ensure that the contractors are knowledgeable about air curtain pit incinerator design and operating procedures.
 - c. Following are recommendations and warnings to assist the Public Works Director and debris staff in planning for air curtain pit incineration operations:
 - i. Be aware that there are no industrial standards for air curtain pit incinerator operations. The set-up has to be customized using the information provided by the manufacturer and will consider such specifications as minimum blower air velocity, pit construction configuration, pit materials, ash handling, acceptable smoke levels and air monitoring requirements.
 - ii. Pits must be constructed out of a highly compacted material that will hold its shape.
 - iii. The water table elevation governs whether the pit is constructed above or below grade.
 - iv. Controls will be implemented to prevent contamination of the ground water. An acceptable solution is to use compacted limestone fill placed over an impervious clay layer.
 - v. Planners will take the initiative in keeping the public informed. Local officials, environmental groups and local residents will be thoroughly briefed on the incineration means being used, how the systems work, environmental standards, health issues and the risk associated with each type of incineration. A proactive public information strategy will be included in any operation that uses incineration as a primary means of volume reduction.
7. Portable Air Curtain Incinerators - Portable incinerators use the same methods as air curtain pit incinerator systems. The only difference is that portable incinerators off-site constructed earth/limestone pit. Portable air curtain incinerators are the most

efficient incineration systems available because the pre-manufactured pit is engineered to precise dimensions to complement the blower system. The pre-manufactured pit requires little or no maintenance as compared to earth/limestone constructed pits, which are susceptible to erosion. Portable air curtain units are ideal for areas with high water tables and sandy soils and areas where smoke opacity must be kept to a minimum.

8. Environmental Controls - The following are recommended environmental controls for all incineration methods:
 - a. A setback of at least 100 feet will be maintained between the debris piles and the incineration area. Keep at least 1,000 feet between the incineration area and the nearest building. Contractors will use fencing and warning signs to keep the public away from the incineration area.
 - b. The fire will be extinguished approximately two hours before anticipated removal of the ash mound. The ash mound will be removed when it reaches two feet below the lip of the incineration pit.
 - c. The incineration pit will be either constructed above ground or below ground so that it is less than eight feet wide and between nine and 14 feet deep.
 - d. The incineration pits will be constructed with limestone and reinforced with earth anchors or wire mesh to support the weight of the loaders. There will be a one foot impervious layer of clay or limestone on the bottom of the pit to seal the ash from the aquifer.
 - e. The ends of the pits will be sealed with dirt or ash to a height of four feet.
 - f. A 12-inch dirt seal will be placed on the lip of the incineration pit area to seal the blower nozzle. The nozzle will be three to six inches from the end of the pit.
 - g. There will be one foot high nonflammable warning stops along the edge of the pit's length to prevent the loader from damaging the lip of the incineration pit.
 - h. To prevent explosions, hazardous or contaminated flammable material will not be placed in the pit.
 - i. The airflow will hit the wall of the pit approximately two feet below the top edge of the pit opposite the blower and the debris will not break the path of the airflow except during dumping.
 - j. The pit will be no longer than the length of the blower system and will be loaded uniformly along its length.

- k. Check with appropriate State agencies for Florida-specific requirements.
9. Smoke - Smoke generated by any of the above incineration methods is often interpreted by the general public as having an environmental impact. Therefore, it is important to also address smoke as part of the air monitoring guidelines. The visual measure of smoke emitted by a burning source is referred to as its "opacity." For disaster situations, the recommended opacity requirements will be set at 15% for 50 minutes out of an hour, not to exceed 40% for the remaining 10 minutes. This allows for additional debris that may be put into the incinerator during that hour. A 30-minute start-up time with a maximum of 40% opacity will be allowed.

VIII. TEMPORARY DEBRIS STORAGE AND REDUCTION SITE ENVIRONMENTAL CONSIDERATIONS

Debris clearance, removal and disposal activities can have significant environmental ramifications. The temporary storage and reduction sites must be setup, operated and closed out properly to minimize environmental harm. This section provides guidelines for air quality monitoring and site closeout procedures, including ash, soil and groundwater testing.

A. Air Quality Monitoring

1. Following a major natural disaster, emphasis is on rapid debris removal from the public rights-of-way. This results in debris coming into a temporary storage site faster than it can be reduced and ultimately disposed of. As a result, organic matter in debris piles begins to decompose and may create toxic or volatile vapors. Incineration operations may also produce pollutants that impact the air quality of the area. Air quality must be monitored to ensure compliance with County, State and Federal environmental regulations.
2. Air quality monitoring will be instituted at all debris storage and reduction sites to check for volatile organic vapors of a petrochemical origin and airborne pollutants caused by incineration operations.
3. Actions will be taken by the temporary debris storage and reduction site operators to keep pollutants at or below acceptable local, State and Federal environmental standards. Testing procedures will include readings for ozone, carbon monoxide,

nitrogen dioxide, sulfur dioxide, lead and particulate matter smaller than 2.5 microns.

4. Flame- and photo-ionization detectors will be used to detect volatile organic vapors. The flame-ionization detector is used to establish parts-per-million at the debris pile. If readings are above acceptable standards, the photo-ionization detector will be used to verify the initial readings.
5. Incineration site readings will be taken at the edge of the incineration pit and approximately 150 feet away. Scattered locations will be established and checked periodically. Wind direction, temperature and any other pertinent meteorological information will be recorded.
6. Coordinate with the appropriate County, State and Federal environmental agency responsible for implementing the Quality Assurance Sampling Plan.
7. The following situations may negatively affect the air quality at a temporary storage and reduction site:
 - a. The incineration pit is not properly constructed.
 - b. The incineration pit has degraded to the point where key specifications are no longer met.
 - c. A poorly trained operator improperly feeds the pits.
 - d. The material is not properly segregated.
 - e. Prolonged rains may accelerate the decomposition process, thereby causing the emission of volatile organic gases. Site Closeout Procedures
8. Each temporary debris storage and reduction site will eventually be emptied of all material and restored to its previous condition and use. The contractor must assure the Public Works Director and staff that all sites are properly restored. Local, State and Federal government monitors will verify this. Site restoration will go smoothly if baseline data were properly collected and site operation procedures were followed.

B. Site Closeout Procedures

1. The key to timely closeout of the sites is the efficient advance scheduling of activities for multiple sites.
2. The basic closeout steps are:

- a. Remove all debris from the site.
 - b. Conduct an environmental audit or assessment.
 - c. Develop a restoration plan.
 - d. Submit the plan for review and approval by the appropriate State regulatory agency
 - e. Execute the plan
 - f. Get acceptance from the landowner
 - g. Terminate lease payments
3. Potential Problems:
- a. The length and terms of private property leases can create suspense dates that become very costly to meet and difficult to manage.
 - b. Differences between local, State and Federal government environmental regulations may cause problems.
 - c. Failure to collect baseline data can result in fraudulent claims for damage to nonexistent structures or the land itself. Videotape recordings and/or photographs will be taken prior to opening a site to prevent fraudulent claims. Background soil and water samples will also be taken before site activities begin to compare with closeout soil and water samples.
4. Planning Requirements - The following planning requirements will be implemented to closeout a temporary storage and reduction site:
- a. Coordinate with local and State officials responsible for construction, real estate, contracting, project management and legal counseling regarding requirements and support for implementation of a site restoration plan.
 - b. Establish a testing and monitoring program for air, ash, soil and groundwater.
 - c. Ensure that the contractors are required to remove all residual debris from temporary sites to approved landfills prior to closure.
 - d. Reference appropriate and applicable environmental regulations.
 - e. Prioritize site closures.
 - f. Schedule closeout activities.
 - g. Develop cost estimates.
 - h. Develop decision criteria for certifying satisfactory closure based on limited baseline information.

- i. Develop administrative procedures and contractual arrangements for site closeout.
 - j. Designate approving authority to review and evaluate contractor closure activities and progress.
 - k. Retain staff during the closure phase to develop site-specific restoration actions.
5. Temporary Site Closure Checklist - The following is a recommended temporary site closure checklist. Narrative responses may be required along with other closure documents.
- a. Site number and location
 - b. Date closure complete
 - c. State regulatory permits observed
 - d. Household hazardous waste removed
 - e. Contractor equipment and temporary structures removed
 - f. Contractor petroleum spills cleaned
 - g. Ash piles removed
 - h. Comparison of baseline information to conditions after the contractor has vacated the temporary site
 - i. Appendices
 - j. Closure documents
 - k. Contracting status reports
 - l. Contract
 - m. Testing results
 - n. Correspondence
 - no. Narrative responses

C. Ash, Soil and Groundwater Testing

Ash, soil and groundwater need to be tested to determine that no long-term environmental contamination is left on the site. High levels of site activity may require additional testing and contaminated material may need to be disposed of in an approved landfill.

1. Ash Testing - All ash piles will be tested using the Toxicity Characteristic Leaching Procedure. One composite sample from each separate ash pile will be analyzed. A minimum of ten samples taken from different strata within the pile is appropriate to develop the composite sample. If unacceptable contamination is not found, ash may be placed in a Class I landfill. If unacceptable levels of contamination are detected, the material will be further evaluated, if appropriate and placed in a hazardous material landfill, as appropriate.

2. Soil Testing - After the stockpiles are removed from the site, soils will be tested for the presence of volatile hydrocarbon contamination. Samples will be taken immediately below the surface, if it is determined that the contractor spilled hazardous materials, such as oil or diesel fuel, on the site.

The entire incineration site will be inspected for any areas of discoloration, odor, or obvious problems. Such areas will be identified and restored, as necessary.

3. Groundwater Testing - Runoff from the incineration sites and other debris stockpiled within storage areas have the potential to contaminate the aquifer. Although the probability of contamination is low, consideration will be given to placing ground water monitoring wells around the perimeter of the site, if it is adjacent to an important aquifer. Groundwater will be tested to determine the probable effects of rainfall leaching through either the ash areas or the stockpile areas and be compared to generally accepted water quality standards.

APPENDIX A

U.S. ARMY CORPS OF ENGINEERS

HURRICANE DEBRIS ESTIMATING MODEL

Background

- The U.S. Army Corps of Engineers (USACE) emergency management staff has developed a modeling methodology designed to forecast potential amounts of hurricane generated debris, based on actual data from Hurricanes Frederic, Hugo and Andres
- The estimated quantities produced by the model have a predicted accuracy of plus or minus 30%
- The primary factor used by the model is the number of households in a developed urban/suburban area
- Other factors utilized are:
 1. Cubic yards of debris generated per household per storm category
 2. Vegetative cover
 3. Commercial density
 4. Precipitation
- Household debris includes damage to the house, contents and surrounding shrubs/trees
- Vegetative cover includes all trees and shrubbery located along public rights-of-way, parks and residential areas
- Commercial density includes debris generated by damage to businesses and industrial facilities
- Private contractors will remove the majority of commercial related debris; however, disposal/reduction space is still required
- Very wet storms will cause ground saturations, increasing tree fall

Initial Planning Data

- For planning purposes, the worst case scenario should be used for the subject area
- The most accurate process is to determine the defined areas by using Doppler radar (National Weather Service Broadcasts) and geographical information systems (GIS)
- Doppler radar will define the storm's intensity and the exact track of the eye of the storm in relation to the affected area
- Track the storm and plot the eye path and 5-mile wide bands out from the eye to defined areas and estimate wind speeds
- The wind speed of the eye wall normally determines the reported storm category with the outward or 5-mile bands being a lesser category
- Track to storm inland until the wind speeds dissipate below hurricane strength

- Divide outlined areas by storm category
- Enter coordinates into a GIS database to determine areas and demographic information such as: Populations, Schools and Businesses

STEP 1 –ESTIMATED DEBRIS QUANTITIES

The formula used in this model will generate debris quantity as an absolute value based on a known/estimated population or a debris quantity per square mile based upon population density per square mile.

- Determine population (P) in the affected area
- For example, 2007 census data for North Port, FL is 57,000, therefore $P = 57,000$
- The assumption of 3 persons per household (H) is used for this model
- Known/estimated population (P) for a jurisdiction may be used to determine a value for H or $H = P/3$

Example

A Category 4 storm passes through the City of North Port. The area is primarily single family dwellings with some apartment complexes, schools, and shopping centers. Vegetation characteristic is heavy because of the proliferation of residential landscape shrubbery and trees throughout the area. The storm is very wet, with rain before and continuing for a few days after the hurricane.

Formula: $Q = (H)(C)(V)(B)(S)$

Q is the quantity of debris in cubic yards
H is the number of households
C is the storm category factor in cubic yards
V is the vegetation characteristic multiplier
B is the commercial/business/industrial use multiplier
S is the storm precipitation characteristic multiplier

$H = P/3 = 57,000/3 = 19,000$ (3 persons per household)
 $C = 50$ (Factor for a Category 4 storm)
 $V = 1.5$ (Multiplier for heavy vegetation)
 $B = 1.3$ (Multiplier for heavy commercial due to schools/stores/apartments)
 $S = 1.3$ (Multiplier for wet storm event)

Then $Q = 19,000 \times 50 \times 1.3 \times 1.3 = 1,605,500$ cubic yards of debris or 1.6 million CY

C is the storm category factor as shown below. It expresses debris quantity in cubic yards (yd³) per household by hurricane category and includes the house and its contents, plus land foliage

Hurricane Category	Value of "C" Factor
1	2 yd ³
2	8 yd ³
3	26 yd ³
4	50 yd ³
5	80 yd ³

V is the vegetation multiplier as shown below. It acts to increase the quantity of debris by adding vegetation, including shrubbery and trees on public rights-of-way.

Vegetative Cover	Value of "V" Multiplier
Light	½
Medium	1.3
Heavy	1.5

B is the multiplier that takes into account areas that are not solely single-family residential, but includes small retail stores, schools, apartments, shopping centers, and light industrial/manufacturing facilities. Built into this multiplier is the offsetting commercial insurance requirement for owner/operator salvage operations.

Commercial Density	Value of "B" Multiplier
Light	1.0
Medium	1.2
Heavy	1.3

S is the precipitation multiplier that takes into account either a "wet" or "dry" storm event. A "wet" storm for Category 3 or greater storms will generate more vegetative debris due to the uprooting of complete trees.

Precipitation Characteristics	Value of "S" Multiplier
None To Light	1.0
Medium To Heavy	1.2

NOTE: Steps 2 and 3 of this model can also be applied to other debris generating events once an estimated quantity of debris is established.

STEP 2 – DEBRIS STORAGE SITE REQUIREMENTS

- Estimate debris pile stack height of 10 feet
- 60% usage of land area to provide for roads, safety buffers, burn pits and household hazardous waste areas

$$1 \text{ acre (ac)} = 4,840 \text{ square yards (yd}^2\text{)}$$

$$10 \text{ foot stack height} = 3.33 \text{ yards (y)}$$

$$\text{Total volume per acre} = 4,840 \text{ yd}^2/\text{ac} \times 3.33 \text{ y} = 16,117 \text{ yd}^3/\text{ac}$$

- From the example above, the acreage required for debris reduction site is:

$$1,600,000 / 16,117 \text{ yd}^3/\text{ac} = 99 \text{ acres (required for debris storage only)}$$

- To provide for roads and buffers, the acreage must be increased by a factor of 1.66

$$99 \text{ ac} \times 1.66 = 164.34 \text{ acres or, since one square mile (mi}^2\text{)} = 640 \text{ acres}$$

$$164 \text{ ac}/640 \text{ as}/\text{mi}^2 = 0.26 \text{ mi}^2$$

- If you assume a 100 acre storage site can be cycled every 45 to 60 days or one time during the recovery period, then $720/2 = 360 \text{ ac}$, or four 100 acre sites would be required.
- The number of sites varies with size, distance from source, speed of reduction (mixed debris is slower than clean woody debris)
- Removal urgency
- The USACE commonly removes approximately 70% of the total volume generated with local governments, volunteer groups, and private individuals removing the remainder.

If 1.6 million cy were estimated, the USACE would estimate removing approximately 1.12 million yd³ of debris

STEP 3 – CATEGORIES OF DEBRIS

Debris removed will consist of two broad categories: clean wood debris and construction and demolition (C&D) debris

- The clean debris will come early in the removal process as residents and local governments clear yards and rights-of-way
- The debris removal mission can be facilitated if debris is segregated as much as possible at the origin along the right-of-way, according to type
- The public should be informed regarding debris segregation as soon as possible after the storm
- Time periods should be set for removal, the first seven to 10 days clean woody debris only, then followed by other debris, with the metals segregated from non-metals
- Most common hurricane-generated debris will consist of the following:

30 % Clean woody debris

70% Mixed C&D

Of the 70% Mixed C&D:

42% burnable, but required sorting

5% soil

14% metals

38 % landfilled

- Based on the above, 1,600,000 yd³ of debris would break down as follows:

480,000 yd³ clean, woody debris

1,120,000 yd³ mixed, C&D

- Of the 1,120,000 yd³ of mixed C&D:

470,400 yd³ is burnable but requires sorting

56,000 yd³ is soil

156,800 yd³ is metals

425,600 is landfilled

- Burning will produce about 95% volume reduction
- Chipping and grinding reduce the debris volume on a 4 to 1 ratio (4 yd³ is reduced to 1 yd³) or by 75%
- The rate of burning is basically equal to the rate of chipping/grinding, about 200 yd³/hr. However, chipping requires on-site storage and disposal of the chips/mulch.

APPENDIX B**PRIVATELY-OWNED ROADS IN THE CITY OF NORTH PORT**

Acacia Ct.	Greenview Court	Osprey Circle
Alani Court	Greenwood Drive	Palena Blvd.
Amoko Court	Haawi Court	Palm Court
Anapa Court	Haele Court	Palmetto Way
Apopo Court	Haki Court	Park Blvd.
Awana Court	Hauli Court	Park Circle
Bailey Palm Court	Herron Creek Blvd.	Parkview Ct.
Bayhill Court	Hidden Oak Court	Peach Circle
Berkley Ct.	Hikina Drive	Pecan Drive
Berry St.	Hoemi Ct.	Phoenix Palm Ter.
Birkdale Court	Holiday Park Blvd.	Pickwick Road
Blossom St.	Holo Court	Pine Shadow Circle
Bobcat Trail	Honu Court	Pine Shadow Court
Boulton Ct.	Jasmine Way	Pine Shadow Lane
Boxwood Street	Joy Ct.	Pinehurst Court
Canary Palm Way	Keena Court	Plantation Blvd.
Carlton Ct.	Kentia Palm Court	Pleasant Ct.
Center Lane	Keystone Ct.	Randwick Ct.
Charm Court	Kilepa Court	Regency Ct.
Chelsea Ct.	Kilohee Court	Rivera Court
Coconut Palm Circle	Kimball Road	Royal Palm Drive
Concord Drive	Kipa Court	Rufus Road
Cottonwood Lane	Kula Ct.	Rutherford Court
Creek Nine Drive	Lady Palm Court	Sable Trace Drive
Dixie Lane	Lakeview Lane	Sage Lane
Dogwood Court	Laurel Ct.	Savannah Drive
Dover Ct.	Lynx Run	Savoy Ct.
Eager St.	Lynx Trail	Scarlett Avenue
Egret Court	Magnolia Drive	Seville Ct.
Elton Ct.	Mallory Ct.	Silver Palm Way
Fairway Court	Marlowe Ct.	Solitaire Palm Court
Fairway Drive	Meade Ct.	St. James Court
Fairway Place	Medinah Court	Tara Drive
Fantasy Ct.	Moonlight Court	Tuscola Blvd.
Filesmere Ct.	Moonlight Cove	Vista Lane
Fishtail Palm Court	Neighborly Court	Whispering Oaks Court
Fleetwood Court	Night Wind Terrace	Whispering Oaks Drive
Floral Court	Oakmont Court	White Ibis Court
Grand Terrace	Ocean Court	White Ibis Drive

APPENDIX C**RIGHT OF ENTRY AGREEMENT**

I/We _____, the owner(s)
of the property commonly identified as _____,
(street)

_____, _____,
(city/town) (county)

State of _____ do hereby grant and give freely and without coercion, the
right of access and entry to said property in the County/City of _____,
its agencies, contractors, and subcontractors thereof, for the purpose of removing and
clearing any or all storm-generated debris of whatever nature from the above described
property.

It is fully understood that this permit is not an obligation to perform debris clearance.
The undersigned agrees and warrants to hold harmless the City of

_____,
State of _____, its agencies, contractors, and subcontractors, for damage of
any type, whatsoever, either to the above described property or persons situated
thereon and hereby release, discharge, and waive any action, either legal or equitable
that might arise out of any activities on the above described property. The property
owner(s) will mark any storm damaged sewer lines, water lines, and other utility lines
located on the described property.

I/We (have _____, have not _____) (will _____, will not _____) received any compensation
for debris removal from any other source including Small Business Administration (SBA),
National Resource Conservation Service (NRCS), private insurance, individual and family
grant program or any other public assistance program. I will report for this property
any insurance settlements to me or my family for debris removal that has been
performed at government expense. For the considerations and purposes set forth
herein, I set my hand this _____ day of _____, 20__.

Witness

Owner

Owner

Telephone Number

Address

APPENDIX D

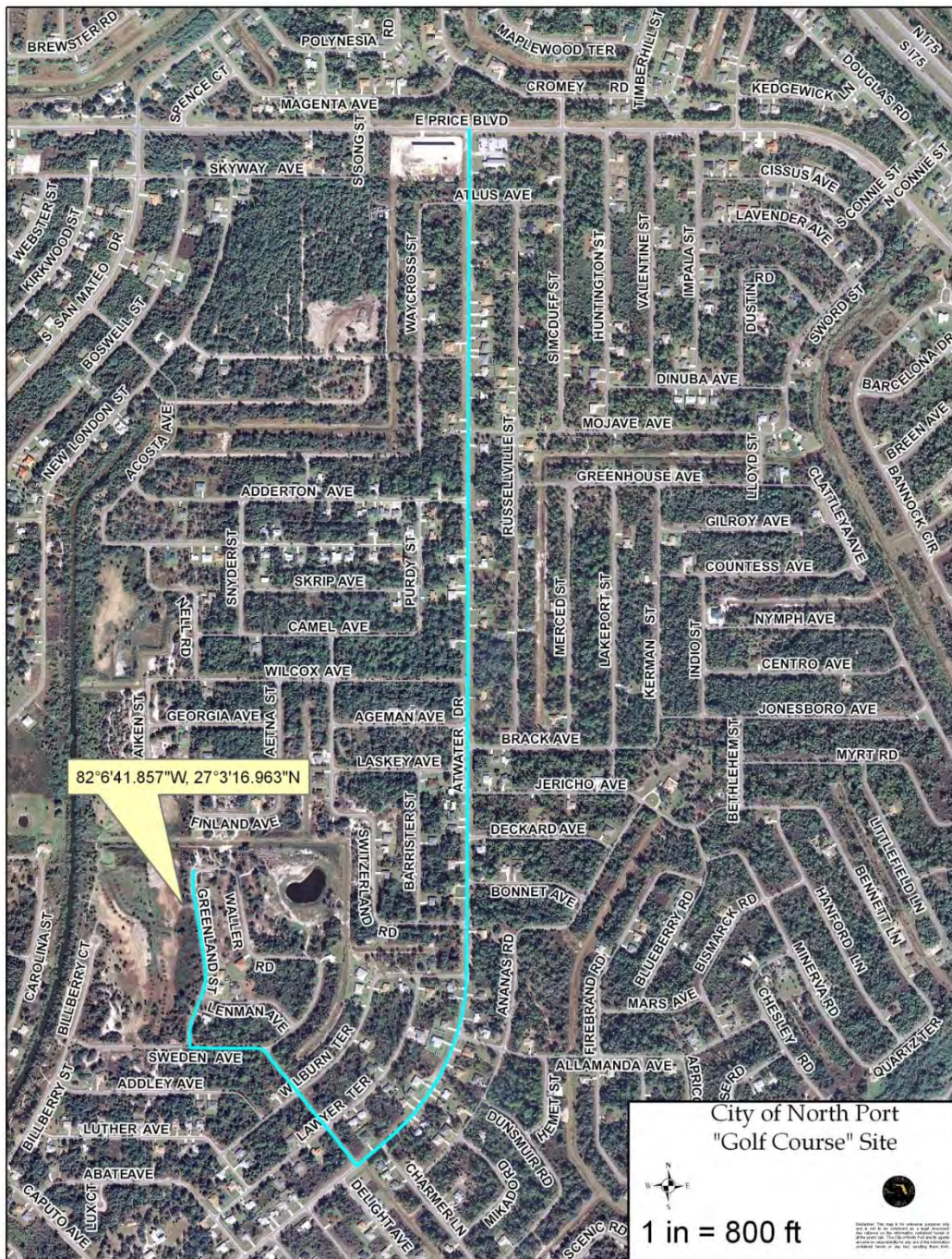
FEDERAL AID ROADWAYS IN THE CITY OF NORTH PORT

Local Name	Mile Point +/- .005	From (Beginning of this segment)	Mile Point +/- .005	To (End of this segment)	Net Length
Appomattox Drive	0.000	Pan American Blvd.	1.560	So. Sumter Blvd.	1.560
Atwater Blvd.	0.000	Hillsborough Blvd-Co/L	2.700	E. Price Blvd.	2.700
Chamberlain Blvd.	0.000	Hillsborough Blvd-Co/L	2.800	W. Price Blvd.	2.800
Cranberry Blvd.	0.000	Hillsborough Blvd-Co/L	2.900	W. Price Blvd.	2.900
Elyton Drive	0.000	Biscayne Drive	0.335	Pan American Blvd.	0.335
N. Biscayne Blvd.	0.000	Trionfo Ave.	1.552		1.552
N. Biscayne Blvd.	1.552		1.803	Ponce De Leon Blvd.	0.251
N. River Road	0.000	SR 45/US 41	5.596	SR 93/I-75	5.596
N. Sumter Blvd.	0.000	W. Price Blvd.	2.132		2.132
N. Sumter Blvd.	2.132		2.377		0.245
N. Sumter Blvd.	2.377		3.120	Tropicaire Blvd.	0.743
North Port Blvd.	0.000	S. Biscayne Blvd.	1.482	Appomattox Drive	1.482
Ortiz Blvd.	2.223	Deleon Dr.	2.436		0.213
Ortiz Blvd.	3.440		4.245	SR 45/US 41	0.805
Ortiz Blvd.	0.000	SR 45/US 41	0.739	Trionfo Ave.	0.739
Pan American Blvd.	0.167	Biscayne Drive	0.555	SR 45/US 41	0.388
Pan American Blvd.	0.000	SR 45/US 41	1.187	Appomattox Drive	1.187
Ponce De Leon Blvd.	0.000	N. Biscayne Blvd.	1.143		1.143
Ponce De Leon Blvd.	1.143		2.302	SR 93/I-75	1.159
Price Blvd.	0.000	Toledo Blade Blvd.	0.294		0.294
Price Blvd.	0.294		6.200	Raintree Blvd.	5.906
Raintree Blvd.	0.000	Charlotte Co. Line	1.600	SR 93/I-75	1.600
Rockley Blvd.	0.000	SR 45/US 41	2.000	Center Street	2.000
S. Biscayne Blvd.	0.000	Chancellor Blvd-Co/L	1.630	SR 45/US 41	1.630
S. Salford Blvd.	0.000	SR 45/US 41	2.541	W. Price Blvd.	2.541
S. Sumter Blvd.	0.000	SR 45/US 41	2.400	W. Price Blvd.	2.400
S. River Road	0.000	SR 45/US 41	1.460		1.460
S. River Road	1.460		3.478		2.018
S. River Road	3.478		6.790	Pine Street	3.312
San Mateo Dr.	0.000	Hillsborough Blvd-Co/L	3.000	E. Price Blvd.	3.000
SR 93/I-75	0.000	Charlotte Co Line	MM 171	City Limit	MM 187
Sumter Blvd.	0.000	Chancellor Blvd.	0.383	SR 45/Us 41	0.383
Tamiami Trail	0.000	Charlotte Co Line	6.141	CR 777/River Rd	6.141
Tamiami Trail	6.141	CR 777/River Rd	9.495		3.354
Tamiami Trail	9.495		14.895	SR 45A (US 41)	5.400
Tamiami Trail	14.895	SR 45a (Us 41)	17.131	CR 772	2.236
Toledo Blade Blvd.	0.000	Hillsborough Blvd-Co/L	4.651	SR 93/I-75	4.651
Tropicaire Blvd.	0.000	Van Camp Street	3.793		3.793
Tropicaire Blvd.	3.793		6.254	Choctaw Blvd	2.461
Tuscola Blvd.	0.000	S. Biscayne Blvd	0.445	SR 45/US 41	0.445
W. Price Blvd.	0.000	N. Biscayne Blvd.	3.300	Salford Blvd.	3.300
W. Price Blvd.	0.000	Salford Blvd.	2.510	Toledo Blade Blvd.	2.510
Winchester Blvd.	0.000	Charlotte Co. Line	3.152	River Road/CR 777	3.152
Yorkshire Blvd.	0.000	Hillsborough Blvd-Co/L	2.384	SR 93/I-75	2.384

APPENDIX E

AERIAL VIEW OF THE FDEP PRE-APPROVED
TEMPORARY DEBRIS STORAGE AND REDUCTION SITE

Greenland Street TDSRS



APPENDIX F

AERIAL VIEW OF THE CITY OF NORTH PORT



APPENDIX G

TEMPORARY DEBRIS STORAGE REDUCTION SITES
FDEP PRE-APPROVAL LETTERFLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION

South District Office
2295 Victoria Avenue, Suite 364
Fort Myers, Florida 33901-3881

RICK SCOTT
GOVERNOR

CARLOS LOPEZ-CANTERA
LT. GOVERNOR

RYAN E. MATTHEWS
INTERIM SECRETARY

Sent via email to: mbramble@cityofnorthport.com

Date: 5/18/2017

Monica Bramble
1100 N Chamberlain Blvd
North Port, FL 34286

RE: 2017 - Pre-Authorization for Disaster Debris Management Sites (DDMS)

Dear Monica Bramble:

This is to notify you that on 5/18/2017, we approved your request for pre-authorization of a disaster debris management site (DDMS) located in Sarasota County for 2017. Disaster debris includes hurricane/storm-generated debris and all other types of disaster debris.

The Department has evaluated your request for a DDMS at the following location:

WACS ID: 100033
Greenland Street
Golf Course Site, North Port
Lat 27:3:23.826 / Long 82:6:46.512
Waste Planned for Management: Yard Trash

In the event of a major storm event or other disaster which results in the Department issuing an Emergency Final Order (the Order) for your county, you may begin using this temporary DDMS as necessary, while also requesting issuance of a field authorization from the Department. Once activated, a DDMS is subject to the following conditions, in addition to the requirements of the Order and Florida Statute 403.7071:

1. Standing water must not be allowed to accumulate in or within 50 feet of areas used to store or process disaster debris;

2. The Department must be notified when the site is opened and begins accepting debris, and when the site is closed and stops accepting debris;
3. Access must be controlled to prevent unauthorized dumping and scavenging;
4. A DDMS must have spotters to correctly identify and segregate waste types for appropriate management;
5. Once the site is open, a spotter must be located in the area where waste is being deposited in order to spot and remove prohibited waste items;
6. The DDMS is limited to managing the type(s) of debris listed above; any putrescible waste received at the DDMS must be removed from the site within 48 hours; all other types of prohibited waste should be managed in accordance with the guidance document (see link below);
7. Unless otherwise approved by the Department in response to a written request from you, the DDMS must cease operation and all disaster debris must be removed from the sites on or before the expiration date of an Order that has been executed by the Department, unless it is modified or extended by further authorization.

The Department has also prepared a guidance document on the establishment, operation and closure of a DDMS for disaster debris. This guidance includes recommended practices, which you are expected to follow as much as practicable, as well as additional requirements from the Order. A copy of this guidance document is available on the DEP website http://www.dep.state.fl.us/mainpage/em/files/debris_guidance.pdf

If you have any questions or comments on this pre-authorization letter, please feel free to contact Rick Roudebush by E-mail at rick.roudebush@dep.state.fl.us or by phone at (239) 344-5653. In order to provide better service to you, the Department is using electronic documents as much as possible. Please provide your E-mail address when replying.

Sincerely,



5/18/2017

Ryan Snyder
South District

Date

RS / rr

Cc: rick.roudebush@dep.state.fl.us , samuel.cannon@em.myflorida.com ,
enrique.hernandez@em.myflorida.com , richard.knowles@em.myflorida.com ,
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Appendix H

Health and Safety Supplement

Purpose

The purpose of this Health and Safety Supplement is to support the existing City safety plan and/or procedures in regards to debris removal activities. These are recommended baseline safety provisions. Ultimately, health and safety is the responsibility of the contracted parties involved in debris removal activities. This document will outline some of the general steps necessary to provide a safe work environment for debris removal and monitoring employees. In addition, this document will identify some representative work hazards and the appropriate measures to reduce risk of injury.

1.0 Dissemination of Information

The debris removal contractor and monitoring firm project managers will be provided with this document and will be expected to disseminate the information and guidelines to their respective personnel. A copy of the document should be available for consultation. In addition, elements of the document will be reviewed periodically during the project to increase worker awareness.

2.0 Compliance

The debris removal contractor and monitoring firm project managers are responsible for health and safety compliance of their respective personnel and subcontractors. Any crews or individuals that are not compliant shall be suspended from debris removal activities until the situation is remedied. Frequent offenders of safety policies and procedures will be dismissed from the project entirely.

3.0 Job Hazard Assessment

Though debris removal activities are fairly similar among events, assessing the particular hazards of each disaster is an important part of maintaining health and safety for the debris removal workers. At a minimum, the following areas of focus should be considered as part of job hazard assessment:

- **Disaster Debris** – Disasters that result in property damage typically generate large quantities of debris which must be collected and transported for disposal. The type of debris varies depending on the characteristics of the region (e.g. terrain, climate, dwelling and building types, population, etc.) and the debris-generating event (e.g. type, event strength, duration, etc.). In addition, the disaster debris produces a host of uneven surfaces, which must be negotiated.

- **Debris Removal** – Often the removal of disaster debris involves working with splintered, sharp edges of vegetative or construction material debris. Many disasters involve heavy rains or flooding. Consequently, disaster debris is damp and heavier than usual. As weights increase, so does the risk of injury.
- **Removal Equipment** – In most disasters, debris must be removed from the public Right-of-Way (ROW) to provide access for emergency vehicles and subsequent recovery efforts. Debris collection and removal requires the use of heavy equipment and power tools to trim, separate and clear disaster debris.
- **Traffic Safety** – The ROW is located primarily on publicly-maintained roads. As a result, much of the debris removal process takes place in traffic of varying levels of congestion. In addition, disasters often damage road signs, challenging safety on the road.
- **Wildlife Awareness** – Disasters are traumatic events for people as well as wildlife. Displaced animals, reptiles and insects pose a hazard to debris removal workers.
- **Debris Disposal** – After disaster debris is collected it is often transported to a temporary disposal, storage and reduction site (DMS). Upon entry to a DMS, the monitoring firm will assess the volume of disaster debris being transported. The collection vehicle will then dispose of the disaster debris and the debris will be reduced either through a grinding operation or incineration. The DMS is a common area for injury. Response and recovery workers in this environment are more likely to be exposed to falling debris, heavy construction traffic, high noise levels, dust and airborne particles from the reduction process.
- **Climate** – Debris-generating disasters often occur in areas or seasons with extreme weather conditions. The effects of temperature and humidity on physical labor must be monitored, and proper work-rest intervals must be assessed.

4.0 Administrative and Engineering Controls

The use of administrative and engineering controls can greatly reduce the threats to public health and safety in debris removal activities. Some common administrative and engineering controls used in the debris removal process are:

Collection Operations

- Conduct debris removal operations during daylight hours only.
- Limit clean-up operations to one side of the road at a time.
- Limit collection work under overhead lines.

- Inspect piles before using heavy equipment to remove them to ensure that there are no hazardous obstructions.
- Make sure that all collection vehicles have properly functioning lights, horns and back-up alarms.
- Load collection vehicles properly (not overloaded or unbalanced).
- Cover and secure loads, if necessary.
- When monitoring the collection process, stay alert in traffic and use safe driving techniques.

Power Tools

- Inspect all power tools before use.
- Do not use damaged or defective equipment.
- Use power tools for their intended purpose.
- Avoid using power tools in wet areas.

Debris Reducing Machinery (Grinders/Wood Chippers)

- Do not wear loose-fitting clothing.
- Follow the manufacturer's guidelines and safety instructions.
- Guard the feed and discharge ports.
- Do not open access doors while equipment is running.
- Always chock the trailer wheels to restrict rolling.
- Maintain safe distances.
- Never reach into operating equipment.
- Use lock out/tag out protocol when maintaining equipment.

DMS/Disposal Operations

- Use jersey barriers and cones to properly mark traffic patterns.
- Use proper flagging techniques for directing traffic.
- Monitor towers must not exit into traffic and should have hand and guard rails to reduce trips and falls.
- Monitor towers must have properly constructed access stairways with proper treads and risers and proper ascent angle (4:1 height/width ratio).
- Monitor towers must be surrounded by jersey barriers which protect the tower and monitors from being struck by inbound or outbound collection vehicles.
- Monitor towers should be located upwind from dust- and particulate generating activities.
- A water truck should spray the site daily to control airborne dust and debris.

5.0 Personal Protective Equipment

Personal Protective Equipment (PPE) is the last resort to providing a safe working environment for workers. PPE does not eliminate or even reduce hazards as

administrative and engineering controls do. PPE works to reduce the risk of injury by creating a protective barrier between the individuals and work place hazards.

Proper use of PPE includes using PPE for its intended purpose. For example, using the wrong type of respirator might expose the worker to carcinogenic particulates. Properly fitting the equipment to the user may require examination by a medical professional. PPE that does not fit well will not provide maximum protection and will decrease the likelihood of the individual continuing to use the equipment. In addition, improper use may result in serious injury or death. The proper use of the equipment is outlined in detail in the manufacturer's instructions.

The following PPE may be applicable in standard ROW, Right-of-Entry (ROE), and vegetative and construction & demolition debris removal activities:

- **Head Protection** – Equipment designed to provide protection for an individual's head against hazards such as falling objects or the possibility of striking one's head against low hanging objects. PPE used to protect the head must comply with ANSI Z89.1-1986, "American National Standard for Personnel Protection - Protective Headwear for Industrial Workers – Requirements."
- **Foot Protection** – Equipment designed to provide protection for an individual's feet and toes against hazards such as falling or rolling objects, objects that may pierce the sole or upper section of the foot, etc. PPE used to protect the feet and toes must comply with ANSI Z-41-1991, "American National Standard for Personal Protection-Protective Footwear."
- **Hand Protection** – Equipment designed to provide protection for an individual's hands against hazards such as sharp or abrasive surfaces. The proper hand protection necessary is dependent upon the situation and characteristics of the gloves. For instance, specific gloves would be used for protection against electrical hazards while the same gloves may not be appropriate in dealing with sharp or abrasive surfaces.
- **Vision/Face Protection** – Equipment designed to provide protection for an individual's eyes or face against hazards such as flying objects. PPE used to protect eyes and face must comply with ANSI Z87.1-1989, "American National Standard Practice for Occupational and Educational Eye and Face Protection." Again, the proper eye/face protection necessary is dependent upon the situation and characteristics of the equipment. For instance, eye and face protection used by individuals who are welding may not be appropriate for individuals operating a wood chipper.
- **Hearing Protection** – Equipment designed to provide protection for an individual's hearing against prolonged exposure to high noise levels. According to OSHA, the permissible level of sound is an average of 90 decibels over the course of an eight (8) hour work day. Above the sound exposure level, hearing

protection is required. PPE used to protect hearing must comply with ANSI S3.19-1974, "American National Standard Practice for Personal Protection-Hearing Protection."

- **Respiratory Protection** – Equipment designed to provide protection for an individual's respiratory system against breathing air contaminated with hazardous gases, vapors, airborne particles, etc. PPE used to the respiratory system must comply with ANSI Z88.2-1992. In addition, the use of respiratory protection requires a qualitative fit test and in some cases a pulmonary fit test by a licensed medical professional.

6.0 PPE Debris Removal Activity

PPE requirements are made based upon the results of the job hazards assessment. The following list of PPE is organized by debris removal activity and is meant to be a representative list. Specific PPE requirements vary from location to location. In general, individuals involved in the debris removal process should personally monitor water consumption to avoid dehydration and use appropriate skin protection (breathable clothes, light colors, sunscreen, etc.). Ultimately, the selection of PPE is the responsibility of the debris removal contractor and monitoring firm project managers.

Debris Collection Monitoring

The hazards of disaster debris collection monitoring include, but are not limited to: struck by vehicles, falls or trips on uneven surfaces, cuts, abrasions or punctures from vegetative or C&D sharps. PPE requirements include:

- Reflective vest;
- Foot protection (rugged shoes or boots, steel toe and shank if required); and
- Long pants.

Debris Disposal Monitoring

The hazards of disaster debris disposal monitoring include, but are not limited to: struck by or caught in/between vehicles, falls or trips on stairs or uneven surfaces, cuts, abrasions or punctures from vegetative or C&D sharps and struck by falling disaster debris. Monitor towers must be equipped with a first aid kit. PPE requirements include:

- Reflective vest;
- Foot protection (rugged shoes or boots, steel toe if required);
- Long pants; and
- Hard Hat.

Debris Removal

The hazards of disaster debris removal include, but are not limited to: struck by vehicles, falls or trips on uneven surfaces, cuts, abrasions or punctures from vegetative or C&D sharps and airborne debris. In addition, PPE requirements include:

- Reflective vest;
- Vision and hearing protection;
- Foot protection (rugged shoes or boots, steel toe and shank if required); and
- Long pants.

Debris Disposal and Reduction

The hazards of disaster debris disposal and reduction include, but are not limited to: struck by or caught in/between vehicles, falls or trips on uneven surfaces, cuts, abrasions or punctures from vegetative or C&D sharps, struck by falling disaster debris and airborne particles. PPE requirements include:

- Reflective Vest;
- Foot protection (rugged shoes or boots, steel toe if required);
- Vision and hearing protection;
- Long pants;
- Gloves; and
- Hard Hat.

Debris Cutting and Trim Work

The hazards of disaster debris cutting and trimming work include, but are not limited to: struck by or caught in/between vehicles, falls or trips on uneven surfaces, cuts, abrasions or punctures from power tools, vegetative or C&D sharps, struck by falling disaster debris and airborne particles. PPE requirements include:

- Reflective Vest;
- Hand and Foot protection (rugged shoes or boots, steel toe if required);
- Vision and hearing protection
- Long pants; and
- Hard Hat

For additional information regarding health and safety requirements, contact OSHA.

Health and Safety Contact Information	
Occupational Safety & Health Administration	800-321-6742
City Contact	(941) 429-7130

Appendix I

FEMA Letter of Plan Approval

U.S. Department of Homeland Security
Region IV
3603 Chambliss-Tucker Road
Atlanta, GA 30341



FEMA

June 30, 2014

Mr. Bryan W. Koon, Director
Florida Division of Emergency Management
2555 Shumard Oak Boulevard
Tallahassee, Florida 32399-2100

Attention: Steve Hyatt

Reference: Public Assistance Pilot Program
Debris Management Plan Review
City of North Port

Dear Mr. Koon:

This letter responds to the Florida Division of Emergency Management request dated April 22, 2014, for the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) to accept the City of North Port's Debris Management Plan (Plan) for participation in the Public Assistance (PA) Alternative Procedures Pilot Program for Debris Removal. This pilot program allows a one-time two (2) percent Federal cost share increase for debris removal operations performed within 90 days from the start of the incident period of a major disaster or emergency declaration.

FEMA Region IV has determined that the Plan:

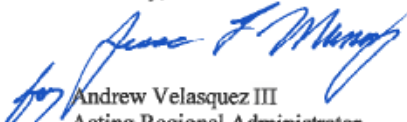
- ☒ **Contains the basic planning elements of a Debris Management Plan along with at least one prequalified debris and wreckage removal contractor (see enclosed Debris Management Plan Checklist). Therefore, FEMA has determined the Plan is acceptable. Accordingly, the City of North Port may receive a one-time two (2) percent Federal cost share increase as part of the PA Alternative Procedures Pilot Program for Debris Removal. Your office should notify FEMA when the City of North Port wishes to apply the incentive to its debris removal work.**
- ☐ Does not contain the basic planning elements as noted in the enclosed Debris Management Plan Checklist. The City of North Port may revise its Plan and resubmit it to FEMA, through your office, for reconsideration.

www.fema.gov

Once the Plan is accepted, it does not mean that FEMA is approving any operational component of the plan nor does it mean that the Federal government will fund work conducted under any aspect of the Plan. Eligibility of costs for debris removal and management in a declared major disaster or emergency will be determined based on established PA Program authorities, regulations, policies and guidance. Subgrantees must comply with Federal procurement requirements (i.e., competitive bidding), as outlined in 44 CFR §13.36 in the procurement of debris removal services.

If you have questions or need additional information, please contact Mr. Jesse F. Munoz, CEM, Director, Recovery Division, at (770) 220-5300.

Sincerely,



Andrew Velasquez III
Acting Regional Administrator



DEPARTMENT OF PUBLIC WORKS

10-YEAR STORMWATER MANAGEMENT PLAN

FISCAL YEARS 2020-2030



TABLE OF CONTENTS

1	Background.....	1-1
2	Drainage System	2-1
3	Water Control Structures (WCS)	3-1
	Water Level Control.....	3-1
	WCS Condition Assessment.....	3-2
	WCS Replacement Plan	3-3
	WCS Repair Plan.....	3-3
4	Drainage Program	4-1
	Neighborhood Rehabilitation by Grid	4-1
	Road Crossing Pipe Replacement.....	4-3
	Outfall Replacement/Lining.....	4-4
	Retention Ditch Rehabilitation.....	4-4
	Tractor Crossing Pipe Replacement/Installation.....	4-5
	Focused Projects.....	4-5
5	Responsive Improvements.....	5-1
6	Level of Service and Maintenance	6-1
	Enhancing the System	6-1
	Right-of-Way Mowing Services	6-1
	Aquatic Spraying Services	6-1
	Swale and Ditch Capacity and Flow Improvements.....	6-1
	Canal Capacity and Flow Improvements.....	6-2
	Lake, Pond and Creek Maintenance.....	6-2
	Drainage System Inspections.....	6-2
7	Flood Reduction Studies	7-1
	Reduce Flooding in the Following Localized Areas	7-1
	Reduce Regional Flooding	7-1
	Costs	7-1

FIGURES

Figure 2-0 Drainage System Diagram	2-1
Figure 3-0 Water Control Structures and Waterway Elevations	3-2
Figure 3-1 Water Control Structure Conditions	3-2
Figure 3-2 5-Year Water Control Structure Replacement Budget Plan	3-3
Figure 3-3 Fiscal Year 2020 WCS Repair Budget Plan.....	3-3
Figure 4-0 Map of Grids 205, 307 and 407	4-1
Figure 4-1 Fiscal Year 2020 Retention Ditch Rehabilitation Schedule.....	4-4
Figure 4-2 Fiscal Year 2020 Focused Projects with Budget	4-5
Figure 6-0 Drainage Level of Service.....	6-1
Figure 7-0 Map of Study Recommendations	7-1

ATTACHMENTS

A. City of North Port Stormwater Drainage System Map.....	8-1
B. Water Control Structure Inspections 2019	9-1
C. Water Control Structures Rehabilitated and Costs.....	10-1
D. Grid System Map	11-1
E. Flood Reduction Study Areas	12-1



1 | BACKGROUND



The Stormwater Management Plan (SMP) is North Port's blueprint for an effective drainage system.

The City of North Port was incorporated in 1959 with only 23 residents and has grown over the last 60 years to become a vibrant community with a population of more than 70,000. North Port has an incorporated area of approximately 104 square miles and is located in southeast Sarasota County.

North Port started as a planned community in the 1960's with an extensive stormwater infrastructure network constructed by General Development Corporation (GDC) consisting of 132 miles of manmade retention ditches, 1,613 miles of roadside swales and 79.1 miles of major wet waterways with 64 water control structures (WCS) and stormwater conveyance piping to support its residential, commercial and light industrial developments (See map, Attachment A).

This 10-year Stormwater Management Plan focuses on the maintenance, rehabilitation and replacement of stormwater infrastructure, with budget estimates on projects within a five-year window and plans for major construction projects in years five through ten.

The infrastructure components were constructed in the late 1960's to 1970's and are all about 50 to 60 years old, nearing the end of their useful life.

The WCS are either constructed as sheet metal weirs with horizontal and vertical metal I-beam supports, or drop structures designed with corrugated metal drop pipes. The metal components in the WCS have corroded over time. Of the 64 WCS, 28 are gated structures and several of these have inoperable sheet metal gates. The GDC-installed stormwater conveyance piping is mostly corrugated metal pipes and many are severely corroded and undersized. Collapsed, corroded metal pipes under roadways have resulted in road closures and extensive erosion.

These WCS and pipe failures have been increasing in frequency. Over time, silt has accumulated in the swale, retention ditch, waterway and creek systems which can cause back up of flood waters. The recently completed Federal Emergency Management Agency (FEMA) flood insurance rate maps showed a significant increase in the 100-year special flood hazard area.



2 | DRAINAGE SYSTEM

The City of North Port's drainage system protects property, preserves natural resources and improves the quality of surface water runoff.

The City of North Port's drainage system provides water quality treatment for stormwater runoff. The system consists of swales, outfalls, retention ditches, retention ponds, waterways and the Myakkahatchee Creek.

Figure 2-0 shows how the drainage system works by conveying stormwater from individual parcels into swales (1). Most of the swales in the City are open-swales with a few (mainly along major roads and in private communities) having closed, or curb-and-gutter swales.

From the swales, stormwater flows into outfalls (2) and then into retention ditches (3). In a few areas, the stormwater flows directly into retention ditches (R-ditches). From the R-ditches, stormwater flows into the waterways (4), and then into the Myakkahatchee Creek.

The drainage system is designed to hold water and slowly convey it through the different segments. The swales, outfalls, retention ditches and waterways provide needed holding time for pollutants to get filtered out of the water. In the rainy season, May-October, stormwater is generally always in each drainage system component.

In addition to stormwater, the City's drainage system is affected by groundwater levels and high tides.

1,600+
Miles of
Swales

132
Miles of
R-ditches

79+
Miles of
Waterways

Figure 2-0
Drainage System Diagram



3 | WATER CONTROL STRUCTURES (WCS)

As major drainage system components, water control structures must be maintained.

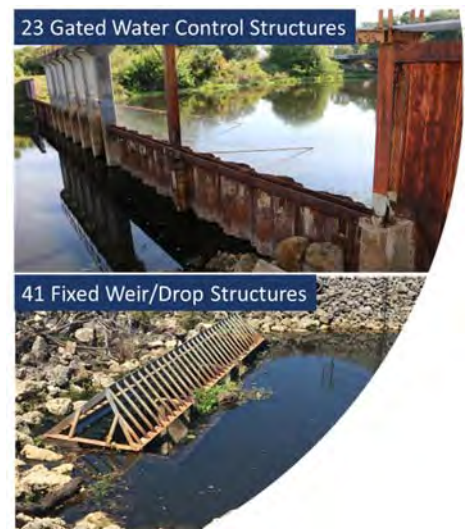
Develop and implement flood reduction and drainage improvement programs while continuing to balance the supply of potable water.

- City of North Port Strategic Plan Infrastructure Objective



The City's waterway system is designed to accommodate several needs: a source for potable water supply, water quality treatment, and stormwater conveyance and attenuation. The waterways form a grid pattern and are interconnected with each other and with the Myakkahatchee Creek.

There are 64 water control structures of which 23 are gated water control structures, five are drop structures, 28 are fixed weir (FW) structures, and eight are drop structures.



Water Level Control

The control elevations of these structures are designed so that water is retained in the waterways in a step-down-elevation-system configuration; meaning the water levels in the waterway segments between structures progressively decrease in elevation from north to south and from east to west (Figure 3-0).

This system configuration allows both retention of stormwater runoff for water quality treatment and storage for potable water use. The structures at the southern end of the system also act as a barrier between the tidal water bodies and the fresh water creek system. This allows the city to maintain a fresh water potable supply.

Figure 3-0
Water Control Structures and Waterway Elevations

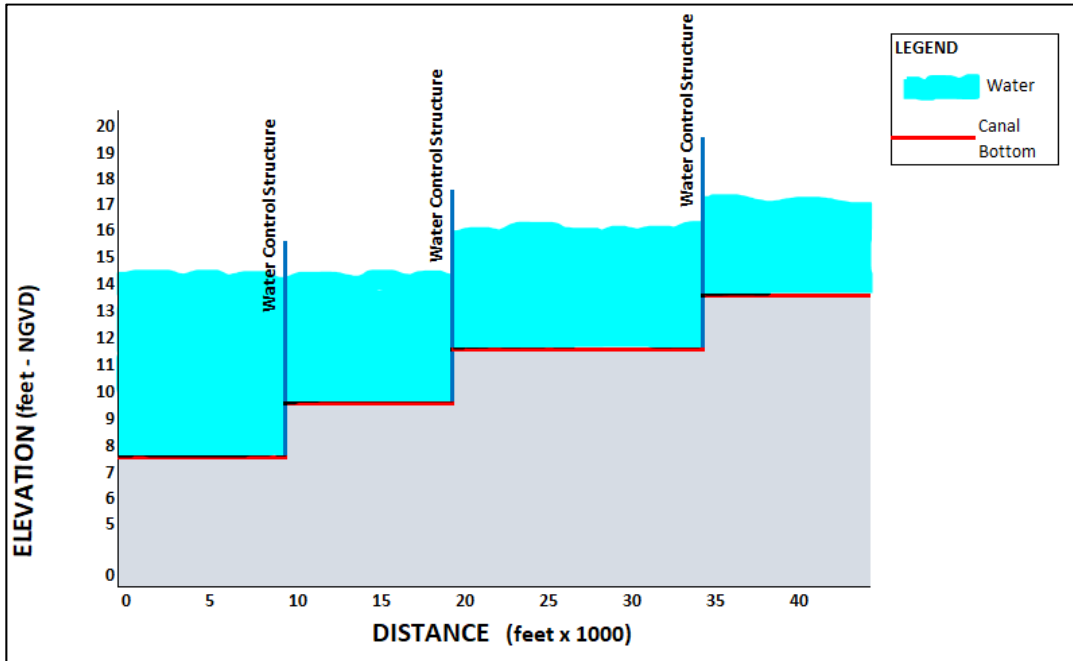


Figure 3-1
Water Control Structure Conditions

Condition

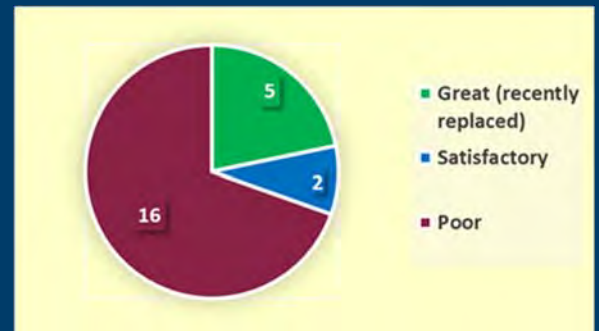
Age, function and structural integrity conditions vary between WCS's and many are in dire need of rehabilitation or complete replacement (Figure 3-1). Delays in the rehabilitation/replacement schedule increase the possibility and risk for a potential massive failure of the deteriorated structures; especially during a severe storm event. Water control structure failures could trigger other catastrophic mishaps such as downstream flooding and washout of roads and bridges.

WCS Condition Assessment

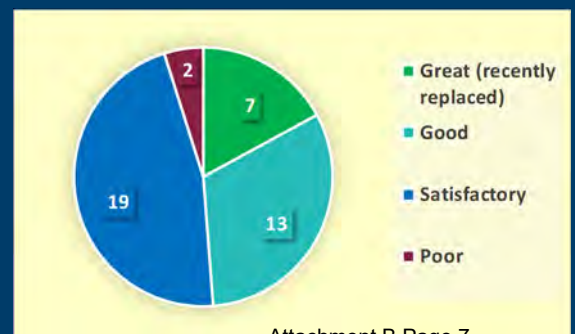
In 2010-2012, an engineering consultant was retained to inspect and evaluate 42 of the City's WCS's to determine structural integrity and functional significance. Of these structures, seven were found to be in overall good condition and require regular inspections and preventive maintenance. Of the remaining 35, 17 structures required complete rehabilitation, replacement or removal and 18 required some repair and maintenance.

The consultant provided a list of WCS priorities for repair or replacement along with cost estimates. Annually, staff updates the list, noting structures that have been repaired or replaced, revising priorities based on current inspection data, and formulating more accurate repair and replacement costs (Attachment B).

GATED WATER CONTROL STRUCTURES CONDITION



FIXED WIER AND DROP STRUCTURES CONDITION



WCS Replacement Plan

The priority for the replacement of the major WCS's is updated annually (Figure 3-2). Since 2006, 11 major WCS's have been completely replaced or rehabilitated, one is in construction, and one is being designed (Attachment C). The current Public Works plan is to annually design and permit one WCS replacement while constructing a previously designed and permitted WCS.

The rehabilitation of WCS 106 on the Cocoplum Waterway just west of North Port Boulevard is underway with completion expected in Spring of 2020. Design for WCS 108 on the Cocoplum Waterway west of Collingswood Boulevard is anticipated to be completed in Fall of 2020 and will be followed by construction budgeted for fiscal year 2021.

Beyond the 5-year budget projections shown, WCS 124, WCS 127, WCS 138, WCS 118, WCS 121 and WCS 125, are anticipated to be constructed in years 2025, 2026, 2027, 2028, 2029 and 2030 respectively. Budget amounts will be proposed when the structure is within the 5-year replacement window.

WCS Repair Plan

Preventative maintenance and minor repairs prolong the life of the WCS's and keep them in good working order. Minor repairs include repair or replacement of: gates, gate actuators, gate stems, gate tracks, tie backs, catwalk deck/railing, vertical and horizontal I-beams, weir sheet metal erosion, and adjacent bank erosion.

The WCS's that have not been replaced are at a vulnerable age when unforeseen component failures can occur. Due to the significant expense and time needed to design, permit and construct replacement WCS's, significant repairs may need to be done on a WCS that is scheduled to be replaced in the near future. Generally, components such as gates, actuators and stems that are in good condition can be salvaged and become spares for use in other failing WCS's.

Public Works Operations staff perform annual inspection of all structures and prioritize major and minor WCS repairs or replacements (Attachment B). Figure 3-3 reflects the fiscal year 2020 repair budget for WCS's.

Figure 3-2
5-year WCS Replacement Budget Plan

	2020	2021	2022	2023	2024
Design	WCS 108	WCS 113	WCS 114	FW 157	WCS 124
Costs	\$199,000	\$308,000	\$203,000	\$234,000	\$241,000
Construction	WCS 106	WCS 108	WCS 113	WCS 114	FW 157
Costs	\$2,500,000	\$2,480,000	\$3,850,000	\$2,540,000	\$2,920,000
Total Costs	2,668,000	\$2,679,000	\$4,158,000	\$2,743,000	\$3,154,000



WCS 106 is currently being rebuilt

Figure 3-3
Fiscal Year 2020 WCS Repair Budget Plan

Structure	Description	Budget Estimate
WCS 108	Repair holes in sheet piling	\$10,000
WCS 113	Repair holes in sheet piling, repair gate stem attachment points, evaluate for gate replacement	\$15,000-\$30,000
WCS 118	Replace #1 gate and track, evaluate for gate replacement	\$15,000-\$20,000
WCS 124	Replace #1 gate and track, evaluate for gate replacement	\$15,000-\$20,000
WCS 125	Replace actuator	\$20,000

Water Control Structure Locations

WCS 106	North Port Blvd and Cocoplum Waterway
WCS 108	Collingswood Blvd and Cocoplum Waterway
WCS 113	Snover Waterway and Myakkahatchee Creek
WCS 114	N Salford Blvd and Snover Waterway

WCS 118	Abbotsford St and Blueridge Waterway
WCS 124	Parade Terrace and Lagoon Waterway
WCS 125	Parkmount Terrace and Lagoon Waterway
FW 157	Panacea Blvd and Snover Waterway

4 | DRAINAGE PROGRAM

A proactive maintenance program has reduced emergency drainage repairs and their corresponding high costs

As mentioned, a considerable portion of the City's stormwater infrastructure was constructed in the late 1960's to 1970's and is in need of replacement. Much of the work done in the past has been reactive, many times due to collapsed pipes or frequent complaints. In fiscal year 2018, Public Works began taking a comprehensive, vigorous proactive approach to scheduling and budgeting for the maintenance, rehabilitation and replacement of the stormwater system. Outlined below are the drainage program elements.

Neighborhood Rehabilitation by Grid

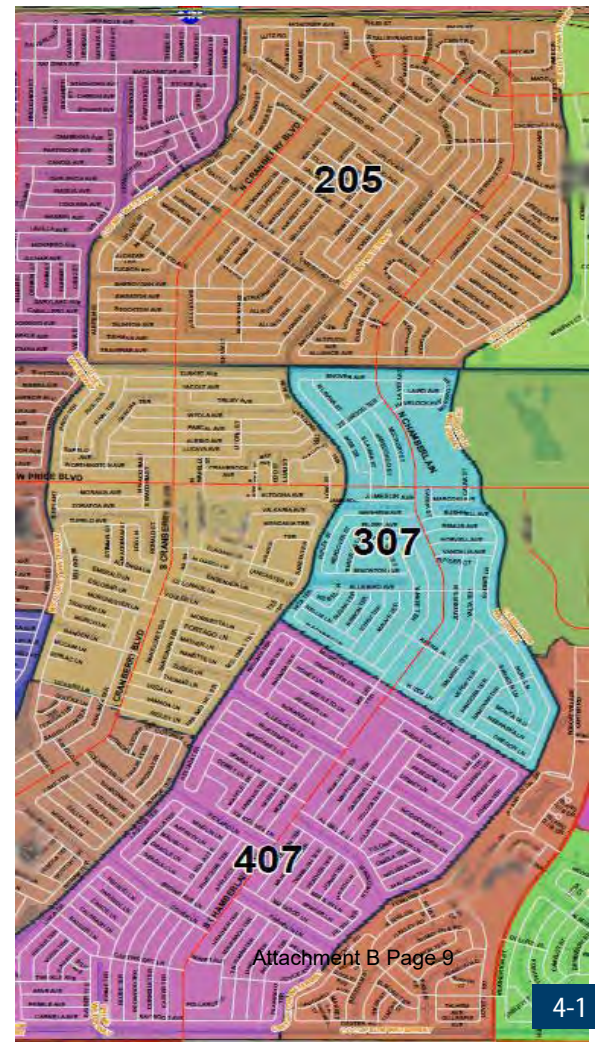
With many different components making up the stormwater drainage system, it is difficult to effectively maintain the system by continually operating in a reactive mode. Using a holistic approach to rehabilitate a neighborhood system of swales, road crossing pipes, outfalls and retention ditches better utilizes resources.

The Neighborhood Rehabilitation by Grid System prioritizes neighborhood stormwater systems improvements by: known flooding, impact on other infrastructure (roads, waterways, etc.), present condition of drainage system, residential density, and impact to community facilities (schools, parks, etc.). The grid system map can be seen in Attachment D.

Grid 205, one of the largest grids in the City, was completed in 2019. Grid 407 rehabilitation, which started in fiscal year 2019, is on schedule to be completed in fiscal year 2020. Grid 307 is scheduled to be rehabilitated in fiscal year 2020. The fiscal year 2020 budget of \$469,500 covers pipes, catch basins, asphalt, rip rap, concrete, sod, hydroseed and surveying.

Figure 4-0

Map of Grids 205, 307 and 407



The Drainage Program is divided into key elements of the City's stormwater infrastructure:

- Neighborhood Rehabilitation by Grid
- Road Crossing Pipe Replacement
- Outfall Replacement
- Retention Ditch Rehabilitation
- Targeted Projects

The 2020 Projects, described in detail on the following pages, were prioritized over other stormwater needs by factors such as known flooding, impact on other infrastructure, present condition of drainage system, residential density and impact to community facilities.





Corrugated steel pipe has an average lifespan of 10-35 years before perforation of the metal occurs.

Road Crossing Pipe Replacement

Road crossing pipes, also called culverts, convey water under the roadway between swales.

Over the past five years, Public Works has replaced over 1,200 corrugated metal road crossing pipes through the following planned and unplanned activities: The Road Bond Project, the Road Rehabilitation Program, annual Drainage Improvement Program and emergency road crossing pipe failures.

There are an estimated 1,338 corrugated metal pipes (CMP's) remaining in the road crossing drainage system. Of these, 1,140 have been divided into the following categories:

- 430 CMPs inspected during the Road Bond Project were estimated to have a life span of 7 years remaining and were not replaced. These road crossing pipes will be replaced through the annual road rehabilitation program as roads are repaved.
- 680 CMPs are in the undeveloped east side area of North Port and pose no significant flood threat to North Port citizens. These will be inspected and added to future road and drainage projects.
- 30 CMPs are estimated to be replaced during the fiscal year 2020 Road Rehabilitation project.

The remaining 198 corrugated metal pipes will be inspected during fiscal years 2020 and 2021. There are a few pipes larger than 36" that will need to be replaced by a contractor. The rest are 36" and smaller and replacement can be completed in-house with material costs estimated at \$550,000. This work is scheduled and budgeted to be completed over ten (10) years. The budget for fiscal year 2020 is \$114,200.





Figure 4-1
Fiscal Year 2020 Retention Ditch
Rehabilitation Schedule

R-DITCH ID	HYDROSEEDING COSTS
61	\$ 3,590
62	\$ 3,910
63	\$ 4,630
66	\$ 3,140

Outfall Replacement/Lining

Outfalls are located in the easement between two property parcels and connect neighborhood swale systems to retention ditches or waterways.

There are an estimated 1,200 outfalls throughout the City. If the parcels on each side of the outfall are developed, the outfall is most likely piped. Parcels that are undeveloped generally have open outfalls.

There are an estimated 300 outfalls throughout the City which are piped, with about 17% having corrugated metal pipes. As the pipes age and deteriorate, they need to be replaced. There are a few instances that due to the pipe location and proximity to homes, outbuildings and/or large trees, the metal pipe, if not too deteriorated, would be lined. In this process, a resin liner is inserted into the existing pipe and cured, creating a pipe-within-a-pipe. This extends the useful life of the pipe without excavation.

Inventorying of the outfall pipes will continue in fiscal year 2020. As part of the Drainage Project, four metal outfall pipes are scheduled to be replaced in fiscal year 2020 with a budget of \$126,000, and seven pipes are expected to be lined with a budget of \$100,000.

Also in fiscal year 2020, Public Works will continue assessing and identifying the outfall pipes needing pipes replaced or added. This information will be used to adequately budget for future rehabilitation.

Retention Ditch Rehabilitation

Stormwater flows from neighborhood swales through the outfalls, then many times into retention ditches prior to flowing into the City's waterway system.

Retention ditches, commonly called R-ditches, slow and store water after rain events and provide water quality benefits by reducing pollutants and sediment.

After time, retention ditches can accumulate sediment and develop slope erosion and must be rehabilitated to ensure they are working as designed. This work, completed by in-house staff, includes digging of retention ditches to the design specifications and reshaping the banks to aid in access and maintenance.

For the last couple of years, maintenance work on the main retention ditch bordering the north side of the City from the Myakkahatchee Creek to Price Boulevard, R-36, has been proceeding. This work will continue through fiscal year 2020. The retention ditches scheduled for rehabilitation in fiscal year 2020 and the costs of hydroseeding are reflected in Figure 4-1.



Tractor Crossing Pipe Replacement/ Installation

Outfalls convey and discharge stormwater into retention ditches or waterways. When the outfall is open (not piped), it is difficult to maintain the retention ditch or waterway as the mowing tractor must dip into and out of the outfall.

To make retention ditch and waterway maintenance safer and more efficient, a tractor crossing pipe is installed at the location where the tractor crosses the outfall. It is estimated there are 380 tractor crossing pipes throughout the City, with 70% of them having corrugated metal pipes. Over time, these metal pipes age and deteriorate and are in need of replacement.

In fiscal year 2020, Public Works will continue inventorying the tractor crossing pipes and assessing their condition to adequately budget for future replacement. Five metal tractor crossing pipes are scheduled to be replaced in fiscal year 2020 with a budget of \$23,200.

Focused Projects

Throughout the City, there are sections of the stormwater system that are failing. These sections, outside of the Grid Project, are evaluated and prioritized for budgeting and scheduled rehabilitation. Three areas: the seawall at Pan American Boulevard and Jeffrey Avenue; Talbot Street outfall; and piping at Talbrook Road and Mayland Street, have been identified for rehabilitation in fiscal year 2020 and budgeted at \$798,800.

2019 Deming Avenue Project before and after



Figure 4-2

Fiscal Year 2020 Focused Projects with Budget

FY2020 PROJECTS	BUDGET
PanAm/Jeffrey Seawall	\$353,200
Talbot Street Outfall	\$60,700
Talbrook/Mayland Piping	\$384,900

5 | RESPONSIVE IMPROVEMENTS

With a significant portion of the stormwater infrastructure more than 60 years old, deterioration to the point of failure will occur.

While a comprehensive stormwater management program plans for maintenance, repair and replacement, situations arise where action outside of the scheduled program is needed. These include pipe failures, swale regrading, waterway erosion and such. Public Works will continue to evaluate, prioritize and budget for each situation requiring improvement.

Culvert failures on Orlando Boulevard, Richbriar Drive and Sawyer Circle
Budget: \$317,350



Sardinia full front piping and sidewalk project
Budget: \$70,265.40



Kenwood Drive culvert failure repair
Budget: \$94,867



6 | LEVEL OF SERVICE AND MAINTENANCE

Frequently of stormwater maintenance services is set in the Level of Service and reflected in the budget.

Enhancing the System

When setting a level of service, a combination of parameters is taken into consideration: system needs, budget constraints, customer desires, and environmental impacts.

Having an open swale type of stormwater system means that after a rain event, stormwater will be stored in the City's swales, outfalls, retention ditches and waterways. Stormwater will slowly migrate through the system to maximize water treatment by filtration. Thus, controlling the movement of stormwater, as opposed to absence of stormwater in swales, is the target service.

Stormwater system maintenance is pivotal and has been set to optimize resources. Recently, assessment fee charges were re-aligned to the benefit received by properties throughout the City.

Right-of-Way Mowing Services

Mowing of right-of-way swales, outfalls, retention ditches and ponds is necessary for improved stormwater drainage flow capabilities. The mowing is completed not for aesthetic purposes, but to maintain the hydraulic function of the stormwater drainage network. A suitable level of service that corresponds to annual assessment fees has been set and is reflected below in Figure 6-0.

Aquatic Spraying Services

Spraying aquatic weeds is necessary to maintain water quality, reduce impediment of water flow, and limit the deposition of sediment. Public Works utilizes only federally-approved herbicides and the City of North Port holds a permit for their use issued by Florida Fish and Wildlife Conservation Commission. Staff carefully monitors for effectiveness of spraying, and only conducts spraying under calm weather conditions. Record keeping of herbicide use and application is documented.



Swale and Ditch Capacity and Flow Improvements

At a minimum, swales and retention ditches are inspected for elevation changes and impediments every eight years and rehabilitated as necessary. In addition, swales in the Grid Project are rehabilitated and culverts cleaned out, as are swales identified by residents as possible concerns and verified by staff as needing restoration.

Figure 6-0

Drainage Level of Service

SERVICE DELIVERY	LEVEL OF SERVICE
RIGHT-OF-WAY MOWING	
Arterial and collector roads	8 times per year
Local roads	6 times per year
Retention ponds and ditches	6 times per year
AQUATIC SPRAYING OF WATERWAYS	3 times per year
SWALE AND DITCH CAPACITY AND FLOW IMPROVEMENTS	Every 8 years
CANAL CAPACITY AND FLOW IMPROVEMENTS	Every 15 years



Canal Capacity and Flow Improvements

Clearing vegetative overgrowth is necessary for proper stormwater conveyance. Canal maintenance dredging is conducted to restore original design depths. Outside of the set service level, issues impeding canal function are addressed as soon as possible.

Lake, Pond and Creek Maintenance

Another essential part of the stormwater management plan is maintenance of the City's lakes, ponds and creek. This includes clearing dense vegetation for proper water flow, removal of debris such as rocks, trees and garbage that has fallen into the waterways, maintaining clear access, and removing sand bars.

Drainage System Inspections

Routine inspections of all City stormwater system components are conducted and any issues resolved. In addition, locations prone to localized flooding and areas where debris, dumped items, and vandalism have been known to create problems are inspected frequently.

Clearing obstructions in the Myakkahatchee Creek is essential to proper water flow which reduces stagnation and the proliferation of algae.



7 | FLOOD REDUCTION STUDIES

Reducing the frequency and severity of flooding in North Port is a high priority and studying potential system solutions helps plan for success.

Big Slough Flood Reduction Study

Public Works has been working with a consultant to complete the Big Slough Flood Reduction Study, cooperatively funded with the Southwest Florida Water Management District (SWFWMD). The consultant conducted stormwater studies and evaluated feasible, cost effective solutions to achieve the tasks listed below. The project is in the permitting stage now and anticipated to be complete in fiscal year 2020.

Reduce Flooding in the Following Localized Areas (study cooperatively funded with SWFWMD):

- Area near the Myakkahatchee Creek just north and south of interstate I-75 (Attachment E). Consultant's work indicated there are no simple local solutions to reduce the flooding in this area and recommends regional solutions.
- Jockey Club area west of the Myakkahatchee Creek (Attachment E). Since the City has resolved flooding issues within the Jockey Club area through pipe replacement and installation of plastic swale liners, the consultant was asked to redirect efforts to the Dorothy Avenue/ Bullard Street area which had flooding as recent as the 2017 Hurricane Irma. Consultant proposed improvements to the conveyance retention ditch system in this area.

Reduce Regional Flooding (study funded by the City):

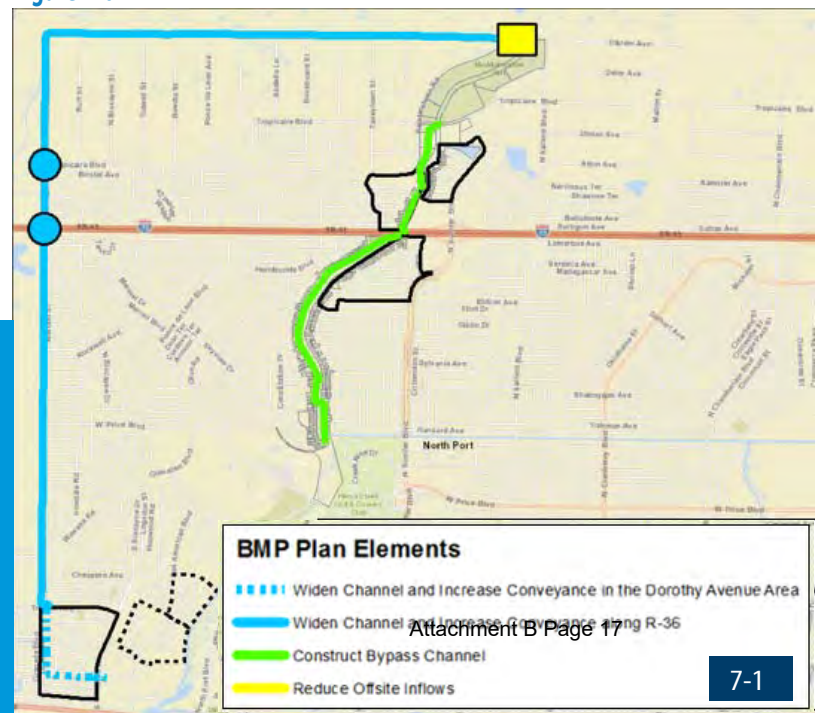
After several flood reduction alternatives were evaluated and presented to the City Commission, the following recommendations were approved as phased components:

- Improve existing retention ditch/conveyance system and upsize road crossing culverts in the Dorothy Avenue area.
- Increase conveyance capacity through widening and upsizing pipe culverts in the R-36 retention ditch/conveyance system that runs along the northern and western boundary of the City.
- Restrict/reduce high flow into the Myakkahatchee Creek near the north City boundary. (Subsequent feedback from Sarasota County and SWFWMD has deemed this option not viable.)
- Construct a new bypass canal parallel to the Myakkahatchee Creek within a portion of the City's Tier I lots that are located north of Price Boulevard. This will not proceed without conducting extensive historical and archaeological environmental research.

Costs

Study costs for the localized areas were covered 50% by a SWFWMD grant. Evaluating reduced regional flooding reduction was funded by the City. Implementation costs will be budgeted in future years.

Figure 7-0



Application for Conceptual Approval from SWFWMD of a Statewide Environmental Resource Permit for the Big Slough Flood Reduction Plan has been submitted.



Attachments



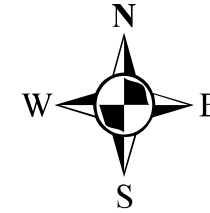
Attachment A

City of North Port Stormwater Drainage System

Type, Structure_Number, Grid	<ul style="list-style-type: none">Ditch Block, DB-301, C5Ditch Block, DB-302, C5Ditch Block, DB-303, C3Ditch Block, DB-304, C3Ditch Block, DB-305, E2Ditch Block, DB-306, E1Ditch Block, DB-307, E2Ditch Block, DB-308, E1Ditch Block, DB-309, F8	<ul style="list-style-type: none">Ditch Block, DB-310, G6Ditch Block, DB-311, E3Ditch Block, DB-312, A6Ditch Block, DB-303, C3Ditch Block, DB-304, C3Ditch Block, DB-305, E2Ditch Block, DB-306, E1Ditch Block, DB-307, E2Ditch Block, DB-308, E1Ditch Block, DB-309, F8	<ul style="list-style-type: none">Drop Structure Pipe, DS-504, C8Drop Structure Box Structure, DS-119, C5Drop Structure Box Structure, DS-126, E5Drop Structure Box Structure, DS-508, E8Drop Structure Box Structure, DS-510, F8Drop Structure Pipe, DS-136, F5Drop Structure Pipe, DS-501, B8Drop Structure Pipe, DS-503, C8	<ul style="list-style-type: none">Fixed Weir, FW-120, C4Fixed Weir, FW-122, D5Fixed Weir, FW-129, E5Fixed Weir, FW-132, F6Fixed Weir, FW-133, G5Fixed Weir, FW-135, F5Fixed Weir, FW-136, F5Fixed Weir, FW-139, G5	<ul style="list-style-type: none">Fixed Weir, FW-151, F4Fixed Weir, FW-152, F4Fixed Weir, FW-153, F4Fixed Weir, FW-154, G4Fixed Weir, FW-155, G4Fixed Weir, FW-156, G4Fixed Weir, FW-157, H4Fixed Weir, FW-158, H4Fixed Weir, FW-159, I4Fixed Weir, FW-160, J4	<ul style="list-style-type: none">Fixed Weir, FW-161, J4Fixed Weir, FW-180, G8Fixed Weir, FW-181, G8Fixed Weir, FW-182, H8Fixed Weir, FW-183, H8Fixed Weir, FW-186, J8Fixed Weir, FW-506, E8Fixed Weir, FW-507, E8Gated Drop Structure, GDS-112, I6	<ul style="list-style-type: none">Gated Drop Structure, GDS-116, H4Gated Drop Structure, GDS-141, I5Gated Drop Structure, GDS-142, H5Gated Drop Structure, GDS-143, I6Gated Drop Structure, GDS-512, F8Water Control Structure, WCS-101, B7Water Control Structure, WCS-106, B7Water Control Structure, WCS-107, D8Water Control Structure, WCS-108, E8Water Control Structure, WCS-109, G8	<ul style="list-style-type: none">Water Control Structure, WCS-110, H8Water Control Structure, WCS-111, I7Water Control Structure, WCS-113, C4Water Control Structure, WCS-114, D4Water Control Structure, WCS-115, E4Water Control Structure, WCS-117, C7Water Control Structure, WCS-118, C5Water Control Structure, WCS-121, D6Water Control Structure, WCS-124, D7Water Control Structure, WCS-125, D6	<ul style="list-style-type: none">Water Control Structure, WCS-127, E7Water Control Structure, WCS-128, E6Water Control Structure, WCS-130, F8Water Control Structure, WCS-131, F7Water Control Structure, WCS-137, F7Water Control Structure, WCS-138, G6Water Control Structure, WCS-140, H6Water Control Structure, WCS-142, H6Water Control Structure, WCS-143, H6Water Control Structure, WCS-144, H6
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Date: 9/24/2018



Prepared by
Engineering Division
Public Works
City of North Port

Disclaimer: This map is for reference purposes only and is not to be construed as a legal document. Any reliance on the information contained herein is at the user's risk. The City of North Port and its agents assume no responsibility for any use of the information contained herein or any loss resulting there from.

Document Path: W:\Infrastructure\Stormwater_Drainage_System.mxd

Attachment B

2019 Water Control Structures NPDES Inspection

Metal, Gates, Pipes and Risers: 1 = No Corrosion, 2 = Surface Rust, 3 = Some Rot, 4 = Major Corrosion Overall: 1 = Good, 2 = Fair, 3 = Poor, 4 = Bad
Concrete: 1 = Good, 2 = Few chips/cracks, 3 = Some Spalling, 4 = Major Chips/Cracks Deterioration Bank Condition: 1 = Good, 2 = Fair, 3 = Poor, 4 = Bad
Structure Location: Replaced or Rehabilitated = 0, Structure located in undeveloped areas (1), east of Toledo Blade (2), west of Toledo Blade (3), developed areas Snover & Cocoplum (4)

Structure #	Waterway	Date	Metal			Gates				Pipes	Risers	Concrete		Bank Condition	Overall	Structure Location	Replacement Priority Score	Other Observations in 2019	Previous Repairs Completed	Major Replacement CIP Project		Minor Repairs Needed by Contractor		In-House Work Needed				Inspector	
			Sheet Pilings	I - Beams	Cat walk	# of Gates	Gate	Hardware	Operational (yes, no, list#)			Columns	Cap							Description	Priority	Description	Priority	Description	Priority	Work Order/or Invoice No.	Completion Date		
WCS 101	Myakkahatchee	1/30/19	1	1	1	6	1	1	All Yes			1	1	1	1	0	0		5/9/14 - Completed replacement of existing structure with new structure, two additional gates for a total of 6 gates, gate automation and telemetry 9/5/18 - Repaired telemetry malfunction, replace part no, NL120 CSI Ethernet Interface			Gate 2 leaking oil. Sand building up on high side, 101 backside.	High					John K and Ken Smith	
WCS 106	Cocoplum	1/30/19	1	1	1	6	1	1	All Yes			4	4	2	4	4	16	Gate 6 opens up half way and jams into track. Same way as putting it down, gate goes up crooked both ways.	Replacement under construction April 2019 to 2020									John K and Ken Smith	
WCS 107	Cocoplum	1/30/19	1	1	1	6	1	1	All Yes			1	1	1	1	0	0		Jan 2011 - Retrofitted with concrete weir wall, 6 new stainless steel gates, concrete spillway and large revetment.									John K and Ken Smith	
WCS 108	Cocoplum	1/30/19	3.5	2.5	1	6	1.5	1.5	All Yes			4		2.5	3.5	3.5	12.25		4/2011 - Replaced 3 Gates Nos. 1, 2 and 5 9/7/12 - Replace corroded horizontal I-beams and corroded sections of vertical I-beams, and repair holes in sheet metal pile. 12/17/15 - Replaced 3 more Gates (including the existing electric gate). Use an existing actuator (from the old WCS 101). Needed two new left hand threaded rods, fabricate 3 new gates #3, 4, and 6 and tracks, minor concrete and sheet pile repair. 1/30/19 PO #047665 - Fixed catwalk grate rusted through in one location.	Design FY2020, Construction FY2021.	1	Repair holes in sheet piling both sides of structure at water level. Big chunk of concrete missing in 6th column 30" down. Catwalk grate rusted through in one location.	High	Repair small erosion on NW bank and large erosion under slab on south side. Remove island downstream ~25'x100' (WxL)					John K and Ken Smith
WCS 109	Cocoplum	1/30/19	1	1	2	6	1	1	All Yes			1	1	1	1	0	0		12/17/2015									John K and Ken Smith	
WCS 110	Cocoplum	1/30/19	3	3	1	6	2.5	2.5	All Yes			1.5		2	3	2	6	Very rusted sheet pilings and I-beams.	1/30/19 PO #047665 Fixed top bars in gate frames very corroded, one hole behind I-beam					Repair large erosion under south downstream concrete side bank				John K and Ken Smith	
WCS 111	Cocoplum	1/30/19	2.5	2	1	4	3	3	All Yes			1.5		4	3	2	6	Vertical I-beams slightly corroded at waterline. Structure was repaired before, new horizontal I-beams and catwalk. Small chips off concrete column. Gates are very corroded.	9/12/12 - Replaced corroded horizontal I-beam and corroded sections of vertical support for "cat walk" 1/30/19 PO #047665 - Fixed top bars in gate frames that was corroded					Repair wash out low side of structure				John K and Ken Smith	
WCS 113	Snover	1/30/19	3	1	2	4	2	2	All Yes			3		3	3	4	12		7/28/14 - Repaired erosion below existing concrete slab on the northwest side of WCS No. 113 by injecting flowable fill (cementitious grout) to fill all voids	CIP WCS Replacement Project - Design FY2021, Construction FY2022.	2	Sheet piling both ends holes needs patch. 3rd column concrete busting out, can see the rebar inside the concrete. All stems on gates are rotten out. S. vertical I-beam has large hole.	High	S. downstream concrete bank cracked and large erosion.				John K and Ken Smith	
WCS 114	Snover	1/30/19	3	2	2	4	1	1	All Yes			3		1	3	3.5	10.5	Concrete pitted and one column concrete corner broken. Sheet piling very corroded at the top.	5/12 - Replaced all 4 gates with new steel gates epoxy coated, replace all gate supports, gate slide frameworks, both horizontal I-beams and replaced corroded section of vertical I-beams, rebuilt corroded sections of all 4 lift rods 9/30/15 - Troubleshoot why gates nos. 1 and 2 not opening easily, replace corroded or bent sections of lift rods as needed; if needed, remove and replace 1 gear box with existing gear box at the public works facility; remove corroded first 14 feet long sections of two-strand horizontal and vertical catwalk railing(both sides of railing) and weld on new galvanized steel two-strand horizontal and vertical railing and paint. 12/2016 - Repaired damage to gate, tracks and gear 1/30/19 Fixed PO #047665 - Fixed hole in S. side sheet piling. Repaired Gate #2 as it does not close all the way down, need to physically hammer gate down	CIP WCS Replacement Project - Design FY2022, Construction FY2023.	3						John K and Ken Smith		
WCS 115	Snover	1/30/19	1	1	1	1	1	1				1	1	1	1	1	1	New structure constructed 2018	8/31/18 - Completed replacement of existing structure with new structure, 4 automated gates with remote telemetry control									John K and Ken Smith	

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Structure #	Waterway	Date	Metal			Gates				Pipes	Risers	Concrete		Bank Condition	Overall	Structure Location	Replacement Priority Score	Other Observations in 2019	Previous Repairs Completed	Major Replacement CIP Project		Minor Repairs Needed by Contractor		In-House Work Needed				Inspector	
			Sheet Piling	I - Beams	Catwalk	# of Gates	Gate	Hardware	Operational (yes, no, list#)			Columns	Cap							Description	Priority	Description	Priority	Description	Priority	Work Order/ Invoice No.	Completion Date		
WCS 117	Blueridge	1/30/19	2	2	1	2	2	2	Yes			1		1	1	3	3					Small hole in horizontal I-beam web on W side. Both horizontal I-beams very corroded. Vertical I-beam at water level very corroded	Medium					John K and Ken Smith	
WCS 118	Blueridge	1/30/19	2	4	1	2	2	2	Yes			1		1	3	3	9	9/12/13 - Replace corroded sections of horizontal and vertical railing 6/4/18 - Replaced I Beam, inspect gear box, clean rod, maintain tracks, maintain gate 1/30/19 PO #047588 - Replaced both horizontal I-beam webs that had holes. Repaired tracks for Gate #2 as it does not close all the way down. Maintained gear box and rod.			Gate 1 needs new track and gate door still open but needs replaced. Vertical I beam needs replaced, rotten out fell in water.						John K and Ken Smith		
WCS 121	MacCaughey	1/30/19	2	4	2	4	3	3	1&4 Yes, 2&4 (electric) No			2	4	2	2	3	6	Concrete cap on weir structure				Vertical I-Beams need replaced. Concrete cap in need of repair, replace two gate actuators with salvaged actuators from WCS 115	Medium to High	Repair erosion under E. and W. downstream side concrete banks					John K and Ken Smith
WCS 124	Lagoon	1/30/19	2	1	1.5	4	2	2	2, 3, 4 Yes, 1 No			2		3	2	3	6	6/13/12 - Remove gate sill bottoms as these are corroded and prevent gate from closing and replace angles welded to gate bottoms 11/6/15 - Replace track guide systems for 3 gates and change anchors in track guide systems; clean and lubricate all 3 lift rods for gates; for all 3 tie rods, weld new equivalent 3 ft sections; replace 3 ft corroded sections of weir vertical I-beams at both side banks and encase new sections of I-beam in concrete; repair hole in sheet piling, install 3 new gates. 1/30/19 PO #047665 - Repaired holes in east side sheet piling and repaired vertical I-Beam. Retrofit surplus actuator in place of non-working actuator	CIP WCS Replacement Project - Design FY2024, Construction FY2025.	5	Gate number 1 needs new track and gate door erosion down stream west side, east side needs all new electric outlets.	Medium to High					John K and Ken Smith		
WCS 125	Lagoon	1/30/19	2	1	1	4	2	2	1, 4 Yes, 2, 4 (electric) No			2		2	2	3	6	6/13/12 - Remove gate sill bottoms as these are corroded and prevent gate from closing and replace angles welded to gate bottoms			Replace actuator with salvaged actuator from WCS 115. Sheet piling by I-beam front side, there's a hole that needs to be patched. I-beam under walkway has half dollar holes in it	Medium to High	Erosion under E. and W. downstream side concrete bank					John K and Ken Smith	
WCS 127	Creighton	1/30/19	2.5	1	2	2	2	2	All Yes			2		2	2	3	6	1/30/19 PO#047665 - Repaired hole in Vertical I-beams and repaired hole in sheet piling by support bar	CIP WCS Replacement Project - Design FY2025, Construction FY2026.	6		Repair downstream backside bank washing out by mesh concrete						John K and Ken Smith	
WCS 128	Creighton	1/30/19	2.5	1.5	1	1	3	2	All Yes			2		1	2.5	3	7.5	West vertical I-beam and sheet piling corroded but no holes.	9/14/12 - Replace corroded horizontal cap and corroded sections of vertical I-beams			Gate #1 has a 0.5" hole. concrete high side has chips and cracks. Repair hole in sheet piling for tie rod attachment is corroded.	Medium to High					John K and Ken Smith	
WCS 130	Bass Point	1/30/19	3	1	1	2	2	2	2 Yes			2		4	2.5	2	5	I-beam replaced August 2007. 8/07 - Replaced gates and corroded horizontal channels. 6/4/18 - Replaced I-Beam, inspect gear box, clean rod, maintain tracks, maintain gate 1/30/19 PO #047588 - Replaced I-beam webs that had holes. Repaired tracks. Maintained gear box and rod.					Repair E. downstream bank major erosion.					John K and Ken Smith	
WCS 131	Bass Point	1/30/19	2.5	1	1	2	4	4	All Yes			3		1	2.5	2	5	9/25/13 Replaced corroded horizontal support beams and corroded sections of tie rods and vertical I-beams on both west and east sides of the structure, patched a small leak in the sheet metal piling and welded new boxes for both gate stems. 8/07 - Weld boxes on gate stems on each gate.			Both gates have pin holes	Medium to High	Repair minor erosion under rip rap which is concreted together. Repair erosion to catwalk again.					John K and Ken Smith	

Attachment B

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Structure #	Waterway	Date	Metal			Gates				Pipes	Risers	Concrete		Bank Condition	Overall	Structure Location	Replacement Priority Score	Other Observations in 2019	Previous Repairs Completed	Major Replacement CIP Project		Minor Repairs Needed by Contractor		In-House Work Needed				Inspector	
			Sheet Pilings	I - Beams	Catwalk	# of Gates	Gate	Hardware	Operational (yes, no, list#)			Columns	Cap							Description	Priority	Description	Priority	Description	Priority	Work Order/or Invoice No.	Completion Date		
WCS 137	New Castle	1/30/19	2.5	1	1	2	1	1	All Yes			2		2	2.5	2	5		8/07 - Replace gates and corroded members. 6/4/18 - Replace I Beam, Inspect Rod, clean and repair any bad threads, Gear box-open, replace any bad bearings, check key ways in gear drives. Check brass lifting bushing. Tracks, replace spacer bars as needed or tracks as needed. Adjust, clean and inspect door for proper operation. 1/30/19 PO #047588 - Replaced both horizontal I-beams which have rotted off.									John K and Ken Smith	
WCS 138	New Castle	1/30/19	3	1.5	1	2	1	1	All Yes			2.5		1.5	3	2	6	Weir corroded on top. Crack on W. downstream concrete side bank. Tie rod bit bowed. Some corrosion on sheet piling above first support bar.	8/07 - Replace gates and corroded members. Washout by walkway fixed									John K and Ken Smith	
WCS 140	Bethlehem	1/30/19	3.5	1	1	2	1	1	All Yes			1.5		1	3		0		12/2017 - Repair one horizontal I beam, Repair one Vertical I beam, Replace gate #1, Replace gate #2 1/30/19 - Fixed Horizontal I-beam that has fallen off, vertical I-beam has holes, gate #1			Some holes in sheet pilings . Low side backside of structure.	Medium	Repair small erosion under E. side bank concrete.					John K and Ken Smith
WCS 162	R - 36	1/30/19	1		1	1	1	1	Yes	1		1	1	1	1	3	3	Need some Riprap back side, 162 washing out.	6/4/15 Repaired erosion below existing concrete slab on the northwest side of WCS No. 113 by injecting flowable fill (cementitious grout) to fill all voids 1/30/19 - Removed willows in R-36 and fixed rip rap on downstream of Van Camp			Erosion continues under E. side bank rip rap. Need to add rip rap or use Uretek grout injection.	High					John K and Ken Smith	
FW 120	Blueridge	1/30/19	1.5	1.5										1.5	1.5	3	4.5	Sheet pilings are rusty. No concrete cap. Middle vertical I-beam web corroded					Large Island blocking water flow. Need machine to pull island out.					John K and Ken Smith	
FW 122	MacCaughey	1/30/19	2										1	1	1.5	3	4.5	Minor cracks in both sides of concrete side banks. Sheet pilings are rusty.	1/30/19 - Fixed W. downstream bank minor erosion.			Pin hole sheet piling next to 1st column	Low					John K and Ken Smith	
FW 123	MacCaughey	1/30/19	1.5										1	1.5	1.5	3	4.5	Cracks in the concrete side bank on SE side.2018					E. downstream bank minor erosion.					John K and Ken Smith	
FW 129	Creighton	1/30/19	1							3.5		1	1	1	1	1	1	Sheet pilings are rusty. Downstream CMP pipes under Price Blvd are corroded	1/30/19 Fixed - Remove fabric and debris over downstream pipes	This structure will be replaced with the Price Blvd Widening project.									John K and Ken Smith
FW 132	Bass Point	1/30/19	1							1		1	1	1	1		0	Good Condition.	5/2011 - Severely corroded corrugated metal pipes CMP, erosion and undermining of side banks. Replace with open concrete weir and RCP culvert pipes.									John K and Ken Smith	
FW 133	Bass Point	1/30/19	1							1		1	1	1	1		0	Good Condition.	11/2014 - Severely corroded corrugated metal pipes CMP, erosion and undermining of side banks. Replace with open concrete weir and RCP culvert pipes.									John K and Ken Smith	
FW 135	Twin Lakes	1/30/19	1							1			1	1	1		0		8/2009 Replaced concrete drop structure with concrete open weir replaced as part of the Toledo Blade widening project					Repair wash out by sidewalk by Rip Rap					John K and Ken Smith
FW 136	Blue Waters	1/30/19	1.5							2		1	1	1	1.5	2	3	Downstream pipe is corroded. Will need replacement in the future						Needs more Rip Rap at downstream pipe					John K and Ken Smith
FW 139	New Castle	1/30/19	1							1			1	1	1	1	1	Culvert pipe upstream end joint separation: West=1", East = 7.75"	4/2012 Severely corroded corrugated metal pipes CMP, erosion and undermining of side banks. Replaced with open concrete weir and RCP culvert pipes.					Needs more Rip Rap at downstream pipe					John K and Ken Smith
FW 151	Snover	1/30/19	1	1									1	1	1	2	2	Minor crack in concrete of upstream spillway											Mike J Bob H
FW 152	Snover	1/30/19	1	1									1	1	1	2	2	Crack in concrete of upstream spillway. Very thick Vegetation 2018											Mike J Bob H
FW 153	Snover	1/30/19	1	1									1	1	1	2	2	Swamp grass thick on upstream side, concrete spillway thick vegetation											Mike J Bob H

2019 Water Control Structures NPDES Inspection

Metal, Gates, Pipes and Risers: 1 = No Corrosion, 2 = Surface Rust, 3 = Some Rot, 4 = Major Corrosion Overall: 1 = Good, 2 = Fair, 3 = Poor, 4 = Bad
Concrete: 1 = Good, 2 = Few chips/cracks, 3 = Some Spalling, 4 = Major Chips/Cracks Deterioration Bank Condition: 1 = Good, 2 = Fair, 3 = Poor, 4 = Bad
Structure Location: Replaced or Rehabilitated = 0, Structure located in undeveloped areas (1), east of Toledo Blade (2), west of Toledo Blade (3), developed areas Snover & Cocoplum (4)

Structure #	Waterway	Date	Metal			Gates				Pipes	Risers	Concrete		Bank Condition	Overall	Structure Location	Replacement Priority Score	Other Observations in 2019	Previous Repairs Completed	Major Replacement CIP Project		Minor Repairs Needed by Contractor		In-House Work Needed				Inspector
			Sheet Pilings	I - Beams	Cat walk	# of Gates	Gate	Hard ware	Operational (yes, no, list#)			Columns	Cap							Description	Priority	Description	Priority	Description	Priority	Work Order/or Invoice No.	Completion Date	
FW 154	Snover	1/30/19	2	4								2	2	2	2	4	Cracks in concrete of upstream spillway				Replace I-Beam	High					Mike J Bob H	
FW 155	Snover	1/30/19	2	2								2	2	2	2	4	Crack in concrete of upstream spillway. Extreme vegetation 2018. Cracks in downstream concrete side bank					Remove Brazilian Peppers that are growing into weir structure					Mike J Bob H	
FW 156	Snover	1/30/19	1	1								1	1	1	2	2	Heavy Vegetation 2018										Mike J Bob H	
FW 157	Snover	1/30/19	4	4								4	2	4	2	8	Access to this structure to repair will need to be evaluated. This structure just west of I-75 on north side of Snover. Complete disrepair 2018.	Design FY2023, Construction FY2024.	4	Upstream concrete and horizontal I-beam completely broken off.	High	Remove large sandbar on downstream side in Snover					Mike J Bob H	
FW 158	Snover	1/30/19	1	1								1.5	1	1	2	2	Crack in concrete of upstream spillway										Mike J Bob H	
FW 159	Snover	1/30/19	1	2								2	1	2	2	4	Horizontal I-beam rusty. Concrete cap sank down ~4 inch off sheet piling.					Concrete cap sank down ~4 inch off sheet piling.					Mike J Bob H	
FW 160	Snover	1/30/19	3	4								3	2	3	2	6	Very tall structure. Big alligator present. Sheet piling corroded thinner at the throat. Concrete cap sank down ~7 inch off sheet piling.				Horizontal I-beam completely broken off.	High					Mike J Bob H	
FW 161	Snover	1/30/19	1	1								2	1	2	2	4						Remove dead cabbage palm ?					Mike J Bob H	
FW 180	Lion Heart	1/30/19	2							1.5		1	1	2	1.5	0	Sheet pilings are rusty. Pipes partly submerged. Small dead cabbage palm and "island" downstream in Charlotte County. Sent John Elias email on 5-31-17 to check. Downstream needs to be cleaned out 2018 - N.P. side clean out										John K and Ken Smith	
FW 181	Sunset	1/30/19	1.5							*		1	1	1	1.5	1	* Pipes underwater, not visible. Small "island" downstream in Charlotte County. Sent John Elias email on 5-31-17 to check.										John K and Ken Smith	
FW 182	Dorchester	1/30/19	1.5							1		1	1	1.5	1	1	Sheet pilings are rusty at water level.										John K and Ken Smith	
FW 183	Morning Star	1/30/19	1.5							2.5			1	1	1.5	0	Downstream CMP pipe corroded at upstream end, no visible holes in side of pipe.				Four round "bullet-like" holes on the west side sheet piling	Low					John K and Ken Smith	
FW 185	Elkcam	1/30/19	1							1			1	1	1	1							Pepper trees need to be removed around bank, pipes and backside of drop structure. **Really bad				John K and Ken Smith	
FW 186	Fordham	1/30/19	1							1			1	1	1	1	Banks look Good.										John K and Ken Smith	
FW 506	Crestwood	1/30/19	2							1			1	2	1.5	3	4.5						Minor wash out downstream needs Riprap					John K and Ken Smith
FW 507	Flamingo	1/30/19	2							1			1	1	1.5	3	4.5						Needs more Riprap by handrail and headwall. Minor wash out by sidewalk.					John K and Ken Smith
FW 510	Courtland	1/30/19	1.5							1		1	1	1	1	2	2		1/30/19 - Small "island" downstream in Charlotte County removed.									John K and Ken Smith
GDS 112	Cocoplum	1/30/19			none	none	none	none	No	none	none			4	4	1	4	*2016 storm broke off riser, gate and portion of catwalk and eroded bank. All broken parts removed in March 2017. Only horizontal pipes left in place and part of catwalk, banks stabilized. Need to get SWFWMD approval to not replace structure in kind.										John K and Ken Smith

Attachment B

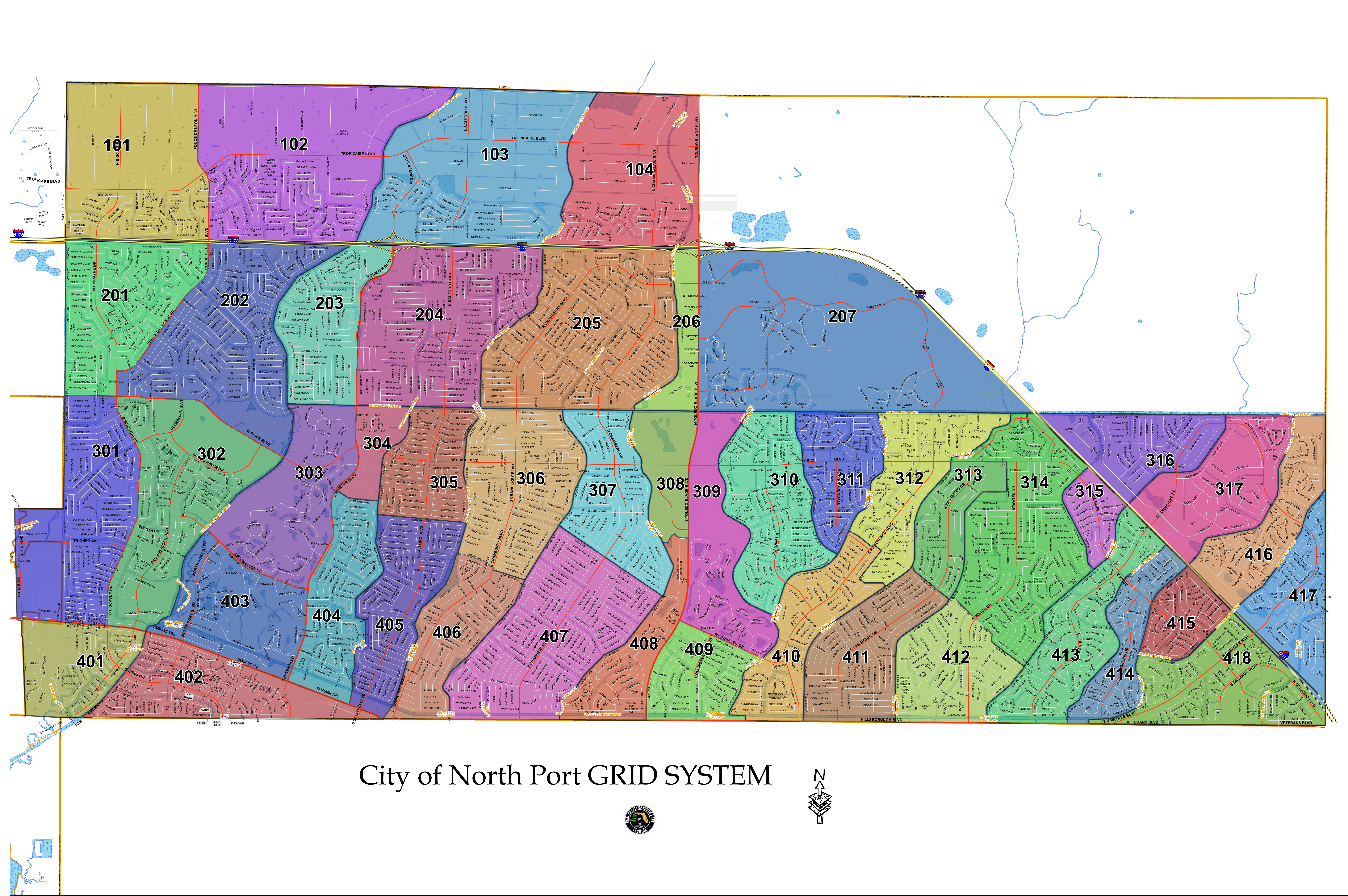
2019 Water Control Structures NPDES Inspection

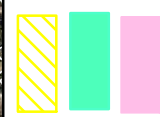
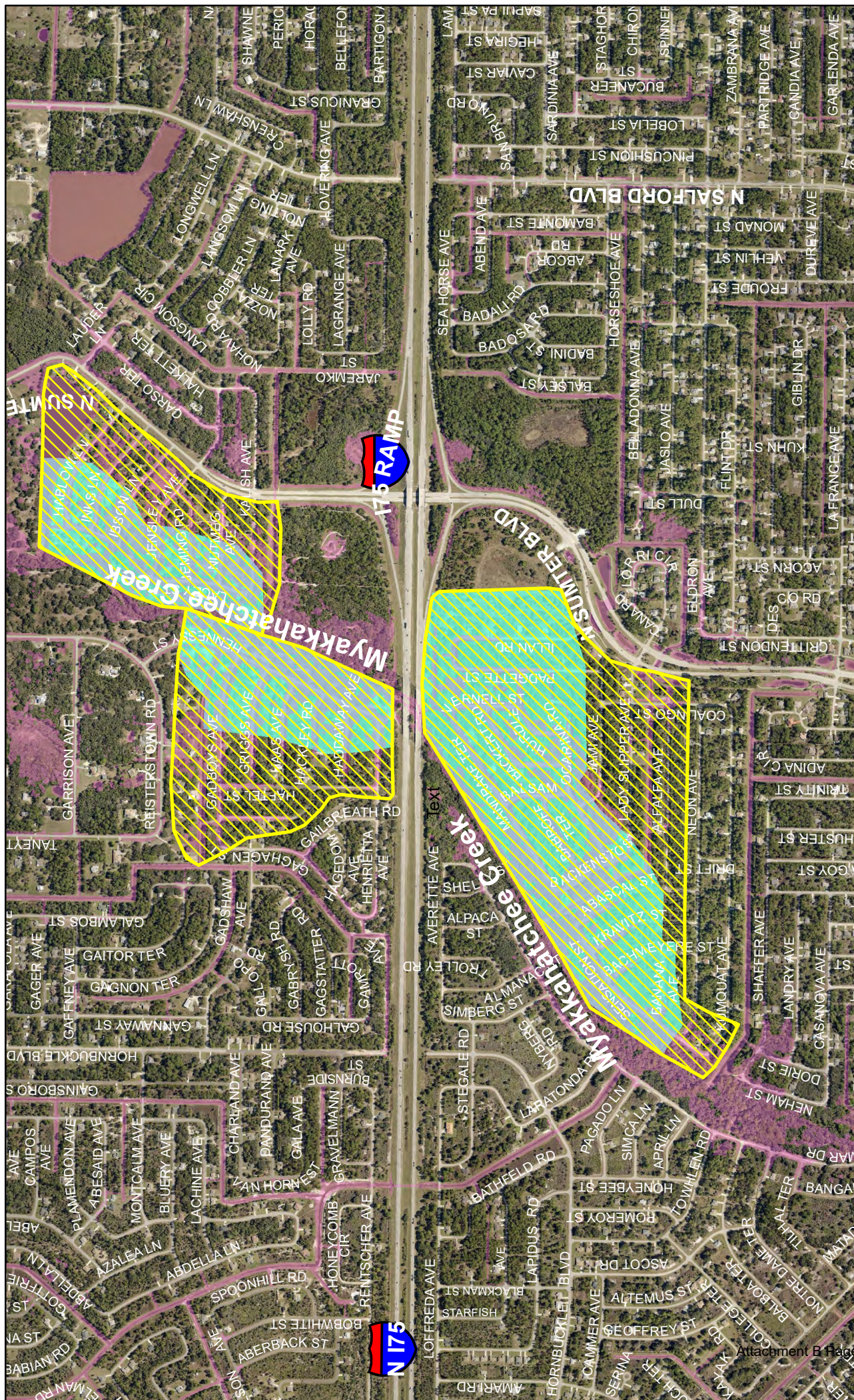
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Structure Location: Replaced or Rehabilitated = 0, Structure located in undeveloped areas (1), east of Toledo Blade (2), west of Toledo Blade (3), developed areas Snover & Cocoplum (4)

Structure #	Waterway	Date	Metal			Gates				Pipes	Risers	Concrete		Bank Condi- tion	Overall	Struct- ure Locati- on	Replace- ment Priority Score	Other Observations in 2019	Previous Repairs Completed	Major Replacement CIP Project		Minor Repairs Needed by Contractor		In-House Work Needed				Inspector
			Sheet Pilings	I - Beams	Cat walk	# of Gates	Gate	Hard ware	Operational (yes, no, list#)			Columns	Cap							Description	Priority	Description	Priority	Description	Priority	Work Order/or Invoice No.	Completion Date	
GDS 116	Snover	1/30/19			2	1	4	4	No	4	4			4	4	1	4	Upstream bank has fabriform.Gate hardware completely rotted away.				Replace hand railing and repair corroded drop pipe and side pipe with gate	High	Bank washout on north and south side of road				John K and Ken Smith
GDS 141	Bethlehem	1/30/19			1	1	4	4	No	4	4			1	4	1	4					Repair holes in side of pipe with gate	High	Gate buried in dirt, excavate dirt from around structure				John K and Ken Smith
GDS 142	Littlefield	1/30/19			1	1	4*	4*	No *	4	4			3	4	1	4	*Gate and horizontal side pipe is broken off by storm in 2017.	1/30/19 - Removed massive amount of dead willows and debris clogging structure. Repaired bank erosion. Remove toy car in upstream ditch.			Replace horizontal side pipe and gate	High					John K and Ken Smith
GDS 143	Newman	1/30/19			2	1	2	2	Does side gate work??	4	4			1	4	1	4	Dime and quarter sized holes in pipe. Pipe under ground giving away.				Replace hand railing and repair corroded drop pipe and side pipe with gate	High	Repair bank washout. Island need to be removed.				John K and Ken Smith
GDS 512	Pellam	1/30/19			1	2	1	1	Yes			1*		2	1	2	2	This is concrete drop box with 2 fiberglass gates. Catwalk is made of trex type composite.						Bank needs to be repaired Riprap				John K and Ken Smith
DS 119	Blueridge	1/30/19								1	1.5	1.5	1.5	1	1.5	3	4.5	One pipe downstream rotten.	1/30/19 - Fixed sidewalk washing out.	This structure will be replaced with the Price Blvd Widening project.								John K and Ken Smith
DS 126	Lagoon	1/30/19								3	1	1.5	1.5	1	1.5	3	4.5	Downstream metal pipes are little rusty but in a good condition. Pipe 1&3 holes in pipe by the bank,	1/30/19 - Fixed erosion of rip rap bank near guardrail	This structure will be replaced with the Price Blvd Widening project.								John K and Ken Smith
DS 501	Cheshire	1/30/19								1					1		0		7/2009 Rebuilt covered concrete structure and replaced corroded 60' diameter CMP pipe with 60" RCP.					Grout seal small leak in joint between inside concrete weir wall and adjoining concrete box (observed by Orrin)				John K and Ken Smith
DS 503	Apollo	1/30/19								2		1	1	1	1		0	Good Condition. Replaced in Sept 2009 *Pipes are under water and not visible.	9/2009 Corroded Triple 72" Diameter CMP drop pipes structure and culvert replacement with concrete box structure with fiberglass skimmer and triple 72" concrete RCP and headwall.								John K and Ken Smith	
DS 504	Jupiter	1/30/19								2		1	1	1	1		0		8/2009 Corroded Triple 72" Diameter CMP drop pipes structure and culvert replacement with concrete box structure with fiberglass skimmer and triple 72" concrete RCP and headwall.					Skimmer in the water needs to be attached back on D.S.				John K and Ken Smith
DS 508	Auburn	1/30/19	1.5							1		1	1	3	2.5		0		4/5/19 Uretek chemical foam grout seal used to repair wash out under fabriform and hole near roadway guardrail									John K and Ken Smith
CRE 5.09		1/30/19																Rotted structure at Crestview Waterway and Hillsborough Blvd				Fabricate and install four 3/8" steel tracks to accommodate 4" x 6" x 8' wooden control planks.	High					

Appendix C - Water Control Structures Rehabilitated and Cost

Water Control Structures	Waterway	Location	Rehab Issues	Completed Date	Cost
WCS 135	Twin Lakes	Price East of Toledo Blade	Replace concrete drop structure with concrete open weir, replaced as part of the Toledo Blade widening project	2009	\$134,860
WCS 109	Cocoplum	East of San Mateo	Severe metal sheet piling corrosions, gates, two gates will not open. Retrofit with concrete weir wall and 6 new stainless steel gates and concrete spillway and large revetment.	2009	\$361,244
DS 501	Cheshire	Chancellor Between Sumter and North Port Blvd	Rebuilt covered concrete structure and replaced corroded 60' diameter CMP pipe with 60" RCP.	2009	\$127,357
DS 503	Apollo	Chancellor Just east of Sumter	Corroded Triple 72" Diameter CMP drop pipes structure and culvert replacement with concrete box structure with fiberglass skimmer and triple 72" concrete RCP and headwall.	2009	\$193,939
DS 504	Jupiter	Chancellor Just east of Salford	Corroded Triple 72" Diameter CMP drop pipes structure and culvert replacement with concrete box structure with fiberglass skimmer and triple 72" concrete RCP and headwall.	2009	\$203,833
WCS 107	Cocoplum	Just west of Chamberlain	Severe metal sheet piling corrosions, gates, two gate will not open. Retrofit with concrete weir wall and 6 new stainless steel gates and concrete spillway and large revetment.	2011	\$589,050
DS 132 and culverts	Bass Point	At Jeannin Dr	Severely corroded corrugated metal pipes CMP, erosion and undermining of side banks. Replace with open concrete weir and RCP culvert pipes.	2011	\$477,603
DS 139 and culverts	Snover	East of Haberland	Severely corroded corrugated metal pipes CMP, erosion and undermining of side banks. Replace with open concrete weir and RCP culvert pipes.	2012	\$529,092
WCS 101	Cocoplum	Myakkahatchee Creek near WTP	Complete replacement of existing structure with new structure, two additional gates for a total of 6 gates, gate automation and telemetry	2014	\$1,476,638
DS 133 and culverts	Snover	West of Haberland	Severely corroded corrugated metal pipes CMP, erosion and undermining of side banks. Replace with open concrete weir and RCP culvert pipes.	2014	\$599,152
WCS 115	Snover	East of Chamberlain Blvd	Severe corrosion of metal sheet piling corrosions and gates. Water level could not be retained upstream by structure. Will either replace or rehabilitate entire structure.	2019	\$1,172,577
WCS 106	Cocoplum	South side of Water Treatment Plant	Concrete columns very deteriorated.	In Progress	\$3,080,000 (budgeted)



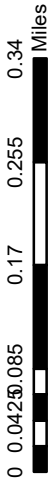


Flood Reduction Study Area Near Myakkahatchee Creek and I-75

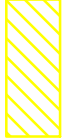
Flood area on July 22, 2013 (Tropical USGS Gage Elev 23.25ft)

Mean Annual Storm Floodplain from 5/22/12 Big Slough Study





Flood Reduction Study Area in Jockey Club Area West of Myakkahatchee Creek



Mean Annual Storm Floodplain from 5/22/12 Big Slough Study



**Watershed Management Program Consulting Services
in the Big Slough Watershed (K883)**

**Best Management Practices (BMP) Analysis
Final Report**

**Prepared for
Southwest Florida Water Management District
&
City of North Port**

**Prepared by
Ardaman & Associates, Inc.**

September 2014

TABLE OF CONTENTS

LIST OF TABLES	iii
LIST OF FIGURES	iv
LIST OF APPENDICES	vi
1.0 INTRODUCTION.....	1
1.1 Authorization.....	1
1.2 Project Location and General Description	1
1.3 Purpose and Objectives.....	1
1.4 Previous Reports	2
2.0 CHARACTERIZATION OF FLOOD PRONE AREAS	3
2.1 Hydrologic Inventory	3
2.1.1 Subbasin Delineation Process	3
2.1.2 Tributary Subbasins and Characterization.	4
2.1.3 Tributary Land Use Characterization.....	5
2.1.4 Tributary Soil Characterization.	6
2.1.5 Tributary Hydrologic Parameterization	8
2.2 Hydraulic Feature Inventory.....	9
2.2.1 Hydraulic Feature Inventory	9
2.2.2 Summary of Water Body Features by Tributary and Type	10
2.2.3 Summary of Conveyance Features by Tributary and Type	11
2.2.4 Tributary Hydraulic Connectivity.....	12
2.3 Magnitude of Present Flooding.....	12
2.3.1 Identification of Flooded Areas	13
2.3.2 Estimated Number of Structures Flooded (10-, 25-, and 100-year)	13
2.3.3 Emergency and Evacuation Route Inundation (10-, 25-, and 100-year) ...	13
3.0 ALTERNATIVE BMP FORMULATION.....	14
3.1 BMP Development Process.....	14
3.2 Alternative BMP Concepts.....	14
3.3 Alternative BMP Evaluation	14
3.3.1 Regional BMPs:.....	15

3.3.1.1	BMP #1: Remove Structures throughout City of North Port Waterways	16
3.3.1.2	BMP #2: Constrain Flow Entering City Of North Port at Big Slough Canal	18
3.3.1.3	BMP #3: Diversion Alternative.....	20
3.3.1.4	BMP #4: R-580 Improvements	22
3.3.1.5	BMP #5: Increase Capacity on Southern Boundary	24
3.3.1.6	BMP #6: Upstream Detention Alternative.....	26
3.3.2	BMP Evaluation of Four Crossings.....	28
3.3.2.1	R-36 Canal at I-75 Evaluation	28
3.3.2.2	Myakkahatchee Creek at I-75 Evaluation.....	29
3.3.2.3	R-36 Canal at Tropicaire Boulevard Evaluation	30
3.3.2.4	Myakkahatchee Creek at Tropicaire Boulevard Evaluation.....	30
3.3.3	WCS-162 Evaluation	34
3.3.3.1	R-36 Canal Drawdown Evaluation	34
3.3.3.2	Storm Events Simulation Results	34
3.3.4	Price Boulevard LOS Improvements	37
3.3.4.1	West Price Boulevard BMP 1	38
3.3.4.2	West Price Boulevard BMP 2	38
3.3.4.3	West Price Boulevard BMP 3	39
3.3.4.4	Other Evaluated BMPs.....	39
3.3.4.5	Summary and Recommendations	40
4.0	CONCEPTUAL PERMIT APPLICATION	41
5.0	Conclusions.....	41

LIST OF TABLES

Table 2-1: Subbasin Size Summary per Tributary	5
Table 2-2: Generalized Land Use Summary per Tributary	6
Table 2-3: Hydrologic Soil Group Summary per Tributary	8
Table 2-4: Water Body Size Summary per Tributary	10
Table 2-5: Conveyance Features per Tributary	11
Table 2-6: Open Channel Lengths per Tributary.....	12
Table 2-7: Estimated Lengths of Road Inundation.....	14
Table 3-1: BMP#1 Results Summary.....	17
Table 3-2: BMP#2 Results Summary.....	19
Table 3-3: BMP#3 Results Summary.....	21
Table 3-4: BMP#4 Results Summary.....	23
Table 3-5: BMP#5 Results Summary.....	25
Table 3-6: BMP#6 Results Summary.....	27
Table 3-7: Location and Description of Existing and BMP Conditions	28
Table 3-8: R-36 Canal at I-75 Crossing Evaluation Results Summary	29
Table 3-9: Myakkahatchee Creek at I-75 Crossing Evaluation Results Summary.....	31
Table 3-10: R-36 Canal at Tropicair Boulevard Crossing Evaluation Results Summary	32
Table 3-11: Myakkahatchee Creek at Tropicair Boulevard Crossing Evaluation Results Summary.....	33
Table 3-12: Mean Annual Event Simulated Maximum Stages in R-36 Canal Upstream of WCS-162.....	36
Table 3-13: Summary of West Price Boulevard BMPs	40
Table 5-1: Summary of Parcels to Survey	41

LIST OF FIGURES

Figure 2-1: 10 Year Level of Service

Figure 2-2: 25 Year Level of Service

Figure 2-3: 100 Year Level of Service

Figure 3-1: BMP Alternative 1 - 1 Day 100 Year Evaluation

Figure 3-2: BMP Alternative 2 - 1 Day 100 Year Evaluation

Figure 3-3: BMP Alternative 3 - 1 Day 100 Year Evaluation

Figure 3-4: BMP Alternative 4 - 1 Day 100 Year Evaluation

Figure 3-5: BMP Alternative 5 - 1 Day 100 Year Evaluation

Figure 3-6: BMP Alternative 6 - 1 Day 100 Year Evaluation

Figure 3-7: Model Results with Mean Annual Floodplain Comparison and Difference in Max Stages (R-36 Canal at I-75 BMP Evaluation)

Figure 3-8: Model Results with 1 Day 100 Year Floodplain Comparison and Difference in Max Stages (R-36 Canal at I-75 BMP Evaluation)

Figure 3-9: Model Results with Mean Annual Floodplain Comparison and Difference in Max Stages (Myakkahatchee Creek at I-75 BMP Evaluation)

Figure 3-10: Model Results with 1 Day 100 Year Floodplain Comparison and Difference in Max Stages (Myakkahatchee Creek at I-75 BMP Evaluation)

Figure 3-11: Model Results with Mean Annual Floodplain Comparison and Difference in Max Stages (R-36 Canal at Tropicair Boulevard BMP Evaluation)

Figure 3-12: Model Results with 1 Day 100 Year Floodplain Comparison and Difference in Max Stages (R-36 Canal at Tropicair Boulevard BMP Evaluation)

Figure 3-13: Model Results with Mean Annual Floodplain Comparison and Difference in Max Stages (Myakkahatchee Creek at Tropicair Boulevard BMP Evaluation)

Figure 3-14: Model Results with 1 Day 100 Year Floodplain Comparison and Difference in Max Stages (Myakkahatchee Creek at Tropicair Boulevard BMP Evaluation)

Figure 3-15: Location of WCS-162

Figure 3-16: Stage at R-36 Canal Upstream of WCS-162

Figure 3-17: Existing Condition LOS and 100 Year Floodplain

Figure 3-18: Updated Existing Condition 100 Year Floodplain

Figure 3-19: BMP_1 25 Year Floodplain Comparison

Figure 3-20: BMP_1 100 Year Floodplain Comparison

Figure 3-21: BMP_2 100 Year Floodplain Comparison

Figure 3-22: BMP_3 100 Year Floodplain Comparison

Figure 5-1: Flooded Parcels to Survey

LIST OF APPENDICES

Appendix A: 2014 Survey Data of WCS-162

Appendix B: WCS-162 Pictures

Appendix C: 2014 Survey Data of West Price Boulevard

Appendix D: Canal Cross-sections and Profiles

Appendix E: Preliminary Cost Estimates

1.0 INTRODUCTION

As described in the Southwest Florida Water Management District's Watershed Management Program Guidelines and Specifications, Best Management Practice (BMP) Alternatives Analysis involves modification of the existing model condition to evaluate best management practices, to address the enhancement and protection of natural systems, recharge, and water quality while achieving flood protection.

BMP alternatives analysis involves the use and modification of the existing model condition to evaluate BMPs, to address habitual flooding conditions while ensuring no adverse impact.

Best management practices (BMP) is a phrase which means the best available techniques to reduce harmful environmental impacts. Usually, BMPs for urban watershed management are storage devices that temporarily store and/or treat urban runoff to reduce flooding and/or remove pollutants. For this task, the following alternative methods were evaluated with the unique purpose of reducing flooding: flow diversion, conveyance improvements, detention, exclusion of all existing drop structures and water control structures (WCS), and modification of gated structure and raising road elevations.

1.1 Authorization

Ardaman and Associates was contracted by the Southwest Florida Water Management District to conduct specific tasks of a Watershed Management Program for the North Port/Big Slough Watershed. The project was initiated in July 2003 and a series of work orders were issued. Work order number 4, issued in August 2005, included BMP alternative analysis for the North Port/Big Slough watershed.

1.2 Project Location and General Description

The Big Slough Watershed is located in southeastern Sarasota County, and the slough is tributary to the Myakka River. Portions of the incorporated City of North Port (those areas east of the Myakka) are located within the southern portion of the watershed. The 195.5 square mile watershed encompasses numerous depressional features, including wetlands and water bodies, the most prominent of which is the Big Slough Canal (also called Myakkahatchee Creek in its lower reaches). The Big Slough Canal passes from north to south through the City of North Port, and receives inflows from an internal system of waterways which provide surface drainage throughout the City, before discharging beneath U.S. Highway 41 toward its confluence with the Myakka River. The Big Slough Watershed and portions of the City of North Port are traversed from east to west by Interstate Highway 75.

1.3 Purpose and Objectives

The objective of this study is to evaluate BMP alternatives that would solve flooding conditions within the City of North Port. Existing condition model results and Floodplain

Level of Service (LOS) were used to identify present watershed flooding condition. Various BMP concepts and alternatives were evaluated for their effectiveness in solving flooding problems, permitability, and economic viability.

1.4 Previous Reports

Over the course of the project, numerous interim reports have been submitted along with supporting data to SWFWMD and City of North Port. Those prior reports contain additional details and supporting documentation regarding these tasks completion, and include the following:

WO#1 – Watershed Evaluation

- Task 1.1.2.1 – Existing Watershed Feature Data Evaluation and Assembly
- Task 1.1.2.2 – Sub-basin delineations and landuse inventory

WO#2 – Watershed Evaluation

- Task 1.1.2 – Watershed Evaluation
 - 1.1.2.2 Hydrologic Feature Inventory
 - 1.1.2.3 Hydraulic Feature Inventory
 - 1.1.2.4 Field Reconnaissance
 - 1.1.2.5 ID of Surveys to be Completed by a PLS
 - 1.1.2.6 Preliminary Junction/Reach Coverage Development
 - 1.1.2.7 SW Assessment Inventory and Approach Development
 - 1.1.2.9 Watershed Evaluation Deliverables

WO#3 – Watershed Evaluation

- Task 2.3.1 – Surveys by a Professional Land Surveyor

WO#4 – Watershed Management Plan

- Task 1.1.3.2 – Watershed Parameterization
- Task 1.1.3.3 – Watershed Model Development & Verification
- Task 1.1.3.4 – Floodplain Analysis and Delineation Report
- Task 1.1.3.5a – Level of Service Determination – original analysis
- Task 1.1.3.5b – Level of Service Determination – with model maintenance
- Task 1.1.3.7a – BMP Alternative Formulation Report – original analysis
- Task 1.1.3.7a – BMP Evaluation of Four Crossings
- Task 1.1.3.7b – BMP Evaluation Price Boulevard
- Task 1.1.3.7b – BMP Evaluation WCS-162
- Task 1.1.3.7b – Final BMP Report

WO#7 – Maintenance of Watershed Parameters and Models

- Task 2.2.1 – 2004-2007 LiDAR Comparison
- Task 2.3.1.1 – Collect and Evaluate Environmental Resource Permit (ERP) Information
- Task 2.3.4 – Limited Field Reconnaissance

Task 2.3.6 and 2.3.7 – Generic Hydrologic Features and Generic Hydraulic Features

Task 2.3.6, 2.3.7, and 2.4.1 – Generic Hydrologic Features, Generic Hydraulic Features, and Refined Generic and Semi-generic Geodatabase and Parameterization

Task 2.4.1, 2.4.2, 2.4.3 – Refined Generic and Semi-generic Geodatabase and Parameterization, Watershed Computer Simulation Model Development and Verification, and Floodplain Analysis and Delineation

Task 2.4.3 – Floodplain Analysis and Delineation

Task N/A – Justification Report and Peer Review Presentation

WO#8 – Maintenance of Watershed Parameters and Models

Task 2.2.2 – 2007 LiDAR Review

WO#12 – Maintenance of Watershed Parameters and Models

Task 2.4.11 - Floodway Analysis Report

2.0 CHARACTERIZATION OF FLOOD PRONE AREAS

The Big Slough watershed is located in the Gulf coastal lowlands of southwestern Florida, characterized by flat topography and sandy, shelly and silty sand soils with little organic matter. Its headwaters are rural, consisting primarily of agricultural and undeveloped lands. A vast majority of urban and built up lands occur in the southern portion of the watershed, within in the City of North Port. Commercial development is generally limited to main thoroughfares within the city, especially along the US 41 corridor. Myakkahatchee Creek/Big Slough Canal begins in the southeastern part of Manatee County (near Edgeville) and flows approximately 21 miles through the City of North Port and ultimately empties to the estuarine portion of the Myakka River.

2.1 Hydrologic Inventory

2.1.1 Subbasin Delineation Process

Subbasin delineations were performed to support watershed parameterization and modeling. The subbasins were delineated using Arc Hydro Tools with LiDAR-based terrain data, where available. The surface model was prepared for “automated” subbasin delineation by combining the large terrain models with highly detailed secondary flow path information. The secondary flow paths were digitized based on scanned and orthorectified as-built information, terrain model features, and field observations of drainage patterns.

A set of protocols was developed for assigning subbasin break points, to allow for batch processing of the watershed using the delineation tools. As a result of pre-processing the surface model in the manner described here, the Arc Hydro tools were better able to recognize surface drainage characteristics and provide accurate subbasin delineations for use in model parameterization. In those areas where LiDAR was not available, other

topographic and drainage delineation information was employed to support automated and manual delineations.

2.1.2 Tributary Subbasins and Characterization.

Tributary areas were defined primarily by grouping surface storage features according to their connectivity (via culverts) or primary overflow paths (across topographic saddles). Open channel conveyance systems were also used to identify unique tributary areas. Each tributary area could then be summarized using GIS to describe unique characteristics, as discussed below.

Subbasin sizes range throughout the study area from 0.33 to 1,673.79 acres. Table 2-1 summarizes subbasin size by tributary area.

Table 2-1: Subbasin Size Summary per Tributary

Tributary ID	Count	Minimum	Maximum	Average
A	60	0.33	36.00	9.17
B	1282	0.06	1244.70	30.97
C	339	0.12	61.14	9.91
D	67	1.23	75.40	26.24
E	210	0.19	151.42	10.30
F	54	0.32	83.20	20.68
G	130	0.32	66.63	11.58
H	42	0.77	35.93	11.87
I	58	0.86	71.29	21.11
J	153	0.60	69.53	14.49
K	188	0.63	79.83	10.53
L	33	0.70	70.08	24.53
M	84	1.38	1040.82	133.85
N	119	0.16	28.22	8.22
O	76	0.88	82.72	15.89
P	38	0.11	120.69	13.19
Q	288	1.04	167.71	25.23
R	263	0.42	234.44	21.53
S	361	0.28	1139.68	21.10
T	65	0.28	45.34	13.73
U	799	0.03	410.92	24.79
V	116	0.42	89.73	14.68
W	29	15.55	1673.79	320.55
X	42	0.36	32.10	9.11
Y	84	0.24	47.38	12.87
Z	36	0.41	54.12	17.78

2.1.3 Tributary Land Use Characterization

While the headwaters of the Big Slough Watershed remain predominantly undeveloped or agricultural, changes in land uses throughout the City of North Port reflect significant population growth, with continued commercial and industrial growth along the US 41 corridor and the Price Boulevard intersections with Sumter Boulevard and Toledo Blade Boulevard.

Land use types were acquired as a GIS coverage from the SWFWMD and updated using 2004 aerial photography. Table 2-2 summarizes generalized land use encountered and respective percent areas of coverage, by tributary.

Table 2-2: Generalized Land Use Summary per Tributary

Tributary ID	Residential	Com/Industrial	Upland/Open	Water/Wetland
A	10.55	0.00	86.54	2.91
B	9.06	1.41	66.33	23.19
C	51.87	6.30	34.51	7.32
D	97.99	0.06	0.18	1.77
E	64.02	2.86	24.11	9.02
F	89.64	2.37	5.43	2.56
G	85.46	0.19	10.80	3.56
H	24.47	0.51	33.01	42.01
I	73.04	3.46	16.82	6.68
J	76.21	3.39	16.98	3.42
K	34.18	3.62	58.39	3.81
L	65.17	0.48	25.84	8.51
M	2.02	0.22	75.29	22.47
N	0.32	4.18	88.79	6.71
O	85.80	0.15	11.00	3.04
P	67.31	2.43	11.53	18.73
Q	0.00	0.75	71.86	27.39
R	32.98	0.78	40.77	25.48
S	16.20	2.33	56.24	25.22
T	57.69	5.05	27.44	9.82
U	1.18	1.95	62.64	34.23
V	35.95	7.19	36.04	20.82
W	1.49	0.27	79.92	18.32
X	76.68	2.32	8.57	12.42
Y	85.27	4.58	9.13	1.03
Z	98.90	0.00	0.00	1.10

2.1.4 Tributary Soil Characterization.

Low permeability, hydric soils associated with depressional areas and flood plains are predominant within the study area.

Soil types were identified using soil survey data for Sarasota, Charlotte, Manatee and DeSoto Counties acquired as a GIS coverage from SWFWMD. Individual soil types were categorized according to their runoff potential. In order to perform that categorization, the hydrologic soil group of each soil was defined according to the relevant soil survey reports. A brief discussion of each hydrologic soil group's characteristics is provided below.

HYDROLOGIC SOIL GROUP A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively well drained sands or gravelly sands. These soils have a high rate of water transmission.

HYDROLOGIC SOIL GROUP B. Soils having a moderate infiltration when thoroughly wet. These consist mainly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

HYDROLOGIC SOIL GROUP C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

HYDROLOGIC SOIL GROUP D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have high shrink-swell potential, soils that have a permanent high water table, soils that have a clay pan or clay layer at or near the surface, and soils that are shallow over nearly impervious material.

Some soil types are classified as belonging to dual hydrologic soil groups, such as A/D, B/D, or C/D. These ratings mean that, under natural conditions, the soil is classified as belonging to hydrologic soil group D, but by artificial methods the water table could be lowered sufficiently so that the soil would fit into a lower runoff potential category.

Table 2-3 presents a summary of hydrologic soil groups encountered (with dual classified groups assigned to the un-drained condition "D") and respective percent areas of coverage.

Table 2-3: Hydrologic Soil Group Summary per Tributary

Tributary	Hydrologic Soil Coverage Area %								
	A	A/D	B	B/D	C	C/D	D	UND	W
A	0.00	0.00	0.00	70.01	0.36	0.88	28.75	0.00	0.00
B	0.00	0.00	0.09	70.30	1.07	0.04	28.16	0.23	0.10
C	0.00	0.06	0.00	61.51	7.64	0.87	25.03	0.00	4.89
D	0.00	0.00	0.00	71.73	0.09	0.21	27.98	0.00	0.00
E	0.00	0.00	0.00	77.85	0.71	0.91	18.81	0.00	1.73
F	0.00	0.00	0.00	63.79	0.00	1.48	34.73	0.00	0.00
G	0.00	0.00	0.00	50.55	0.04	0.00	49.41	0.00	0.00
H	0.00	0.00	0.00	90.15	5.12	0.00	4.73	0.00	0.00
I	0.00	0.00	0.00	66.44	0.06	0.77	32.73	0.00	0.00
J	0.00	0.00	0.00	65.84	0.00	0.85	33.09	0.00	0.22
K	0.00	0.00	0.00	70.16	0.08	1.21	28.08	0.00	0.47
L	0.00	0.00	0.00	50.53	0.00	1.90	47.57	0.00	0.00
M	0.38	0.00	0.36	77.05	4.82	0.00	17.38	0.01	0.00
N	0.00	0.00	0.00	68.48	0.00	0.45	29.89	0.00	1.18
O	0.00	0.00	0.00	67.36	0.00	0.00	32.50	0.14	0.00
P	0.00	0.00	0.00	75.24	0.00	0.12	24.64	0.01	0.00
Q	0.00	0.00	0.00	64.78	0.00	0.13	35.09	0.00	0.00
R	0.00	0.00	0.00	65.45	0.00	0.90	33.62	0.02	0.00
S	0.00	0.00	0.00	63.35	0.00	0.07	36.57	0.00	0.00
T	0.00	0.00	0.00	70.31	0.00	0.52	29.17	0.00	0.00
U	0.00	0.00	0.00	64.62	0.00	0.01	34.98	0.00	0.39
V	0.00	0.00	0.00	48.77	0.00	0.00	51.23	0.00	0.00
W	0.61	0.00	0.25	75.03	11.94	0.00	12.17	0.00	0.00
X	0.00	0.00	0.00	56.73	0.00	0.00	42.64	0.00	0.64
Y	0.00	0.00	0.00	70.24	0.00	0.15	29.61	0.00	0.00
Z	0.00	0.00	0.00	73.02	0.00	3.30	23.69	0.00	0.00

2.1.5 Tributary Hydrologic Parameterization

Subbasin parameterization was performed in order to assign values for hydrologic model development, including: Time of Concentration (Tc), Runoff Curve Number (CN), Percentages of imperviousness, and Peak Rate Factor (K').

Time of Concentration (Tc) is generally defined as the amount of time it takes for a drop of water to travel from the most hydrologically distant point in a basin to the point where that basin discharges to a receiving water body (represented in the model as a node). It is used as a parameter in the computation of a runoff hydrograph, when using the SCS Unit Hydrograph method for hydrograph generation.

The Tc computation was made according to techniques recommended in TR-55 by the National Resource Conservation Service. According to that methodology, runoff generally moves along the surface of a basin as sheet flow, shallow concentrated flow, open channel flow, or some combination of these until it is intercepted by a storage or conveyance system. Travel times for each flow segment are computed and summed, yielding a time of concentration for the basin. Further adjustments can be made to account for movement through ponds, storm sewers and the like in order to account for additional travel time, when not accounted for in the modeled conveyance system.

Travel segment data for this study was developed using aerial photography, one foot SWFWMD 1"=200' scale aerial imagery, 2-foot SWFWMD digital photogrammetric contours and the digital terrain model to define travel paths, lengths, slopes and land cover for sheet and shallow concentrated flow segments. For open channel segments, cross sectional geometry and roughness values were estimated, and lengths and slopes taken from the terrain model. For conveyance systems (such as pipes, channels, embedded ponds and wetlands) a velocity method was employed to adjust times of concentration.

Runoff Curve Numbers were developed for each subbasin, based on land use and hydrologic soil group designations. Using GIS, basin, land use and soils polygon coverages were intersected with one another, resulting in the creation of a single composite polygon coverage. Each polygon in the composite coverage contains a land use code, a hydrologic soil group, and a basin assignment. Combinations of land use and soils were then used, along with a lookup table of curve number values, to define area-weighted runoff curve numbers within each basin. Percentages of imperviousness were developed in a like manner, based on land use within each subbasin area. Runoff curve numbers that were employed in this analysis were representative of average antecedent moisture conditions (AMC-II) and were adapted from tables provided in the NRCS publication, TR-55.

The peak rate factor (K') is a numeric value used to describe the shape of a unit hydrograph for a basin. The peak rate factor varies from one basin to another. Throughout the state, typical values applied by hydrologists range from 256 to 484, with even lower values applied in flat, swampy areas. A peak rate factor of 256 was used for all subbasins within the Big Slough watershed. That value is most appropriate in basins that exhibit little topographic relief, which includes the vast majority of all subbasins delineated in the study area.

2.2 Hydraulic Feature Inventory

2.2.1 Hydraulic Feature Inventory

An inventory of hydraulic features within the watershed area was initially performed using digital aerial photography, as-built and ERP data, in order to identify conveyance structures, open channels, SMSAs, lakes and wetlands greater than one acre in area throughout the watershed. Each feature was assigned a unique HYD-ID, as an identifier for subsequent field reconnaissance and survey. The hydraulic feature inventory served as an initial database of features to be incorporated into a model database for simulation.

2.2.2 Summary of Water Body Features by Tributary and Type

Wetlands and water bodies of varying size are located throughout the watershed area. Named water bodies include: Big Slough Canal or Myakkahatchee Creek, Cocoplum Water Way, Snover Water Way and a series of named internal water ways providing surface drainage for the City of North Port. Area lakes range in size from 1.0 to 125 acres. In addition, numerous retention and detention ponds are present, providing stormwater attenuation and water quality treatment throughout the area. Table 2-4 presents a summary of water bodies and their sizes in each tributary.

Table 2-4: Water Body Size Summary per Tributary

Tributary	Count	Minimum Area (acres)	Maximum Area (acres)	Average Area (acres)
A	0	0.00	0.00	0.00
B	386	0.20	110.46	4.90
C	9	0.60	2.77	1.72
D	0	0.00	0.00	0.00
E	37	0.19	25.93	3.06
F	1	3.99	3.99	3.99
G	9	1.26	17.93	3.93
H	10	0.77	12.99	3.98
I	11	0.07	12.23	2.79
J	5	0.40	2.39	1.20
K	3	2.21	11.54	5.96
L	3	2.86	5.06	3.88
M	18	1.01	6.89	3.13
N	6	1.22	13.75	4.75
O	3	1.05	3.04	1.73
P	1	75.40	75.40	75.40
Q	121	1.03	36.57	4.72
R	77	1.22	60.85	9.02
S	112	0.35	35.30	5.72
T	20	1.08	19.34	5.93
U	363	0.13	125.04	5.61
V	12	1.12	30.60	12.98
W	0	0.00	0.00	0.00
X	5	1.18	15.20	7.16
Y	0	0.00	0.00	0.00
Z	0	0.00	0.00	0.00

2.2.3 Summary of Conveyance Features by Tributary and Type

Surface drainage throughout the watershed consists largely of natural sloughs, creeks and numerous manmade ditches and canals. Manmade storage features (SMSA) and natural depressional features (lakes and wetlands) are interconnected by drainage culverts or joined across natural topographic saddles. Table 2-5 summarizes number of conveyance features and Table 2-6 presents lengths of open channels in each tributary.

Table 2-5: Conveyance Features per Tributary

Tributary	Bridge	Channel	Culvert	Riser Pipes	Weir
A	1	23	10	50	175
B	16	382	210	39	3631
C	16	156	108	129	1028
D	0	43	9	3	194
E	0	67	67	50	616
F	0	27	13	1	175
G	1	63	42	28	384
H	2	17	9	13	138
I	0	27	10	17	195
J	0	87	51	1	427
K	4	75	51	77	531
L	0	19	6	0	103
M	0	9	18	0	202
N	2	49	27	69	316
O	0	39	19	13	218
P	0	24	15	0	95
Q	1	65	18	0	867
R	0	114	72	0	752
S	6	104	44	49	1050
T	0	27	19	10	197
U	3	47	116	62	2316
V	1	51	50	5	345
W	1	15	18	0	48
X	0	28	11	0	94
Y	0	49	23	0	239
Z	0	19	11	0	97

Table 2-6: Open Channel Lengths per Tributary

Tributary ID	Count	Minimum (feet)	Maximum (feet)	Average (feet)
A	23	267	1600	780
B	382	124	4819	1173
C	155	193	3674	1011
D	44	252	1896	1067
E	67	221	2110	855
F	27	185	1977	1053
G	64	243	1985	801
H	16	361	2261	908
I	28	293	2347	1179
J	87	255	2844	956
K	75	265	1935	897
L	19	491	2443	1167
M	10	723	5785	2052
N	49	231	2501	882
O	39	260	2186	973
P	24	88	2890	1070
Q	65	367	2677	1300
R	110	384	2878	1449
S	103	257	2309	932
T	26	260	2021	996
U	47	500	4442	1623
V	51	255	2202	786
W	15	1137	4578	2372
X	32	257	2421	1254
Y	49	224	2426	896
Z	19	443	2191	1044

2.2.4 Tributary Hydraulic Connectivity

Connectivity within tributary areas was determined through review of aerial photographs, as-built and construction drawings, topographic data and field investigation. That connectivity is defined and stored in the project database as a node-reach topological relationship.

2.3 Magnitude of Present Flooding

The magnitude of present flooding in the watershed was identified by using the results of floodplain and flood protection level of service (LOS) analyses.

2.3.1 Identification of Flooded Areas

The City of North Port experiences three distinct types of flooding problems. The most severe and the least common problem is a small number of habitable structures near Big Slough that experience flooding in the 100 year event. Also significant and very isolated is major road flooding in 25-year and 100-year events. Finally extensive local road flooding is common even during a smaller storm event. While inconvenient, this local road flooding poses little risk of damage to the citizens' property.

As shown in Figure 2-1, 2-2, and 2-3 (10, 25, and 100-year LOS figures), the majority of flooding within the City is related to street flooding. An arterial street/emergency route (West Price Boulevard), which provides access to the City's emergency facilities, will flood in 10-year or higher storm events.

Most of the habitable structures that flood in a 100-year storm event are located in the neighborhood located adjacent to Big Slough/Myakkahatchee Creek between Cocoplum Waterway and Tropicair Boulevard. Locations of the houses that would flood (model predicted) in a 100-year storm event are shown in Figure 2-3 (100-year LOS figure).

2.3.2 Estimated Number of Structures Flooded (10-, 25-, and 100-year)

Based on the model results, it is estimated that ~5 structures will flood in a 10-year storm event; ~ 7 structures will flood in a 25-year storm event; and ~75 structures will flood in a 100-year storm event within the City of North Port.

Habitable structures were identified by visually inspecting 2008 aerial imagery in the City of North Port, and placing a point in GIS on the topographical high of the 2004/2007 hybrid LiDAR DTM. The elevation of the 2004/2007 hybrid LiDAR DTM at the point was compared with 10-year, 25-year and 100-year modeled maximum stages. Where maximum stages were higher than the habitable structure, it was reported as a flooded structure. Since the surveyed house pad elevations (finished floor elevations) data was not available, the method applied in estimating the number of flooded structures is very approximate.

2.3.3 Emergency and Evacuation Route Inundation (10-, 25-, and 100-year)

Estimated lengths of emergency and evacuation route inundation are presented in Table 2-7. As stated earlier, the majority of flooding within the City is associated with street/road flooding.

Evacuation routes were received from the City of North Port, and emergency routes were identified by Ardaman as the shortest route from an emergency facility to an evacuation route. Street centerlines were acquired from Sarasota County. The positions of all lines were verified in GIS as on the centerline of the road, and moved to the centerline if necessary. Any portion of the centerline of the road that overlapped with the 10-year, 25-year or 100-year floodplain was reported as inundated.

Table 2-7: Estimated Lengths of Road Inundation

Storm Event	Length of Emergency Route Inundation (feet)	Length of Evacuation Route Inundation (feet)
10-year	6,403	1,464
25-year	7,758	3,077
100-year	19,625	7,218

3.0 ALTERNATIVE BMP FORMULATION

According to Southwest Florida Water Management District's Watershed Management Program Guidelines and Specifications (SWFWMD G&S), the generation of best management practices (BMP) alternatives must take into account many watershed management issues in order to formulate an alternative that is permittable, economically viable, and is supported by the public. This study is mainly focused in addressing storm event flooding conditions within the City of North Port.

3.1 BMP Development Process

As described in the SWFWMD G&S, alternatives analysis involves the use and modification of the existing model condition to evaluate BMPs, to address habitual flooding conditions while ensuring no adverse impact.

Best management practice is a phrase which means the best available techniques to reduce harmful environmental impacts. Usually, BMPs for urban watershed management are storage devices that temporarily store and/or treat urban runoff to reduce flooding and/or remove pollutants. For this task, the following alternative methods were evaluated with the unique purpose of reducing flooding: Flow diversion, conveyance improvements, detention and exclusion of all existing drop structures and water control structures (WCS), modification of gated structure and raising road elevations.

3.2 Alternative BMP Concepts

Various BMP alternative concepts evaluated in this study include conveyance improvements, stormwater management storage areas, flood proofing, and flow diversions.

3.3 Alternative BMP Evaluation

BMP alternative evaluations were performed using the existing watershed model and updating it to reflect various BMP scenarios. The following sections provide a brief description of each evaluated BMP alternative and a summary of the evaluation outcome.

3.3.1 Regional BMPs:

BMP alternatives that could potentially improve flooding condition in a large area are considered as regional BMPs. These alternatives could significantly alter the hydrodynamics of the drainage system. Although the alternatives presented in this report might not be permittable or economically viable, they provide a better understanding of the hydraulic response when applying the BMPs to further understand improvement limitations.

Six different regional BMPs were evaluated. Results from each BMP evaluation were compared to a benchmark scenario to evaluate the impact of the BMP. The benchmark scenario used was the 24-hour-100 year existing condition model previously submitted. The storm event used for the evaluations was the 24-hour, 100 year event with a Type II, Florida modified rainfall distribution.

For these analyses, the following GIS procedures were used when comparing the existing condition (Benchmark) and the proposed scenario (BMP):

Three potential analyses were considered when comparing each BMP scenario to the Benchmark Scenario.

- For the first analysis, the geoprocessing tool “Symmetric Difference” was applied with the BMP floodplain and benchmark floodplain as inputs, resulting in flooded area reduction and flooded area increase polygons for each scenario. Flooded area reduction represents area that flooded in the benchmark scenario, but not in the BMP scenario, and flooded area increase represents area that did not flood in the benchmark scenario, but did flood in the BMP scenario. Results were then summarized by sub-watershed in acres.
- The second analysis compared the length of street flooding in the BMP scenarios to length of street flooding in the benchmark scenario. The BMP scenario floodplain shapefile was intersected with the streets shapefile, and the total length of flooding was summarized by sub-watershed. Benchmark flooded street data was obtained from previous analysis per LOS (Level of Service) requirements.
- The final analysis compared the number of flooded parcels in the benchmark scenario to the number of flooded parcels in the BMP scenarios. To determine which parcels were flooded we used the parcels polygon shapefile downloaded from Sarasota County. Elevations were extracted from the LiDAR-based terrain data utilizing the centroid of the parcel as a calculation point, and one foot was added to the calculated elevation to represent buildings on fill material. Parcels in waterways or ponds were eliminated and not considered in these analyses. These elevations were then compared to the maximum stages from the CHAN model output for the BMP and benchmark simulation. Any parcels with elevations less than the maximum stage were considered flooded. The comparisons of the BMP scenario to the benchmark scenario were then broken down by sub-watershed for better understanding of local response to the BMP.

3.3.1.1 BMP #1: Remove Structures throughout City of North Port Waterways

Objective:

The objective of this BMP is to understand current primary drainage system capacity assuming no losses due to water control structures or drop structures within several waterways. Also, additional connectivity was provided among a few R canals southwest of the I-75 corridor to evaluate the response when transferring some of the existing load throughout less compromised areas.

Description:

Water control structures (WCS) and drop structures (DS) depicted in Figure 3-1 were removed and replaced with an equivalent channel section that mimics the immediate upstream canal's section. Also, and as stated before, additional connections were provided between a few existing secondary manmade R canals. Specifically, canal R-36 was hydraulically connected to the R-43 canal via a weir with equivalent channel geometry. Similarly, the R-43 canal was also connected with the R-24 and R-32 (See Figure 3-1).

Results:

Overall results indicate general improvements immediately north of Price Blvd and along Bass Point waterway while increasing flooding between S Toledo Blvd and S Sumter Blvd. Also, improvements are observed southwest of I-75 where supplemental canal connectivity was provided. An initial evaluation suggests that this BMP may not be feasible due to potential loss of potable water supply, fish and wildlife habitat, and wetlands. Please refer to Figure 3-1 and Table 3-1 for a summary of BMP#1 analysis results.

Table 3-1: BMP#1 Results Summary

Sub-Watershed	Bench Mark Total Flooded Area (Acres)	BMP1 Total Flooded Area (Acres)	BMP1 Total Flooded Area Change (%)	Bench Mark Flooded Street Length (Feet)	BMP1 Flooded Street Length (Feet)	BMP1 Flooded Street Length Change (%)	Bench Mark Flooded Parcels (Units)	BMP1 Flooded Parcels (Units)	BMP1 Flooded Parcels Change (%)
A	58	59	0.8	7,959	8,124	2.1	2	2	0.0
B	15,839	15,881	0.3	304,750	306,791	0.7	665	655	-1.5
C	724	745	2.8	118,951	124,883	5.0	38	40	5.3
D	150	172	14.5	38,510	47,969	24.6	15	17	13.3
E	407	446	9.5	47,961	65,534	36.6	2	2	0.0
F	98	124	25.7	22,234	34,741	56.3	1	1	0.0
G	250	208	-16.7	53,687	36,920	-31.2	17	9	-47.1
H	199	186	-6.4	1,082	548	-49.3	2	2	0.0
I	165	165	0.2	21,519	25,051	16.4	2	1	-50.0
J	335	298	-11.2	84,088	57,952	-31.1	15	15	0.0
K	240	237	-1.3	45,022	44,366	-1.5	5	5	0.0
L	69	67	-1.5	11,354	11,267	-0.8	0	0	0.0
M	2,426	2,475	2.0	0	0	0.0	0	0	0.0
N	150	146	-2.7	14,407	14,101	-2.1	1	1	0.0
O	189	177	-6.2	56,008	49,468	-11.7	9	8	-11.1
P	191	192	0.5	11,134	11,173	0.4	6	6	0.0
Q	3,733	3,735	0.1	0	0	0.0	0	0	0.0
R	2,294	2,320	1.1	86,929	99,236	14.2	43	60	39.5
S	2,489	2,454	-1.4	23,286	20,576	-11.6	74	74	0.0
T	206	190	-8.1	14,915	9,256	-37.9	5	2	-60.0
U	9,907	9,888	-0.2	8,973	8,934	-0.4	19	19	0.0
V	553	545	-1.5	20,054	18,184	-9.3	6	6	0.0
W	1,207	1,207	0.0	0	0	0.0	0	0	0.0
X	92	92	0.4	7,471	7,445	-0.3	2	2	0.0
Y	189	179	-5.1	70,162	63,890	-8.9	11	11	0.0
Z	51	48	-5.9	14,978	14,783	-1.3	0	0	0.0
Total	42,211	42,236	0.1	1,085,434	1,081,192	-0.4	940	938	-0.2

3.3.1.2 BMP #2: Constrain Flow Entering City Of North Port at Big Slough Canal

Objective:

The objective of this BMP is to constrain the volume of water coming from offsite areas through the Big Slough canal prior to entering the City in the Estates area.

The BMP would involve real estate acquisition, maintenance activities, dam construction and removal of existing hydraulic structures (culverts).

Description:

On the northwest City boundary, at the intersection of Big Slough canal with R-36 and R-580 waterways, all existing earthen weirs were raised to limit runoff from offsite areas, leaving the Big Slough canal as the only conveyance system into the western portion of the City (see Figure 3-2). All earthen weirs farther north, at the intersection of Big Slough canal and Power Line Road were raised as well.

Results:

This BMP results in approximately 0.5 feet flood stage reduction within the vicinity of the Big Slough canal from the City's northern border to just south of I-75. Likewise, results indicate that flood stages increase approximately 1.0 foot in the offsite areas north of R-36 and R-580 waterways. Table 3-2 summarizes BMP#2 analysis results.

Table 3-2: BMP#2 Results Summary

Sub-Watershed	Bench Mark Total Flooded Area (Acres)	BMP2 Total Flooded Area (Acres)	BMP2 Total Flooded Area Change (%)	Bench Mark Flooded Street Length (Feet)	BMP2 Flooded Street Length (Feet)	BMP2 Flooded Street Length Change (%)	Bench Mark Flooded Parcels (Units)	BMP2 Flooded Parcels (Units)	BMP2 Flooded Parcels Change (%)
A	58	58	0.0	7,959	7,958	0.0	2	2	0.0
B	15,839	16,092	1.6	304,750	260,559	-14.5	665	458	-31.1
C	724	725	0.0	118,951	118,959	0.0	38	38	0.0
D	150	150	0.0	38,510	38,460	-0.1	15	15	0.0
E	407	407	0.0	47,961	47,969	0.0	2	2	0.0
F	98	98	0.0	22,234	22,241	0.0	1	1	0.0
G	250	250	0.0	53,687	53,666	0.0	17	17	0.0
H	199	199	-0.1	1,082	1,078	-0.4	2	2	0.0
I	165	165	0.0	21,519	21,514	0.0	2	2	0.0
J	335	314	-6.4	84,088	72,205	-14.1	15	12	-20.0
K	240	240	0.0	45,022	45,020	0.0	5	5	0.0
L	69	69	0.0	11,354	11,354	0.0	0	0	0.0
M	2,426	2,421	-0.2	0	0	0.0	0	0	0.0
N	150	150	0.0	14,407	14,407	0.0	1	1	0.0
O	189	189	0.0	56,008	55,994	0.0	9	9	0.0
P	191	179	-6.1	11,134	10,124	-9.1	6	4	-33.3
Q	3,733	3,742	0.2	0	0	0.0	0	0	0.0
R	2,294	2,302	0.3	86,929	86,186	-0.9	43	45	4.7
S	2,489	2,486	-0.2	23,286	20,530	-11.8	74	73	-1.4
T	206	206	0.0	14,915	14,904	-0.1	5	5	0.0
U	9,907	9,907	0.0	8,973	8,973	0.0	19	19	0.0
V	553	552	-0.2	20,054	20,043	-0.1	6	6	0.0
W	1,207	1,207	0.0	0	0	0.0	0	0	0.0
X	92	87	-5.1	7,471	5,780	-22.6	2	2	0.0
Y	189	188	-0.5	70,162	69,877	-0.4	11	11	0.0
Z	51	51	-0.1	14,978	14,952	-0.2	0	0	0.0
Total	42,211	42,434	0.5	1,085,434	1,022,753	-5.8	940	729	-22.4

3.3.1.3 BMP #3: Diversion Alternative

Objective:

The purpose of this BMP is to divert flows from offsite areas via the existing R-36 canal, by increasing its capacity and improving its hydraulic connectivity with Deer Prairie Slough canal.

This BMP would involve construction of new structures, maintenance activities, real estate acquisition, and detailed hydrologic and hydraulic evaluation of the western boundary (Deer Prairie Slough watershed).

Description:

On the northwest boundary, along R-36 canal, two earthen overflow weirs were provided to enhance the R-36 waterway connectivity with Deer Prairie Slough canal (See Figure 3). Weir location and parameters were selected based on terrain and hydraulic constraints. The weirs were located on the northwest corner to address flooding in the Estates area and along Big Slough canal. Weir lengths and elevation used are as follows: Weir 1, L: 300 feet at EL:22.0 feet, NAVD88 and Weir 2, L:450 feet at EL:21.0 feet, NAVD88. The R-36 canal capacity was also doubled by replacing the existing cross-section with a 60 feet bottom width trapezoidal channel with 4:1 side slopes. The current model assumes no tailwater influence from Deer Prairie Slough.

Results:

As anticipated, simulation results indicate flood reduction throughout the Estates area, along the Big Slough Canal between the R-36 canal and I-75 corridor as well as in the localized area along Big Slough south of I-75 (See Figure 3-3). Overall results indicate a flood stage reduction between 0.1 foot and 1.0 foot throughout the aforementioned areas.

As mentioned before, these results were obtained assuming no increase in stages in the Deer Prairie Slough Canal since a fixed tailwater condition was used for modeling purposes. Further consideration of impacts of additional flow into the Deer Prairie Slough watershed should be taken into account during final evaluation of BMP's. Table 3-3 summarizes BMP#3 analysis results.

Table 3-3: BMP#3 Results Summary

Sub-Watershed	Bench Mark Total Flooded Area (Acres)	BMP3 Total Flooded Area (Acres)	BMP3 Total Flooded Area Change (%)	Bench Mark Flooded Street Length (Feet)	BMP3 Flooded Street Length (Feet)	BMP3 Flooded Street Length Change (%)	Bench Mark Flooded Parcels (Units)	BMP3 Flooded Parcels (Units)	BMP3 Flooded Parcels Change (%)
A	58	58	0.0	7,959	7,958	0.0	2	2	0.0
B	15,839	15,720	-0.8	304,750	282,118	-7.4	665	568	-14.6
C	724	724	-0.1	118,951	118,890	-0.1	38	38	0.0
D	150	150	-0.2	38,510	38,348	-0.4	15	15	0.0
E	407	407	-0.1	47,961	47,880	-0.2	2	2	0.0
F	98	98	-0.3	22,234	22,141	-0.4	1	1	0.0
G	250	250	0.0	53,687	53,663	0.0	17	17	0.0
H	199	198	-0.3	1,082	1,065	-1.5	2	2	0.0
I	165	165	0.0	21,519	21,463	-0.3	2	2	0.0
J	335	316	-5.7	84,088	73,854	-12.2	15	13	-13.3
K	240	240	0.0	45,022	45,022	0.0	5	5	0.0
L	69	69	0.0	11,354	11,354	0.0	0	0	0.0
M	2,426	2,426	0.0	0	0	0.0	0	0	0.0
N	150	150	0.0	14,407	14,407	0.0	1	1	0.0
O	189	189	0.0	56,008	55,998	0.0	9	9	0.0
P	191	184	-3.4	11,134	10,572	-5.0	6	4	-33.3
Q	3,733	3,731	-0.1	0	0	0.0	0	0	0.0
R	2,294	2,199	-4.1	86,929	64,689	-25.6	43	27	-37.2
S	2,489	2,486	-0.1	23,286	20,653	-11.3	74	73	-1.4
T	206	206	0.0	14,915	14,892	-0.2	5	5	0.0
U	9,907	9,907	0.0	8,973	8,973	0.0	19	19	0.0
V	553	552	-0.2	20,054	19,978	-0.4	6	6	0.0
W	1,207	1,207	0.0	0	0	0.0	0	0	0.0
X	92	86	-5.6	7,471	6,029	-19.3	2	2	0.0
Y	189	184	-2.4	70,162	68,020	-3.1	11	9	-18.2
Z	51	51	-0.2	14,978	14,924	-0.4	0	0	0.0
Total	42,211	41,953	-0.6	1,085,434	1,022,891	-5.8	940	820	-12.8

3.3.1.4 BMP #4: R-580 Improvements

Objective:

The objective of this alternative is to induce additional flows through Creighton waterway by improving current conveyance capacity in the R-580 waterway.

Description:

Waterway R-580's bottom profile was reset assuming a flat ditch at its lower elevation of 15.0 feet, NAVD along the entire stretch. The current bottom configuration of the R-580 waterway transitions between 17.71 feet, NAVD88 bottom elevation on the most western end to 23.0 feet, NAVD88 bottom elevation at the most eastern end and sags between these ends at elevation 15.0 feet, NAVD88 (see Figure 3-4).

Results:

This alternative results in small improvements within the vicinity of Big Slough. However, and as intended, additional flows were induced towards Creighton waterway. Inducing additional flow through Creighton waterway will result in additional flooding near I-75 for this particular rainfall event as shown on Figure 3-4. A summary of BMP#4 analysis results is presented in Table 3-4.

Table 3-4: BMP#4 Results Summary

Sub-Watershed	Bench Mark Total Flooded Area (Acres)	BMP4 Total Flooded Area (Acres)	BMP4 Total Flooded Area Change (%)	Bench Mark Flooded Street Length (Feet)	BMP4 Flooded Street Length (Feet)	BMP4 Flooded Street Length Change (%)	Bench Mark Flooded Parcels (Units)	BMP4 Flooded Parcels (Units)	BMP4 Flooded Parcels Change (%)
A	58	58	-0.1	7,959	7,953	-0.1	2	2	0.0
B	15,839	15,806	-0.2	304,750	298,627	-2.0	665	638	-4.1
C	724	725	0.1	118,951	119,411	0.4	38	38	0.0
D	150	151	0.2	38,510	38,526	0.0	15	15	0.0
E	407	408	0.1	47,961	48,223	0.6	2	2	0.0
F	98	99	0.4	22,234	22,517	1.3	1	1	0.0
G	250	250	0.1	53,687	53,782	0.2	17	17	0.0
H	199	199	-0.1	1,082	1,077	-0.4	2	2	0.0
I	165	165	0.1	21,519	21,636	0.6	2	2	0.0
J	335	329	-1.9	84,088	80,578	-4.2	15	15	0.0
K	240	240	0.0	45,022	45,026	0.0	5	5	0.0
L	69	69	0.0	11,354	11,354	0.0	0	0	0.0
M	2,426	2,426	0.0	0	0	0.0	0	0	0.0
N	150	150	0.0	14,407	14,412	0.0	1	1	0.0
O	189	189	0.1	56,008	56,041	0.1	9	9	0.0
P	191	189	-0.7	11,134	11,005	-1.2	6	5	-16.7
Q	3,733	3,720	-0.4	0	0	0.0	0	0	0.0
R	2,294	2,288	-0.3	86,929	85,260	-1.9	43	43	0.0
S	2,489	2,489	0.0	23,286	22,823	-2.0	74	74	0.0
T	206	206	0.0	14,915	14,957	0.3	5	5	0.0
U	9,907	9,910	0.0	8,973	8,973	0.0	19	19	0.0
V	553	577	4.3	20,054	23,139	15.4	6	10	66.7
W	1,207	1,207	0.0	0	0	0.0	0	0	0.0
X	92	90	-1.3	7,471	7,215	-3.4	2	2	0.0
Y	189	188	-0.4	70,162	69,897	-0.4	11	11	0.0
Z	51	51	-0.1	14,978	14,939	-0.3	0	0	0.0
Total	42,211	42,179	-0.1	1,085,434	1,077,371	-0.7	940	916	-2.6

3.3.1.5 BMP #5: Increase Capacity on Southern Boundary

Objective:

The objective of this alternative is to evaluate the system response when doubling the southern boundary discharge capacity into Charlotte Harbor area.

The BMP would involve conveyance improvements, construction of new structures and/or reconditioning of existing structures, maintenance activities, real estate acquisition, and detailed evaluation of the southern boundary through hydrology and hydraulic modeling.

Description:

All structures discharging from Cocoplum waterway into the Charlotte Harbor area under Hillsborough Blvd and their upstream weirs were doubled in capacity. A total of 13 structures under Hillsborough Blvd were double in the model and a total of 6 lateral weirs along Cocoplum waterway were doubled in size (see Figure 3-5).

Results:

This alternative was evaluated for information purposes only, as it is understood that inducing additional flows into Charlotte Harbor would not be desirable. Results indicate that improvements relative to house flooding were not significant; however roads experienced a considerable flood reduction between S Sumter Blvd and Atwater Dr. (see Figure 3-5). A summary of BMP#5 analysis results is presented in Table 3-5.

Table 3-5: BMP#5 Results Summary

Sub-Watershed	Bench Mark Total Flooded Area (Acres)	BMP5 Total Flooded Area (Acres)	BMP5 Total Flooded Area Change (%)	Bench Mark Flooded Street Length (Feet)	BMP5 Flooded Street Length (Feet)	BMP5 Flooded Street Length Change (%)	Bench Mark Flooded Parcels (Units)	BMP5 Flooded Parcels (Units)	BMP5 Flooded Parcels Change (%)
A	58	58	0.1	7,959	8,001	0.5	2	1	-50.0
B	15,839	15,836	0.0	304,750	304,487	-0.1	665	665	0.0
C	724	612	-15.6	118,951	75,331	-36.7	38	25	-34.2
D	150	121	-19.8	38,510	20,694	-46.3	15	7	0.0
E	407	395	-3.1	47,961	42,761	-10.8	2	2	0.0
F	98	76	-22.7	22,234	8,236	-63.0	1	1	-11.8
G	250	245	-2.1	53,687	51,993	-3.2	17	15	0.0
H	199	196	-1.4	1,082	1,000	-7.6	2	2	-50.0
I	165	143	-13.1	21,519	8,237	-61.7	2	1	0.0
J	335	335	0.0	84,088	84,042	-0.1	15	15	0.0
K	240	238	-0.8	45,022	44,688	-0.7	5	5	0.0
L	69	67	-2.1	11,354	11,317	-0.3	0	0	0.0
M	2,426	2,426	0.0	0	0	0.0	0	0	0.0
N	150	149	-0.6	14,407	14,407	0.0	1	1	0.0
O	189	180	-4.6	56,008	51,322	-8.4	9	9	0.0
P	191	191	0.0	11,134	11,133	0.0	6	6	0.0
Q	3,733	3,733	0.0	0	0	0.0	0	0	0.0
R	2,294	2,293	-0.1	86,929	86,339	-0.7	43	43	0.0
S	2,489	2,489	0.0	23,286	23,282	0.0	74	74	0.0
T	206	206	-0.3	14,915	14,756	-1.1	5	5	0.0
U	9,907	9,907	0.0	8,973	8,973	0.0	19	19	0.0
V	553	553	0.0	20,054	20,047	0.0	6	6	0.0
W	1,207	1,207	0.0	0	0	0.0	0	0	0.0
X	92	92	0.0	7,471	7,471	0.0	2	2	0.0
Y	189	189	0.0	70,162	70,161	0.0	11	11	0.0
Z	51	51	0.0	14,978	14,976	0.0	0	0	0.0
Total	42,211	41,988	-0.5	1,085,434	983,655	-9.4	940	915	-2.7

3.3.1.6 BMP #6: Upstream Detention Alternative

Objective:

The objective of this analysis is to examine the effects when attenuating peak flow rates in agricultural areas along the Big Slough canal with a series of new detention facilities.

This BMP would involve construction of stormwater management storage areas, maintenance activities and real estate acquisition.

Description:

In offsite areas, seven detention facilities were added to the model. Each detention area has a 100 acre footprint and is more than 10 feet deep. These areas were located on upland sites along Big Slough canal where feasible (see Figure 3-6). The bottom elevations of these detention areas were set at the adjacent canal initial elevation. Each of these ponds was linked to the Big Slough canal by a 500 feet weir. The crest elevations were set at the bottom of the pond. The total anticipated detained volume is 600 acre-ft per detention site, a total of 4,200 acre-ft.

Results:

Results indicate that the supplemental detention area alternative produces little reduction in peak water surface elevations. Elevations along Big Slough were reduced by only 0.1 to 0.6 feet, making this option less attractive. The extent of flooding for this BMP is essentially the same as the existing scenario with few flood reduction areas along the Big Slough canal (see Figure 3-6). Initial evaluation suggests that the costs associated with purchasing the proposed detention areas from private landowners will likely be high. In addition the complexity of building reservoirs will make it a less attractive solution; e.g. runup wave analysis will increase the height of the perimeter berm. Total costs include an initial cost of location, proper land acquisition and construction, in addition to recurring maintenance and operation costs. A summary of BMP#6 analysis results is presented in Table 3-6.

Table 3-6: BMP#6 Results Summary

Sub-Watershed	Bench Mark Total Flooded Area (Acres)	BMP6 Total Flooded Area (Acres)	BMP6 Total Flooded Area Change (%)	Bench Mark Flooded Street Length (Feet)	BMP6 Flooded Street Length (Feet)	BMP6 Flooded Street Length Change (%)	Bench Mark Flooded Parcels (Units)	BMP6 Flooded Parcels (Units)	BMP6 Flooded Parcels Change (%)
A	58	58	0.0	7,959	7,959	0.0	2	2	0.0
B	15,839	15,645	-1.2	304,750	280,497	-8.0	665	563	-15.3
C	724	724	-0.1	118,951	118,818	-0.1	38	38	0.0
D	150	150	-0.5	38,510	38,067	-1.2	15	15	0.0
E	407	407	-0.1	47,961	47,827	-0.3	2	2	0.0
F	98	98	-0.6	22,234	22,019	-1.0	1	1	0.0
G	250	250	0.0	53,687	53,659	-0.1	17	17	0.0
H	199	197	-0.8	1,082	1,021	-5.6	2	2	0.0
I	165	165	-0.1	21,519	21,418	-0.5	2	2	0.0
J	335	311	-7.2	84,088	72,123	-14.2	15	13	-13.3
K	240	240	0.0	45,022	45,022	0.0	5	5	0.0
L	69	69	0.0	11,354	11,354	0.0	0	0	0.0
M	2,426	2,426	0.0	0	0	0.0	0	0	0.0
N	150	150	0.0	14,407	14,407	0.0	1	1	0.0
O	189	189	-0.1	56,008	55,961	-0.1	9	9	0.0
P	191	183	-3.8	11,134	10,588	-4.9	6	4	-33.3
Q	3,733	3,723	-0.3	0	0	0.0	0	0	0.0
R	2,294	2,268	-1.2	86,929	80,023	-7.9	43	42	-2.3
S	2,489	2,485	-0.2	23,286	20,307	-12.8	74	73	-1.4
T	206	206	0.0	14,915	14,866	-0.3	5	5	0.0
U	9,907	9,907	0.0	8,973	8,973	0.0	19	19	0.0
V	553	550	-0.5	20,054	19,833	-1.1	6	6	0.0
W	1,207	1,207	0.0	0	0	0.0	0	0	0.0
X	92	88	-4.4	7,471	6,413	-14.2	2	2	0.0
Y	189	187	-0.7	70,162	69,679	-0.7	11	11	0.0
Z	51	51	-0.4	14,978	14,887	-0.6	0	0	0.0
Total	42,211	41,934	-0.7	1,085,434	1,035,721	-4.6	940	832	-11.5

3.3.2 BMP Evaluation of Four Crossings

Under this evaluation, as requested by the City of North Port, hydraulic performance and the effects of potential conveyance improvements at four sites, including: R-36 Canal at I-75, Myakkahatchee Creek at I-75, R-36 Canal at Tropicaire Boulevard, and Myakkahatchee Creek at Tropicaire Boulevard were analyzed.

A systematic evaluation was conducted to first understand the existing hydraulic behavior of each of the four crossings under various synthetic storm events. Head differences across each structure, flow conditions at peak discharge, and hydraulic connectivity (including flow patterns in adjacent areas) were assessed to understand unique conditions at each crossing.

In order to evaluate effectiveness of potential BMP improvements at these locations (including any resulting flood reduction and/or downstream flood increase), conveyance capacity at each site was increased by doubling the number of existing structures. This was achieved by adding a duplicate set of model reach elements at each location. A description of existing crossings and the applied BMP for evaluation are provided in Table 3-7.

Table 3-7: Location and Description of Existing and BMP Conditions

Crossing Location	Existing Crossing	BMP Condition
R-36 Canal at I-75	Two (2) 7.5' x 6' box culverts	Two (2) identical 7.5' x 6' box culverts were added in parallel to existing structure
Myakkahatchee Creek at I-75	Two (2) parallel bridges with 8 piers and a total span of 540 feet	Two (2) identical parallel bridges were added in parallel to existing structure
R-36 Canal at Tropicaire Blvd	Two (2) 5' diameter RCP culverts	Two (2) identical 5' diameter RCP culverts were added in parallel to existing structure
Myakkahatchee Creek at Tropicaire Blvd	One (1) bridge with 4 piers and a total span of 150 feet	One (1) identical bridge was added in parallel to existing structure

3.3.2.1 *R-36 Canal at I-75 Evaluation*

Existing condition model results indicate that more than two feet of head difference occurs across this structure during the 100-year storm event (see Table 3-8 and Figures 3-7 & 3-8). Under the proposed BMP condition, model results indicate that a peak stage reduction of up to 0.6 feet occurs upstream of the crossing, while a stage increase of approximately 0.6 feet occurs in the downstream areas. It is notable that reduced discharges are observed from the R-36 Canal westward into the adjacent Deer Prairie Slough watershed for the proposed BMP condition. This overflow connection with the adjacent watershed to the west is located north of I-75. The reduced overflow results in an increased total volume remaining within the North Port area, by virtue of the improved conveyance capacity of the proposed BMP. In summary, increasing the crossing capacity of the R-36 Canal at I-75 may reduce water levels upstream of the crossing, but

also raises flood elevations in the downstream areas. Mitigation of flooding in downstream areas was beyond the scope of this evaluation.

Table 3-8: R-36 Canal at I-75 Crossing Evaluation Results Summary

Table 3-8 (a): Existing Condition Upstream and Downstream Node Maximum Stages and Flows

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)*	NR3210	17.47	19.57	20.38	20.99	21.69	22.30
D/S Node Max Stage (ft)*	NR3220	16.82	18.33	18.86	19.20	19.56	19.92
Difference in Stage (ft)	n/a	0.65	1.24	1.52	1.78	2.14	2.38
Flow (cfs)	n/a	424	586	654	710	779	846

Table 3-8 (b): With BMP Upstream and Downstream Node Maximum Stages and Flows

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)*	NR3210	17.05	18.97	19.74	20.34	21.08	22.08
D/S Node Max Stage (ft)*	NR3220	16.88	18.61	19.25	19.69	20.19	20.74
Difference in Stage (ft)	n/a	0.17	0.36	0.49	0.65	0.90	1.34
Flow (cfs)	n/a	433	631	735	845	997	1223

Table 3-8 (c): Difference in Flows and Stages between BMP and Existing Condition

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)	NR3210	-0.42	-0.60	-0.64	-0.65	-0.61	-0.22
D/S Node Max Stage (ft)	NR3220	0.06	0.28	0.39	0.49	0.63	0.82
Flow (cfs)	n/a	9	45	82	135	218	377

*Vertical datum of stage reported in the table is with reference to NAVD88 Datum.

3.3.2.2 Myakkahatchee Creek at I-75 Evaluation

Existing condition model results indicate that approximately one foot of head difference occurs across this structure during extreme storm events (see Table 3-9 and Figures 3-9 & 3-10). This head difference is relatively small considering the magnitude of flow that arrives from the upstream contributing watershed (up to 8000 cubic feet per second). The applied BMP at this location assumes that the conveyance capacity of the bridge

crossing was doubled. In other words, an identical, parallel 540-foot bridge span was added to investigate the benefit of increasing bridge capacity. Under this hypothetical scenario, model results indicate that a localized stage reduction of 0.7 feet is observed immediately at the upstream end of the crossing. However, peak stage reductions decrease further upstream of the crossing along the creek. No significant change in peak elevations is observed 1,200 feet upstream of the crossing. Also, no significant change to flooding conditions is observed in areas downstream of the crossing. In summary, increasing the crossing capacity of the bridge over Myakkahatchee Creek at I-75 may reduce water levels immediately upstream of the crossing, but does not generally improve flooding conditions north of I-75. The area impacted by this improvement is very localized and would not justify the cost of the improvement.

3.3.2.3 R-36 Canal at Tropicaire Boulevard Evaluation

Existing condition model results indicate that up to three feet of head difference occurs across this structure during various storm events (see Table 3-10 and Figures 3-11 & 3-12). Under the proposed BMP conditions, model results indicate a peak stage reduction of approximately 0.8 feet upstream of the crossing, while a stage increase of up to 1.1 feet occurs downstream of Tropicaire. During all events, discharges from the R-36 canal into Deer Prairie Slough watershed are observed north of Tropicaire Boulevard. The proposed BMP results in a reduction of those discharges to Deer Prairie Slough and a resulting increased total volume remaining within the North Port area. In summary, while increasing the crossing capacity of the R-36 Canal at Tropicaire Boulevard may reduce water levels upstream of the crossing, it also raises flood elevations in downstream areas. Mitigation of flooding in downstream areas was beyond the scope of this evaluation.

3.3.2.4 Myakkahatchee Creek at Tropicaire Boulevard Evaluation

Existing condition model results indicate that the maximum calculated head difference for the various storm events is 0.2 feet; therefore the bridge is not causing a flow restriction (see Table 3-11 and Figures 3-13 & 3-14). Regardless, a BMP was applied for evaluation and assumes that the conveyance capacity was increased (doubled) by adding an identical bridge element in parallel to the existing structure. Under this scenario, model results indicate that a maximum localized stage reduction of approximately 0.1 feet was calculated, yet no significant change is observed further upstream nor downstream of the crossing. In summary, increasing the crossing capacity of the bridge over Myakkahatchee Creek at Tropicaire Boulevard does not substantially improve flooding conditions north of I-75.

Model results (maximum stages and maximum flows) for various storm events (Mean Annual, 5-year, 10-year, 25-year, 50-year, and 100-year) are provided in tabular form within the accompanying geodatabase.

Table 3-9: Myakkahatchee Creek at I-75 Crossing Evaluation Results Summary

Table 3-9 (a): Existing Condition Upstream and Downstream Node Maximum Stages and Flows

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)*	NB0750	20.40	21.89	22.19	22.46	22.82	23.93
D/S Node Max Stage (ft)*	NB0780	19.81	20.86	21.13	21.37	21.79	22.83
Difference in Stage (ft)	n/a	0.59	1.03	1.07	1.09	1.02	1.10
Flow (cfs)	n/a	1306	3045	3640	4236	5290	7816

Table 3-9 (b): With BMP Upstream and Downstream Node Maximum Stages and Flows

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)*	NB0750	19.97	21.16	21.45	21.71	22.14	23.35
D/S Node Max Stage (ft)*	NB0780	19.82	20.87	21.14	21.39	21.83	23.02
Difference in Stage (ft)	n/a	0.16	0.29	0.31	0.32	0.30	0.33
Flow (cfs)	n/a	1311	3601	3673	4291	5175	8509

Table 3-9 (c): Difference in Flows and Stages between BMP and Existing Condition

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)	NB0750	-0.43	-0.72	-0.75	-0.75	-0.68	-0.58
D/S Node Max Stage (ft)	NB0780	0.00	0.01	0.01	0.02	0.04	0.20
Flow (cfs)	n/a	5	556	33	55	-115	692

*Vertical datum of stage reported in the table is with reference to NAVD88 Datum.

Table 3-10: R-36 Canal at Tropicaire Boulevard Crossing Evaluation Results Summary

Table 3-10 (a): Existing Condition Upstream and Downstream Node Maximum Stages and Flows

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)*	NR0170	21.57	21.99	22.08	22.15	22.22	22.33
D/S Node Max Stage (ft)*	NR3190	18.15	19.74	20.48	21.07	21.73	22.31
Difference in Stage (ft)	n/a	3.42	2.25	1.61	1.08	0.49	0.01
Flow (cfs)	n/a	414	420	420	420	421	420

Table 3-10 (b): With BMP Upstream and Downstream Node Maximum Stages and Flows

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)*	NR0170	20.77	21.77	21.94	22.06	22.18	22.32
D/S Node Max Stage (ft)*	NR3190	19.29	20.68	21.11	21.49	21.90	22.32
Difference in Stage (ft)	n/a	1.48	1.10	0.83	0.57	0.28	0.00
Flow (cfs)	n/a	550	575	576	578	578	577

Table 3-10 (c): Difference in Flows and Stages between BMP and Existing Condition

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)	NR0170	-0.80	-0.21	-0.14	-0.09	-0.04	0.00
D/S Node Max Stage (ft)	NR3190	1.14	0.94	0.63	0.42	0.17	0.01
Flow (cfs)	n/a	136	156	156	157	158	157

*Vertical datum of stage reported in the table is with reference to NAVD88 Datum.

Table 3-11: Myakkahatchee Creek at Tropicaire Boulevard Crossing Evaluation Results Summary

Table 3-11(a): Existing Condition Upstream and Downstream Node Maximum Stages and Flows

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)*	NB0700	22.79	24.28	24.51	24.71	24.99	26.13
D/S Node Max Stage (ft)*	NB0710	22.70	24.08	24.31	24.52	24.83	26.07
Difference in Stage (ft)	n/a	0.09	0.19	0.20	0.20	0.16	0.06
Flow (cfs)	n/a	1332	2582	2785	2890	2973	2756

Table 3-11(b): With BMP Upstream and Downstream Node Maximum Stages and Flows

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)*	NB0700	22.73	24.17	24.41	24.63	24.94	26.11
D/S Node Max Stage (ft)*	NB0710	22.71	24.12	24.35	24.57	24.88	26.09
Difference in Stage (ft)	n/a	0.02	0.05	0.06	0.06	0.05	0.02
Flow (cfs)	n/a	1353	2712	3001	3167	3278	3031

Table 3-11(c): Difference in Flows and Stages between BMP and Existing Condition

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)	NB0700	-0.06	-0.10	-0.10	-0.09	-0.06	-0.02
D/S Node Max Stage (ft)	NB0710	0.01	0.04	0.04	0.05	0.05	0.02
Flow (cfs)	n/a	21	131	217	277	305	275

*Vertical datum of stage reported in the table is with reference to NAVD88 Datum.

3.3.3 WCS-162 Evaluation

WCS-162 is located on the R-36 Canal, north of Interstate 75, and immediately upstream of Tropicair Boulevard (refer to Figure 3-15). This is the only gated weir structure on the R-36 Canal, with one 2.25 feet high by 2 feet wide pull up slide gate. The City generally operates this structure by fully opening the gate in anticipation of a storm event to lower the water level in the R-36 canal to minimize potential upstream flooding; otherwise, the gate remains closed. The City staff would like to determine if adding gates would help draw down the canal more quickly and increase conveyance capacity.

3.3.3.1 *R-36 Canal Drawdown Evaluation*

To reduce impacts downstream of WCS-162 while improving peak conditions upstream of the structure, an evaluation was performed to determine the benefits of adding additional gates. The evaluation included calculating the drawdown time for the R-36 canal and the additional conveyance capacity provided by the additional gates.

To evaluate BMPs at WCS-162, Ardaman requested to survey the structure to better understand the geometry of the structure and canal with the purpose of assessing availability of adequate space for additional gates. The survey data provided by Van Buskirk/Fish & Associates, Inc. is included in Appendix A, and the structure pictures are provided in Appendix B. The existing condition model was revised using the latest (2014) survey information for this BMP Evaluation. The update model simulated results rendered no change in model results compared to the May 2012 Governing Board approved model.

The benefits of reducing time required to lower R-36 canal elevation by adding gates at WCS-162 upstream of the structure were assessed by performing a drawdown analysis. For the drawdown evaluation, the R-36 canal upstream of WCS-162 was assumed to be at the control elevation of the weir (elevation 18.3 feet NAVD88). The water level at the canal was simulated by fully opening the existing gate with no additional flows coming into the canal. The existing condition drawdown simulation results indicates that it would take approximately 18 hours to lower the canal to elevation 15 feet (refer to Figure 3-16).

The canal drawdown simulation was repeated for one and two additional gates scenarios. The canal stage hydrographs upstream of the structure with additional gates are also plotted in Figure 3-16. As shown in Figure 3-16, the time required to drawdown R-36 canal will decrease to 11 hours by adding an identical gate. When 2 additional matching gates are provided, the time require to drawdown R-36 canal would decrease to 9 hours. Therefore, the total time required to drawdown R-36 canal (to elevation 15 feet) upstream of WCS-162 will be reduced by 7 and 9 hours by adding one and two additional gates respectively.

3.3.3.2 *Storm Events Simulation Results*

The mean annual, 5-year, and 10-year storm events were simulated using the updated existing condition model with 2014 survey information. The City's water control structure operation criteria were employed in these simulations. The gates are closed at the

beginning of the simulation, and they will be fully open when Big Slough Canal stage at Tropicair rises to Elevation 15.88 feet NAVD88.

Benefits of flood control at the upstream of WCS-162 during a storm event were evaluated by simulating the mean annual storm event starting at the drawdown stage levels (Elevation 15 feet NAVD88). For this evaluation, initial stages in R-36 Canal upstream of WCS-162 were set to the drawdown levels, i.e. simulated canal stages after 18 hours of drawdown simulation. The lower initials at the canal will account for the additional canal storage capacity available upstream of WCS-162. During the lower initial condition simulation, the WCS-162 gate was assumed to be opened throughout the simulation. Model results with lowered initials were compared to the results with the normal initial stage, which is at the invert elevation (at elevation 18.29 feet NAVD88) of WCS-162 weir. Table 3-12 presents model results and comparison of max stages of R-36 canal upstream of WCS-162 weir with normal and lowered initial stage at the canal for the mean annual storm event. As indicated in the table, simulated results suggest that there will be no difference in peak stages in R-36 canal due to the lower initial canal stage. It should be noted that model results suggest the 50-foot wide weir at WCS-162 overtops by 2.6 feet conveying 328 cfs of peak flow across the structure during the mean annual storm event. The R-36 Canal upstream of WCS-162 holds approximately 30 acre-feet of storage capacity behind the gate, whereas more than 3,000 acre-feet of runoff volume is conveyed by the canal during the mean annual storm event. The additional available storage seems to be insignificant compared to the runoff conveyed by the canal during the storm event.

In addition, benefits of having one additional gate with the lowered R-36 canal stages upstream of WCS-162 were also evaluated. For this scenario, both gates (one existing and one additional BMP gate) were assumed to be fully opened throughout the simulation. The model results for mean annual storm event for this scenario are also presented in Table 3-12. The simulated results suggest that there will be no difference in R-36 canal max stages upstream of WCS-162 with an additional gate at the structure. As no difference in peak stages were predicted for the mean annual storm event, no other higher return period storm events (5-year and 10-year) were analyzed with additional gates.

In conclusion, providing one or two additional gates at WCS-162 will help to reduce the time required to drawdown canal levels at the upstream of the structure; however the model results suggest that lower initial levels in R-36 canal upstream of the structure will provide no benefits in terms of reducing flooding at the upstream areas even for small storm events such as mean annual storm event. Also, the modeling results suggest that there would be no adverse impacts in the downstream of WCS-162 due to the additional gate.

**Table 3-12: Mean Annual Event Simulated Maximum Stages in R-36 Canal
Upstream of WCS-162**

Model Node ⁺	Existing Condition Max Stage (ft, NAVD88)	Scenario 1: Existing with Lowered Initials		Scenario 2: One Additional Gate BMP with Lowered Initials	
		Max Stage (ft, NAVD88)	Difference in Max Stage (ft)	Max Stage (ft, NAVD88)	Difference in Max Stage(ft)
NR0170*	21.55	21.55	0.00	21.56	0.01
Water Control Structure WCS-162					
NR3160**	21.86	21.86	0.00	21.85	0.00
NR3150	21.87	21.86	0.00	21.86	0.00
NR3140	22.09	22.09	0.00	22.09	0.00
NR3130	22.23	22.23	0.00	22.23	0.00
NR3125	22.42	22.41	-0.01	22.41	-0.01
NR3120	22.58	22.57	-0.01	22.57	-0.01
NR3110	22.76	22.76	-0.01	22.76	-0.01
NR3100	22.85	22.84	-0.01	22.84	-0.01
NR3090	22.94	22.94	0.00	22.94	0.00
NR3080	23.01	23.01	0.00	23.01	0.00
NR3070	23.09	23.09	0.00	23.08	0.00
NR3060	23.20	23.20	0.00	23.20	0.00
NR3050	23.40	23.40	0.00	23.40	0.00
NR3040	23.44	23.44	0.00	23.44	0.00
NR3030	23.51	23.51	0.00	23.51	0.00
NR3025	23.58	23.58	0.00	23.58	0.00
NR3020	23.59	23.59	0.00	23.59	0.00
NR3010	23.62	23.62	0.00	23.62	0.00
NB5695	23.65	23.65	0.00	23.65	0.00

⁺ Model nodes are presented from downstream to upstream location at R-36 canal

* Model Node Downstream of WCS-162

** Model Node Upstream of WCS-162

3.3.4 Price Boulevard LOS Improvements

Existing condition model results (May 2012 Governing Board approved model) predict that West Price Boulevard would intermittently flood between Locher Road and the Big Slough Canal during the 10, 25, and 100-year, 24-hour storm events. The currently designated City of North Port Level of Service (LOS) is shown in Figure 3-17. As shown on this figure, the West Price Boulevard stretch is identified as an arterial street that floods during the 100-year, 24-hour design storm event. This arterial street is critical to stormwater emergency response since it provides access to emergency facilities such as North Port Utilities Building, North Port High School and Heron Creek Middle School. Therefore, the City of North Port requested further evaluation of the stretch of West Price Boulevard between North Biscayne Boulevard and the Big Slough Canal to provide BMP recommendations to meet the City of North Port LOS criteria. City Unified Land Development Code Chapter 18 Level of Service criteria for arterial roads states that flooding must be less than 6 inches, as measured at the outside edge of pavement in a 100-year, 24-hour design storm event.

Ardaman staff reviewed the May 2012 Governing Board approved model setup within the area of interest (AOI) to verify whether the current model adequately represents the 2014 condition. With desktop and field reconnaissance of the area, it was observed that a section of the surface and sub-surface drainage systems near the North Port High School had been recently updated. Ardaman recommended surveying the AOI to better represent the existing condition. The survey data provided by Van Buskirk/Fish & Associates, Inc. is included in Appendix C.

Existing (2014) Condition Description:

Based on recent survey, stormwater runoff collected from the north and south swales of West Price Boulevard generally flows west from the North Port Utilities Building, whereas stormwater runoff from the remaining areas flows east from this location. Accumulated stormwater runoff going west from the North Port Utilities Building ultimately flows north via the Indian burial ground toward the R-32 canal.

Stormwater runoff going east toward Big Slough is routed through a series of surface water features (ditches, swales and inlets) which connects to a sub-surface system along the north side of West Price Boulevard.

Existing Condition Model Update and Results:

The May 2012 Governing Board approved model was updated using the 2014 survey provided by Van Buskirk/Fish & Associates, Inc. The revised 100-year storm event model results indicate that West Price Boulevard would not flood near the North Port High School as previously predicted. However, the stretch of West Price Boulevard north of Little Salt Spring would still flood by 0.4 feet at the crown during the 10-year storm event. Survey data indicates that road overtopping would occur at the lowest point (near the culvert crossing) at 17.3 feet NAVD88. The model predicted the 25-year and 100-year storm maximum stages at West Price Boulevard are 17.9 and 18.2 feet NAVD88 respectively. The revised existing condition floodplain delineations for the 100-year storm event and the revised LOS are presented in Figure 3-18.

BMP Alternative Analysis

The objective of this series of BMPs is to mitigate flooding along the stretch of West Price Boulevard near the Indian burial ground to meet the existing City of North Port LOS criteria.

Five different BMP alternatives were considered. Only the three alternatives that were determined to be effective in improving the LOS are described below:

3.3.4.1 West Price Boulevard BMP 1

Description

The first BMP alternative involves dredging the R-24 and R-32 canals. As shown in Figure 3-19, this alternative would require: dredging 2,300 feet of R-24 canal and 1,800 feet of R-32 canal to add approximately 2 to 3 feet of depth; and installing one extra parallel 36-inch pipe at the existing culvert crossing, between Indian burial ground and the R-32 canal. Figures showing comparison of existing and BMP cross-sections and bottom profiles of these canals are provided in Appendix D.

The City is not allowed to disturb the 50-foot wide drainage right-of-way through the Indian burial ground.

Results

Model results, comparison of floodplains, and the maximum stages at notable locations are presented in Figure 3-19. Model results with BMP_1 alternative suggest that West Price Boulevard would not overtop during the 25-year storm event. In addition, this alternative would reduce flooding on some local streets (Dundee Ave, Surf Ave, and San Salvador Road) located north of R-32 canal.

The model predicted that the 100-year maximum stage at West Price Boulevard with BMP_1 alternative will be reduced from 18.2 to 17.5 feet NAVD88. West Price Boulevard would still overtop by 0.2 feet over the crown of the road at the lowest section during the 100-year storm event. However, the road would be passable according to City of North Port LOS criteria. Figure 3-20 shows the comparison of the 100-year floodplain and maximum stages at notable locations with BMP 1 alternative. Model results also indicate that there will be no adverse impacts at downstream areas due to this improvement.

3.3.4.2 West Price Boulevard BMP 2

Description

The second BMP alternative consists of raising the road (West Price Boulevard) such that it would not flood during the 100-year design storm event. This alternative would involve raising approximately 1,900 feet of West Price Boulevard to an elevation of 18.5 feet NAVD88. Survey data suggests that the lowest segment of the road, which is located at the culvert crossing, needs to be raised by 1.2 feet to reach an elevation of 18.5 feet NAVD88. Figure 3-21 shows the comparison of the 100-year floodplain as well

as the extent of West Price Boulevard that needs to be raised to reduce flooding potential during the event.

Results

Model results suggest that the 100-year peak stages upstream and downstream of the culvert across West Price Boulevard would be 18.2 feet NAVD88 with this alternative. The model predicted the 100-year maximum stage at West Price Boulevard is below the recommended raised road crown elevation of 18.5 feet NAVD88. The peak stage model results suggest that there will be no adverse impacts or increase in stages upstream or downstream of the improvement for any modeled storm event.

Additional right-of-way requirement to raise the road and its availability should be thoroughly assessed prior to selecting this BMP alternative.

3.3.4.3 West Price Boulevard BMP 3

Description

The third BMP alternative evaluated incorporates both BMP_1 and BMP_2 improvements, i.e. dredging the R-32 and R-24 canals, adding a new pipe crossing, and raising the road such that it would not flood during the 100-year storm event.

Results

Model results suggest that the 100-year peak stage upstream of the culvert across West Price Boulevard would be 17.6 feet NAVD88 with this alternative. Figure 3-22 shows the comparison of the 100-year floodplain as well as the elements of BMP_3 improvements. This alternative would require raising approximately 950 feet of West Price Boulevard to elevation 18.0 feet NAVD88. Compared to BMP_2 improvements, this alternative would reduce the required road improvement length by half at a lower elevation (6 inches lower than BMP_2). Similar to BMP_1 and BMP_2, the peak stage model results suggest that there will be no adverse impacts or increase in stages upstream or downstream of the road improvement for any model storm event.

3.3.4.4 Other Evaluated BMPs

In addition to the three previously described BMP alternatives, a few other BMPs were evaluated. However, modeling results suggest that these BMPs would not mitigate the flooding conditions along the evaluated stretch of West Price Boulevard.

One of the other BMPs evaluated was to install a 24-inch pipe at the south side of West Price Boulevard near the culvert that would run approximately 1,400 feet to the east and connect to the existing sub-surface system inlet. This BMP did not show any improvements since the BMP pipe is too long and there was not sufficient hydraulic gradient available to convey the necessary flow rate through the pipe.

Another BMP evaluated was to provide a 20-foot wide cut/swale that would connect the flooded area south of West Price Boulevard to the south towards the Little Salt Spring basin. 25-year storm event model results suggest that this BMP alternative would lower

peak stages at West Price Boulevard only by 0.2 feet. However, the road would still flood during this event. Also, this BMP may raise environmental concerns considering that it would require diverting stormwater runoff from the road towards Little Salt Spring basin.

3.3.4.5 Summary and Recommendations

Various BMP alternatives were evaluated to mitigate flooding at West Price Boulevard with the purpose of meeting City of North Port LOS criteria. BMP_1 alternative (dredging R-24 and R-32 canals) would eradicate the road flooding in a 25-year design storm event, and it would minimize flooding in a 100-year storm event to make it passable during the event. BMP_2 alternative would eliminate road flooding in a 100-year design storm event by raising West Price Blvd. BMP_3 alternative would also eliminate West Price Boulevard road flooding in a 100-year storm event while minimizing road improvements. A summary of 100-year peak stages for each BMP alternatives and recommended road crown and edge of pavement elevations are provided in Table 3-13. It is estimated that it would cost \$0.8 million, \$0.9 million, and \$1.3 million for BMP_1, BMP_2, and BMP_3, respectively (see Appendix E for the detailed cost estimates). These cost estimates are approximate, and they are used for the comparison purpose only. Considering the project cost, BMP_2 alternative (raising the road) appears to be the most effective approach to eliminate road flooding conditions for the 100-year design storm event. In 2010, the city cleaned these canals with the purpose of removing mucks accumulated at the bottom. It is recommended current cross-sections and bottom profiles of these canals be surveyed to verify dredging requirements prior to selecting dredging alternatives. Also, canal dredging cost could be less, if City of North Port performs the dredging using in-house resources.

Table 3-13: Summary of West Price Boulevard BMPs

BMP Description	100-year Flood Elevation (ft, NAVD88)		EOP Elevation (ft, NAVD88)		Road Crown Elevation (ft, NAVD88)		Preliminary Cost Estimate for Construction in 2017
	Without BMP	With BMP	Existing	Proposed	Existing	Proposed	
No. 1- Dredge R-24 and 32, add 36" pipe	18.2	17.5	17	17	17.3	17.3	\$832,000
No. 2- Raise 1900 LF of Price Blvd 1.2' higher	18.2	18.2	17	18.2	17.3	18.5	\$859,000
No. 3- Dredge R-24 and 32, add 36" pipe, Raise 850 LF of Price Blvd 0.7' higher	18.2	17.6	17	17.7	17.3	18.0	\$1,308,000

The 25-year and 100-year storm events revised existing condition and BMP 1, 2, and 3 alternatives model results (maximum stages and maximum flows) are provided in tabular form within the accompanying geodatabase along with updated model network (basins, nodes, and reaches). CHAN model data and simulation run files for these alternatives are also included in an external hard drive.

4.0 CONCEPTUAL PERMIT APPLICATION

Conceptual permit application was not included in this project.

5.0 CONCLUSIONS

It is recommended that the City of North Port purchase the small number of habitable structures in which flooding is predicted in the 100 year event. Purchasing the affected properties may be more cost effective than implementing any BMPs. Figure 5-1 shows the 74 parcels (one parcel contains two habitable structures) identified in the LOS analysis, in addition to 25 parcels reported as flooded in 1992 and 27 properties reported as damaged in 2003 (also see Table 5-1 below). Several parcels were identified as flooded in more than one event, which is noted in the table.

It is recommended that finished floor elevations of the 101 parcels are acquired by survey, and finished floor elevations are compared with modeled 100 year event maximum stages, to determine which properties flood in the 100 year event. Highlighted rows indicate parcels that were identified as flooded in the LOS analysis, and have documented flooding in the 1992 and/or 2003 event.

Table 5-1: Summary of Parcels to Survey

PID	Address	City, State, Zip	In 100 Year Level of Service Analysis	Reported as Flooded in 1992	Reported as Flooded in 2003
1122-16-0325	1297 NACKMAN RD	NORTH PORT, FL 34288	Yes		
1008-25-5316	1400 LONGBOW AVE	NORTH PORT, FL 34288	Yes		
0976-26-4128	2386 VESTRIDGE ST	NORTH PORT, FL 34287	Yes		
0964-08-1404	2912 OKLAHOMA ST	NORTH PORT, FL 34286	Yes		
0995-18-2835	2989 SARLETT ST	NORTH PORT, FL 34287		Yes	
0995-18-2836	2999 SARLETT ST	NORTH PORT, FL 34287		Yes	
0967-06-0117	3166 SNOWBIRD ST	NORTH PORT, FL 34291	Yes	Yes	Yes
0993-26-4012	3236 MONTCLAIR CIR	NORTH PORT, FL 34287	Yes		
0993-26-3801	3262 MONTCLAIR CIR	NORTH PORT, FL 34287	Yes		
0993-26-3730	3589 MONTCLAIR CIR	NORTH PORT, FL 34287	Yes		
0993-26-3815	3626 MONTCLAIR CIR	NORTH PORT, FL 34287	Yes		
0993-26-3816	3652 MONTCLAIR CIR	NORTH PORT, FL 34287	Yes		

PID	Address	City, State, Zip	In 100 Year Level of Service Analysis	Reported as Flooded in 1992	Reported as Flooded in 2003
0954-14-2522	4268 BACKENSTO ST	NORTH PORT, FL 34291	Yes		Yes
1144-07-4316	4268 LEESBURG AVE	NORTH PORT, FL 34288	Yes		
1002-18-4613	4353 MCKIBBEN DR	NORTH PORT, FL 34287	Yes		
1002-27-6618	4399 MONGITE RD	NORTH PORT, FL 34287	Yes		
1002-18-4810	4440 MONGITE RD	NORTH PORT, FL 34287	Yes		
0955-15-4601	4441 COBBLER LN	NORTH PORT, FL 34286	Yes		
1002-27-6621	4441 MONGITE RD	NORTH PORT, FL 34287	Yes		
0996-19-1923	4531 NELE ST	NORTH PORT, FL 34287		Yes	
1002-18-4806	4534 MONGITE RD	NORTH PORT, FL 34287	Yes		
1002-27-6627	4567 MONGITE RD	NORTH PORT, FL 34287	Yes		
0996-19-1922	4573 NELE ST	NORTH PORT, FL 34287		Yes	
1002-27-6628	4583 MONGITE RD	NORTH PORT, FL 34287	Yes		
1002-27-6629	4599 MONGITE RD	NORTH PORT, FL 34287	Yes		
1002-27-6630	4609 MONGITE RD	NORTH PORT, FL 34287	Yes		
1002-27-6631	4625 MONGITE RD	NORTH PORT, FL 34287	Yes		
1002-18-5011	4628 MONGITE RD	NORTH PORT, FL 34287	Yes		
1002-18-5010	4640 MONGITE RD	NORTH PORT, FL 34287	Yes		
1002-27-6632	4641 MONGITE RD	NORTH PORT, FL 34287	Yes		
1002-18-5008	4668 MONGITE RD	NORTH PORT, FL 34287	Yes		
0996-19-4324	4943 GROBE ST	NORTH PORT, FL 34287	Yes		
0996-19-2317	4964 GROBE ST	NORTH PORT, FL 34287		Yes	
1001-27-6105	4974 ESCALANTE DR	NORTH PORT, FL 34287	Yes		
1001-27-6106	4982 ESCALANTE DR	NORTH PORT, FL 34287	Yes		
1001-27-6316	4983 ESCALANTE DR	NORTH PORT, FL 34287	Yes		
0996-19-4325	4987 GROBE ST	NORTH PORT, FL 34287	Yes		
1001-27-6107	4990 ESCALANTE DR	NORTH PORT, FL 34287	Yes		
0996-19-2318	4991 BULLARD ST	NORTH PORT, FL 34287		Yes	

PID	Address	City, State, Zip	In 100 Year Level of Service Analysis	Reported as Flooded in 1992	Reported as Flooded in 2003
0953-15-2713	5005 LACEY ST	NORTH PORT, FL 34286	Yes		Yes
0996-09-4126	5009 BULLARD ST	NORTH PORT, FL 34287	Yes		
0955-15-3218	5060 IBSON LN	NORTH PORT, FL 34286	Yes		
0942-15-3308	5089 HABLOW LN	NORTH PORT, FL 34286	Yes		
0942-15-3307	5101 HABLOW LN	NORTH PORT, FL 34286	Yes		
1001-27-6115	5102 ESCALANTE DR	NORTH PORT, FL 34287	Yes		
0942-15-3205	5133 INKS LN	NORTH PORT, FL 34286	Yes		
1001-27-6117	5142 ESCALANTE DR	NORTH PORT, FL 34287	Yes		
0942-15-3204	5149 INKS LN	NORTH PORT, FL 34286	Yes		
0942-15-3301	5173 HABLOW LN	NORTH PORT, FL 34286	Yes		
0953-15-2415	5208 GRIGGS AVE	NORTH PORT, FL 34291	Yes		
0953-15-2214	5224 HACKLEY RD	NORTH PORT, FL 34291	Yes		
0953-15-2615	5272 GADBOYS AVE	NORTH PORT, FL 34291	Yes		
0953-15-2614	5278 GADBOYS AVE	NORTH PORT, FL 34291	Yes		
0953-15-2324	5290 HAAS AVE	NORTH PORT, FL 34291	Yes		
1001-27-6122	5292 TREKELL ST	NORTH PORT, FL 34287	Yes		
1001-27-6123	5302 TREKELL ST	NORTH PORT, FL 34287	Yes		
0996-19-4339	5323 GROBE ST	NORTH PORT, FL 34287		Yes	
0944-15-2728	5363 LACEY ST	NORTH PORT, FL 34286	Yes		Yes
0955-15-4505	5382 NOHAVA RD	NORTH PORT, FL 34286	Yes		
0954-14-2930	5437 MANDRAKE TER	NORTH PORT, FL 34291	Yes		
0954-14-2515	5497 LADY SLIPPER AVE	NORTH PORT, FL 34291			Yes
0953-14-1109	5516 REISTERSTOWN RD	NORTH PORT, FL 34291			Yes
0944-07-1204	5519 GARRISON AVE	NORTH PORT, FL 34291			Yes
0953-14-1108	5547 TANEYTOWN ST	NORTH PORT, FL 34291			Yes
0953-14-1208	5551 REISTERSTOWN RD	NORTH PORT, FL 34291	Yes	Yes	Yes

PID	Address	City, State, Zip	In 100 Year Level of Service Analysis	Reported as Flooded in 1992	Reported as Flooded in 2003
0953-14-1113	5555 HENNESSY ST	NORTH PORT, FL 34291	Yes	Yes	Yes
0953-14-1207	5585 REISTERSTOWN RD	NORTH PORT, FL 34291			Yes
0953-14-1111	5588 REISTERSTOWN RD	NORTH PORT, FL 34291	Yes		Yes
0944-07-1202	5621 GARRISON AVE	NORTH PORT, FL 34291	Yes		
0953-14-1206	5621 REISTERSTOWN RD	NORTH PORT, FL 34291	Yes	Yes	Yes
0953-14-1112	5624 REISTERSTOWN RD	NORTH PORT, FL 34291	Yes	Yes	Yes
0942-08-0004	5625 N SUMTER BLVD	NORTH PORT, FL 34286	Yes		
1002-18-4802	5650 POSTMA ST	NORTH PORT, FL 34287	Yes		
0954-14-2520	5654 LADY SLIPPER AVE	NORTH PORT, FL 34291			Yes
0944-07-1309	5664 GARRISON AVE	NORTH PORT, FL 34291	Yes		Yes
0944-07-1304	5779 REISTERSTOWN RD	NORTH PORT, FL 34291	Yes	Yes	Yes
0967-05-8905	5788 SYLVANIA AVE	NORTH PORT, FL 34291			Yes
0967-05-8904	5814 SYLVANIA AVE	NORTH PORT, FL 34291			Yes
0942-04-1904	5815 SUMTER BLVD	NORTH PORT, FL 34286	Yes		Yes
0968-05-7474	5834 BURWIN AVE	NORTH PORT, FL 34291	Yes		
0968-05-7448	5839 BATTERSEA AVE	NORTH PORT, FL 34291	Yes		Yes
0968-05-7450	5861 BATTERSEA AVE	NORTH PORT, FL 34291	Yes		Yes
0968-05-8024	5933 BURWIN AVE	NORTH PORT, FL 34291	Yes		
0968-05-7454	5971 BATTERSEA AVE	NORTH PORT, FL 34291	Yes		Yes
0941-04-1613	6527 REISTERSTOWN RD	NORTH PORT, FL 34291			Yes
0943-01-1009	6531 TANEYTOWN ST	NORTH PORT, FL 34291		Yes	
0941-04-1611	6669 REISTERSTOWN RD	NORTH PORT, FL 34291	Yes	Yes	Yes
0941-04-1609	6869 REISTERSTOWN RD	NORTH PORT, FL 34291		Yes	Yes


PID	Address	City, State, Zip	In 100 Year Level of Service Analysis	Reported as Flooded in 1992	Reported as Flooded in 2003
0941-04-1615	6969 REISTERSTOWN RD	NORTH PORT, FL 34291			Yes
0952-12-1121	7254 MUNCEY RD	NORTH PORT, FL 34291	Yes		
0996-09-3204	8515 FAY AVE	NORTH PORT, FL 34287		Yes	
0996-19-4520	8634 HERBISON AVE	NORTH PORT, FL 34287		Yes	
0996-19-4508	8645 CRISTOBAL AVE	NORTH PORT, FL 34287		Yes	
0996-19-4519	8664 HERBISON AVE	NORTH PORT, FL 34287		Yes	
0996-19-4517	8720 HERBISON AVE	NORTH PORT, FL 34287	Yes		
0996-19-4515	8772 HERBISON AVE	NORTH PORT, FL 34287		Yes	
0996-19-4513	8795 CRISTOBAL AVE	NORTH PORT, FL 34287		Yes	
0995-19-2413	8796 PORTO BELLO AVE	NORTH PORT, FL 34287	Yes		
0996-19-4514	8798 HERBISON AVE	NORTH PORT, FL 34287	Yes	Yes	
0995-18-2838	8855 CHESEBRO AVE	NORTH PORT, FL 34287		Yes	
0995-18-2837	8875 CHESEBRO AVE	NORTH PORT, FL 34287		Yes	

We trust that this report satisfies your expectations and appreciate the opportunity to work with you on this important project. If you have any questions, or if we can be of further service to you, please do not hesitate to call.

Very truly yours,
ARDAMAN & ASSOCIATES, INC.


Nestor Aceituno, P.E.
Senior Project Engineer

10/10/2014


Shankar Gautam, P.E.
Project Engineer

cc: Elizabeth Wong, City of North Port

FIGURES

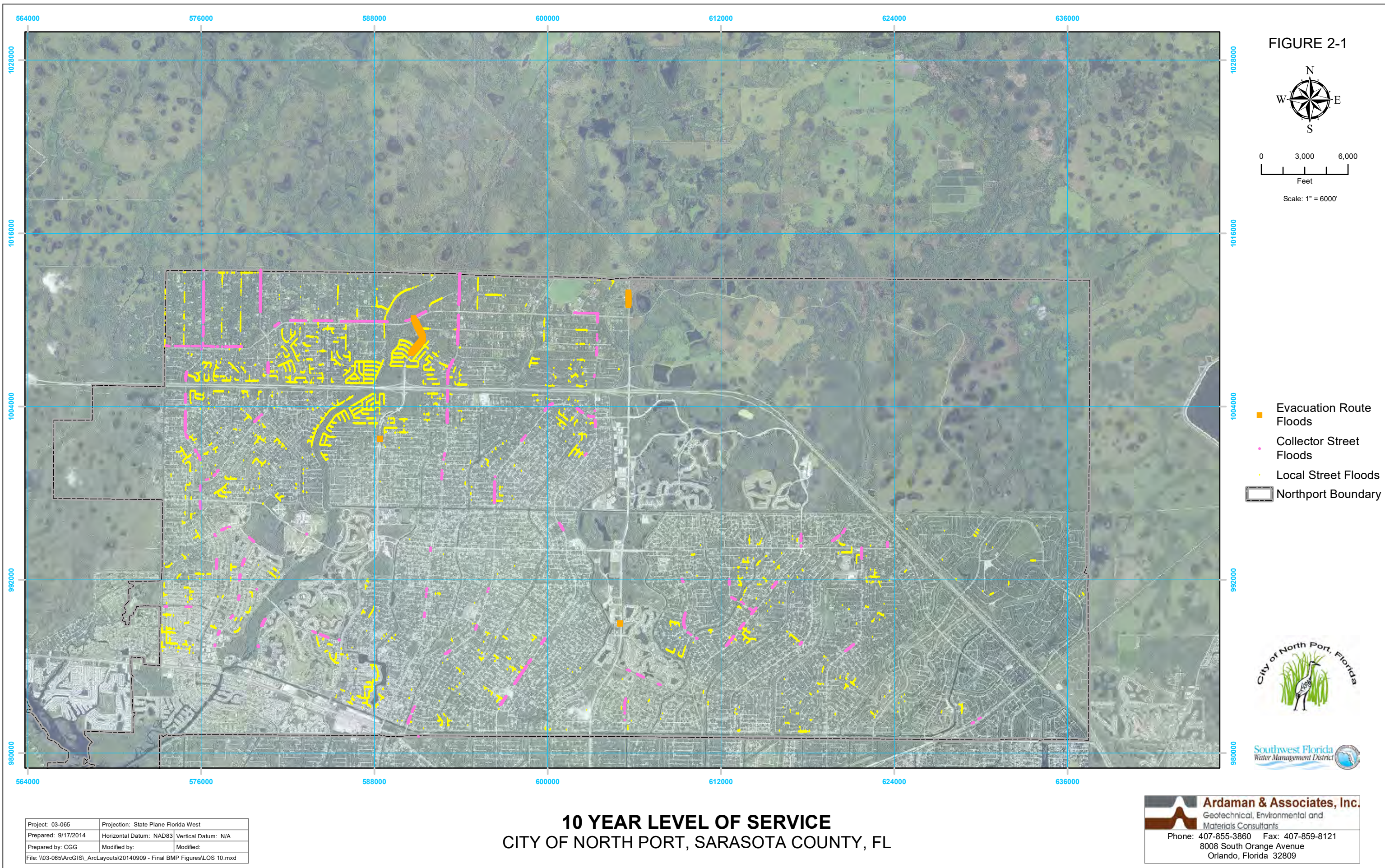
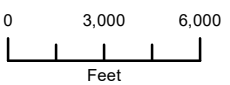


FIGURE 2-1



Scale: 1" = 6000'

- Evacuation Route Floods
- Collector Street Floods
- Local Street Floods
- Northport Boundary



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10 YEAR LEVEL OF SERVICE **CITY OF NORTH PORT, SARASOTA COUNTY, FL**

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 Geotechnical, Environmental and
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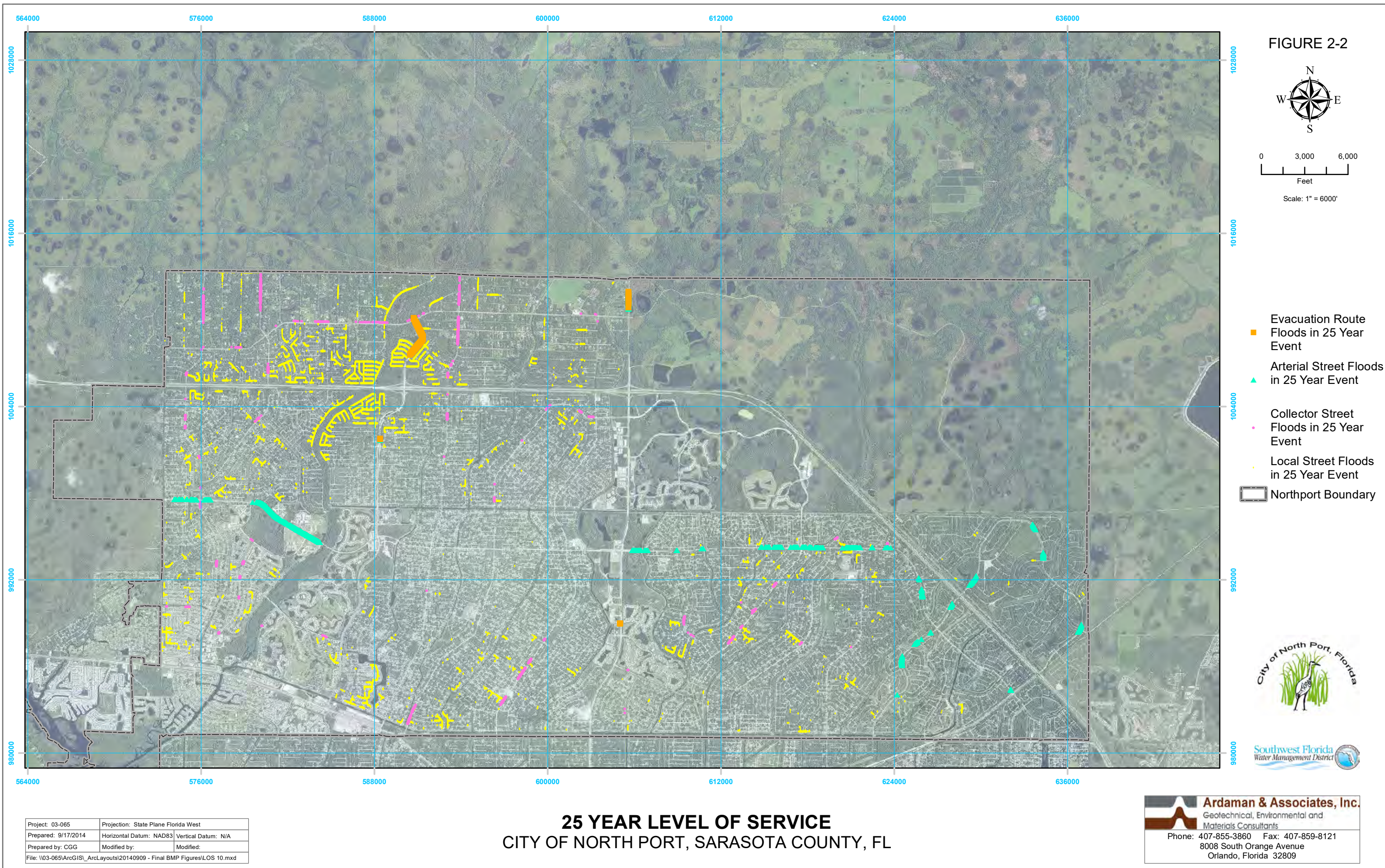
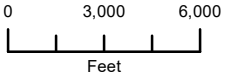
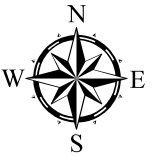


FIGURE 2-2



Scale: 1" = 6000'

- Evacuation Route
Floods in 25 Year Event
- Arterial Street Floods
in 25 Year Event
- Collector Street
Floods in 25 Year Event
- Local Street Floods
in 25 Year Event
- Northport Boundary



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25 YEAR LEVEL OF SERVICE
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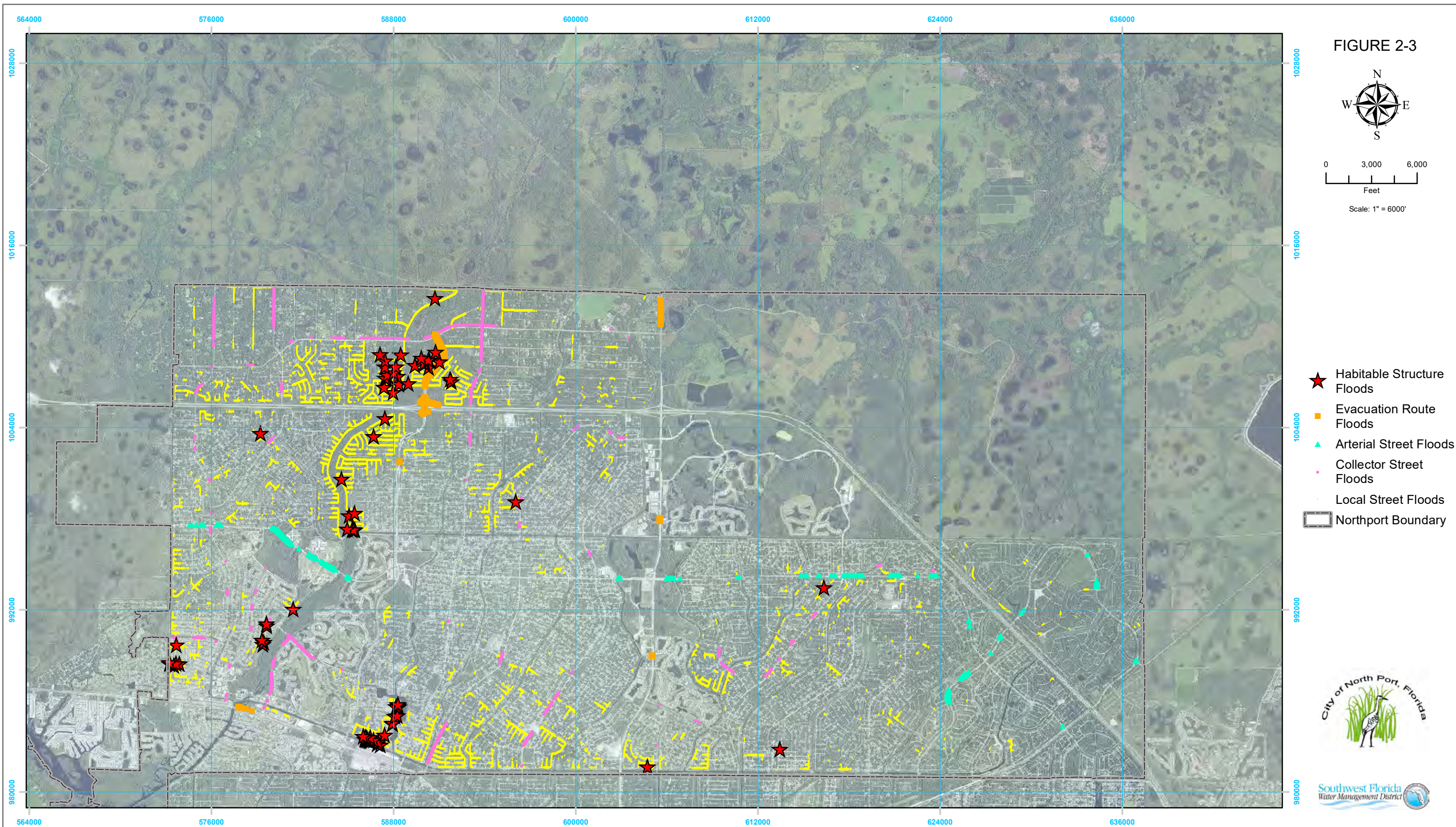
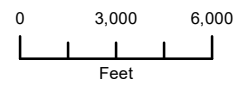


FIGURE 2-3



Scale: 1" = 6000'

- ★ Habitable Structure Floods
- Evacuation Route Floods
- ▲ Arterial Street Floods
- Collector Street Floods
- Local Street Floods
- ▭ Northport Boundary



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100 YEAR LEVEL OF SERVICE **CITY OF NORTH PORT, SARASOTA COUNTY, FL**

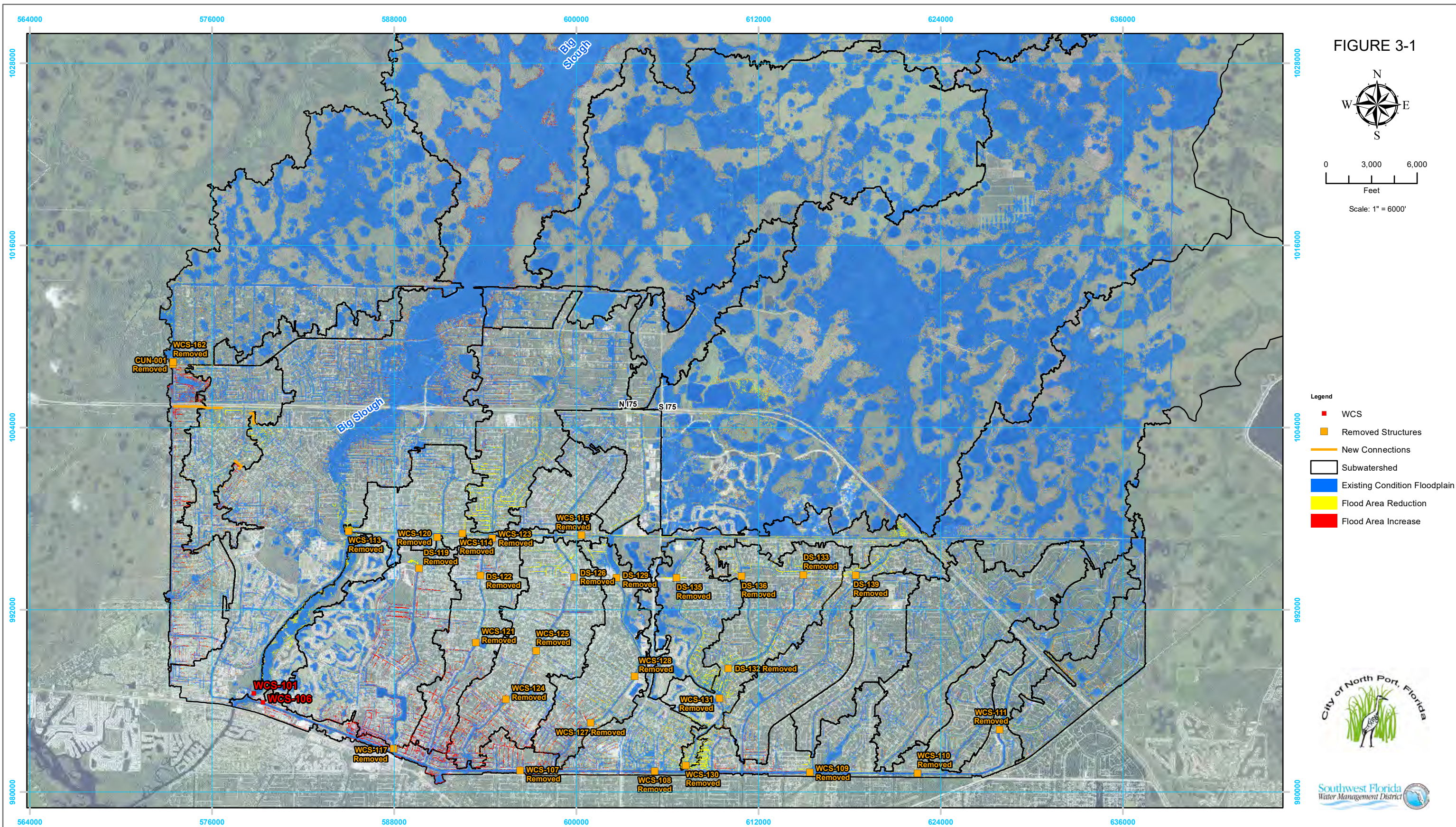


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NORTH PORT / BIG SLOUGH WMP

BMP ALTERNATIVE 1 - 1 DAY 100 YEAR EVALUATION

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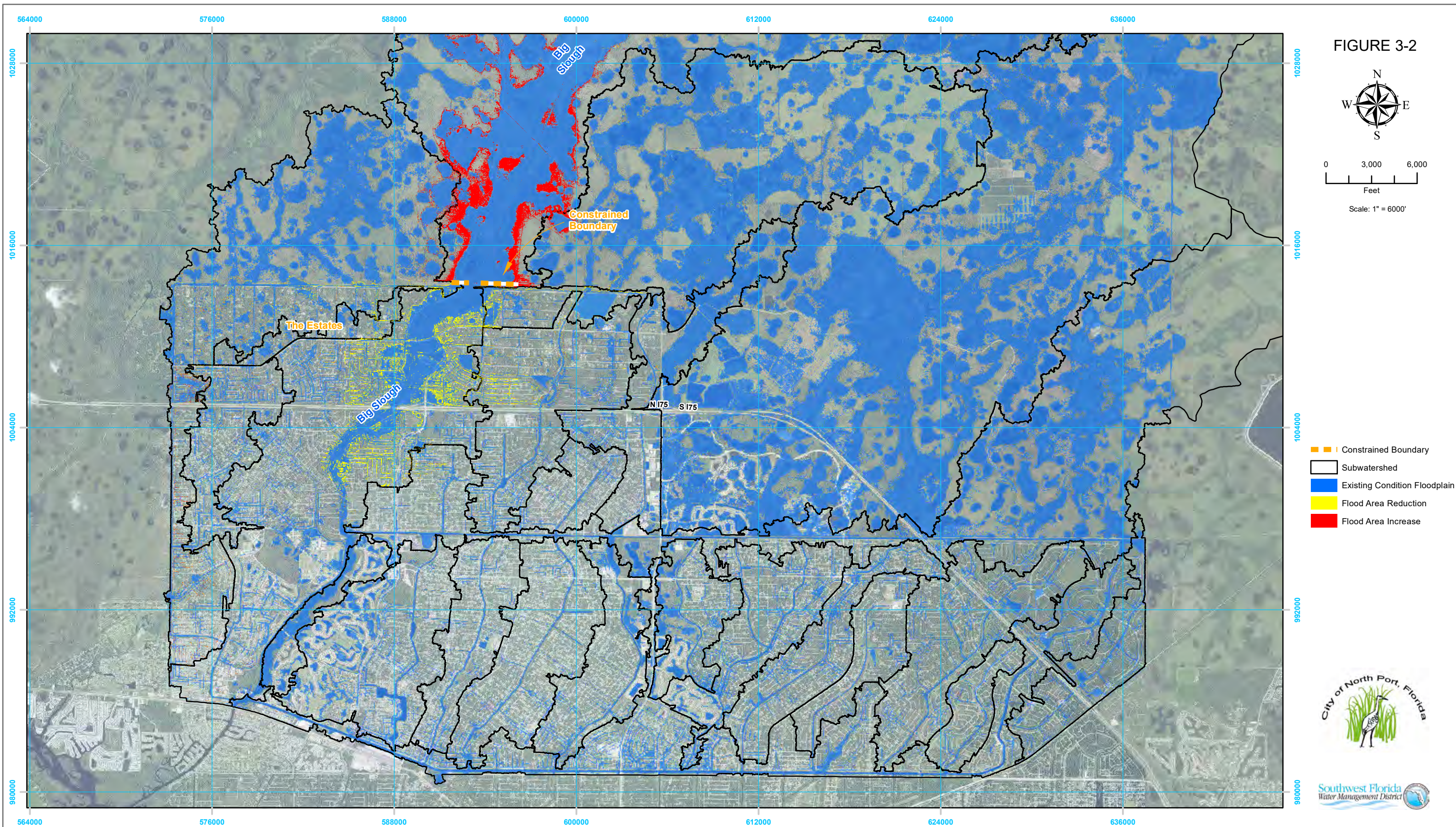
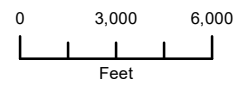


FIGURE 3-2



Scale: 1" = 6000'

- - - Constrained Boundary
- Subwatershed
- Existing Condition Floodplain
- Flood Area Reduction
- Flood Area Increase



Project: 03-065	Projection: State Plane Florida West	
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NORTH PORT / BIG SLOUGH WMP

BMP ALTERNATIVE 2 - 1 DAY 100 YEAR EVALUATION

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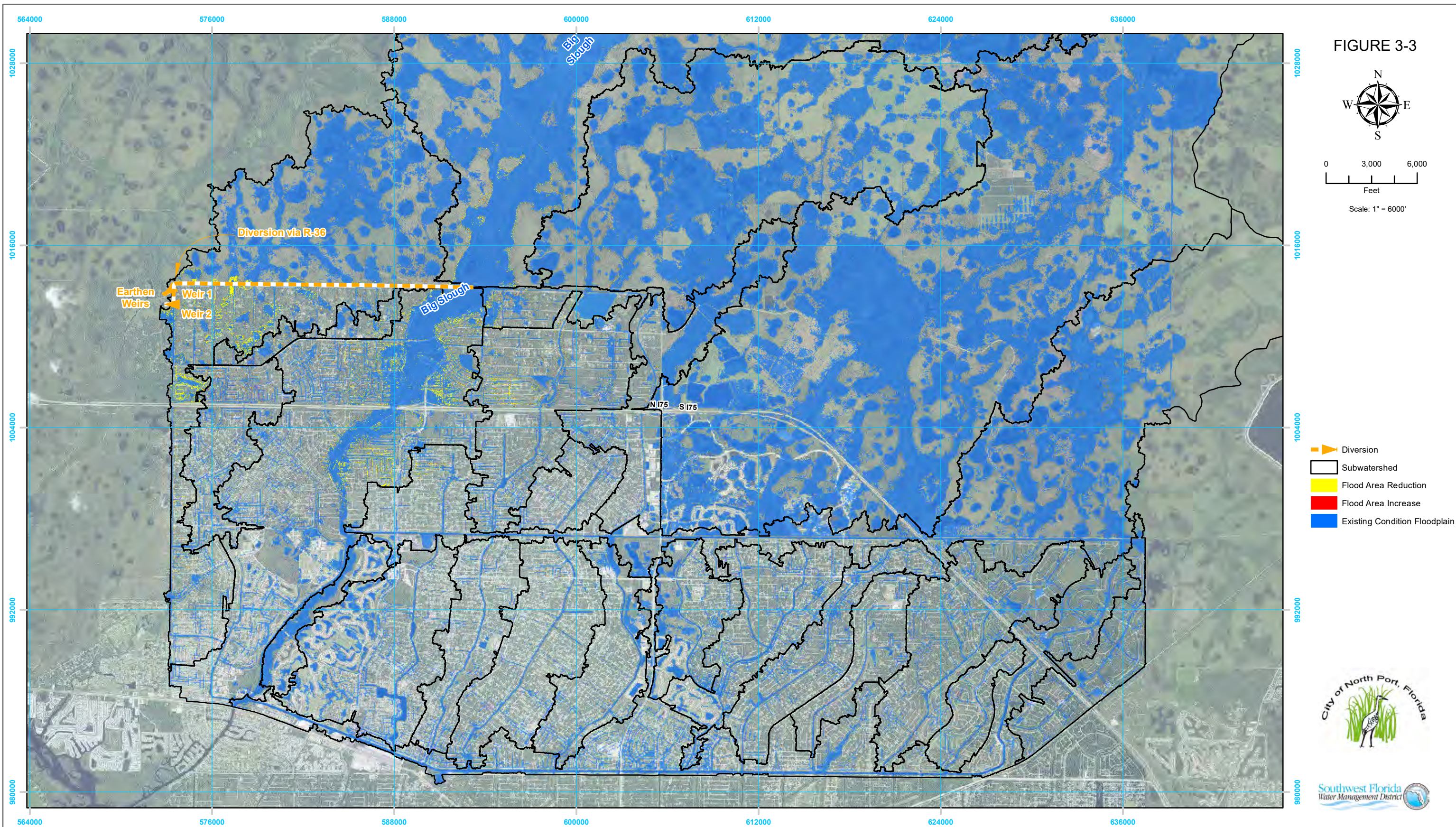
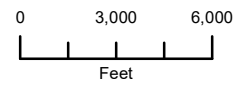


FIGURE 3-3



Scale: 1" = 6000'

- Diversion
- Subwatershed
- Flood Area Reduction
- Flood Area Increase
- Existing Condition Floodplain



Project: 03-065	Projection: State Plane Florida West	
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NORTH PORT / BIG SLOUGH WMP

BMP ALTERNATIVE 3 - 1 DAY 100 YEAR EVALUATION

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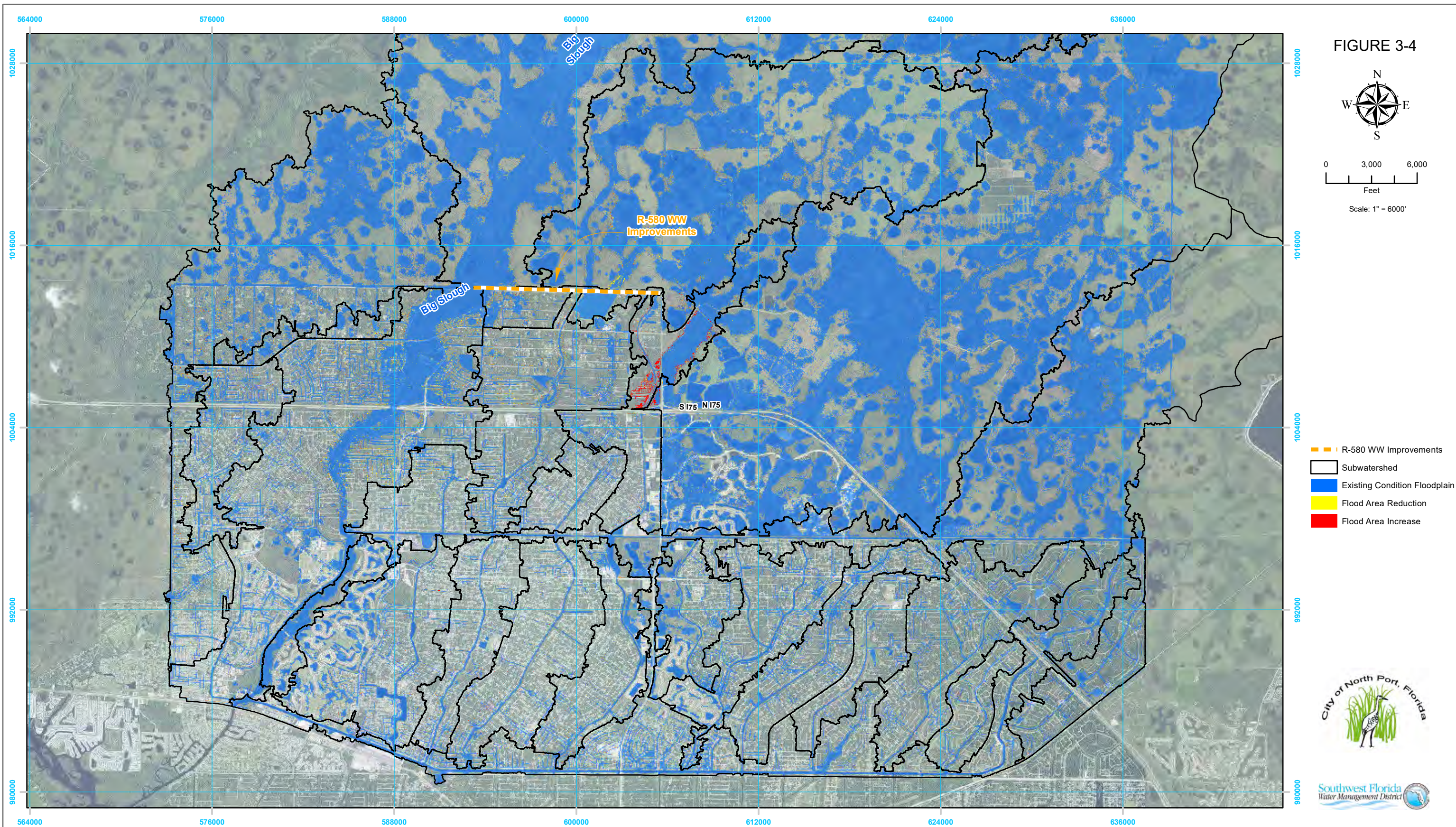
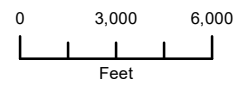


FIGURE 3-4



Scale: 1" = 6000'

- R-580 WW Improvements
- Subwatershed
- Existing Condition Floodplain
- Flood Area Reduction
- Flood Area Increase



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NORTH PORT / BIG SLOUGH WMP

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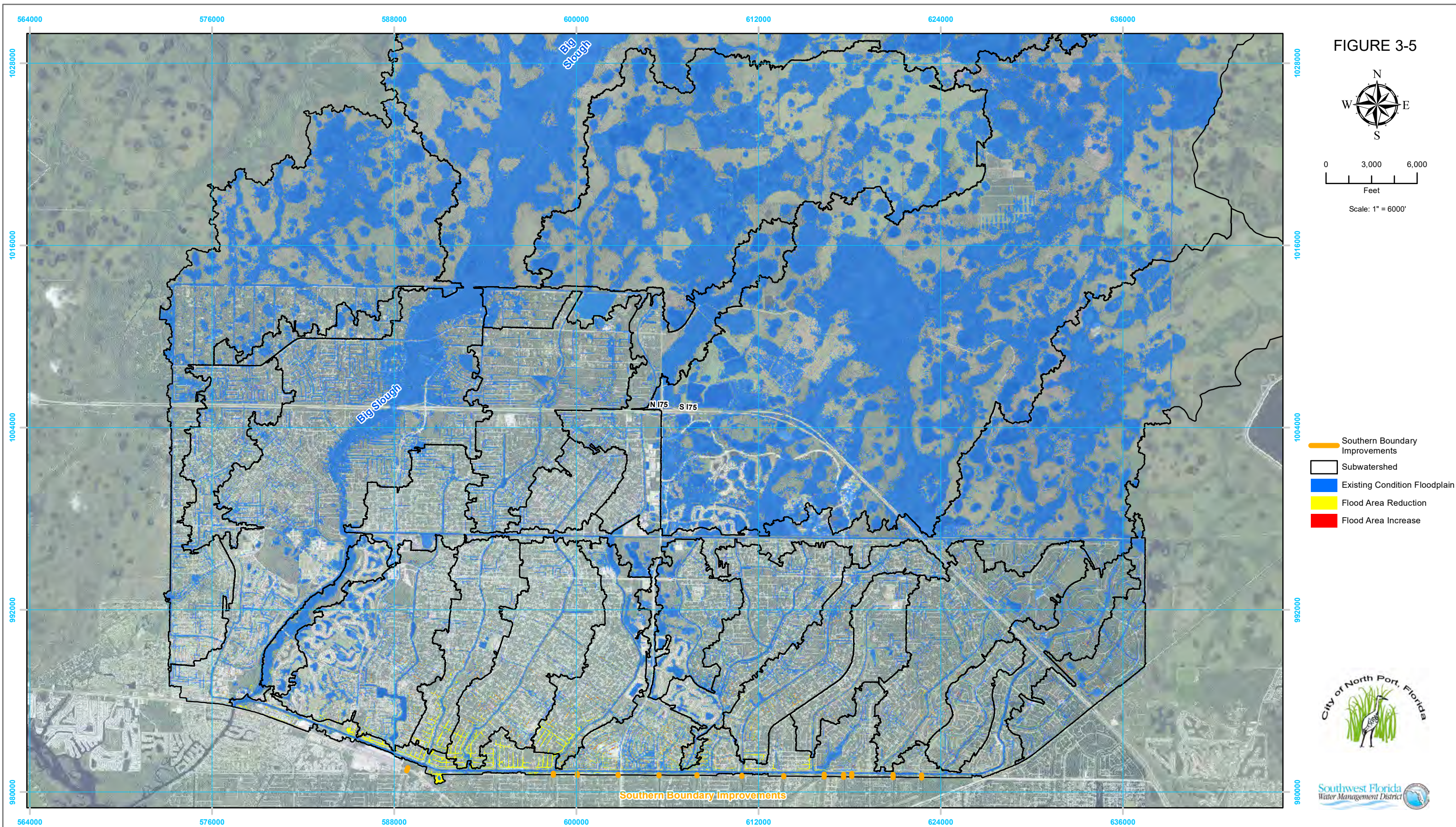
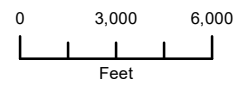


FIGURE 3-5



Scale: 1" = 6000'

- Southern Boundary Improvements
- Subwatershed
- Existing Condition Floodplain
- Flood Area Reduction
- Flood Area Increase



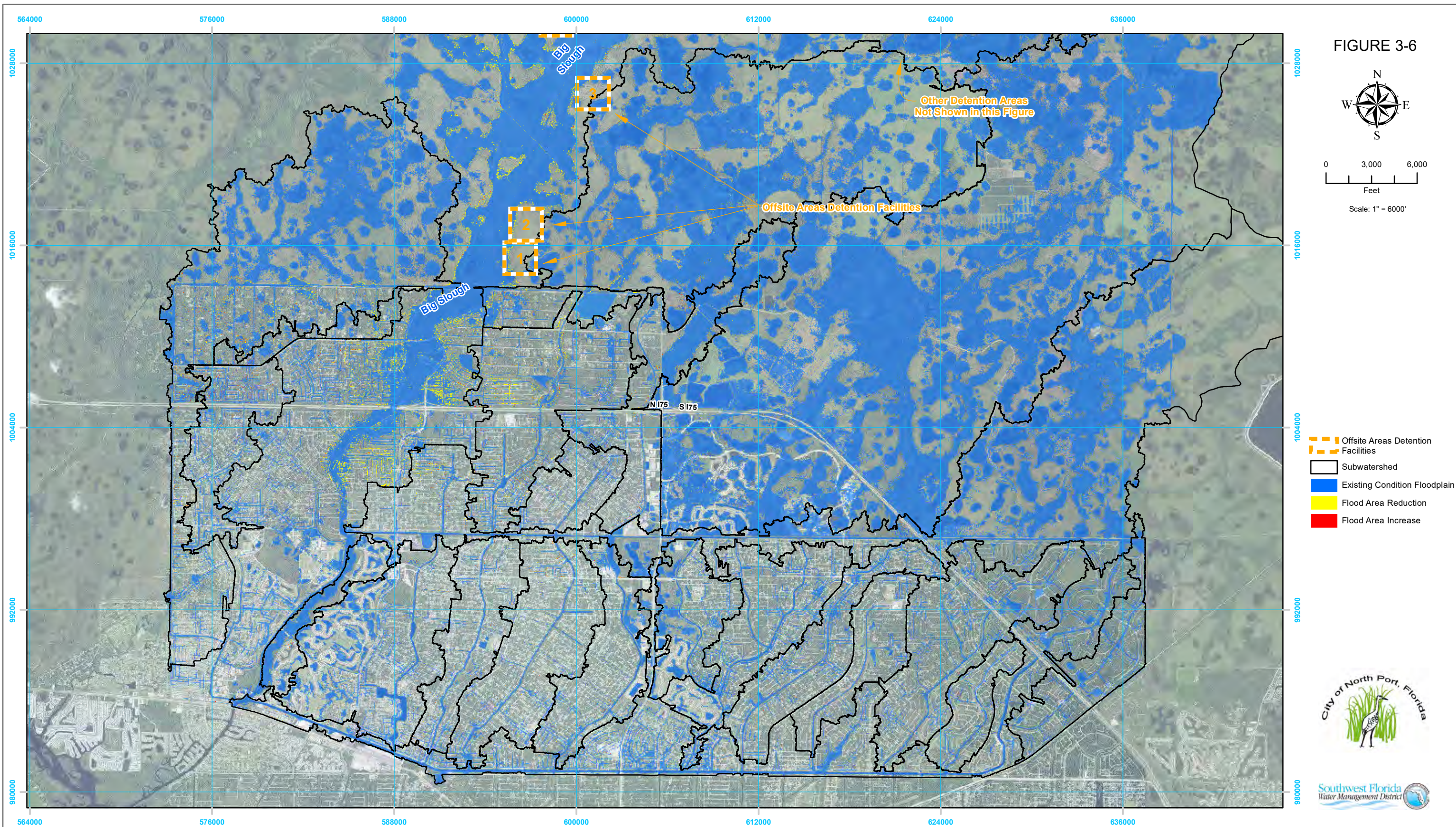
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NORTH PORT / BIG SLOUGH WMP

BMP ALTERNATIVE 5 - 1 DAY 100 YEAR EVALUATION

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NORTH PORT / BIG SLOUGH WMP

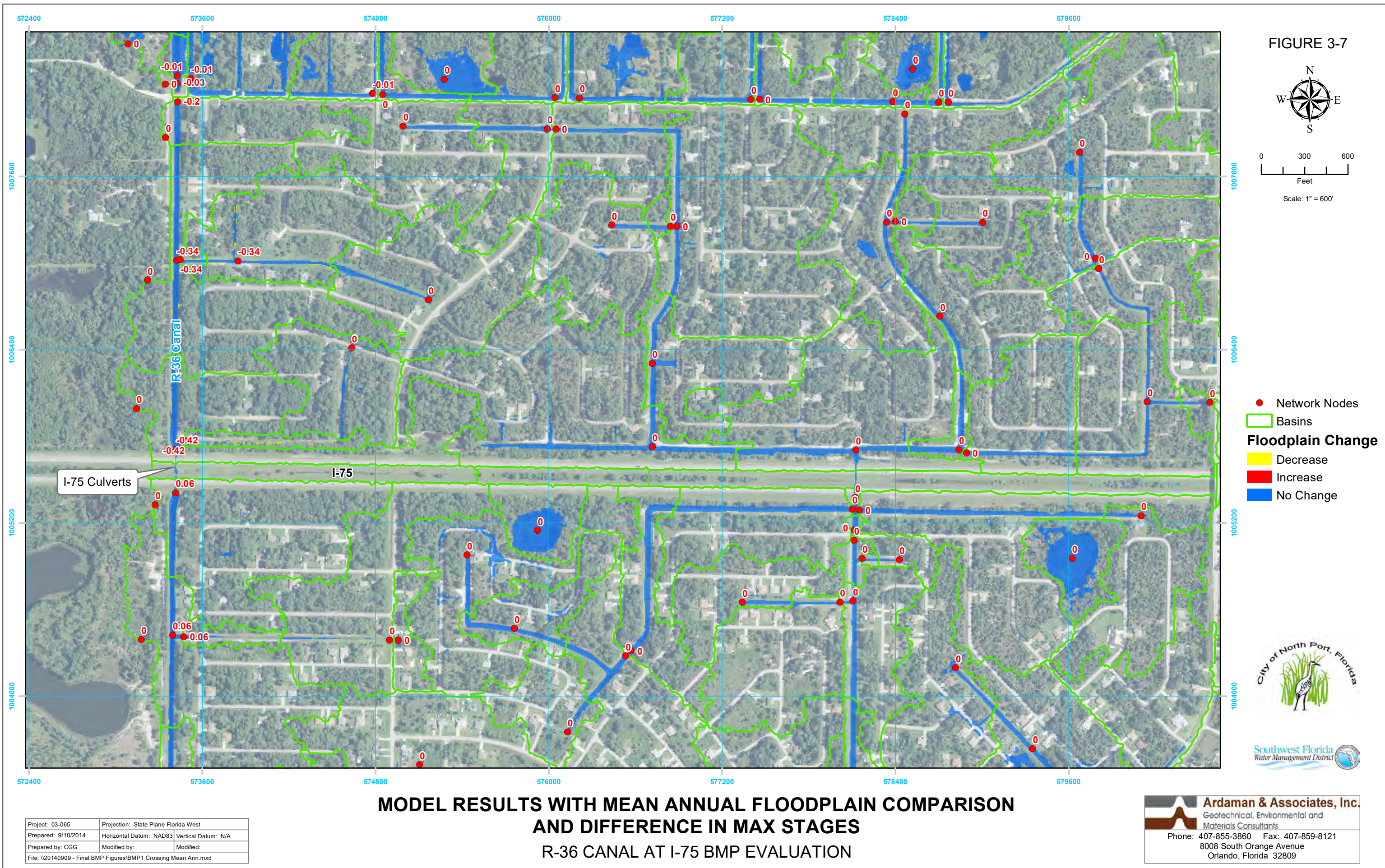
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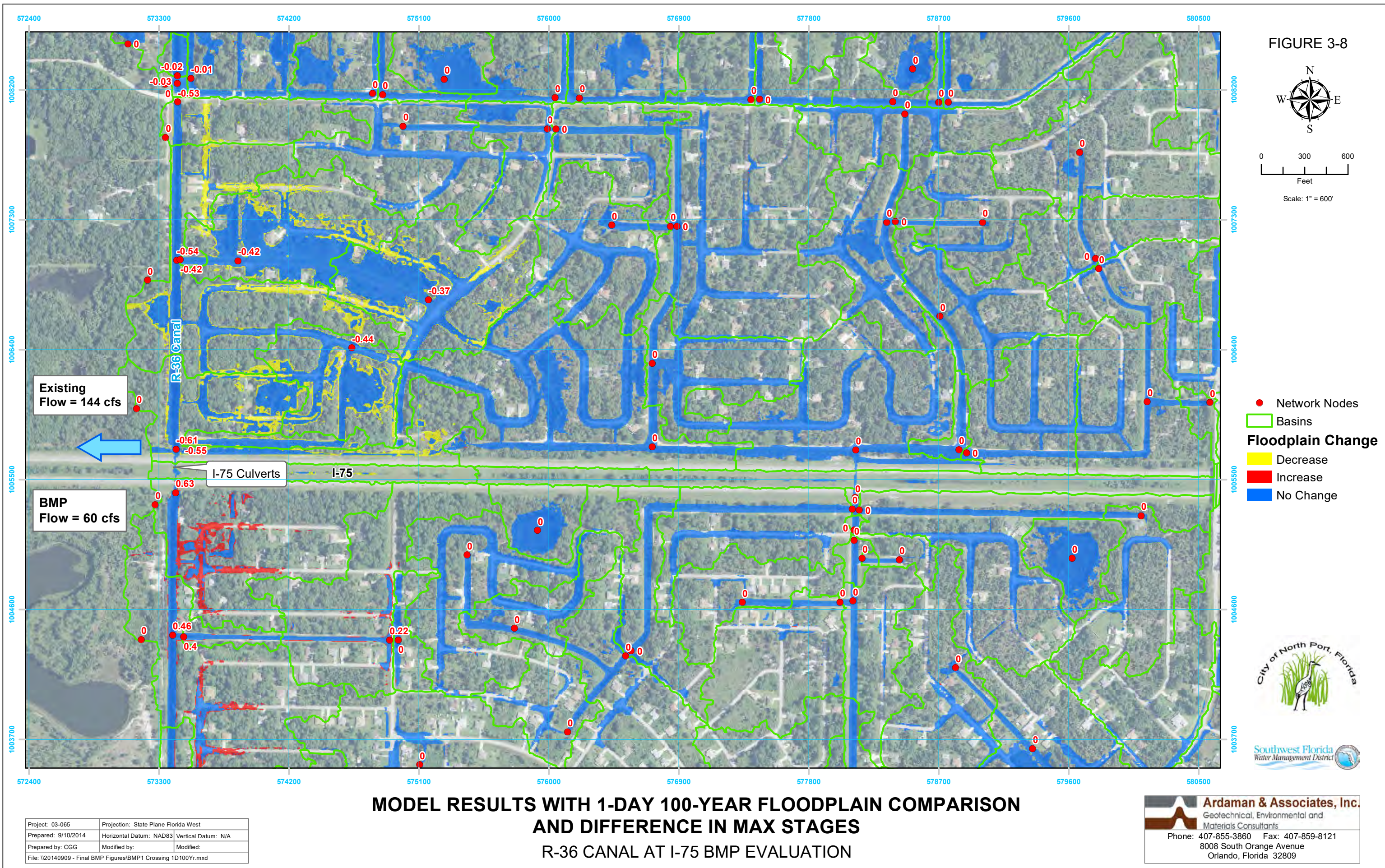
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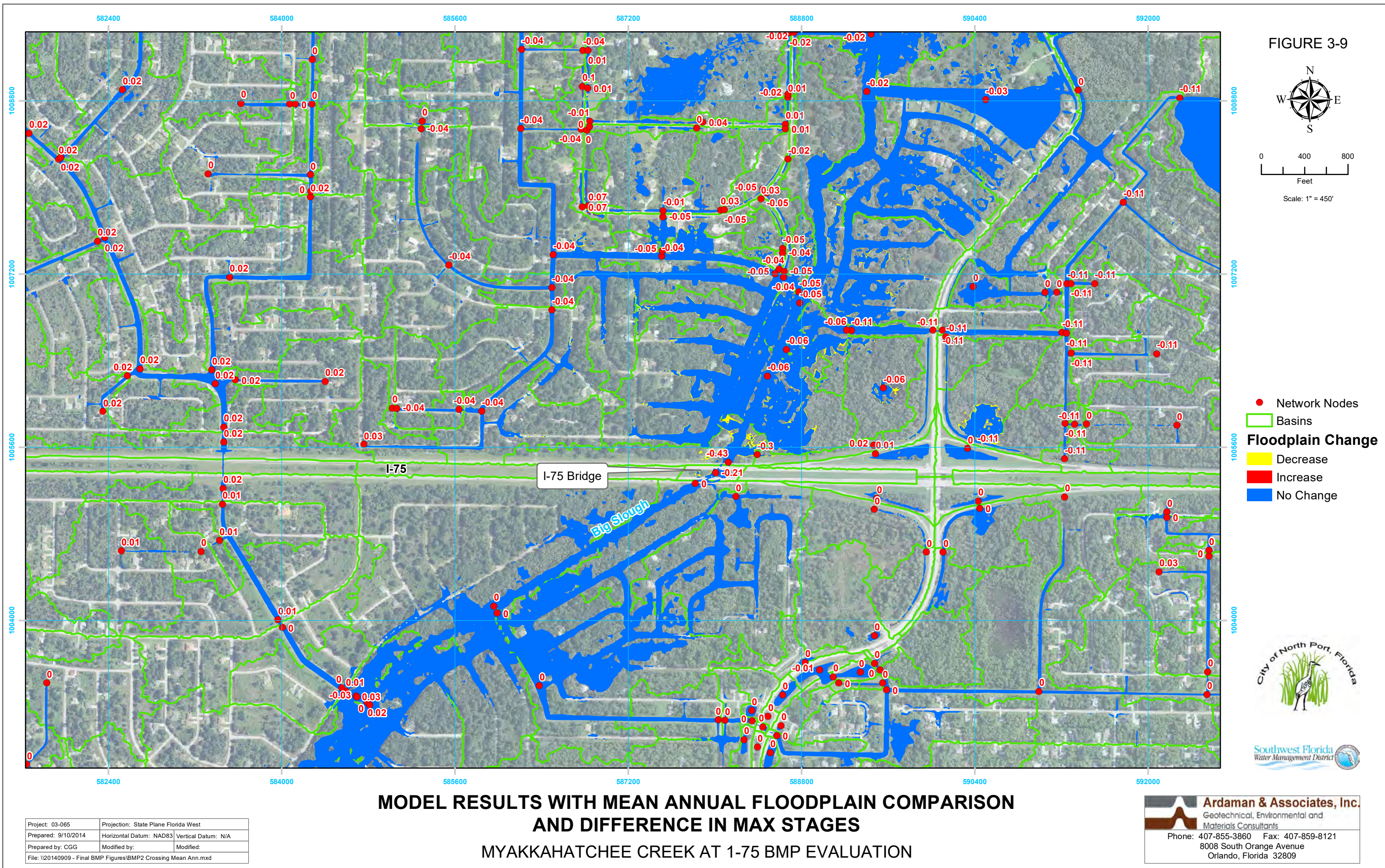
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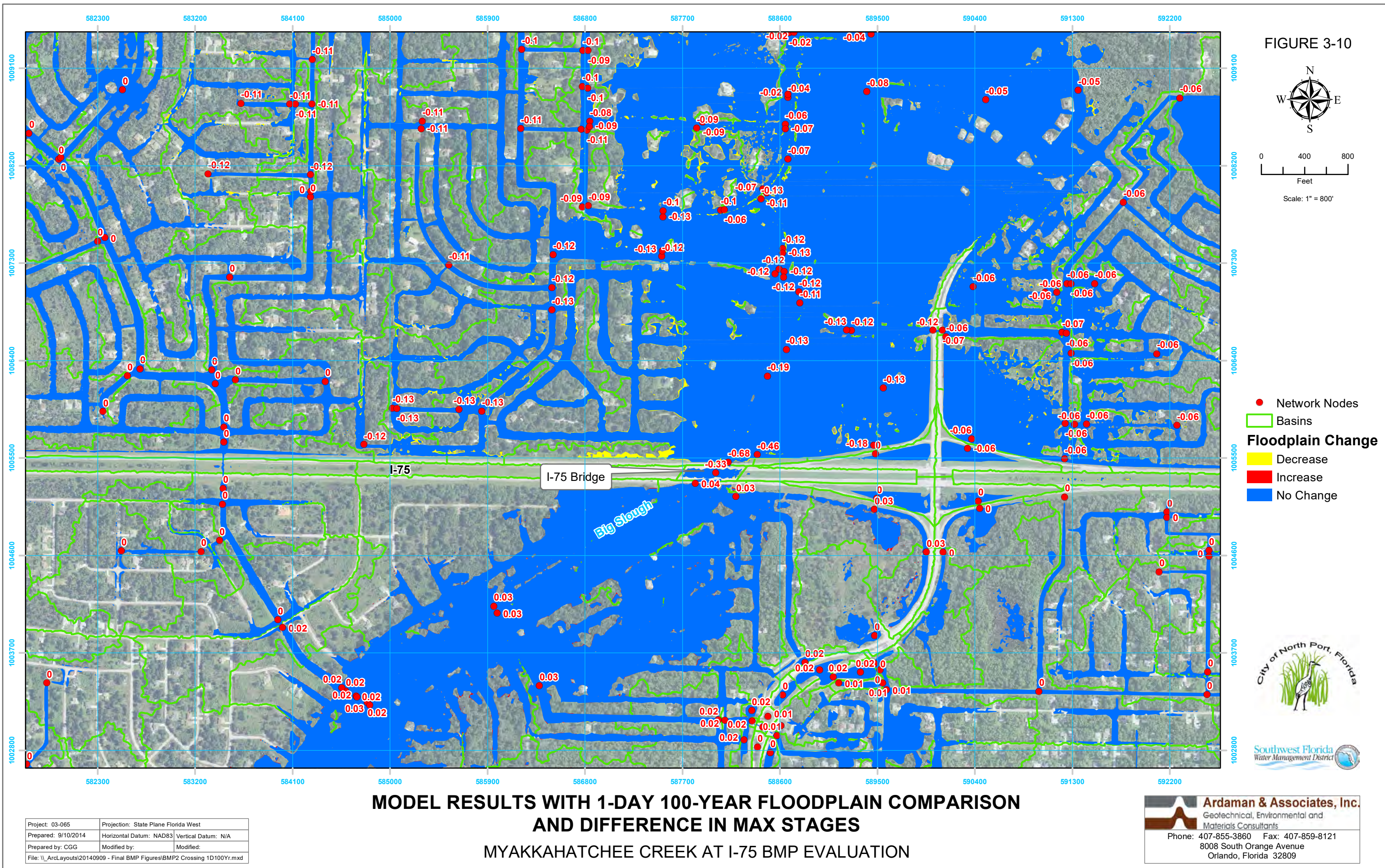
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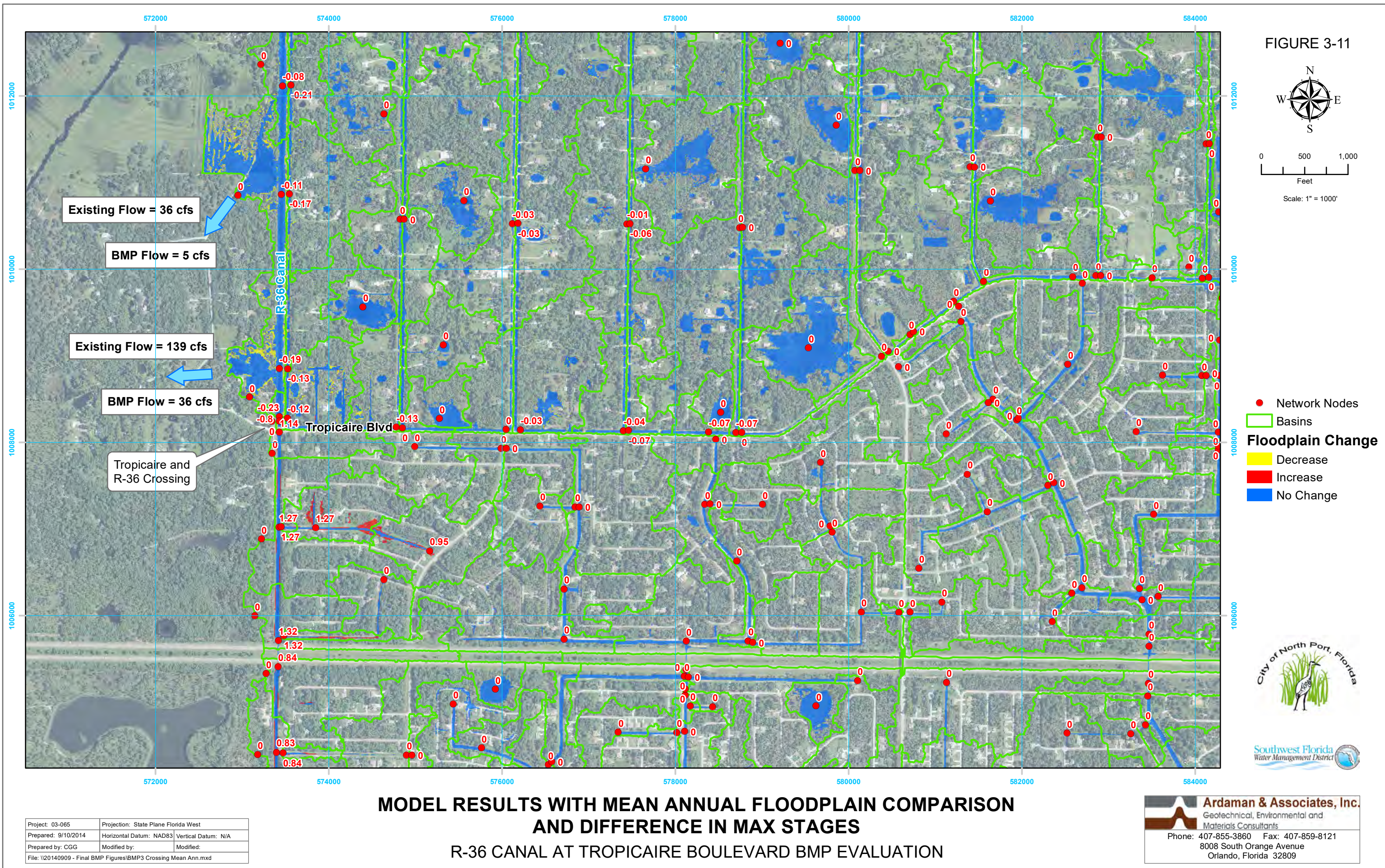
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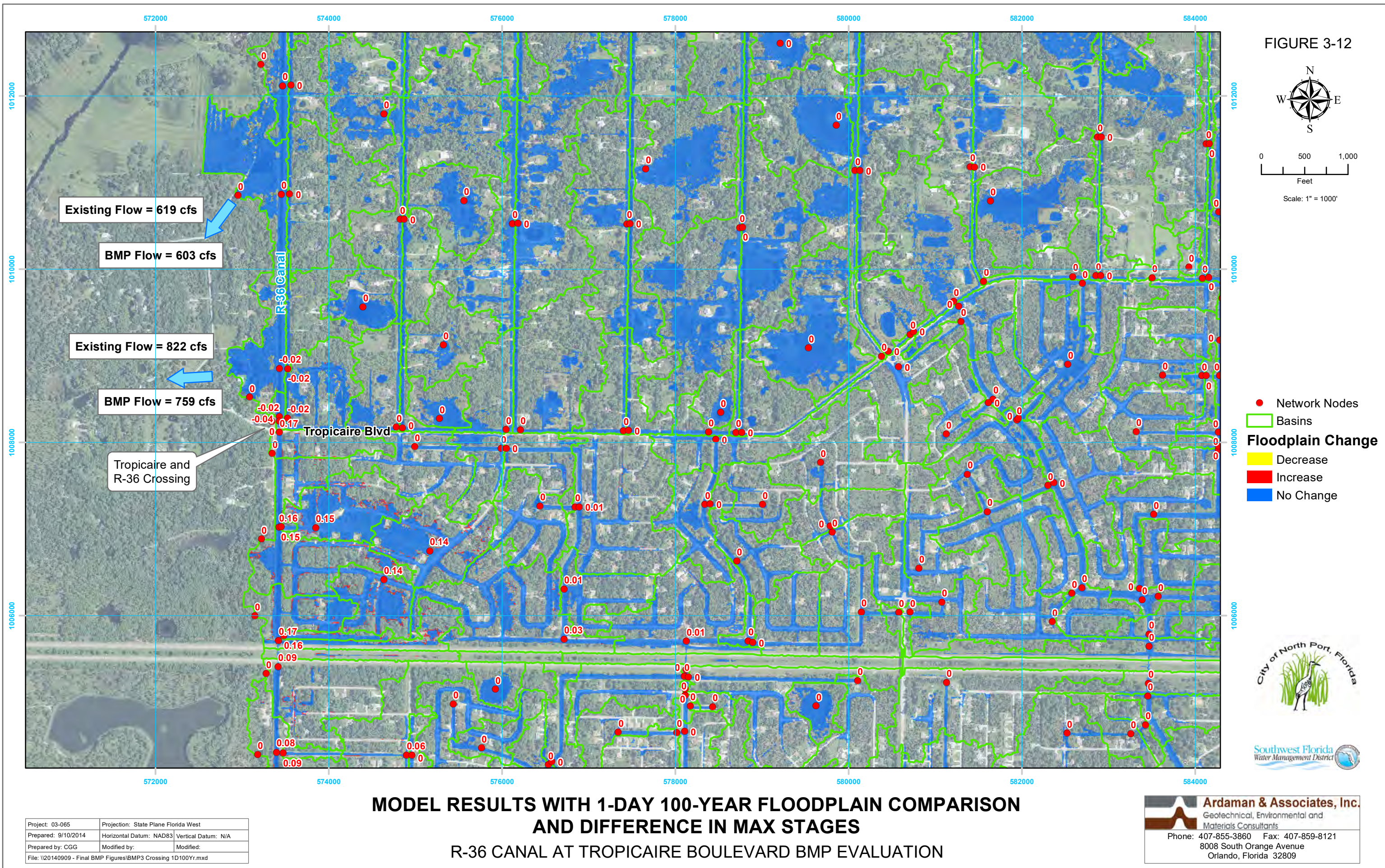


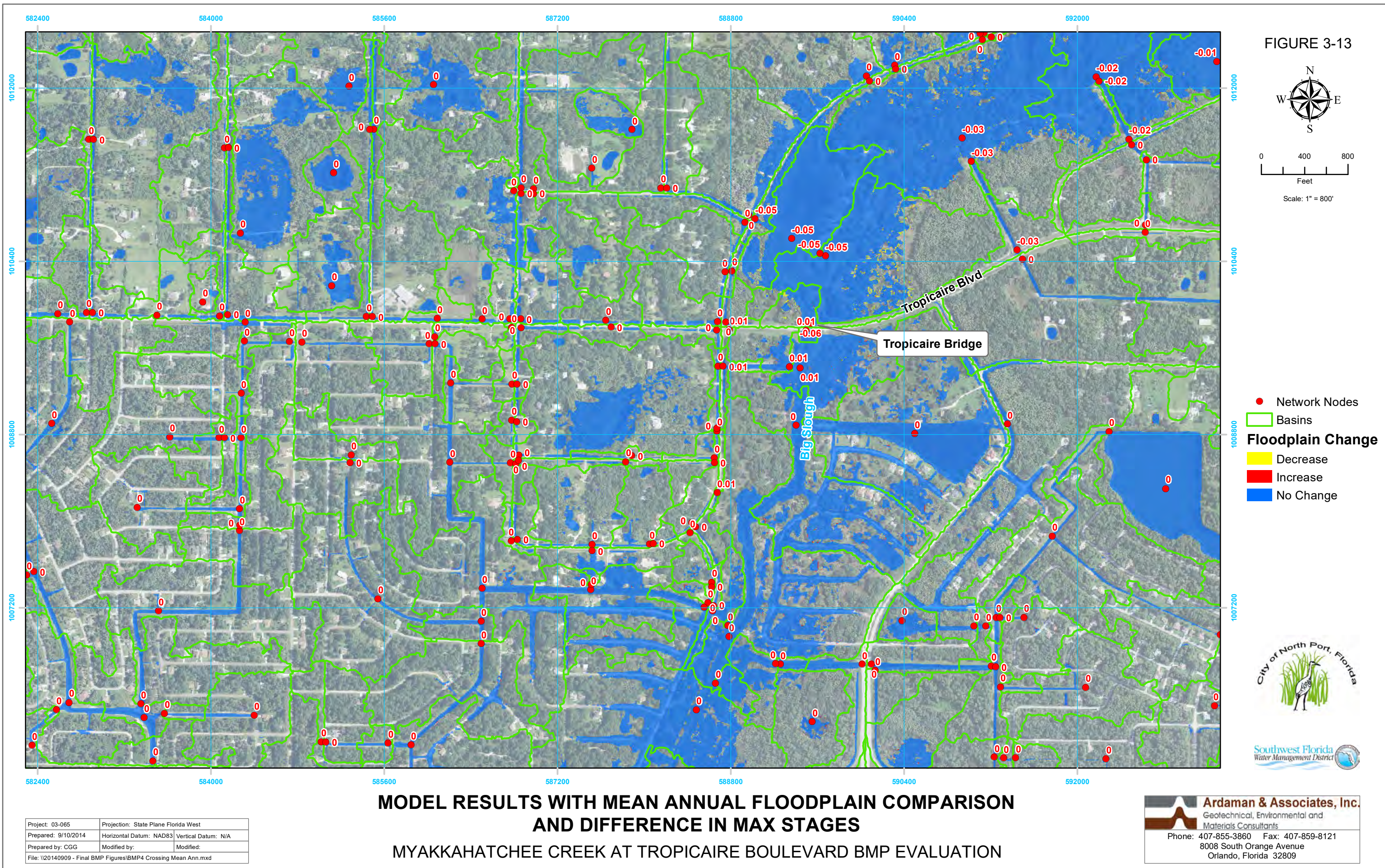


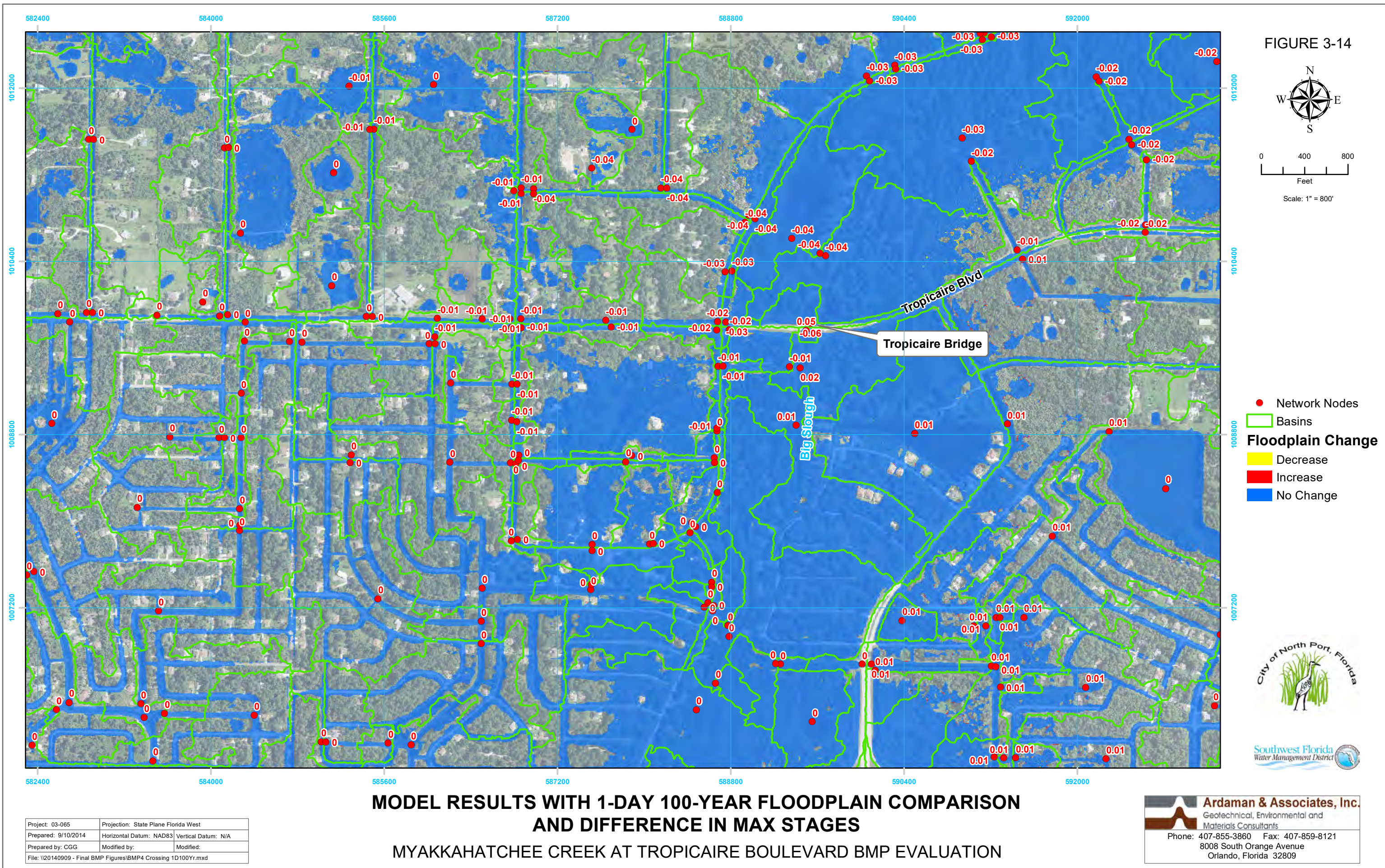












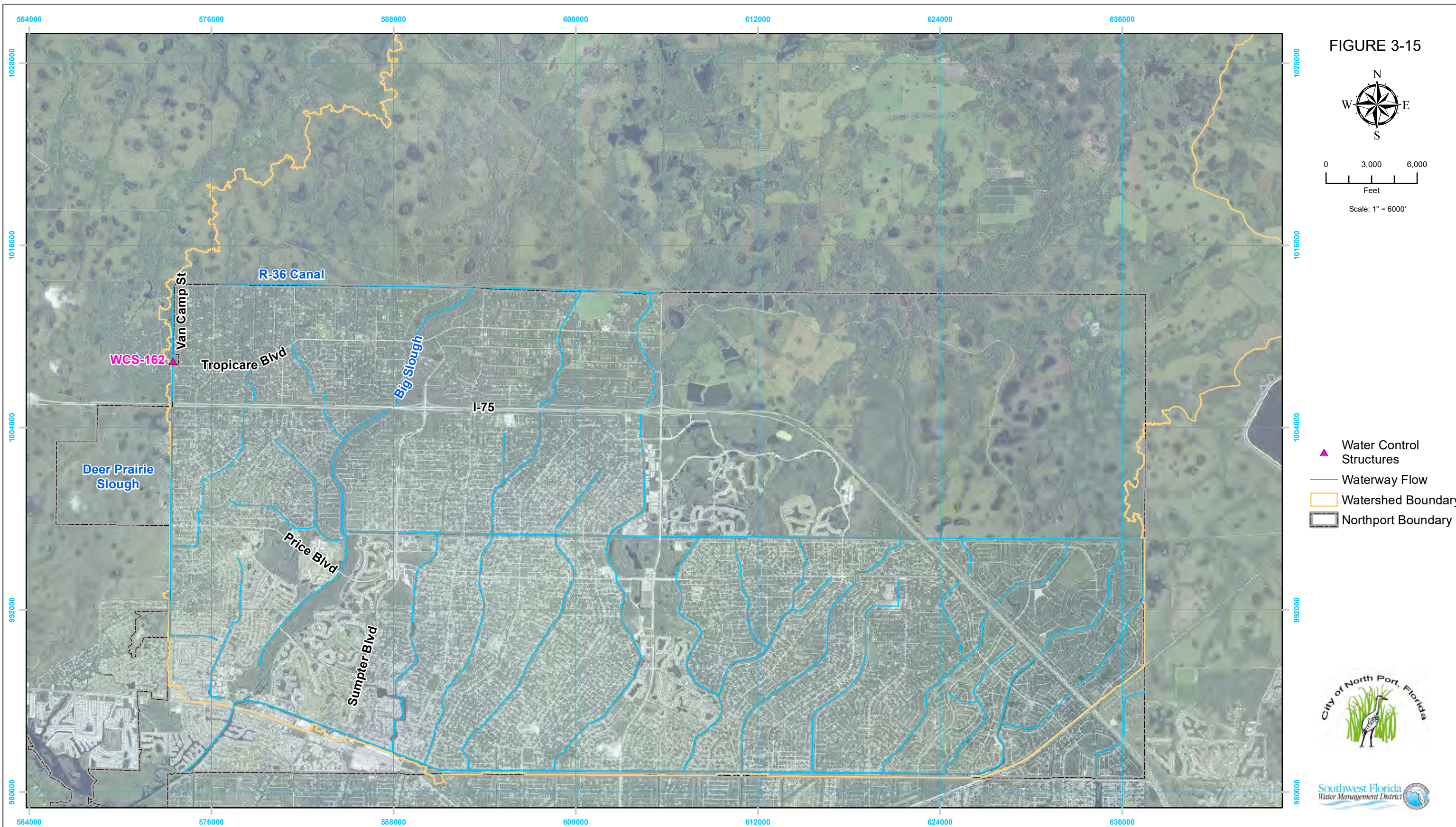
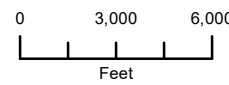
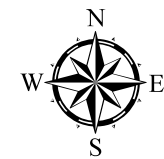






FIGURE 3-15



Scale: 1" = 6000'

-  Water Control Structures
-  Waterway Flow
-  Watershed Boundary
-  Northport Boundary



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LOCATION OF WCS-162

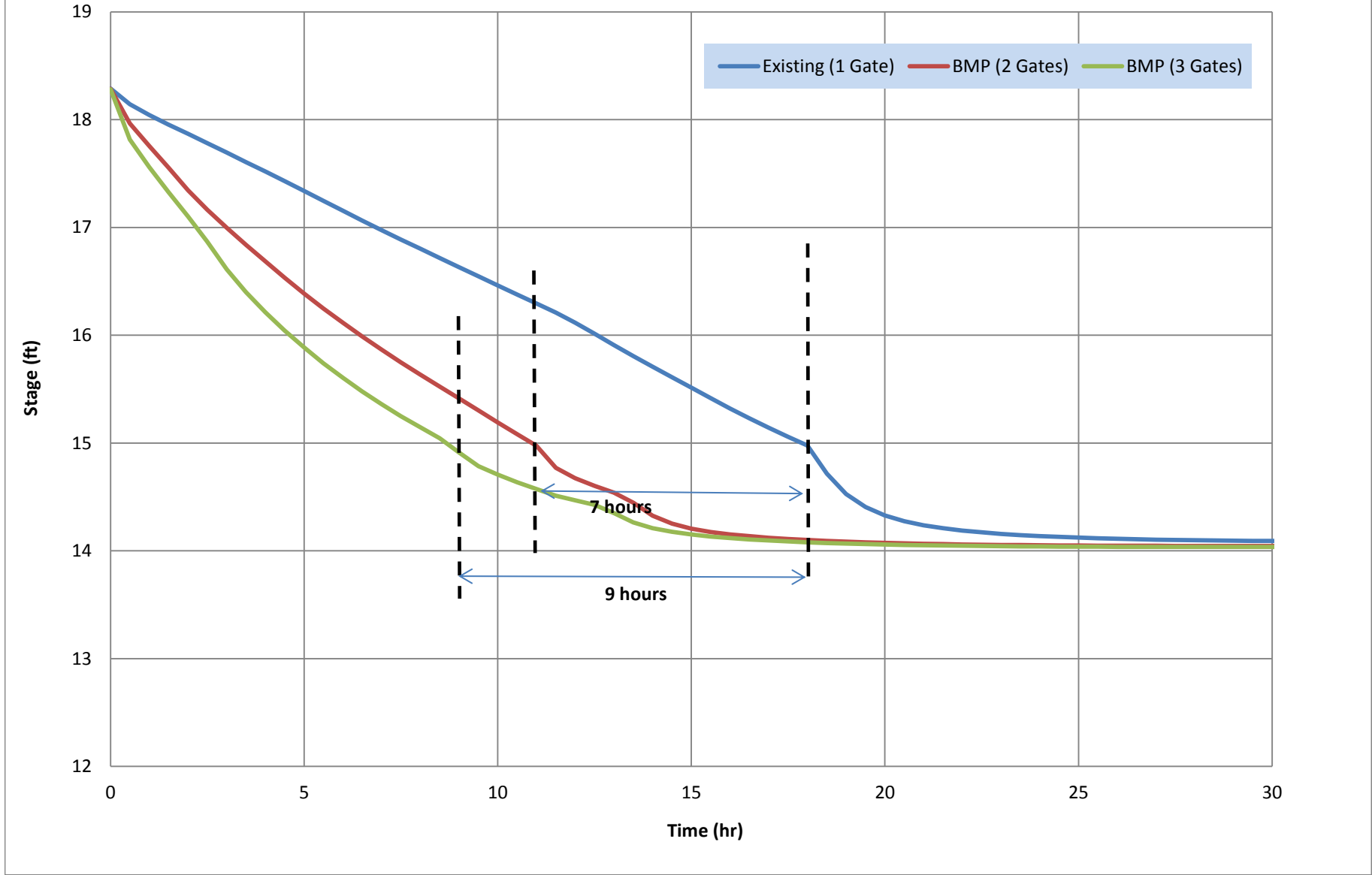
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Figure 3-16. Stage at R-36 Canal Upstream of WCS-162



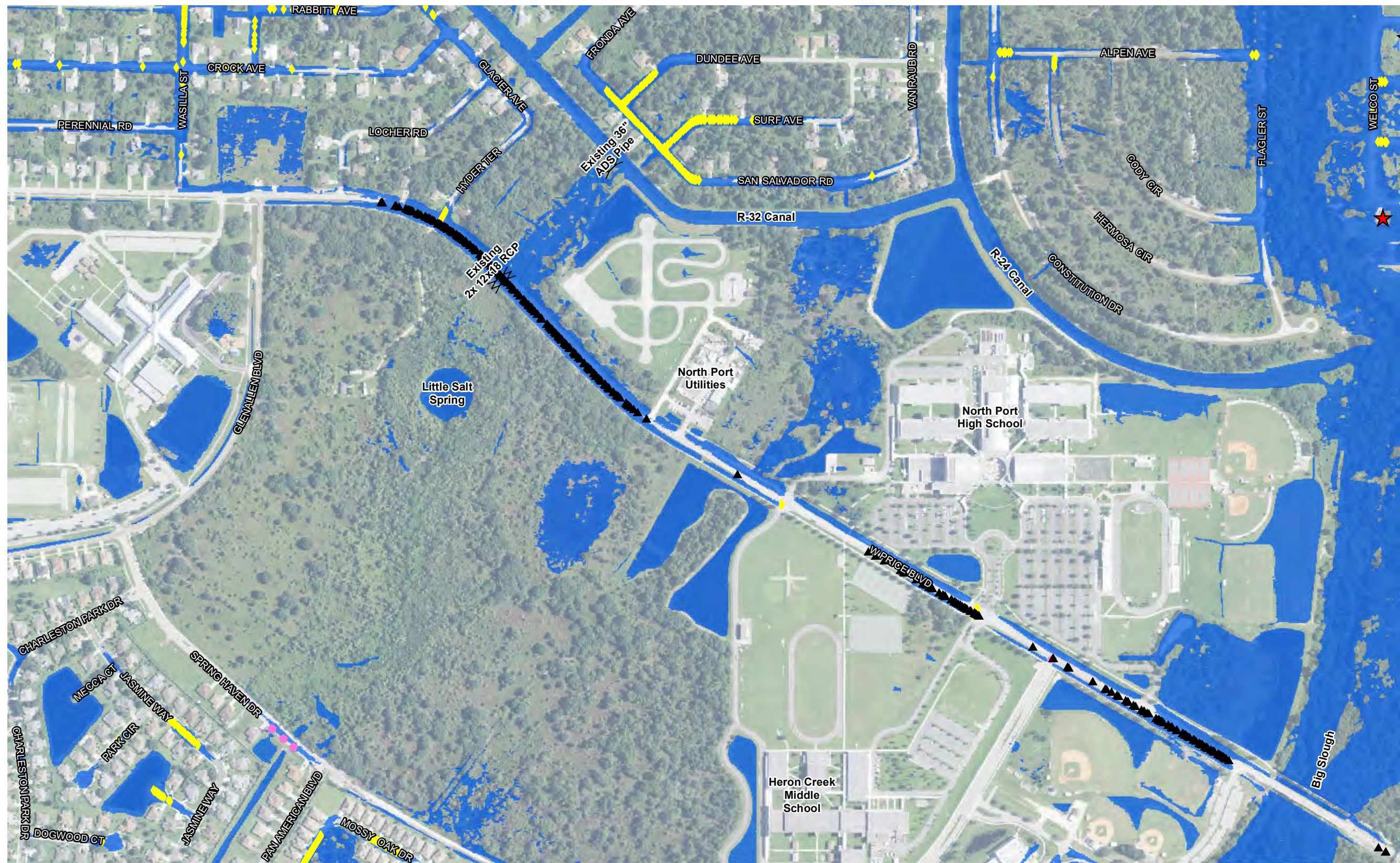
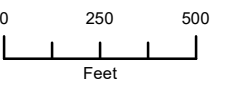
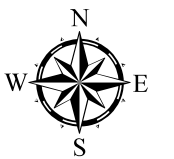


FIGURE 3-17



Scale: 1" = 500'

- Habitable Structure Floods in 100 Year Event
- Arterial Street Floods in 100 Year Event
- Evacuation Route Floods in 100 Year Event
- Collector Street Floods in 25 Year Event
- Local Street Floods in 25 Year Event



EXISTING CONDITION LOS AND 100-YEAR FLOODPLAIN NORTH PORT/BIG SLOUGH WMP

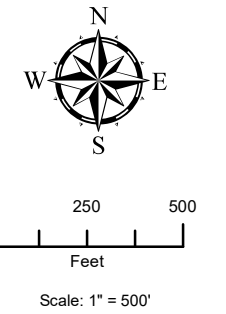
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Prepared: 08-05-14	Horizontal Datum: HARN Vertical Datum: N/A
Prepared by: TJC	Modified by:
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FIGURE 3-18



- Habitable Structure Floods in 100 Year Event
- Arterial Street Floods in 100 Year Event
- Evacuation Route Floods in 100 Year Event
- Collector Street Floods in 25 Year Event
- Local Street Floods in 25 Year Event



UPDATED EXISTING CONDITION 100-YEAR FLOODPLAIN NORTH PORT/BIG SLOUGH WMP

Project: 03-065	Projection: State Plane Florida West
Prepared: 08-05-14	Horizontal Datum: HARN Vertical Datum: N/A
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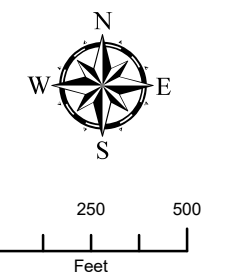


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FIGURE 3-19



- Node
(Maxstage Change)
- BMP_1
- Decrease
- Increase
- No Change



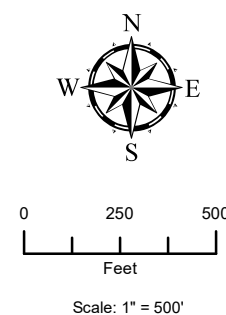
BMP_1 25-YEAR FLOODPLAIN COMPARISON NORTH PORT/BIG SLOUGH WMP

Project: 03-065	Projection: State Plane Florida West
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Prepared by: TJC	Modified by:
File: _ArcLayouts\20140909 - Final BMP Figures\Price Blvd BMP_1_1D25Y.mxd	

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FIGURE 3-20



- Node (Maxstage Change)
- - - BMP_1
- Decrease
- Increase
- No Change



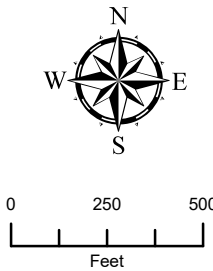
BMP_1 100-YEAR FLOODPLAIN COMPARISON NORTH PORT/BIG SLOUGH WMP

Project: 03-065	Projection: State Plane Florida West
Prepared: 08-05-14	Horizontal Datum: HARN Vertical Datum: N/A
Prepared by: TJC	Modified by:
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FIGURE 3-21



- Node (Maxstage Change)
- BMP_2
- Decrease
- Increase
- No Change



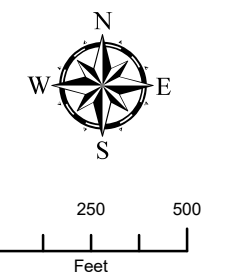
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Prepared: 08-05-14	Horizontal Datum: HARN Vertical Datum: N/A
Prepared by: TJC	Modified by:
File: \\ArcGIS_ArcLayouts\\20140909 - Final BMP Figures\\Price Blvd BMP 2.mxd	

BMP_2 100-YEAR FLOODPLAIN COMPARISON
NORTH PORT/BIG SLOUGH WMP

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FIGURE 3-22



- Node (Maxstage Change)
- BMP_3
- Decrease
- Increase
- No Change



Project: 03-065	Projection: State Plane Florida West
Prepared: 08-05-14	Horizontal Datum: HARN Vertical Datum: N/A
Prepared by: TJC	Modified by:
File: \\ArcGIS_ArcLayouts\20140909 - Final BMP Figures\Price Blvd BMP 3.mxd	

BMP_3 100-YEAR FLOODPLAIN COMPARISON **NORTH PORT/BIG SLOUGH WMP**



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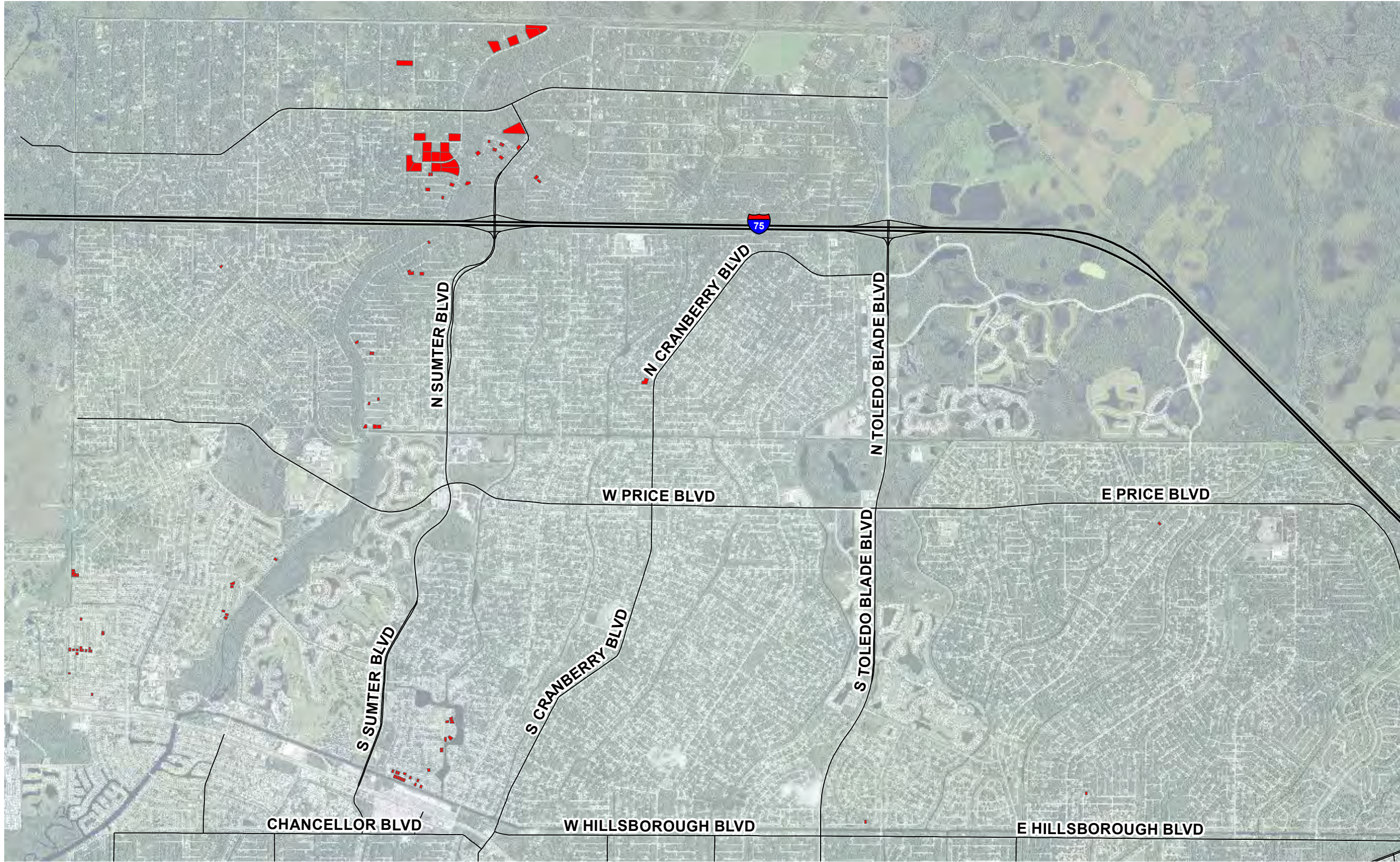
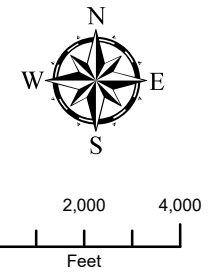


FIGURE 5-1



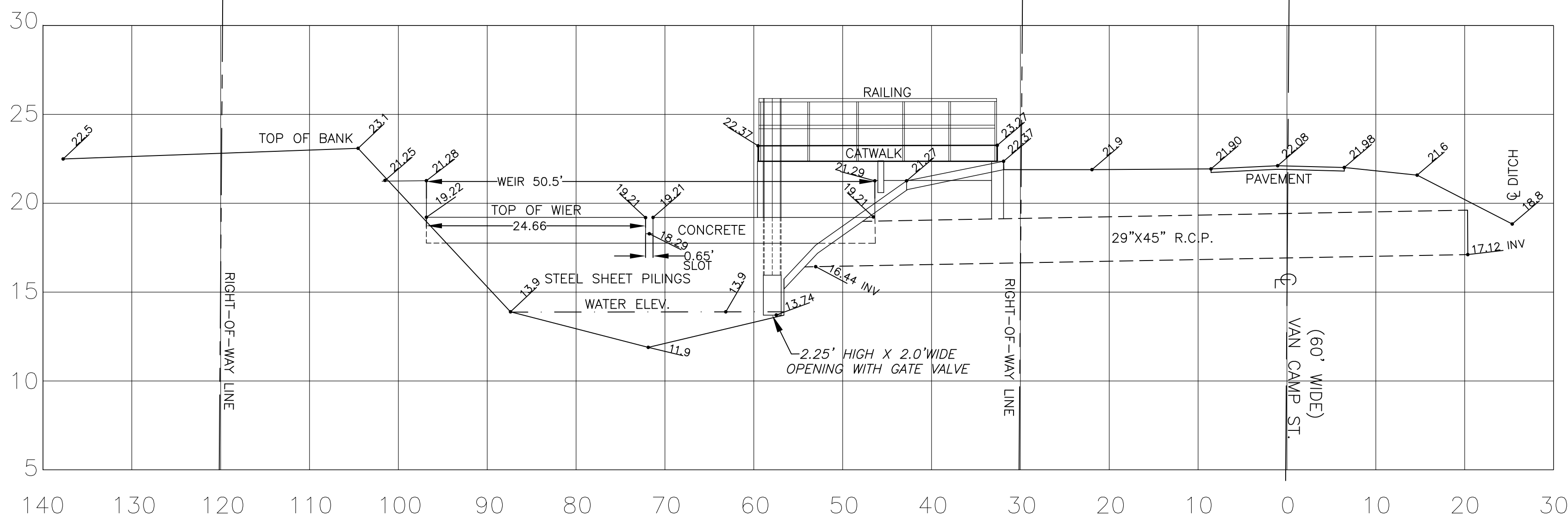
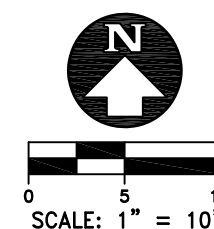
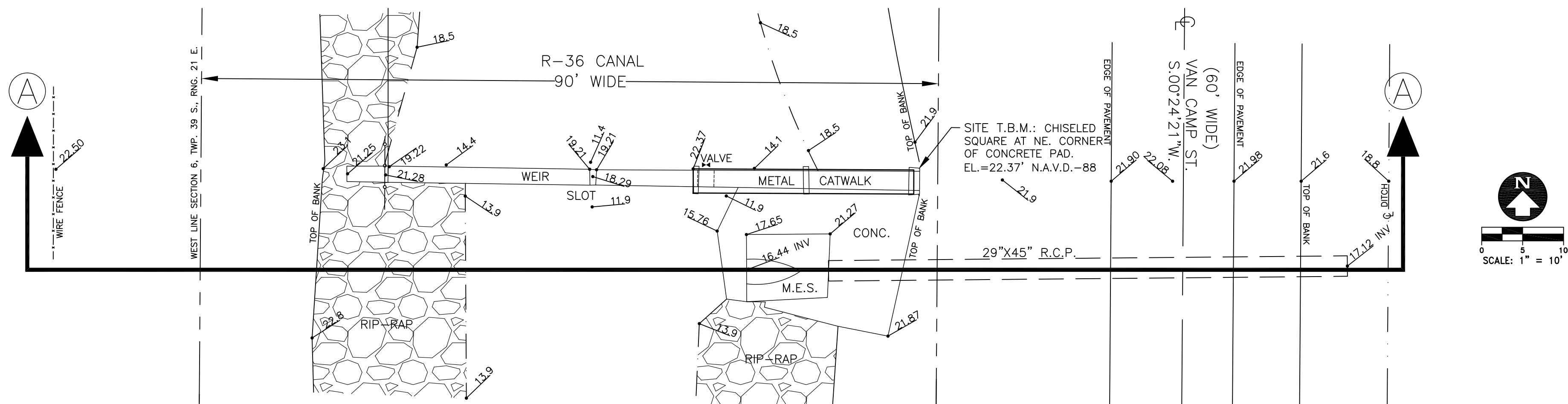
FLOODED PARCELS TO SURVEY NORTH PORT/BIG SLOUGH WMP

Project: 03-065	Projection: State Plane Florida West
Prepared: 09-30-14	Horizontal Datum: HARN Vertical Datum: N/A
Prepared by: TJC	Modified by:
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APPENDIX A

2014 Survey Data of WCS-162



SCALE:
1" = 10' HORIZ.
1" = 5' VERT.

SECTION "A" - "A" WATER CONTROL STRUCTURE #162

LEGEND

T.B.M. TEMPORARY BENCH MARK
E.O.P. EDGE OF PAVEMENT
C CENTERLINE
7.7 TYPICAL SPOT ELEVATION
R.C.P. REINFORCED CONCRETE PIPE
M.E.S. MITERED END SECTION

SURVEYOR'S NOTES/REPORT:

- BEARINGS ARE BASED ON AN ASSUMED MERIDIAN. A BEARING OF S.00°24'21"W. WAS ASSIGNED TO THE CENTERLINE OF VAN CAMP STREET PER RECORD PLAT OF NORTH PORT CHARLOTTE ESTATES.
- ELEVATIONS SHOWN ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988. F.D.E.P. BENCH MARK N-698-2007.
- THE ACCURACY OF THIS MAP OF SURVEY IS BASED ON CONTROL MEASUREMENTS THAT MEET OR EXCEED THE MINIMUM ACCURACY REQUIREMENTS FOR THIS TYPE OF SURVEY AS SPECIFIED IN CHAPTER 5J-17, FAC. THIS MAP'S DIGITAL DATA IS INTENDED TO BE DISPLAYED AT A SCALE OF 1"=20' OR SMALLER.
- SURVEY PERFORMED FOR THE "SPECIFIC PURPOSE" OF PROVIDING ELEVATION AND DIMENSION DETAILS OF THE WATER CONTROL STRUCTURE FOR USE BY THE CITY OF NORTH PORT DEPARTMENT OF ENGINEERING.

FOR: CITY OF NORTH PORT
DEPARTMENT OF ENGINEERING

CERTIFICATE

I, hereby certify that this Map/Report of Survey as shown and/or described herein represents the results of Field Surveys performed under my supervision, that it is true and correct to the best of my knowledge, information and belief and meets the requirements of Chapter 5J-17, F.A.C. pursuant to Section 472.027, F.S. Subject to all notations as shown herein.

Van Buskirk / Fish & Associates, Inc., LB#3739

By: *Alan K. Fish*
Alan K. Fish, P.S.M.
Registered Professional Surveyor & Mapper
Florida Certificate No. 3941

Date of Survey: JUNE 19TH, 2014

"Not valid without the signature and the original raised seal of a Florida licensed surveyor and mapper."

REVISIONS:	BY:

MAP OF "SPECIFIC PURPOSE SURVEY,
OF WATER CONTROL STRUCTURE # 162
IN NORTH PORT CHARLOTTE ESTATES
CITY OF NORTH PORT, SARASOTA COUNTY, FLORIDA

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SURVEYORS - MAPPERS -
DEVELOPMENT CONSULTANTS
VBF
12450 Unit C Tamiami Trail - North Port, FL 34287 - (941) 426-0681

DATE:	6-19-2014
SCALE:	AS NOTED
DRAWN:	GC
PROJECT NO.	14-1087
SHEET	1

APPENDIX B

WCS-162 Pictures



Looking North-West from the downstream of WCS-162



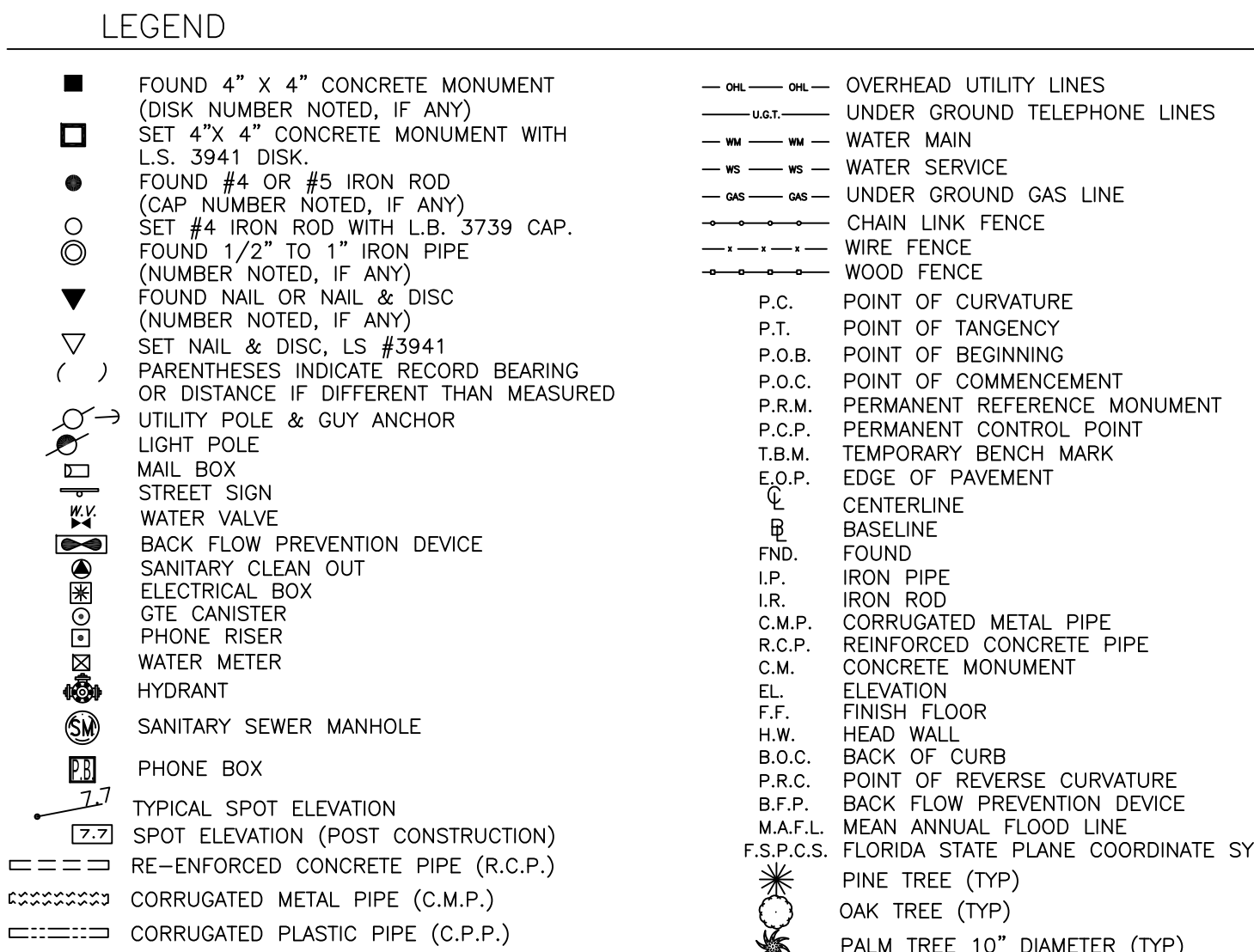
Looking South-West from the upstream of WCS-162



Looking South-West from the upstream of WCS-162

APPENDIX C

2014 Survey Data of West Price Boulevard



- 1) BEARINGS ARE BASED ON "GRID NORTH" FLORIDA STATE PLANE COORDINATE SYSTEM, "WEST ZONE". COORDINATES ARE NAD 1983/2007.
- 2) ELEVATIONS SHOWN ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM.
- 3) THIS SURVEY WAS PERFORMED FOR THE "SPECIFIC PURPOSE" OF PROVIDING TOPOGRAPHIC SPOT ELEVATIONS, CULVERT AND STORM DRAIN PIPE SIZES AND ELEVATIONS, OR ELEVATIONS OF OTHER SELECTED ELEVATION DATA FOR USE IN A DRAINAGE STUDY OF THE PORTIONS OF PRICE BLVD. SHOWN IN THIS MAP. THIS SURVEY WAS NOT FOR:
- 4) EASEMENTS SHOWN IF AND ARE INTERPRETED FROM RECORD PLAT DEDICATIONS OR TITLE INFORMATION SUPPLIED TO OR ACQUIRED BY THE SURVEYOR AT THE TIME OF THE SURVEY. THIS SURVEY MAY BE SUBJECT TO OTHER RESERVATIONS, RESTRICTIONS, COVENANTS, EASEMENTS OR AGREEMENTS AFFECTING THE INTERESTS AND RIGHTS OF THE SURVEYED UNDERGROUND UTILITIES HAVE NOT BEEN LOCATED. IF UTILITY LINES ARE SHOWN, THEY WERE LOCATED AND IDENTIFIED BY OTHER MEANS. THE SURVEYOR ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OR THE COMPLETENESS OF SAID UTILITY LOCATIONS.
- 5) THE ACCURACY OF THIS MAP OF SURVEY IS BASED ON THE CONTROL MEASUREMENTS AND THE PRECEDED MINIMUM ACCURACY REQUIREMENTS FOR THIS TYPE OF SURVEY AS SPECIFIED IN CHAPTER 55-17, F.A.C. THIS MAP'S DATA ACCURACY IS INTENDED TO BE DISPLAYED AT A SCALE OF 1"=20' OR SMALLER.

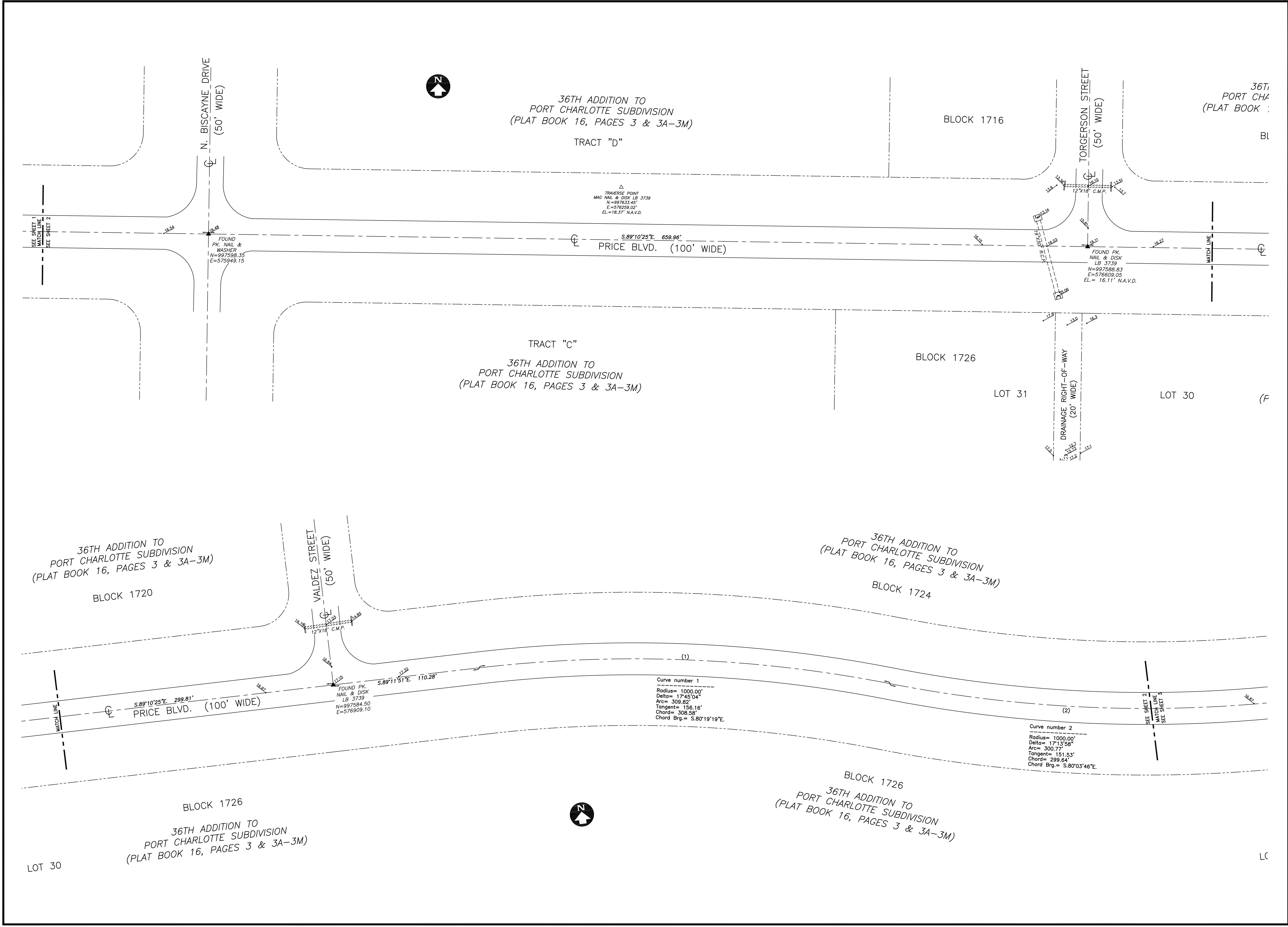
Date of Survey: JUNE 17, 2014

"Not valid without the signature and the original raised seal of a Florida licensed surveyor and mapper."

MAP OF "SPECIFIC PURPOSE SURVEY" SHOWING FIELD SURVEY DATA COLLECTED FOR A DRAINAGE STUDY ALONG A PORTION OF PRICE BLVD. IN THE CITY OF NORTH PORT, FLORIDA

Van Buskirk / Fish & Associates, Inc.
SURVEYORS - MAPPERS -
DEVELOPMENT CONSULTANTS
 12450 Unit C Tamiami Trail - North Port, FL 34287 - (941) 426-0681

DATE: 6-17-2014
SCALE: 1" = 30'
DRAWN: GC
PROJECT NO. 14-1088
SHEET 1
OF 7 SHEETS

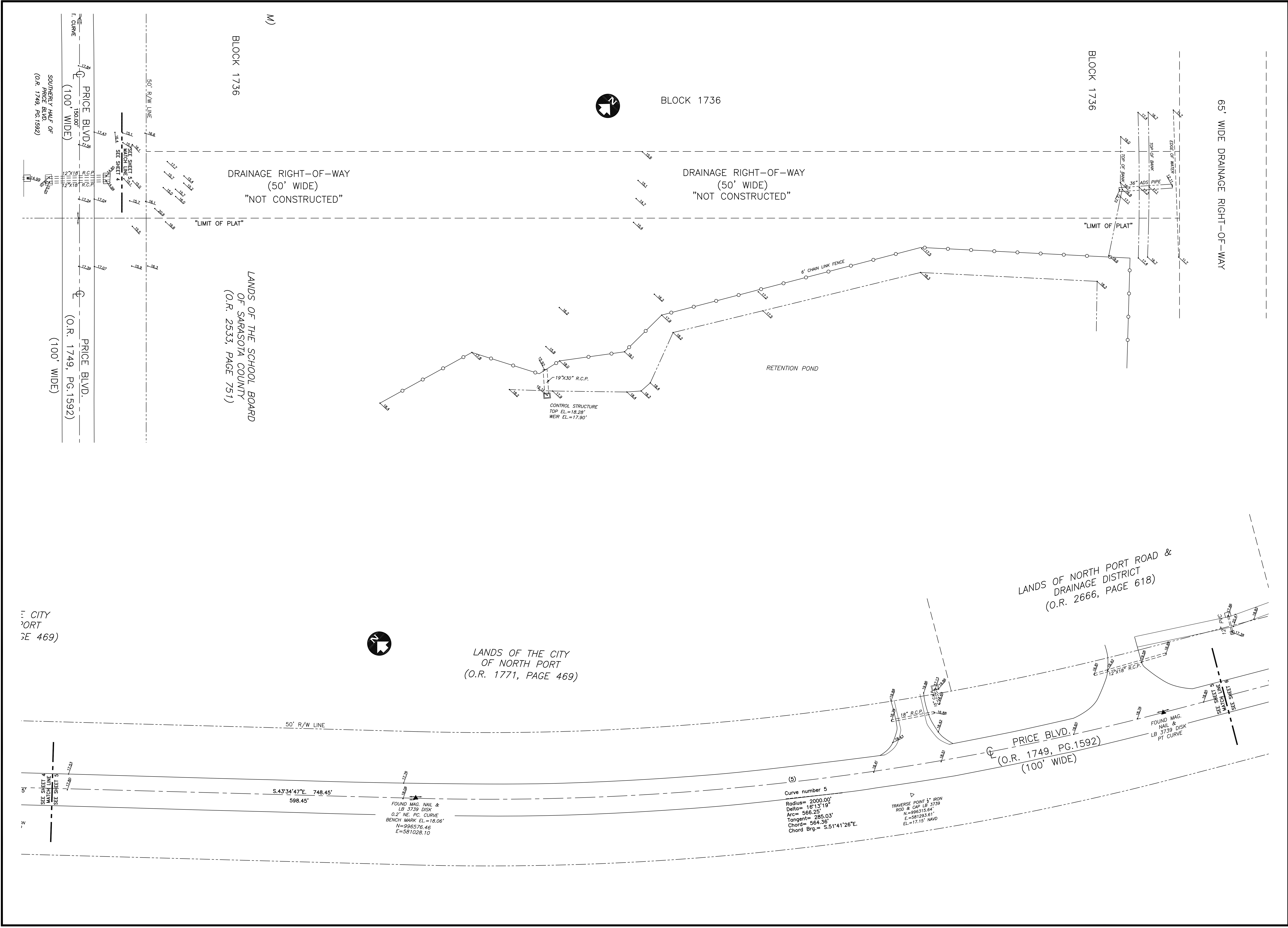


REVISIONS:	BY:

MAP OF "SPECIFIC PURPOSE SURVEY" SHOWING FIELD SURVEY DATA COLLECTED FOR A DRAINAGE STUDY ALONG A PORTION OF PRICE BLVD. IN THE CITY OF NORTH PORT, FLORIDA

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DATE: 6-17-2014
SCALE: 1" = 30'
DRAWN: GC
PROJECT NO. 14-1088
SHEET 2 OF 7 SHEETS



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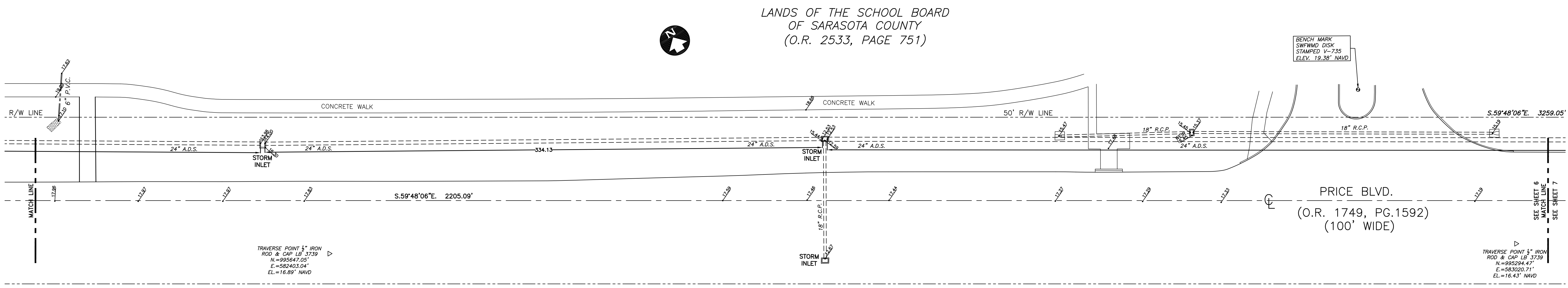
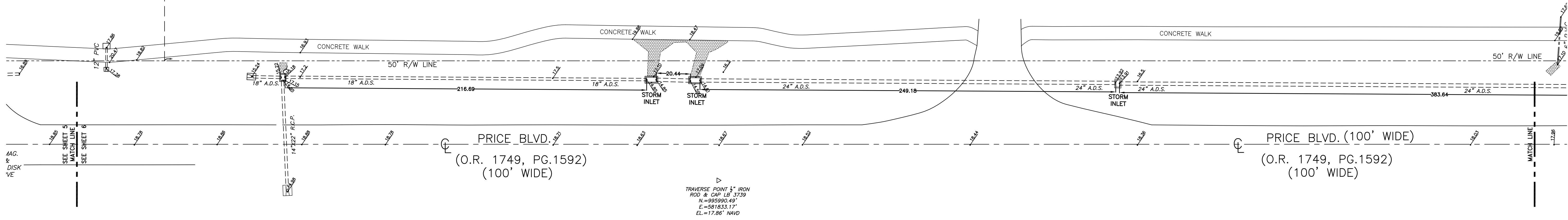
MAP OF "SPECIFIC PURPOSE SURVEY" SHOWING FIELD SURVEY DATA COLLECTED FOR A DRAINAGE STUDY ALONG A PORTION OF PRICE BLVD. IN THE CITY OF NORTH PORT, FLORIDA

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DATE: 6-17-2014
SCALE: 1" = 30'
DRAWN: AKF
PROJECT NO. 14-1088
SHEET 5 OF 7 SHEETS

ROAD &
:T
518)



REVISIONS:	BY:

MAP OF "SPECIFIC PURPOSE SURVEY" SHOWING FIELD SURVEY DATA COLLECTED FOR A DRAINAGE STUDY ALONG A PORTION OF PRICE BLVD. IN THE CITY OF NORTH PORT, FLORIDA

Van Buskirk / Fish & Associates, Inc.

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12450 Unit C Tamiami Trail - North Port, FL 34287 - (941) 426-0681

DATE: 6-17-2014

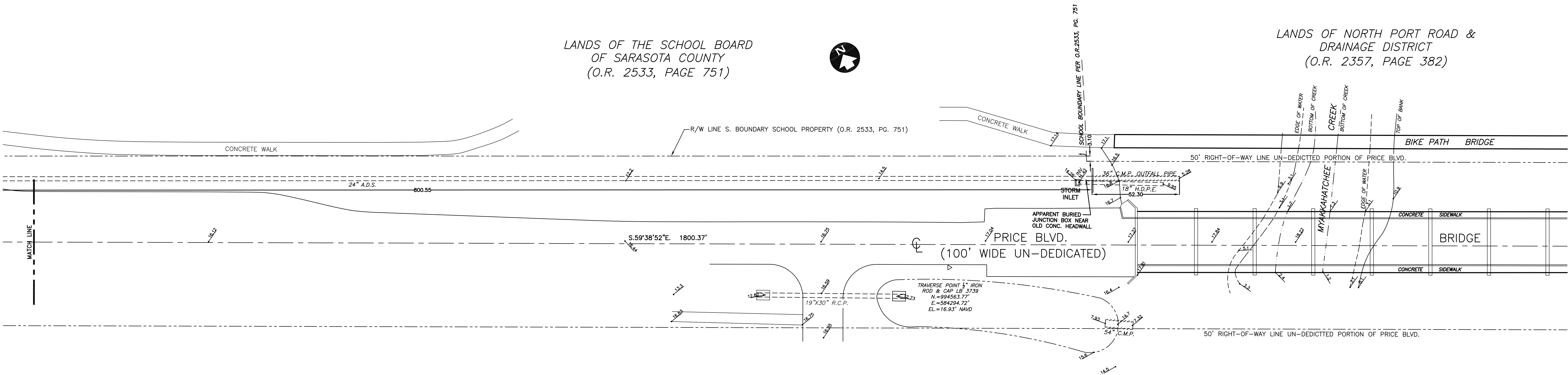
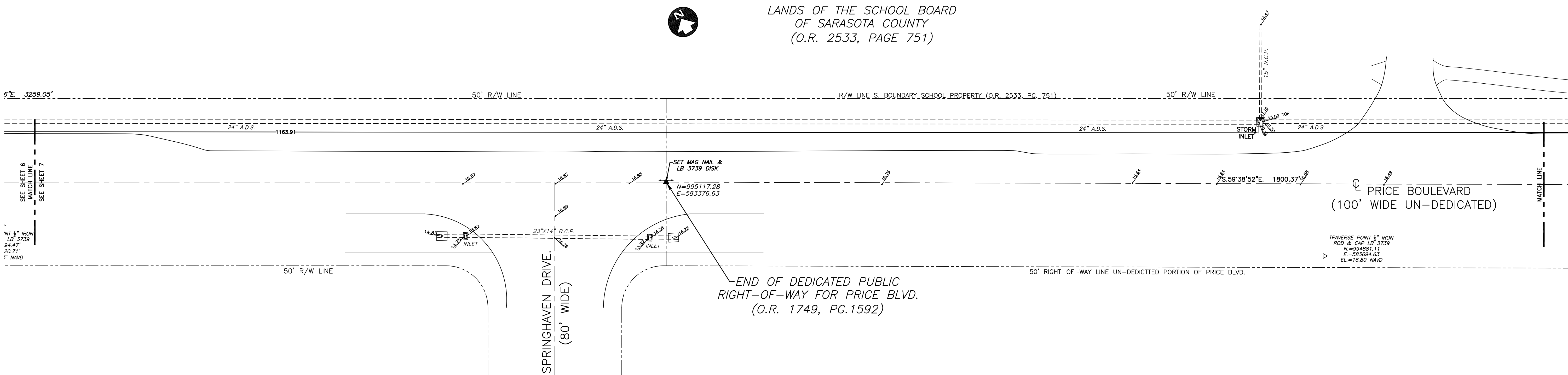
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DRAWN: AKF

PROJECT NO. 14-1088

SHEET 6

OF 7 SHEETS



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MAP OF "SPECIFIC PURPOSE SURVEY" SHOWING FIELD SURVEY DATA COLLECTED FOR A DRAINAGE STUDY ALONG A PORTION OF PRICE BLVD. IN THE CITY OF NORTH PORT, FLORIDA

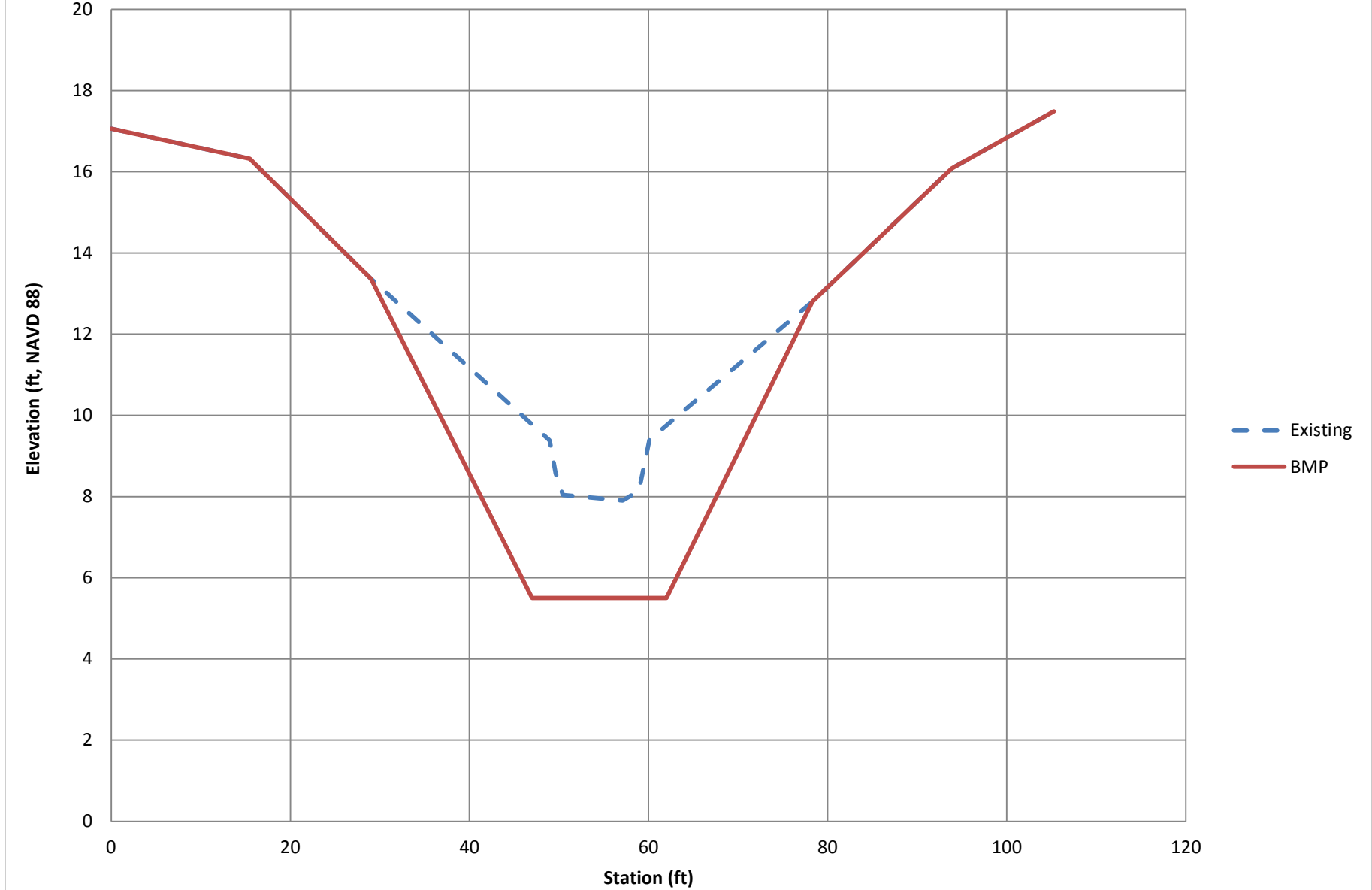
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DEVELOPMENT CONSULTANTS
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1" = 30'
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AKF
PROJECT NO.
14-1088
SHEET
7
OF 7 SHEETS

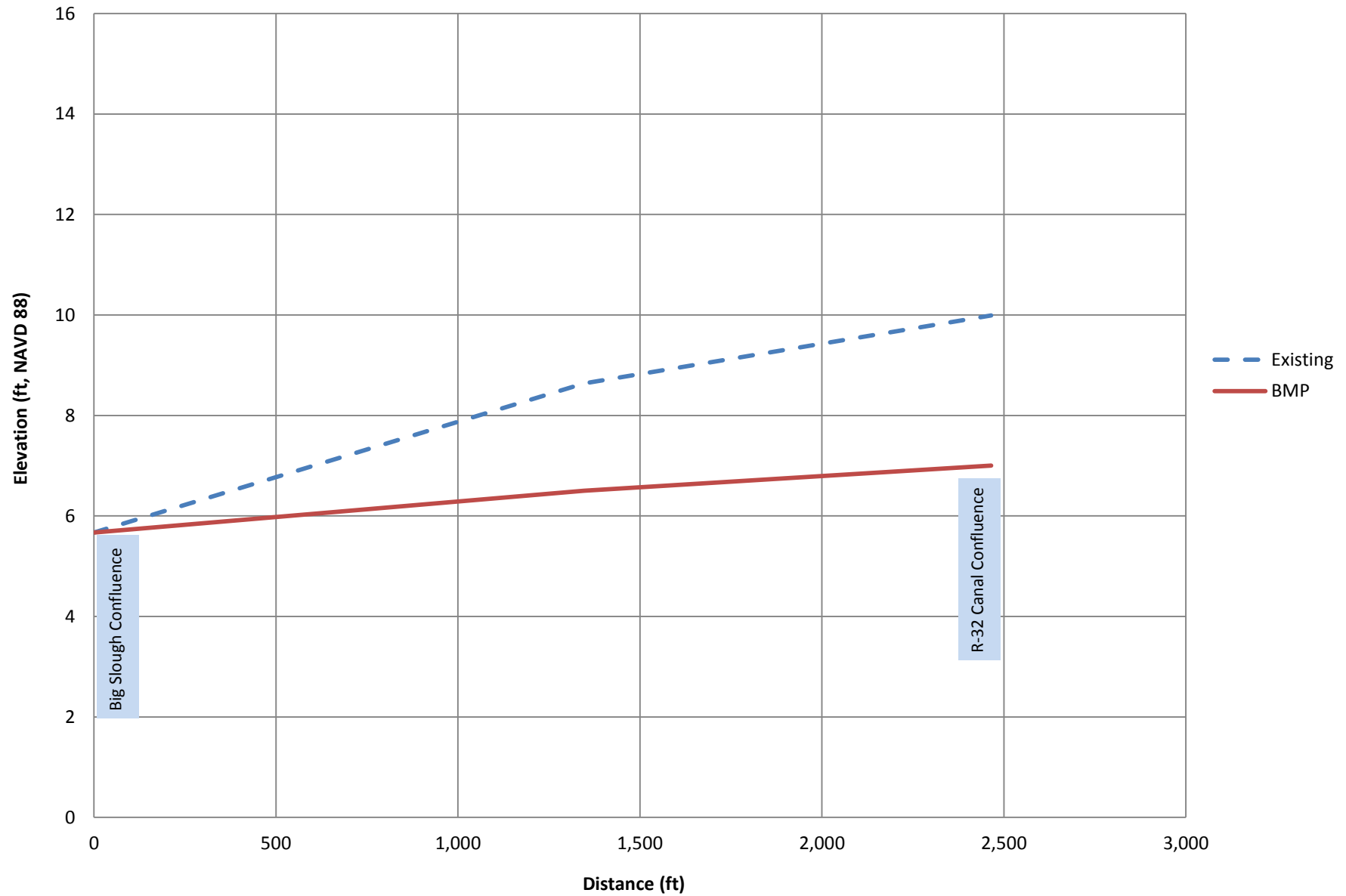
APPENDIX D

Canal Cross-sections and Profiles

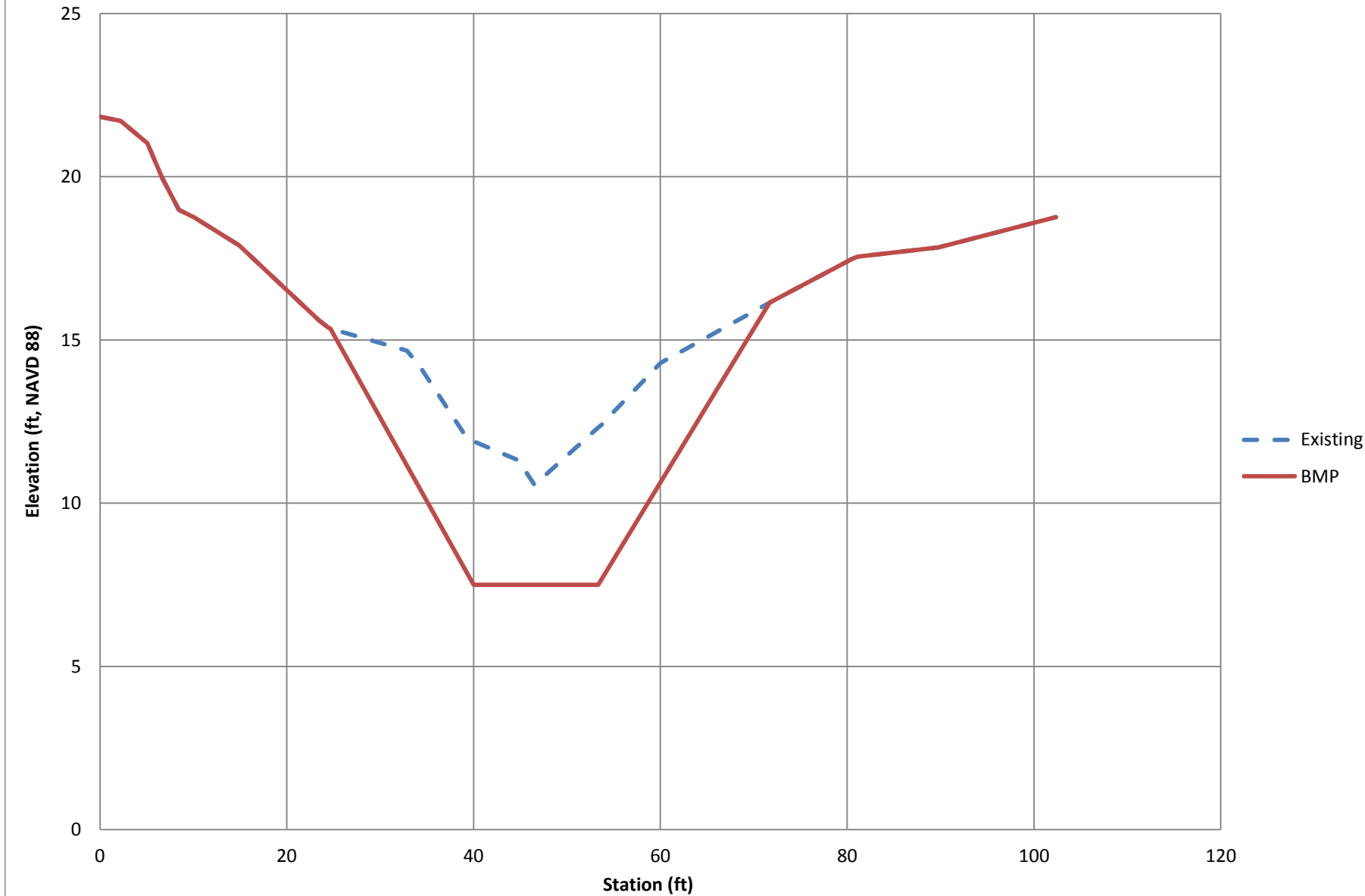
Existing and BMP Sections R-24 Canal



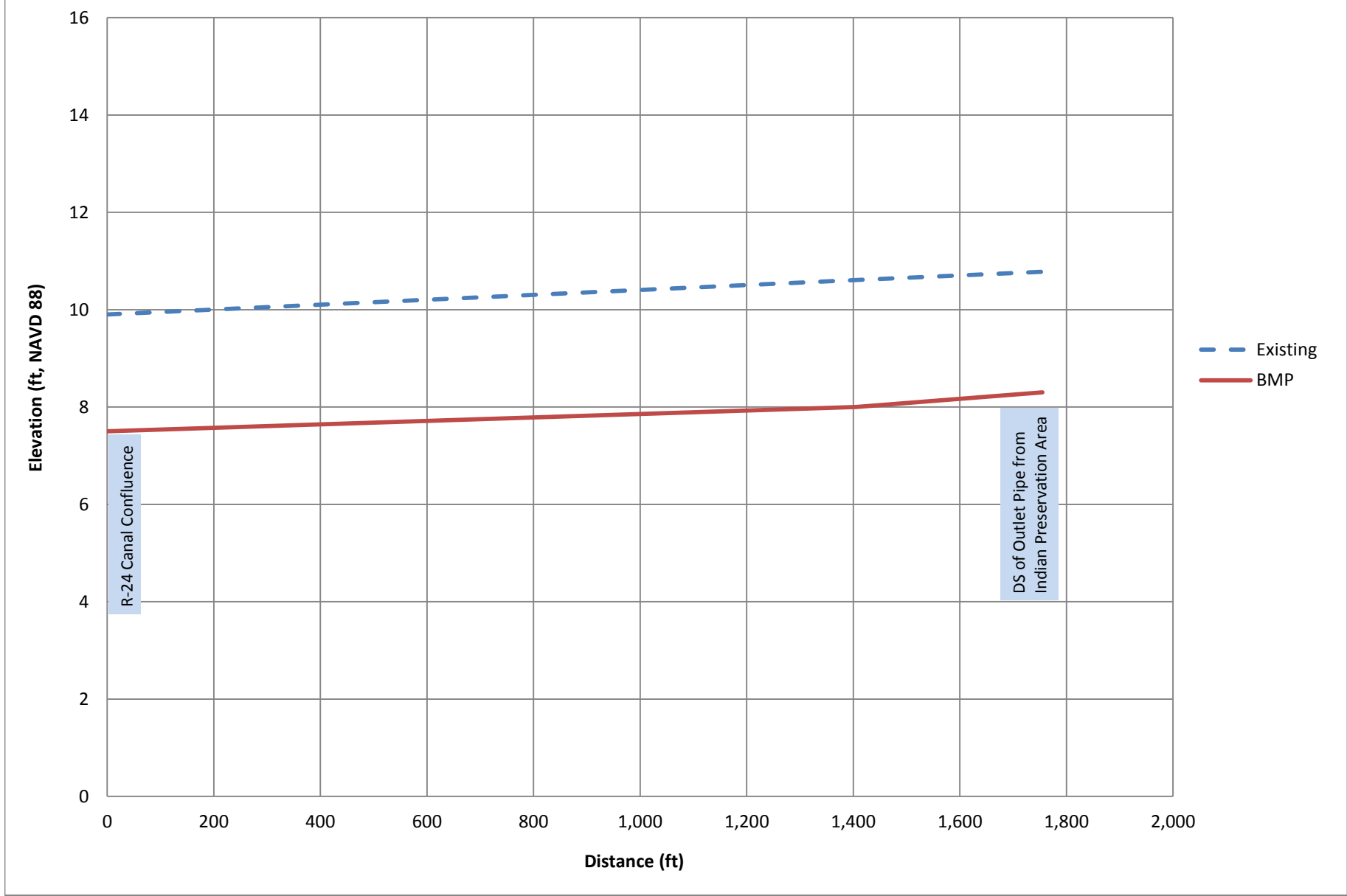
R-24 Canal Bottom Profile



Existing and BMP Sections R-32 Canal



R-32 Canal Bottom Profile



APPENDIX E

Preliminary Cost Estimates

BMP No. 1 (Dredging R-24 and R-32 Canals) Preliminary Cost Estimates

Item	Length (ft)	Width (ft)	Cross Section area	Quantity	Unit	Unit Cost *	Estimated Cost	Comments
Dredging and removal of dredgings - 1,800 ft of R-32 Canal	1800		144.5	9633	CY	\$ 25	\$ 240,833	
Dredging and removal of dredgings - 2,300 ft of R-24 Canal	2300		118.3	10077	CY	\$ 25	\$ 251,935	
Bank Stabilization R-32 Canal Assume 1, 800ft long 20 feet wide on each side	1800	38		7600	SY	\$ 2	\$ 15,200	
Bank Stabilization R-24 Canal Assume 2,300 ft long 20 feet wide on each side	2300	38		9711	SY	\$ 2	\$ 19,422	
36-inch Pipe Crossing				40	LF	\$ 50	\$ 2,000	
Erosion and Sediment Control							\$ -	
MOT				1	LS	\$ 5,000	\$ 5,000	
Mobilization and Demobilization				1	LS	\$ 5,000	\$ 5,000	
Other Project Costs				1	LS	\$ 5,000	\$ 5,000	
Subtotal							\$ 544,391	
Design and Permitting Consultant Services (15%)							\$ 81,659	
Construction and Inspection Consultant Services (5%)							\$ 27,220	
Contingency (10%)							\$ 65,327	
Total FY 2014 cost							\$ 718,596	
Total FY 2017 Inflated Cost (5% per year)							\$ 831,864	

* Estimated Costs from Thomas Marine Construction

BMP No. 2 (Raising 1,900 ft of Price Boulevard) Preliminary Cost Estimates

Item	Length (ft) *	Width (ft)	Depth (in)	Quantity	Unit	Unit Cost	Estimated Cost **	Comments
Detail Topographic Survey				1	ea	\$ 5,000	\$ 5,000	
Mill Existing Asphalt	2100	24		5600	SY	\$ 15	\$ 84,000	
Add road base to elevate road 1.2'	2100	26	15	6067	SY	\$ 30	\$ 182,000	\$15 per SY per 8" thickness. Double cost for 15" thickness.
Type SP Structural Course 1.5"	2100	26	1.5	455	TON	\$ 100	\$ 45,500	100lb per SY per inch thickness / 2000lb per ton
Friction Course 1.5"	2100	26	1.5	455	TON	\$ 120	\$ 54,600	
Swale Regrading and sodding (assume 20 ft wide each side of Price Blvd)	2100	20		9333	SY	\$ 5	\$ 46,667	
Surveying (Construction staking, surveying, as-builts)				1	LS	\$ 7,500	\$ 7,500	
Erosion and Sediment Control				1	LS	\$ 5,000	\$ 5,000	
MOT				1	LS	\$100,000	\$ 100,000	Need bypass lanes
Mobilization and Demobilization (6%)				1	LS	\$ 31,816	\$ 31,816	
Subtotal							\$ 562,083	
Design and Permitting Consultant Services (15%)							\$ 84,312	
Construction and Inspection Consultant Services (5%)							\$ 28,104	
Contingency (10%)							\$ 67,450	
Total FY 2014 cost							\$ 741,949	
Total FY 2017 Inflated Cost (5% per year)							\$ 858,899	

* Add 100 feet on each for transition to existing road pavement elevation

** Cost inflated about 15% from 2014 Sumter/Price Intersection improvements cost from Ben Newman

BMP No. 3 (Raising 950 ft of Price Boulevard and Dredging R-24 and R-32 Canals) Preliminary Cost Estimates

Item	Length (ft) *	Width (ft)	Depth (in)	Quantity	Unit	Unit Cost	Estimated Cost **	Comments
Detail Topographic Survey				1	ea	\$ 5,000	\$ 5,000	
Mill Existing Asphalt	1150	24		3067	SY	\$ 15	\$ 46,000	
Add road base to elevate road 8"	1150	26	8	3322	SY	\$ 15	\$ 49,833	\$15 per SY per 8" thickness.
Type SP Structural Course 1.5"	1150	26	1.5	249	TON	\$ 100	\$ 24,917	100lb per SY per inch thickness / 2000lb per ton
Friction Course 1.5"	1150	26	1.5	249	TON	\$ 120	\$ 29,900	
Swale Regrading and sodding (assume 20 ft wide each side of Price Blvd)	1150	20		5111	SY	\$ 5	\$ 25,556	
Surveying (Construction staking, surveying, as-builts)				1	LS	\$ 7,500	\$ 7,500	
Erosion and Sediment Control				1	LS	\$ 5,000	\$ 5,000	
MOT				1	LS	\$100,000	\$ 100,000	Need bypass lanes
Mobilization and Demobilization (6%)				1	LS	\$ 17,622	\$ 17,622.33	
Dredging R-24 and R-34 Canals (see BMP 1 cost estimate for detailed cost breakdown)							\$ 544,391	
Subtotal							\$ 855,719	
Design and Permitting Consultant Services (15%)							\$ 128,358	
Construction and Inspection Consultant Services (5%)							\$ 42,786	
Contingency (10%)							\$ 102,686	
Total FY 2014 cost							\$ 1,129,549	
Total FY 2017 Inflated Cost (5% per year)							\$ 1,307,594	

* Add 100 feet on each for transition to existing road pavement elevation

** Cost inflated about 15% from 2014 Sumter/Price Intersection improvements cost from Ben Newman



David A. DeLoach, State of Florida, Professional Engineer, License No. 47761
This item has been electronically signed and sealed by David A. DeLoach, P.E.
on May 9, 2019 using a SHA authentication code.

Printed copies of this document are not considered signed and sealed and the
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City of North Port

Professional Engineering Services for the Big Slough Flood Reduction Study

Agreement #2016-48
Department of Public Works

STORMWATER MANAGEMENT PLAN



May 2019

DeLoach Engineering Science, PLLC
1845 Ivanhoe Road | Orlando, FL 32804

DeLoach Engineering Science
water resources and civil engineering

Table of Contents

INTRODUCTION	1
Prior Work Completed	2
PROJECT AREA DESCRIPTION	3
Soil Conditions	4
Land Use Conditions	5
Historical Flooding	6
PREVIOUS BMP EVALUATIONS AND FINDINGS.....	7
Stormwater Management Master Plan (1993).....	7
Watershed Management Program Consulting Services in the Big Slough Watershed (2014)	8
BIG SLOUGH WATERSHED MODEL DESCRIPTION	10
Governing Board Approval (use as best available information)	10
Model Updates.....	10
FLOOD REDUCTION CONCEPTS AND CANDIDATE PLANS	12
Potential Solutions for Hydraulic Evaluation	13
Internal Flow Diversion and Increased Conveyance Capacity	13
External Flow Diversion	13
Offsite Storage	14
Acquisition	14
Preliminary Evaluation of Hydraulic Performance.....	14
Development of a Preferred Plan for Improvement.....	15
Plan Components and Candidate Plan Development.....	15
Candidate Plan Descriptions and Performance	16
Benefit and Cost Comparison of Candidate Plans	17
Flood Reduction Comparison of Candidate Plans.....	17
Evaluation of Cost for Acquisition.....	18
Identification of the Preferred Plan for Flood Reduction	19
Plan Coordination with Offsite Property Owners/Managers	19
SWERP Pre-application Meeting with SWFWMD	19

RECOMMENDED STORMWATER MANAGEMENT MASTER PLAN	20
Dorothy Avenue Improvements	20
Purpose	20
Configuration	20
Bypass Canal Construction	20
Purpose	20
Configuration	22
R-36 Improvements	22
Purpose	22
Configuration	22
Inflow Control Structure	23
Purpose	23
Configuration	23
Engineer's Opinion of Probable Cost	24
Benefits and Benefit to Cost Ratio (BCR)	24
Flood Area Reduction for 1-Day Mean Annual Event in the I-75 Area	25
Flood Area Reduction for 1-Day 5-Year Event in the I-75 Area	26
Flood Area Reduction for 1-Day 10-Year Event in the I-75 Area	27
Flood Area Reduction for 1-Day 25-Year Event in the I-75 Area	28
Flood Area Reduction for 1-Day 50-Year Event in the I-75 Area	29
Flood Area Reduction for 1-Day 100-Year Event in the I-75 Area	30
Flood Area Reduction for 1-Day Mean Annual Event in the Dorothy Avenue Area	31
Flood Area Reduction for 1-Day 5-Year Event in the Dorothy Avenue Area	32
Flood Area Reduction for 1-Day 10-Year Event in the Dorothy Avenue Area	33
Flood Area Reduction for 1-Day 25-Year Event in the Dorothy Avenue Area	34
Flood Area Reduction for 1-Day 50-Year Event in the Dorothy Avenue Area	35
Flood Area Reduction for 1-Day 100-Year Event in the Dorothy Avenue Area	36

**City of North Port
Big Slough Flood Reduction Study**

STORMWATER MANAGEMENT PLAN REPORT

The purpose of this report is to present a conceptual stormwater management master plan for drainage system improvements covering flood-prone areas in the Big Slough Watershed within the City of North Port. This report expands upon the North Port/Big Slough Watershed Management Program project (Ardaman & Associates, Inc., 2003-2014) and includes, as appendices, copies of selected reports including interim project reports by DeLoach Engineering Science, PLLC (DES) that have documented progress toward development of a viable stormwater management plan. Elements carried over from prior reports, including text, figures, and tables, have been updated to include new and better information and, where different, supersede information contained in those prior reports. A set of project deliverables, including updated geodatabase, collected field data, model input and output data, and digital library of prior reports and presentations, accompanies this report. These materials provide information in support of a request for conceptual approval of a Statewide Environmental Resource Permit (SWERP) application.

INTRODUCTION

The Big Slough Flood Reduction Study, which was cooperatively funded by and between the City of North Port and the Southwest Florida Water Management District (SWFWMD), was performed for the Department of Public Works under City of North Port Agreement #2016-48. Notice to Proceed to conduct the flood study was issued to DES on October 13, 2016. Per the Project Plan (Appendix A), DES evaluated feasibility and cost effectiveness of various solutions intended to reduce flooding in the City within the Big Slough Watershed. The Big Slough Flood Reduction Feasibility Study was comprised of two distinct parts:

- Part 1 was to evaluate localized flooding along Myakkahatchee Creek in two specific flood-prone areas and recommend construction projects or other methods to mitigate flooding. The I-75 and Jockey Club areas along Myakkahatchee Creek were initially designated for this work. However, collection and conveyance system improvements conceived and performed by the City of North Port stormwater department proved effective at reducing flooding within the Jockey Club area prior to this project getting underway. Consequently, the nearby flood-prone Dorothy Avenue area was instead targeted along with the I-75 area for Part 1 analysis and stormwater planning.
- Part 2 was to evaluate preliminary regional concepts including, but not limited to, those previously developed by others, with the intent to advance large scale conceptual solutions to mitigate flooding throughout the City of North Port.

Localized solutions to recurrent flooding were found to be ineffective in the selected Part 1 project areas. Larger-scale solutions thus became the focus of all flood reduction planning. To the extent that the proposed improvements can be implemented by the City independent of adjacent landowners, the stormwater plan meets Part 1 objectives. Plan components which require authorizations from adjacent land owners/managers will be implemented over a longer period of time and satisfy Part 2 objectives.

Prior Work Completed

The Big Slough watershed and City of North Port stormwater management system have been the subjects of prior investigations. Reference has been made by DES to the following reports:

- North Port Water Control District Phase I Report, Inventory and Approach to Analysis, for General Development Utilities, Inc., by R. D. Ghioto & Associates, Inc. (1984) presents data and information that describes NPWCD facilities, their function and condition.
- City of North Port Big Slough Watershed Study Phase III Task 2 Final Report, Stormwater Management Master Plan, by Camp, Dresser & McKee, Inc. (1993) presents conceptual solutions for flooding as well as assessments of potential water supplies and of nonpoint source pollution and describes a stormwater management plan to reduce flooding during extreme storm events.
- Watershed Management Program (WMP) Consulting Services in the Big Slough Watershed (K883), Best Management Practices (BMP) Analysis Final Report, for Southwest Florida Water Management District and City of North Port, by Ardaman & Associates, Inc. (2014) evaluates BMP alternatives to address flooding based on effectiveness, permissibility, and economic viability.

The 1993 Stormwater Management Master Plan by CDM was partially implemented, providing increased local conveyance through replacement of culvert structures at four locations. Those improvements are accounted for in more recent model development. Other plan components were not completed including those for storage and flow diversion, apparently due to regulatory and financial constraints of that time.

Two important reports from the Ardaman WMP project are reproduced in Appendix B and Appendix C. Under the WMP project, an “existing condition” (2004 land use) model was developed and six regional BMP alternatives evaluated that could potentially reduce flooding through combinations of conveyance improvements, stormwater management storage areas, flood proofing, and flow diversion. Although the regional alternatives developed under the WMP project were not incorporated into a specific plan for implementation, the work provided insight to the system’s hydraulic response and BMP limitations.

Additionally, hydraulic performance and effects of potential local conveyance improvements were analyzed under the WMP project at the following sites:

- R-36 Canal at I-75
- Myakkahatchee Creek at I-75
- R-36 Canal at Tropicair Boulevard
- Myakkahatchee Creek at Tropicair Boulevard
- WCS-162 location on the R-36 Canal (possibility of adding gates to the existing structure)
- Price Boulevard drainage system (five alternative sets of improvements)

Importantly, BMP evaluation results were compared to the 1-Day 100-Year existing condition model only.

The current Big Slough Flood Reduction Study builds upon all prior work to advance previously developed and new concepts to achieve flood mitigation in areas where residential structures are shown as flooding in the recently updated Flood Insurance Rate Maps (FIRMs). Performance of proposed improvements will be considered relative to lesser storm events from mean annual up to and including the 100-year storm event to evaluate cost and benefit relationships across a broader range of conditions.

PROJECT AREA DESCRIPTION

The Big Slough Watershed (Figure 1) is located in southeastern Sarasota County and is tributary to the Myakka River. Portions of the City of North Port located east of the Myakka River are within the southern portion of the Big Slough Watershed. The Big Slough Canal (also called Myakkahatchee Creek in its lower reaches) passes from north to south and receives inflows from numerous waterways within the City.

Discharge of waters from the City and upstream offsite areas occurs primarily via Myakkahatchee Creek as it passes beneath US 41. Lesser discharges occur southward through several open weirs, drop structures, and culverts along Hillsborough Boulevard into waterways which continue through Port Charlotte. Several of those downstream waterways are controlled by structures while others are tidally influenced.

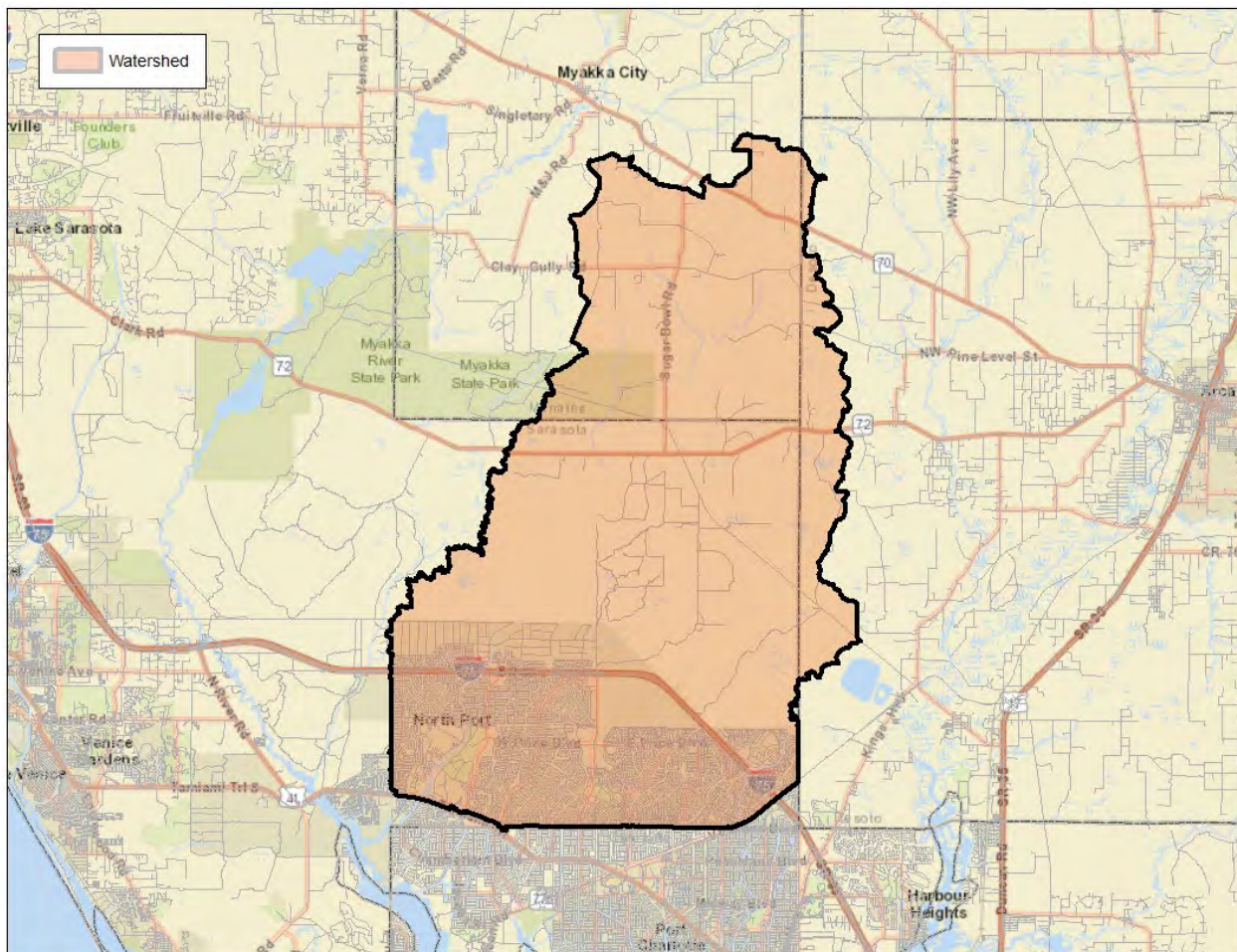


Figure 1: The Big Slough Watershed

Soil Conditions

Figure 2 and Figure 3 illustrate the spatial distribution of hydrologic soil groups in the I-75 and Dorothy Avenue project areas, respectively, based upon Soil Surveys published by the U.S. Department of Agriculture, Natural Resource Conservation Service (USDA-NRCS).

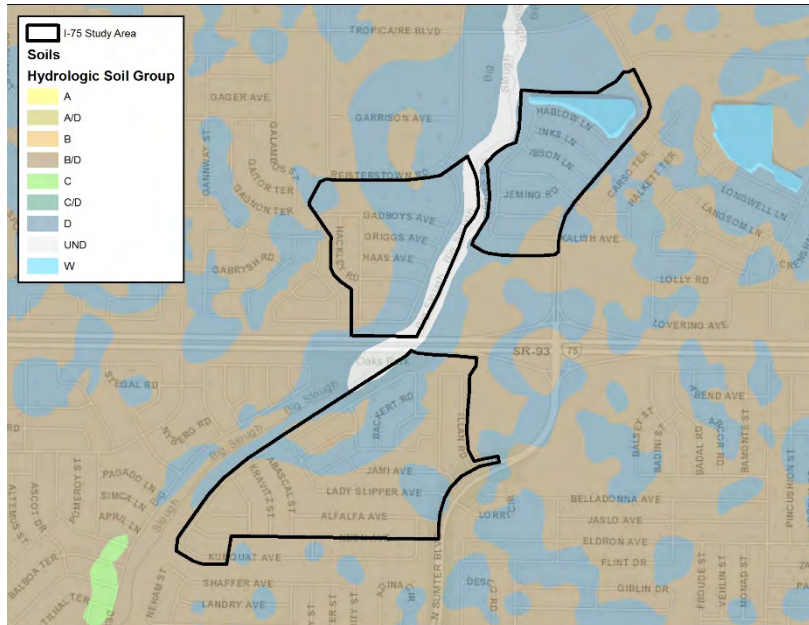


Figure 2: Hydrologic Soil Groups, I-75 Area

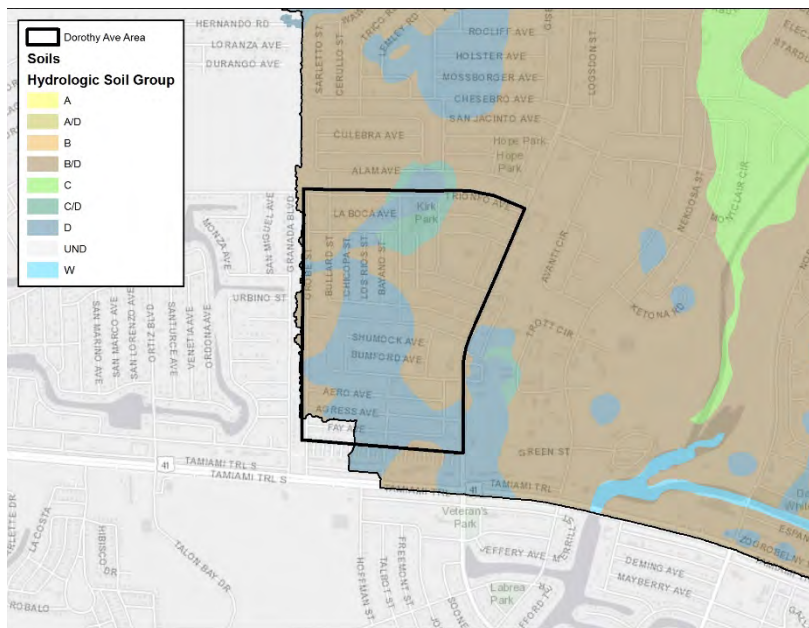


Figure 3: Hydrologic Soil Groups, Dorothy Avenue Area

Low permeability, hydric soils associated with depressional areas and floodplains are predominant in areas immediately adjacent to Myakkahatchee Creek and the Big Slough canal and throughout much of the Dorothy Avenue area. These soils are classified as being in Hydrologic Soil Group (HSG) “D”, exhibiting low infiltration rates and available storage capacity. These soils are located in areas that have historically been prone to flooding.

Soils throughout much of the watershed fall into the dual HSG A/D, B/D, and C/D categories. In developed areas where extensive ditching may keep surficial aquifer water levels low, these soils may provide higher infiltration rates and maintain greater soil storage capacity than occur naturally. Water level control structures which maintain higher water level in canals, however, may reverse this effect, resulting in significantly higher runoff potential in these soils. While North Port contains an extensive ditch system, water level control structures maintain higher normal water levels to meet local or regional water supply purposes and/or to mitigate environmental impacts of dewatering.

Land Use Conditions

Figure 4 and Figure 5 illustrate conditions in the I-75 and Dorothy Avenue areas, respectively. Both are comprised primarily of single-family residential land use, ranging from low to high density, with some commercial areas. Much of the I-75 area is undeveloped, primarily due to frequent and severe flooding.

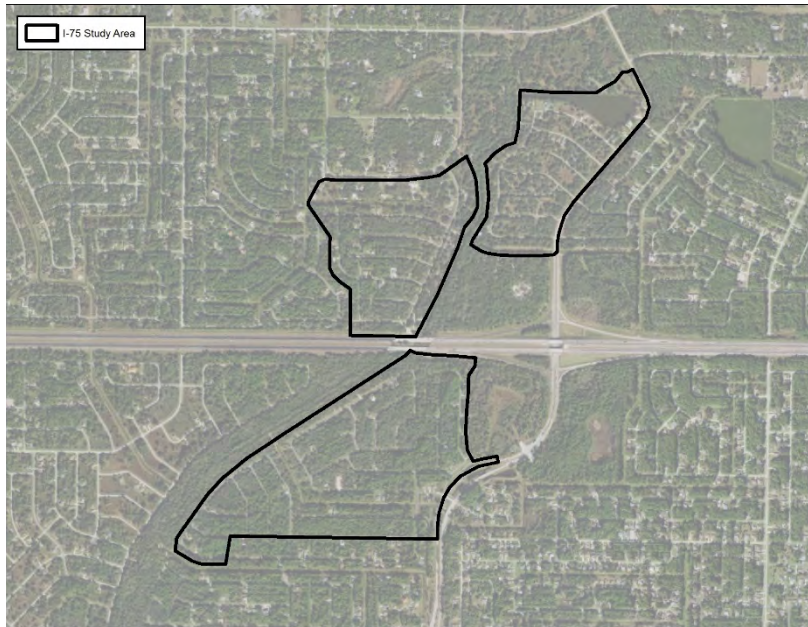


Figure 4: Land Use (Aerial), I-75 Area

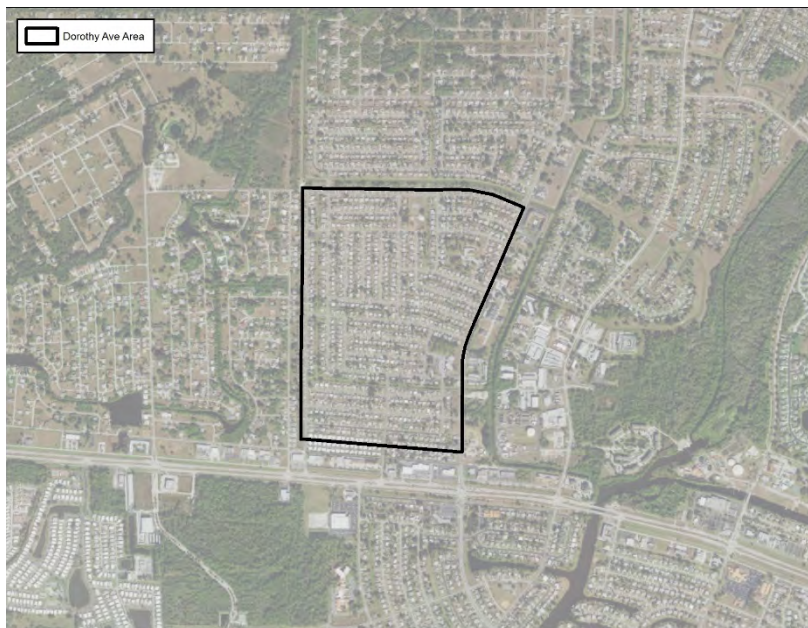


Figure 5: Land Use (Aerial), Dorothy Avenue Area

Boundaries of various land use categories were provided by the SWFWMD in GIS format for use in hydrologic model development and are based upon the Florida Land Use Cover and Forms Classification (FLUCCCS) system. Impervious values are derived for various land use categories and are an important factor in determining runoff generation from rainfall.

There is a wide variety of land use and land cover in the Big Slough watershed, including a significant amount of urban land (nearly 40%) which occurs primarily in the lower half of the watershed. A large amount of agricultural land, open range, and conservation lands are in the upper half of the watershed.

The Dorothy Avenue area is one of the earliest constructed residential communities in North Port and is comprised of high-density single family residential land use. The large amount of imperviousness (roads, driveways, and rooftops) generates high runoff rates and volumes, and local flooding results from inadequate collection and conveyance systems. Flooding during large events is exacerbated by overflows from the R-36 canal into R-231 at Trionfo Avenue.

Historical Flooding

Figure 6 and Figure 7 illustrate the extents of flood inundation in the I-75 and Dorothy Avenue areas, respectively, for the mean annual, 10-year, and 100-year storm events. Flood areas are based on storm event modeling results using the updated existing condition model and mapping on a LiDAR-based terrain.

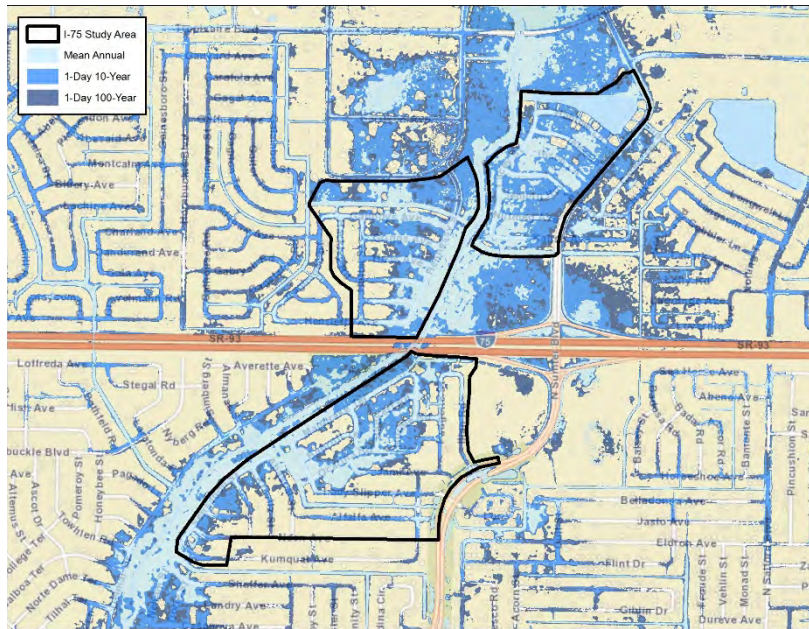


Figure 6: Flood Inundation Areas, I-75 Area



Figure 7: Flood Inundation Areas, Dorothy Avenue Area

The City of North Port has often experienced flooding in the Big Slough Watershed, including in the areas near Myakkahatchee Creek north and south of I-75, where the depth and very long duration of flooding has required emergency evacuation of many residents. Moderate to extreme flooding of streets occurs throughout older portions of the City in the vicinity of Dorothy Avenue. The nature of flooding in both of these areas, and particularly around I-75, is such that regional improvements are required to achieve significant and cost-effective flood reduction.

DES and City of North Port staff had opportunities to observe and record flooding conditions on several occasions over the past decade. The mapped inundation areas shown here accurately portray observed flooding under similar historic rainfall conditions.

Simulation results were validated and peer review performed prior to Governing Board approval of the model and flood mapping. The model represents best available information upon which to develop baseline information for design and permitting of drainage improvements in North Port.

PREVIOUS BMP EVALUATIONS AND FINDINGS

The Big Slough watershed and City of North Port stormwater management system have been subjects of several prior investigations (Appendix D). Two projects of the past 25 years, in which rigorous evaluations were undertaken to solve recurrent, large-scale flooding problems in the City, are briefly described here.

Stormwater Management Master Plan (1993)

As part of the City of North Port's stormwater improvement program, Camp Dresser & McKee, Inc. (CDM) developed a Stormwater Management Master Plan for the Big Slough watershed. The plan, which was conducted in three phases, sought to evaluate flooding problems and determine engineering solutions. The third phase included analyses of various alternatives for flood reduction. Detailed modeling was conducted to assess potential flood reduction afforded by those alternatives. A cost/benefit analysis was also conducted to evaluate and recommend a plan for detailed design.

The Phase III Task 1 interim report (CDM, 1992) outlined conceptual solutions to identified flooding problems. Preliminary stormwater model runs were conducted to provide an initial assessment of each solution's effectiveness in reducing flooding. Results and preliminary cost estimates were presented for each solution. The costs and benefits of each conceptual solution were compared in a matrix. Solutions considered in the preliminary evaluation included the following:

- Acquisition: Purchase of flooded lands would preclude flooding damage by preventing the development of the property but would not prevent roadway flooding.
- Storage: Construction of stormwater detention basins would detain flow from the agricultural areas north of the city and would reduce and attenuate peak inflow rates.
- Diversion: Stormwater flows would be diverted into an adjacent watershed to the west (Deer Prairie Slough), thus reducing flow through the city.
- Conveyance: Increased conveyance capacity of the city's hydraulic system would include excavating existing channels, resizing culverts at stream crossings, cleaning existing channels, and constructing relief channels parallel to existing channels.

Based upon preliminary analyses, purchase of flooded lands was removed from consideration and the three remaining alternatives, and combinations of those alternatives, were examined in more detail.

The Phase III Task 2 Final Report, Stormwater Management Master Plan (CDM, 1993) presents conceptual solutions for flooding as well as assessments of potential water supplies and nonpoint source pollution and describes a stormwater management plan to reduce flooding during extreme events. The set of alternatives evaluated in greater detail included: culvert improvements; stormwater diversion by pumping; stormwater diversion by channel; upstream detention; and relief channel construction. The recommended plan included diversion pumping to the Futrell tract, located west of R-36 and south of I-75, coupled with culvert improvements and construction of a relief channel adjacent to Myakkahatchee Creek. This plan provided the greatest flood protection benefit and could be phased. The 1993 Stormwater Management Master Plan was partially implemented, providing increased local conveyance through replacement of culvert structures at four locations. Those improvements are accounted for in the current Existing Conditions model. Other plan components were not completed including those for storage and flow diversion, apparently due to regulatory and financial constraints.

Watershed Management Program Consulting Services in the Big Slough Watershed (2014)

Ardaman & Associates, Inc. evaluated various BMP alternatives to address flooding conditions based on effectiveness, permissibility, and economic viability. Under the WMP project, an Existing Conditions model was developed and regional BMP alternatives evaluated to reduce flooding through combinations of conveyance improvements, stormwater management storage areas, flood proofing, and flow diversion.

Simulations were performed of six regional BMP scenarios to evaluate the impact of various large-scale flood mitigation concepts. The benchmark scenario for comparison and performance evaluation was the SWFWMD Governing Board-approved 100-year 24-hour existing condition model.

- Remove structures throughout City of North Port waterways. The objective of evaluating this BMP was to understand primary drainage system capacity assuming no losses due to water control structures or drop structures. Additional connectivity was provided among a few R canals southwest of the I-75 corridor to transferring some of the existing load to less compromised areas. Results indicate flood stage reduction immediately north of Price Blvd and along Bass Point waterway while increasing flooding between S Toledo Blvd and S Sumter Blvd. Also, improvements are observed southwest of I-75 where new canal connectivity was provided. It was noted that structure removal is not feasible due to loss of potable water supply, fish and wildlife habitat, and wetlands.
- Constrain Flow Entering City of North Port at Big Slough Canal. The objective of this BMP was to constrain the volume of water coming from offsite areas through the Big Slough canal prior to entering the north section of the City in the Estates area. The BMP would involve real estate acquisition, maintenance activities, dam construction, and removal of existing hydraulic structures. Results indicate approximately 0.5 feet flood stage reduction near the Big Slough canal from the City's northern boundary to just south of I-75 while flood stages increase approximately 1.0 foot in offsite areas in Carlton Ranch north of the R-36 and R-580 waterways.
- Diversion Alternative. The purpose of this BMP is to divert flows from offsite areas via the existing R-36 canal, by increasing its capacity and improving its hydraulic connectivity with Deer Prairie Slough canal. This BMP would involve construction of new structures, maintenance activities, real estate acquisition, and detailed hydrologic and hydraulic evaluation of the western boundary (Deer Prairie Slough watershed). Results indicate flood reduction throughout the Estates area, along the Big Slough Canal between the R-36 canal and I-75 corridor as well as in the localized area along Big Slough south of I-75, with flood stage reductions between 0.1 foot and 1.0 foot throughout those areas. Impacts of additional flow into Deer Prairie Slough were not considered.
- R-580 Improvements. The purpose of this BMP is to induce additional flows through Creighton waterway by improving conveyance capacity in the R-580 waterway. Results indicate small improvements near Big Slough. However, inducing additional flow through Creighton Waterway causes additional flooding near I-75.
- Increase Capacity on Southern Boundary. The objective of this alternative was to evaluate system response when doubling the southern boundary discharge capacity along the County line into Port Charlotte. The BMP would involve conveyance improvements, construction of new

structures and/ or reconditioning of existing structures, maintenance activities, real estate acquisition, and evaluation of the receiving waters through hydrologic and hydraulic modeling. Results indicate that improvements relative to house flooding were not significant. However, roads experienced a considerable flood reduction between S Sumter Blvd and Atwater Drive. This alternative was evaluated for information purposes only, as it is understood that allowing additional flows into Port Charlotte may not be desirable.

- Upstream Detention Alternative. The objective of this analysis is to examine the effects when attenuating peak flow rates in agricultural areas along the Big Slough canal with a series of new detention facilities. This BMP would involve construction of stormwater management storage areas, maintenance activities, and real estate acquisition. Results indicate relatively small reduction in peak water surface elevations on the order of 0.1 to 0.6 feet along Big Slough. The extent of flooding for this BMP is essentially the same as the existing scenario with few flood reduction areas along the Big Slough canal.

Although the regional alternatives developed under the WMP project were not incorporated into a specific plan for implementation, the work provides valuable insight to the system's hydraulic response and BMP limitations.

Performance of several additional, site-specific BMPs were also evaluated and discussed.

- BMP Evaluation of Four Road Crossings. Simulations were performed to assess hydraulic performance and effects of potential conveyance improvements at: R-36 Canal at I-75, Myakkahatchee Creek at I-75, R-36 Canal at Tropicair Boulevard, and Myakkahatchee Creek at Tropicair Boulevard. A systematic evaluation was conducted to understand existing hydraulic behavior at each of the four crossings under various synthetic storm events.
- WCS-162 Evaluation. WCS-162 is located on the R-36 Canal, north of Interstate 75, and immediately upstream of Tropicair Boulevard. The City opens the gate in anticipation of a storm event to lower the water level in the R-36 canal to minimize potential upstream flooding; otherwise, the gate remains closed. This investigation was performed to determine if adding gates would help draw down the canal more quickly and increase conveyance capacity.
- Price Boulevard LOS Improvements. The objective of this series of BMPs is to mitigate flooding along the stretch of West Price Boulevard near the Indian burial ground to meet the existing City of North Port LOS criteria. Five different BMP alternatives were considered.

The WMP project did not result in a plan for improvements. It was recommended that the City of North Port purchase the small number of habitable structures in which flooding is predicted for the 100-year event. Purchasing the affected properties may be more cost effective than implementing BMPs evaluated under the WMP project.

BIG SLOUGH WATERSHED MODEL DESCRIPTION

As previously discussed, this current project builds upon prior work performed. The SWFWMD Governing Board-Approved North Port / Big Slough WMP Watershed Model (Ardaman & Associates, Inc.) was used, with minor updates, to develop a stormwater management plan for flood reduction in the I-75 and Dorothy Avenue areas and to demonstrate that the proposed improvements will not result in adverse impacts to adjacent properties in response to mean annual, 10-, 25- and 100-year 24-hour storm events. The model was developed under a cooperative agreement between the City of North Port and SWFWMD.

Governing Board Approval (use as best available information)

The North Port / Big Slough WMP watershed model uses CHAN (Version 2.03, Aquarian Software, Inc.) to simulate the hydrologic and hydrodynamic response of the watershed to rainfall. Having been constructed over several years according to SWFWMD Guidelines and Specifications, the WMP model was validated using historical flood information. Approved by the Governing Board on May 22, 2012, it is considered best available information for local use in environmental resource permitting at the SWFWMD.

This same model has been used successfully for other design and permitting in the North Port/Big Slough watershed area. Most recently, the same model was used for design and permitting of the WCS-106 structure replacement.

Model Updates

While the base model for this project was originally planned to be the SWFWMD Governing Board-approved 2012 Version of 2004 Condition model, City of North Port staff requested, and DES agreed, that a specific set of model features reflecting existing conditions be updated in that 2012 Version of the watershed model (Appendix E). Specifically, those updates included:

- adding a single 24-inch PVC pipe from Public Works site to Creighton WW;
- utilizing available as-built survey data and adding two (2) gates at WCS 101;
- incorporating available survey and storm pipe data in Price Blvd area;
- changing a 30-inch ADS pipe, flowing from Price Blvd to R-32, to a 36-inch ADS; and
- adding three (3) 48-inch CMP culverts beneath Appomattox Blvd.

Upon review, some of those revisions were found to have been implemented by Ardaman over the period from 2012 through 2014, with the SWFWMD Governing Board-approved 2012 Version of 2004 Condition model as a base. For example, Ardaman had already incorporated field survey data that was collected at Water Control Structure WCS-162 and throughout the vicinity of Price Boulevard.

Therefore, to expedite the 2016 model update, Ardaman's 2014 version of the 2004 Condition model was used as a starting point. An added benefit to using this model as a starting point is that model element naming conventions are preserved and will match all references in reports, notes, and correspondence generated by Ardaman during the period from 2012 through 2014.

DES staff reviewed and supplemented the 2014 model revisions as discussed in the following.

- Add a single 24-inch PVC pipe from Public Works site to Creighton WW

The Ardaman 2014 model was found to contain the 24-inch PVC pipe. Specifically, model Reach RI0016 from Node NI0016 to Node NI0020 contains a 77-foot 24-inch pipe with upstream invert 20.21 feet, NAVD, and downstream invert 17.65 feet, NAVD. A Network_Arc feature was added to the geodatabase as the pipe was not included in the Ardaman geodatabase.

- Utilize available as-built survey data and add two (2) gates at WCS 101

The Ardaman 2014 model does not contain up to date control structure data for the additional gates. As-built drawings provided to DES by the City of North Port were used to update model reach data for the gates as well as to correct adjacent weir lengths. No changes were made to RB1060A representing the four original gates, RB1060B was added to represent two new gates, and weir reaches RB1060E, F, and G were replaced with RB1060C. Network_Arcs were edited in the Geodatabase to reflect these changes.

- Incorporate available survey and storm pipe data in Price Blvd area

The Ardaman 2014 model was found to incorporate site-specific field survey data collected in the Price Boulevard area. Model input was compared to survey drawings (Van Buskirk / Fish & Associates, June 17, 2014) for consistency, and no revisions were deemed necessary.

- Change 30-inch ADS pipe, flowing from Price Blvd to R-32, to 36-inch ADS

The Ardaman 2014 model was found to correctly reflect a 36-inch diameter pipe with inverts as indicated on field survey Sheet 5 of 7 Van Buskirk / Fish & Associates dated June 17, 2014.

- Add three (3) 48-inch CMP beneath Appomattox Blvd (Stantec plans available)

The Ardaman 2014 model does not include these conveyance features. Three (3) 48-inch CMP were added at model Reach RH0110A from Node NH0110 to Node NH0130, with upstream inverts 3.09, 2.92, and 2.87 feet, NAVD, and downstream inverts 2.51, 2.79, and 2.76 feet, NAVD. Information was taken from Stantec design drawings for Phase 3 Reclaimed Water Main Extension Appomattox Drive (2014), assuming NAVD as the vertical datum and estimating 100-ft pipe lengths. One Network_Arc was added to the Geodatabase to reflect pipe connectivity.

FLOOD REDUCTION CONCEPTS AND CANDIDATE PLANS

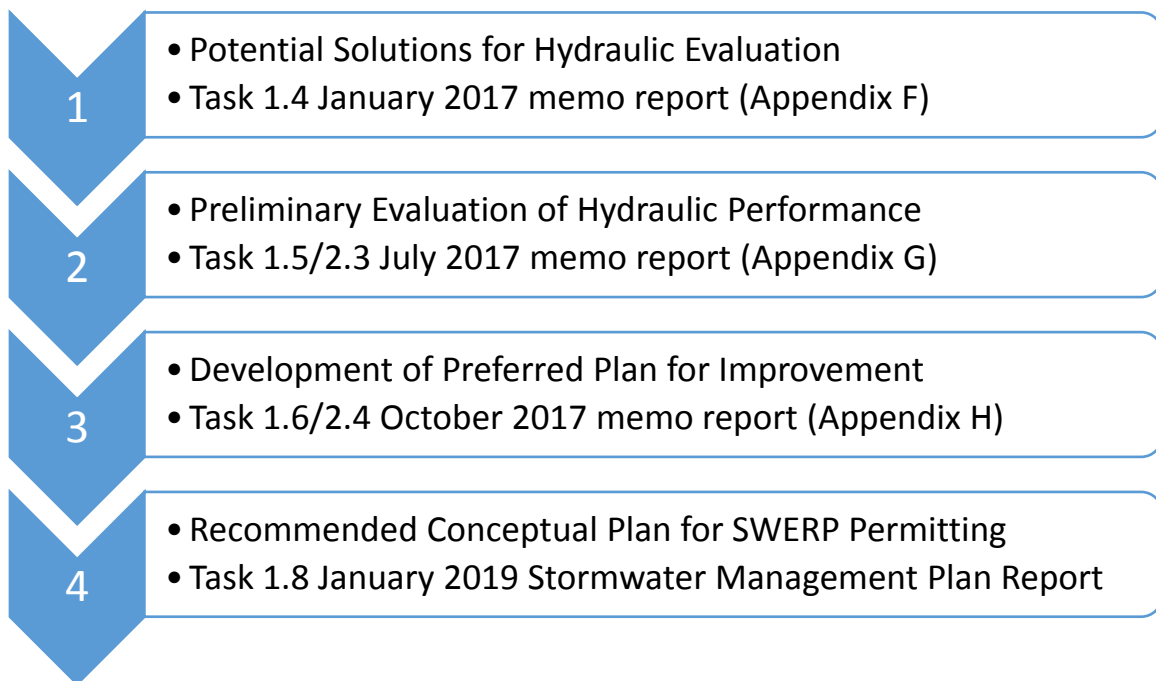
Development of a stormwater management plan to achieve flood reduction in the Big Slough watershed included:

- identification and discussion of potential solutions or plan components;
- preliminary evaluation of alternative solutions;
- assembly of promising solutions into candidate plans for testing;
- identification of a preferred plan;
- and development of the preferred plan into a stormwater management master plan.

Flood reduction solutions that were considered and discussed by the project team included internal flow diversion and increased conveyance capacity; external flow diversion; off-site storage; gate operations; flood-proofing; property acquisition; and elevation of roadways. As potential solutions were considered, a set of alternatives were selected for hydraulic evaluation as stand-alone or combined improvements.

Note: Team meeting notes are reproduced in the following section(s) to generally describe the plan development process. Not all discussion points, comments, and considerations contained in these notes are fully addressed in this Stormwater Management Plan report. The reader is directed to prior reports, memoranda, and presentations for discussion of relevant plan development and evaluation topics.

Development of the Stormwater Management Plan and Related Reports



Potential Solutions for Hydraulic Evaluation

A set of alternatives were selected for preliminary hydraulic evaluation to determine effectiveness of the individual solutions and point the way toward a cost-effective plan for flood reduction. Specifically, the following set of alternatives were selected by the project team for preliminary hydraulic evaluation.

Internal Flow Diversion and Increased Conveyance Capacity

- **Parallel Relief Channel Construction**
A new, parallel canal could be constructed from the northern City boundary to Price Boulevard within Tier 1 and/or Tier 2 lots along either side of the Myakkahatchee Creek. The additional conveyance may reduce flow rate and peak stages along the main channel from start to end of the parallel relief channel.
- **Channel Improvements along R-580**
The R-580 waterway's bottom profile could be reconfigured, creating a more uniform and hydraulically efficient conveyance way. Improvement of the R-580 Waterway would induce more flow eastward from Big Slough along the City's northern boundary toward Creighton Waterway, resulting in reduced flows and flood stages in Myakkahatchee Creek.
- **R-36 Improvements to South of WCS-101**
A whole series of improvements could be made to canal segments and structures to enhance the overall conveyance capacity of the R-36 waterway system. The additional stormwater conveyance capacity may induce higher westward flow out of Big Slough at the north boundary of the City. Diverting those higher flows southward to WCS-101 would reduce flow and stages along the more flood prone segments of Myakkahatchee Creek.
- **Snover Waterway to Cocoplum Waterway**
Improvements could be made to existing structures along Snover Waterway and beneath Price Boulevard to increase flow through canals that connect with Cocoplum Waterway. The additional conveyance capacity may induce higher eastward flow out of Big Slough into Snover Waterway. Diverting those higher flows southward to Cocoplum Waterway would reduce flow and stages along the more flood prone segments of Myakkahatchee Creek.
- **Other Miscellaneous Improvements**
Evaluations of canals and structures throughout the area for opportunities to increase conveyance.

External Flow Diversion

- **Connection to Deer Prairie Slough**
Stormwater flows could be diverted westward to the adjacent Deer Prairie Slough watershed, reducing flow through the City. Several variations could be considered, including gravity and pumped diversions both with and without added storage facilities.
- **Enhanced Discharges Along Southern Boundary to Port Charlotte – Tidal Outfalls Only**
Structures located within the Cocoplum Waterway and discharging beneath Hillsborough Boulevard could be improved to increase discharges into the Port Charlotte conveyance system. Additional conveyance capacity would divert stormwater southward and reduce flooding in the southern portion of the City.

Offsite Storage

- **Constrain Inflows to City with Increased Upstream Floodplain Storage**
Raise existing earthen berms on the northwest City boundary at the intersection of Big Slough canal with R-36 and R- 580 waterways. Also, raise earthen weirs farther north at the intersection of Big Slough canal and Power Line Road. Improvements would leave the Big Slough canal as the only conveyance system into the western portion of the City. Inflows would be reduced, dropping stages along Myakkahatchee Creek.
- **Creation of Upstream Detention, Reservoirs, or Joint Use Facilities**
One or more detention ponds, reservoirs, or joint-use facilities could be constructed to provide offsite stormwater detention. The facilities would reduce inflow rates and stages along Myakkahatchee Creek.

Acquisition

- **Purchase of Flood Prone Lands and/or Flood Prone Structures**
Some communities turn to property acquisition to mitigate flood risk by establishing permanent, public open space and to get homeowners in flood-prone areas permanently out of harm's way. In North Port, many lots have been acquired on the west side of the Myakkahatchee Creek to serve as a linear park. Additional acquisition may be considered to remove other lands from the 100-year floodplain. Removal of those properties would reduce future flood-related damages but would not impact flood levels.

Preliminary Evaluation of Hydraulic Performance

The above selected alternatives were combined and incorporated into the Big Slough watershed model in various configurations to allow for an initial screening-level review of hydraulic performance. Proposed condition simulations were performed for the mean annual, 10-year, and 100-year 24-hour storm events, with stages and flows compared to the existing condition. Flood inundation areas for each simulation were also mapped and used to depict areas removed from, or added to, the existing condition floodplain.

Flood reduction concepts were effective to varying degrees at reducing flood levels in the watershed, particularly in the I-75 study area, given assumptions and simplifications made while developing the screening-level models. Potential adverse impacts could also be seen in mapping the simulation results. These preliminary simulation results provided general information on potential performance characteristics of each of the tested flood reduction concepts for comparison and discussion.

A Team Meeting was held to discuss concepts and preliminary hydraulic performance. The following summarizes notable points that were raised during the team meeting and the important issues that were subsequently addressed as the project moved forward.

- Refinement and future performance evaluations of structure modifications at the upstream inflow point (to constrain and reduce inflows to the City of North Port) should consider a wider range of control elevations and results used by the District for decision-making on allowable changes to area, depth, and duration of inundation in upstream District lands.
- Refinement and future performance evaluations of the R-36 conceptual plan for improvements should consider channel widening with and without culvert structure improvements providing additional conveyance beneath Tropicair and I-75.
- Refinement of the R-36 conceptual plan for improvements should include matching pre/post discharge rates westward into the Deer Prairie system, so as to minimize increased flows

downstream in the City of North Port. Preliminary modeling did not make full use of available discharge capacity to the west. No increase in rate of discharge to the Deer Prairie system should be considered, at this time.

- Refinement of the R-36 conceptual plan for improvements should consider (and preferably conform to) existing rights-of-way and drainage easements. City of North Port can provide existing ROW information as depicted on drainage system as-builts. However, acquisition of additional drainage easements along the western boundary from Sarasota County is not out of the question.
- Refinement of the R-36 conceptual plan for improvements should look more closely at existing bridge crossings and available right-of-way for channel enlargement to its confluence with R-226 and further downstream to Myakkahatchee Creek.
- Two culvert locations on the west boundary of Jockey Club should be evaluated and recommendations made regarding sufficiency and/or modifications needed to reduce flooding in the Jockey Club area (considering any increase in water levels that may result from the R-36 improvements and associated re-routing of flows).
- Refinement and future performance evaluations of the parallel bypass canal should include a more accurate representation of the combined conveyance and should eliminate double accounting of conveyance as a result of overlapping open channel cross sections. A request has been made to the District for cross section source data, cross section extents, surveyed point locations, conveyance way boundaries, etc., from the District's North Port/Big Slough WMP project files (including intermediate deliverables).
- Only two Price Boulevard drop structures are scheduled to be replaced with the widening project. City of North Port will identify those structures and the other remaining structures will be revised to again match the existing condition model configuration. Future performance evaluations will include the two identified structures as operable gates.

Team input in review and discussion of the screening-level model results contributed greatly to model development and the subsequent assembly and testing of candidate plans for drainage improvement.

Development of a Preferred Plan for Improvement

Through the preliminary evaluation of hydraulic performance it was determined that the Big Slough Flood Reduction Study preferred plan for improvement would be comprised of: internal flow diversion and increased conveyance capacity; external flow diversion; offsite storage; and/or property acquisition. Those basic plan components were considered by the Project Team to be most promising, based on review of preliminary hydraulic evaluations, and were merged into a small number of Candidate Plans for more rigorous consideration.

Plan Components and Candidate Plan Development

More specifically, the following alternatives were considered by the team for detailed evaluation.

- *Offsite Storage.* Flood reduction would be achieved in part by construction of a gated water control structure located at the FPL easement just north of the northern City boundary to limit high flows entering the City. Low flows will remain unchanged as a four-foot opening in the upstream face of the structure would extend fully to the existing channel bottom.

- *Internal Flow Diversion and Increased Conveyance Capacity.* Flood reduction would be achieved in part by construction of a parallel relief (bypass) channel alongside Myakkahatchee Creek within Tier 1 lots that have been acquired by the City of North Port, and through widening of the R-36 canal. Wide and Narrow options were considered for each channel improvement concept.
- *External Flow Diversion.* Flood reduction would be achieved in part through higher discharges westward to Deer Prairie Slough. Large increases are considered infeasible as SWFWMD has already restored the slough system and likely will not permit higher inflows to the slough. Therefore, the Preferred Plan will be adjusted to meet pre/post discharge rates and District staff will be asked at an upcoming coordination meeting if those rates can be increased.
- *Additional drainage improvements* may be achieved through upsizing R-36 culverts at Tropicaire, water control structure replacement during the widening of Price Boulevard, and improvements to the R-580 canal. The effect of Price Boulevard improvements will be localized. Widening of the R-36 and R-580 canals is expected to require additional and perhaps extensive downstream drainage system improvements to eliminate bottlenecks in other flood prone areas of the City.
- *Acquisition* would reduce losses through purchase of flood prone lands and/or building structures.

Numerous configurations were developed which incorporated various versions and combinations of the “Offsite Storage” and the “Internal Flow Diversion and Increased Conveyance Capacity” concepts described above. While a large number of configurations were evaluated (e.g., offsite storage with flow control set at a lower, 10-year event peak, stage), if performance was not superior to other configurations then they were not advanced as Candidate Plans.

After a Preferred Plan is selected from among the Candidate Plans, other alternative components can again be considered during finalization of the stormwater plan. For example, discussion with District land management staff may allow for adjustments to the offsite inflow control as well as external flow diversions to Deer Prairie Slough. These final plan modifications may have a small (but not insignificant) impact on performance which will be accounted for in final performance and benefit/cost evaluations.

Candidate Plan Descriptions and Performance

While a large number of configurations were assembled and tested in a preliminary fashion, a total of eight candidate plans were deemed most promising and carried forward through rigorous evaluation. Each of the eight candidate plans was comprised of one or more of the following components:

- *Offsite Storage/Control of Inflow in Myakkahatchee Creek*
 - Existing: No hydraulic control of inflow in Myakkahatchee Creek from upstream offsite areas.
 - Low Control: 150-foot concrete weir with crest at elevation 24.0 feet for overtopping of high flows. 4-foot wide slot open to existing channel bottom to allow normal low flows.
 - High Control: 150-foot concrete weir with crest at elevation 25.5 feet for overtopping of high flows. 4-foot wide slot open to existing channel bottom to allow normal low flows.
- *Internal flow diversion via R-36*
 - Existing: No improvements to existing ditch along northwestern and western city boundary.
 - Narrow: Widen ditch to maximum extent within existing drainage easement/right of way.
 - Wide: Widen ditch to 60-foot bottom with 4:1 side slopes, easement acquisition as-needed.

- *Internal flow diversion via R-580*
Existing: No improvements to existing ditch along northern city boundary east of Big Slough.
Narrow: Widen ditch to maximum extent within existing drainage easement/right of way.
Wide: Widen ditch to 60-foot bottom with 4:1 side slopes, easement acquisition as-needed.
- *Internal flow diversion via Bypass*
Existing: No bypass. All flow within Big Slough Canal/Myakkahatchee Creek and floodplain.
Narrow: Excavate bypass ditch with 20- to 50-foot bottom 4:1 side slopes for flow diversion.
Wide: Excavate bypass ditch with 50-foot bottom 4:1 side slopes for flow diversion.

Proposed condition simulations were performed for the mean annual, 10-year, and 100-year 24-hour storm events. Flood reduction performance of each plan was compared to the existing condition.

- The “wide” Internal Flow Diversion via Bypass component, comprised of excavating a bypass ditch within Tier 1 lots along the Myakkahatchee Creek with 50-foot bottom width and 4:1 side slopes, provided the majority of flood reduction benefits in each of the four best-performing Plans, with added improvement resulting from configurations of R-36 improvements and inflow control.
- Widening of R-36 provided benefits in terms of flood reduction in the I-75 area, but additional improvements (culvert pipe upsizing and modification of some secondary collection systems) would be required to mitigate increased water levels along R-36 south of Tropicair Boulevard. Furthermore, acquisition of additional easement would be difficult along R-36 and it would therefore be desirable to keep within the existing easement with any improvements.
- Restriction of inflows from the north also reduced flood levels in the I-75 area, although to a lesser extent than the bypass construction and R-36 widening concepts, while improvements to R-580 provided very little flood reduction benefit.

Benefit and Cost Comparison of Candidate Plans

Screening-level estimates of project benefits (flood damage reduction) were developed to allow initial comparisons of rough Benefit to Cost Ratio (BCR) values across Candidate Plans. Benefits considered cost avoidance for road repair and for residential structure damages for mean annual, 10-year, and 100-year storms. Cost calculations were also performed to develop preliminary order of magnitude estimates of probable construction costs, which could be compared across Candidate Plans to aid in selecting a Preferred Plan. A ratio of annualized benefits to annualized costs was calculated and that BCR assigned to each Candidate Plan for rough comparison to aid in selecting a Preferred Plan. Based on the screening-level estimates of Candidate Plan benefits, several plans are recommended for consideration.

Flood Reduction Comparison of Candidate Plans

Flood inundation areas for each simulation were mapped to depict areas removed from the floodplain. Flood reduction scenarios incorporating the wide bypass component were more effective in reducing flood levels in the watershed, particularly in the I-75 study area, than other Candidate Plans. Candidate Plans, as initially configured, may also result in increased flooding in downstream areas. Plan refinements and additional improvements were developed for the selected plan to relieve downstream bottlenecks and accommodate increased flows that result from the wider R-36 or addition of the Bypass.

Evaluation of Cost for Acquisition

A summary of combined “just value” for flood-prone parcels in the I-75 area (Figure 8) was presented to the Project Team. Flood risk was based on Existing Condition simulation of the 10-year storm event, with inundation areas mapped on a LiDAR-based terrain model. Parcels inundated 50% or more were selected.

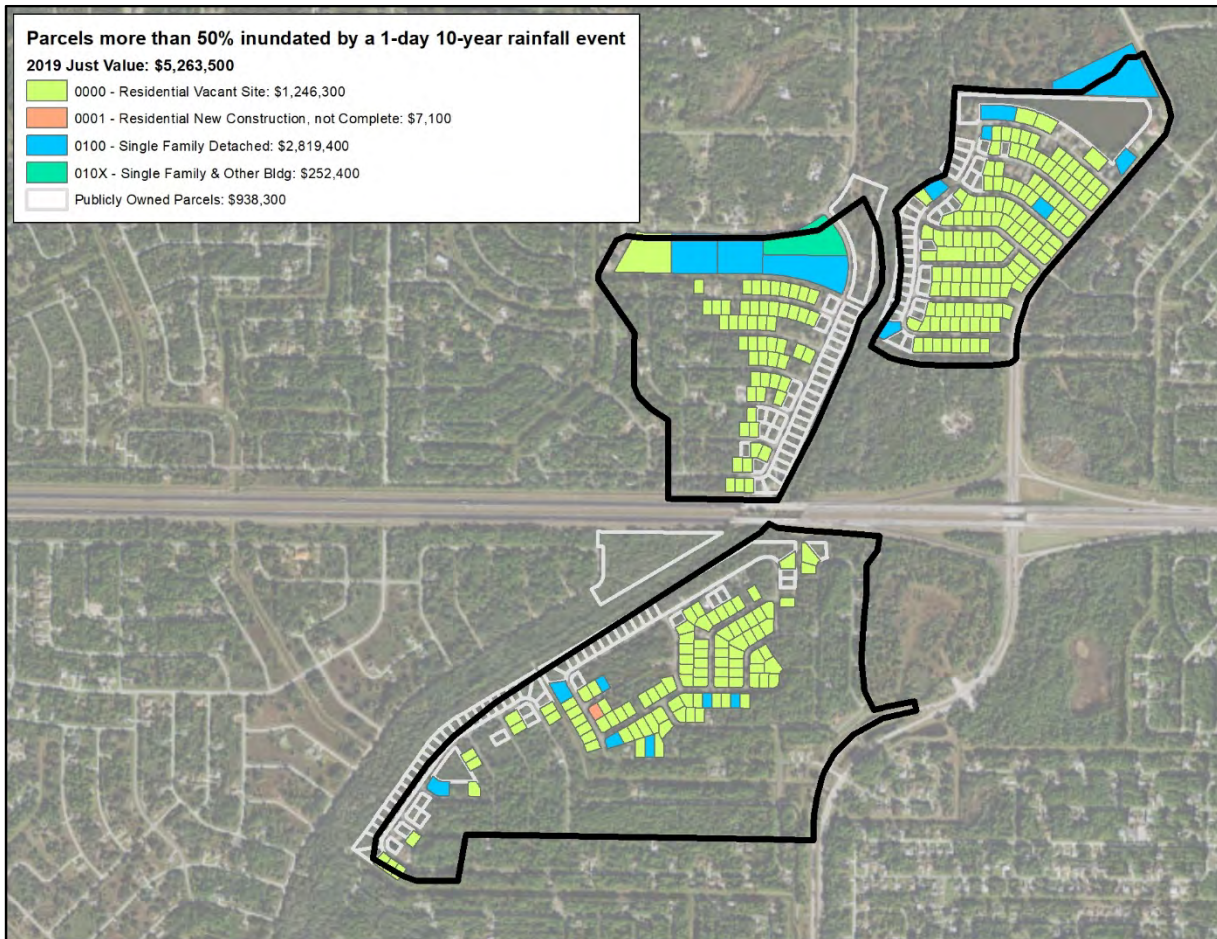


Figure 8

While it is understood that a land purchase option would be developed based on a more rigorous protocol, the cost assessment summarized below provides order of magnitude information for consideration.

	Preliminary Estimate of Acquisition Cost (Based on Sarasota County Property Appraiser 2019, projected at 4% inflation)				
	<u>2019</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>	<u>2035</u>
Estimated Property Value*	\$ 4,325,200	\$ 4,498,208	\$ 5,472,758	\$ 6,658,447	\$ 8,101,018
Estimated Annualized Cost**	\$ 313,403	\$ 325,939	\$ 396,555	\$ 482,470	\$ 586,999
* Combined "Just Value" of properties inundated 50% or more by flooding from a 10-year Storm Event; Excludes publicly owned parcels					
** Cost annualized over 50 years at 7%, 13.8 PV Annuity Factor (estimated acquisition cost only)					

Identification of the Preferred Plan for Flood Reduction

Based upon the Project Team's review and discussion of preliminary hydraulic evaluation results, a set of alternatives were advanced for development of improvements to achieve flood reduction through internal flow diversion and increased conveyance capacity, external flow diversion, offsite storage, and acquisition. Those concepts were refined and combined into a small number of Candidate Plans for evaluation of hydraulic performance, preliminary cost estimates, and screening-level benefit estimates.

This interim report, meetings, and team discussion provides a basis for evaluation of the Candidate Plans. The Project Team selected from among these Candidate Plans and the Preferred Plan was evaluated more rigorously for permissibility, costs, and benefits, resulting in a recommended plan for SWERP permitting.

Plan Coordination with Offsite Property Owners/Managers

The City of North Port is coordinating with both Sarasota County and SWFWMD regarding planned improvements for flood reduction. Coordination with those agencies, being responsible for management of the affected adjacent properties, is required to demonstrate that the proposed stormwater system modifications would not have an adverse impact and to seek authorizations and/or easements required for permit approval and project implementation.

- Regarding the restriction of inflows, it can be shown that normal flows will not be impacted by the proposed water control structure and that peak stage increases will be inconsequential in terms of environmental or other offsite impacts.
- Regarding the increase of outflows, historical flow patterns toward the Deer Prairie Slough/Creek system were interrupted decades ago by construction of R-36. While significant amounts of stormwater are currently discharged westward from the R-36 canal when it exceeds its bank, it may be allowable or even desirable to increase and/or redistribute those flows without causing adverse impacts.

In a joint meeting it was determined that additional time was needed to fully address existing conservation easements, offsite storage and discharge requirements, and potential impacts. Some options would require revisions to be made to the District's existing model of the Deer Prairie Slough area for proper evaluation. Because discussions are expected to continue for some time, those plan elements requiring offsite easements should be scheduled for later phases of implementation.

SWERP Pre-application Meeting with SWFWMD

City of North Port staff attended a pre-application meeting with staff of the SWFWMD in November 2018, during which a description of flood problems, the preferred plan of improvements, and flood reduction performance was provided. Comments and input were solicited regarding permitting requirements and other matters. It was agreed that requesting Conceptual Approval of the Stormwater Management Master Plan through submittal of a SWERP application for the entire project, followed by timely submittals of applications for construction of project components in a phased manner, would be the appropriate approach to permitting. Summary notes of the pre-application meeting are provided in Appendix I.

RECOMMENDED STORMWATER MANAGEMENT MASTER PLAN

The recommended Stormwater Management Master Plan, as presented by DES staff to the North Port City Commission on December 6, 2018 (Appendix J), has the following major components:

- Improvements to the existing retention ditch/conveyance system and upsizing road crossing culverts in the Dorothy Avenue area.
- Construction of a new bypass canal parallel to the Myakkahatchee Creek within a portion of the City's Tier 1 lots from south of Tropicair Boulevard to north of Price Boulevard.
- Increasing conveyance capacity through canal widening and upsizing pipe culverts in the R-36 retention ditch/conveyance system along the northern and western boundary of the city.
- Restriction/reduction of high flow into Myakkahatchee Creek near the north City Boundary.

Dorothy Avenue Improvements

Purpose: Improvements in the Dorothy Avenue area are proposed to serve two purposes:

- Under an initial phase, the extent and duration of localized flooding could be reduced by providing additional storage and conveyance capacity in the existing R-231, R-70, and R-69 canal systems. In this instance, a single box culvert should suffice to replace culverts at Trionfo Avenue, Porto Bello Avenue, Herbison Avenue, Eager Street, Allen Road, and South Biscayne Drive.
- Under the full plan, this conveyance system also serves to receive and convey higher flows passed southward via the improved R-36 ditch system. In order to handle higher flows from the north, three (3) box culverts will be required at each of the above road crossings.

Models were tested for both conditions to ensure suitable performance under phased implementation.

Configuration: For conceptual permitting purposes, the stormwater management plan includes:

- widening the existing ditches passing through the area, with bottoms ranging between fourteen and twenty feet in width and relatively steep (2:1) side slopes consistent with other stable ditches in the area, while lowering the ditch bottoms to elevation 1.5 feet, NAVD, and
- replacing existing culverts with triple 6'x4' box culverts at each road crossing.

Bypass Canal Construction

Purpose: Construction of a bypass canal is proposed to provide regional storage and conveyance capacity to reduce flooding in the I-75 project area and other portions of the City. This can be accomplished through excavation of a wide trapezoidal bypass channel within the extents of Tier 1 lots already acquired by the City between Tropicair Boulevard and Price Boulevard. The bypass canal would be constructed on either the east or west set of Tier 1 lots. Alternate configurations may address or include the following:

- A simple, trapezoidal cross section that is sodded for erosion protection is preferred as it would allow for maximum storage and conveyance capacity with reduced construction cost and minimal maintenance requirements. Some portions of the bypass canal may have other characteristics to

meet various goals. For example, segments may contain wet pools, some types and amounts of wetland vegetation, etc., as required to achieve water quality improvement, mitigate for wetland encroachments, or mitigate/avoid surficial aquifer impacts (dewatering) in adjacent areas.

- Existing lateral ditches (R-23, R-5, R-1, and unnamed interconnections), which currently discharge to the Myakkahatchee Creek may be intercepted by the bypass, piped beneath the bypass, or allowed to flow through breaks in the bypass ditch. The latter configuration would require additional structural connections be constructed between the bypass and Myakkahatchee Creek at points upstream and downstream of the existing lateral inflows. It is recommended (and proposed condition model construction assumes) that those inflows be intercepted by the bypass
- Exchange of flow between the Myakkahatchee Creek and the bypass canal will be limited to higher flows in order to maintain minimum flows and levels. Exchange may either be limited to discrete points, with a berm constructed along the creek-side bank of the bypass to prevent overflows, or overtopping may be allowed at existing overflows located between the creek and bypass canal. Detailed topographic ground survey is required to establish existing overflow elevations.
- There are no structural weirs being proposed at this time. Conveyance between the bypass channel and existing creek will be via large openings in the bank that runs between the two. These connector features are easily located at the endpoints of each bypass segment in the plan and profile and depicted in the typical sections provided in the accompanying Conceptual Plan set. Sheet D-3 provides a conceptual-level details of the bypass channel and bypass weir configurations in plan and section views.
- Elevations shown in the Conceptual Plan set (Sheets S-2 and S-3) are approximate as they are based on LiDAR-based terrain information and will change when more-detailed survey is collected to support design of the system. For modeling and future design purposes, the bypass channel is placed approximately one foot above the adjacent creek bottom and the connecting weirs (located at bypass segment endpoints) is placed one foot above the bypass channel bottom (two feet above the creek bottom). This configuration allows the creek to carry two feet of normal flow before any flow exchange occurs into the bypass.
- The bypass canal alignment is to be determined during detailed design and may be relocated from the Tier 1 lots to over the adjacent road right of way with some encroachment on adjacent Tier 1 and Tier 2 lots. The bypass canal alignment may also shift from one side of the Myakkahatchee Creek to the other for various reasons, such as to accommodate other Tier 1 lot uses (parks, etc.), avoid local impacts (such as archaeological or wetland conditions), or reduce cost and/or complexity of construction (such as in some large meanders of the Myakkahatchee Creek).

Models were tested for all of the above conditions to ensure suitable performance under a range of implementation conditions. For example, manning's roughness values were varied from 0.040 to 0.150 to reflect changes in vegetation cover in the bypass channel (sodded versus wetland vegetation), all three interconnectivity options for lateral ditches were evaluated, exchange between the creek and canal was allowed across topographic saddles (from LiDAR-based terrain) and restricted with a constructed berm, and the final (downstream) segment of the bypass canal was tested on both the east and west side of the Myakkahatchee Creek in anticipation of possible construction issues just upstream of Price Boulevard.

These alternatives were generally discussed during pre-application meetings held with SWFWMD for the Statewide Environmental Resource Permit (SWERP) application and details will be worked out during subsequent design and permitting (i.e., in phased SWERP applications for construction approval)

Configuration: For conceptual permitting purposes, the stormwater management plan includes:

- construction of a sodded trapezoidal bypass canal on the west side (switching to the east side in the lower segment to avoid meanders of the Myakkahatchee Creek), utilizing the full width of Tier 1 lots from Tropicaire Boulevard to north of Price Boulevard, with bottoms ranging between fifty and eighty feet in width and moderate (4:1) side slopes, excavated to elevations one foot above the existing Creek bottom, and intercepting lateral surface inflows (from R-23, R-5, R-1, etc.).
- exchange between Myakkahatchee Creek and the bypass is allowed only at discrete flow diversion points, where 150-foot wide broad-crested weirs allow high flows to move out of and back into the Creek at elevations two feet above the Creek bottom, with the diversion structures to be comprised of either earthen or structural berms, with structure design and erosion protection to be determined based on flow conditions, site characteristics, and geotechnical recommendations.

R-36 Improvements

Purpose: Improvements to the existing R-36 canal and culvert structures are proposed to increase storage and conveyance capacity of that system, allowing diversion of higher flows from north of the City around its western perimeter and thereby reducing flooding near I-75 and in other flood prone areas. This is the “narrow” improvement option, which constrains canal widening to existing drainage easements.

Changes to flow rate and/or volume at existing overflows westward to Deer Prairie Slough require agency coordination between the City of North Port, SWFWMD, and Sarasota County. While the current conceptual design does not increase peak flows to the west, the conceptual approval of the SWERP should recognize and allow for this future improvement. Changes in the design configuration from the current plan will require detailed topographic survey of the western bank and natural grade outside (west) of the R-36 canal, detailed modeling of both the Big Slough and Deer Prairie watersheds, and a modification of the North Port/Big Slough Stormwater Management Master Plan and SWERP.

Configuration: For conceptual permitting purposes, the stormwater management plan includes:

- Widening the existing R-36 canal section to the maximum extent possible while remaining within the existing drainage easement, with bottom widths ranging from 30 to 65 feet and relatively steep (2:1) side slopes consistent with existing bank conditions along R-36, while maintaining the ditch bottoms at their current elevations. Assume 20% of total length of improved (widened) channel will require rip-rap erosion protection, for cost estimating purposes.
- Enlarging WCS-162 and installing two additional 60” culverts at Tropicaire Boulevard
- Installing two additional 48” culverts at I-75

Proposed features are depicted in plan and profile, cross section, and detail sheets in the accompanying Conceptual Plan set.

To develop cross section data for the R-36 canal system, the SWFWMD LiDAR-based terrain model was first adjusted using available bottom elevation information in order to better describe existing geometry. A proposed condition terrain model was then developed by applying proposed channel geometry for various design configurations (e.g., combinations of bottom width and side slope). Using the terrain models and other available information, such as aerial photos and property boundaries downloaded from the Sarasota County property appraiser, aided in the development of proposed condition channel geometry by confirming that the proposed system could be constructed within site constraints.

The hydraulic model and conceptual plan set depictions of channel sections are in close agreement, given that geometry for both was taken from the same set of terrain models. For model development, cross sections were cut from existing and proposed condition terrain models at the reach midpoint for each modeled channel segment. Cross sections shown in the conceptual plan drawings Sheets S-1 to S-4 were taken from the existing and proposed condition terrain models at various locations for general depiction and cost evaluation (used for quantity takeoffs, etc.) of the proposed work.

Because the model is constructed with cross sections cut from the terrain model at discrete points, there will be some small variation in storage between the two. This level of accuracy is adequate and appropriate for conceptual-level plan development, modeling, performance evaluation, and cost estimating. Construction-level design and permitting will be based on thorough site-specific survey of channel features with model updates being performed in order to confirm existing and proposed condition performance.

Inflow Control Structure

Purpose: Improvements at the inflow point north of the City are proposed to reduce flows and thereby drop peak stages along the Myakkahatchee Creek. A gated control structure will be installed at the FPL Power Line Road with an open bay at the creek bottom to allow low flows to pass unimpeded. The gated structure will cause higher flows to be attenuated with increased upstream storage on undeveloped lands. While a “high” control option is currently recommended, with overtop at elevation 25.5 feet NAVD, the degree to which inflows are restricted, upstream flood storage is increased, and downstream stages are reduced will depend on the outcome of ongoing agency coordination regarding storage on those lands.

Models were tested for a range of configurations to ensure suitable performance. The current stormwater management plan is conservative and results in a relatively small increase in upstream inundation.

Configuration: For conceptual permitting purposes, the stormwater management plan includes:

- construction of a gated water control structure on the upstream side of Power Line Road with a four-foot opening at existing channel bottom at 17.5 feet, NAVD, and with gates closed overflow and adjacent structure overtop elevations at 25.5 feet, NAVD.
- Existing culverts at Power Line Road converted to risers with control elevation 25.5 feet, NAVD.
- Power Line Road surface smoothed and low points filled to elevation 26.0 feet, NAVD.

The control structure may be located immediately upstream or downstream of the FPL roadway, and the number and size of gates are to be determined, with the single open gate for unimpeded low flows.

Engineer's Opinion of Probable Cost

Estimated project costs including engineering design, permitting, and construction are based on RS Means 2017 Heavy Construction Costs with national average values adjusted to the Ft Myers/Sarasota County area. Estimates include a 30% contingency and were projected to future years (up to 2035) assuming 4% inflation. Combined costs for each of those projections were annualized over 50 years at 7%.

	Engineer's Estimate of Probable Construction Cost (Based on RS Means 2017, with costs projected at 4% inflation)				
	2017	2020	2025	2030	2035
Dorothy (Triple Box Culvert)	\$ 5,628,495	\$ 6,331,291	\$ 7,702,984	\$ 9,371,858	\$ 11,402,298
R-36 Improvements	\$ 15,379,020	\$ 17,299,306	\$ 21,047,251	\$ 25,607,199	\$ 31,155,073
Bypass (flowway, n = 0.040)	\$ 17,121,876	\$ 19,259,782	\$ 23,432,470	\$ 28,509,182	\$ 34,685,779
Reduce Northern Inflows	\$ 2,575,105	\$ 2,896,643	\$ 3,524,209	\$ 4,287,739	\$ 5,216,690
Estimated Combined Cost	\$ 40,704,496	\$ 45,787,022	\$ 55,706,913	\$ 67,775,978	\$ 82,459,840
Estimated Annualized Cost*	\$ 2,949,442	\$ 3,317,721	\$ 4,036,515	\$ 4,911,037	\$ 5,975,028

* Combined construction cost annualized over 50 years at 7%, 13.8 PV Annuity Factor (capital cost only, excludes O&M)

Benefits and Benefit to Cost Ratio (BCR)

Benefits are based upon flood reduction achieved across a range of simulated storm events compared to the existing condition. For roadway removed from floodplain, benefits reflect avoidance of repair costs at a rate of \$50,000 per mile. For parcels removed from the floodplain, benefits reflect avoidance of \$6,300 per occurrence, based on historical NFIP claims statistics reduced by 85 percent to account for lot vacancy.

	Flood Reduction (acres)	Road Flood Reduction (miles)	Parcels Reduction (centroid)
2.33-year	244	7.8	234
5-year	359	12.9	405
10-year	460	18.3	538
25-year	495	20.7	542
50-year	518	21.1	562
100-year	557	24.5	558

Annual benefit is calculated by multiplying total project benefits for a storm event simulation by the event probability then summing across events simulated. In the case of the full stormwater management plan, annualized benefits accrue to \$1,977,742 with a BCR of 67 percent. Future enhancements (e.g., allowing greater inflow restriction or diversions to Deer Prairie) may increase the flood reduction performance and BCR of the full plan. In the meantime, a much higher BCR can be achieved through partial (Phase I) implementation of the master plan to include the Dorothy Avenue and Bypass components, only, where annualized project benefits would accrue to \$1,842,132 for an excellent BCR of 138 percent.

Flood Area Reduction for 1-Day Mean Annual Event in the I-75 Area

Figure 8 illustrates reduced extents of inundation in the I-75 area for the Mean Annual storm event for the full stormwater management master plan model.

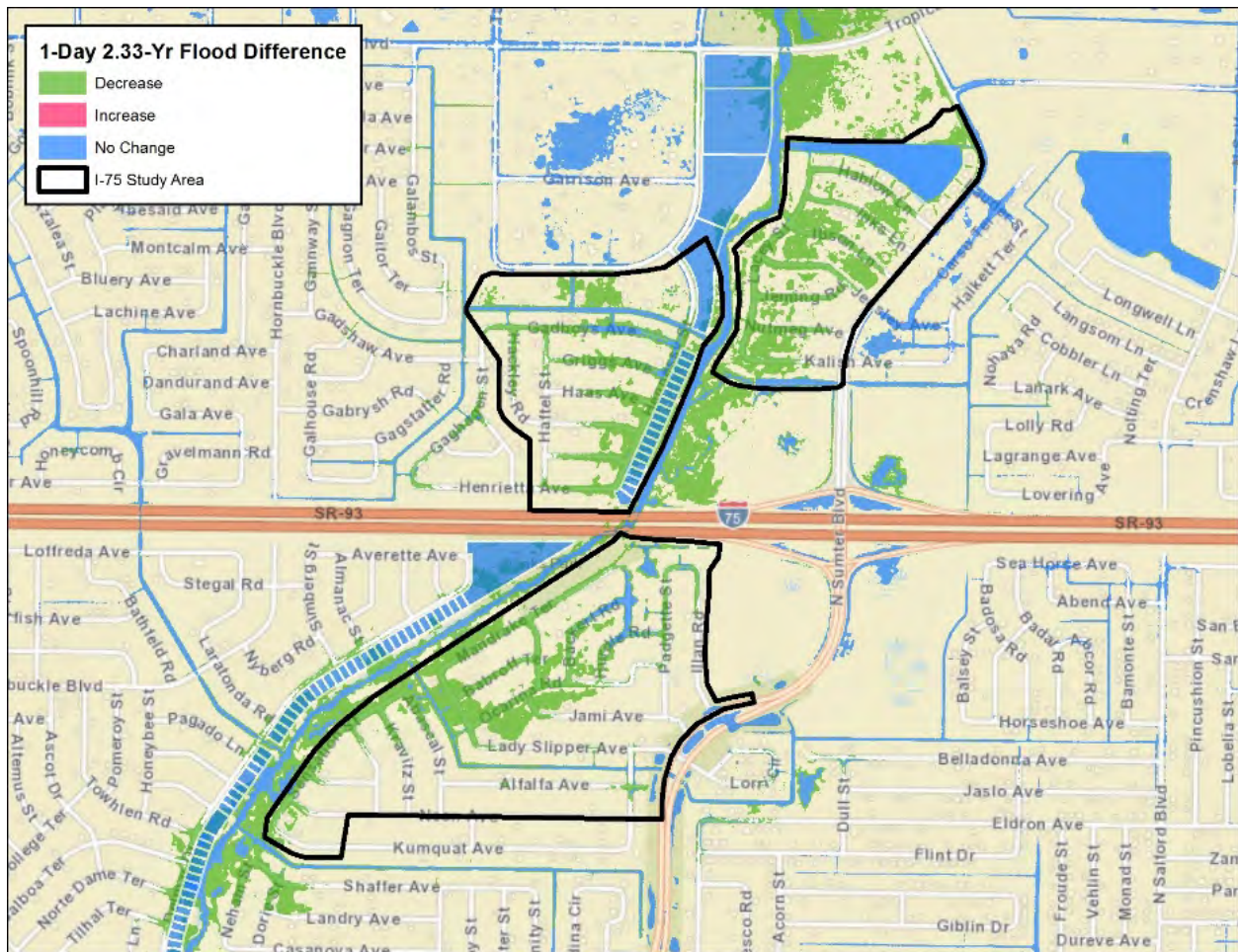


Figure 9: 1-Day 2.33-Year Flood Difference Map, I-75 Area

Flood Area Reduction for 1-Day 5-Year Event in the I-75 Area

Figure 9 illustrates reduced extents of inundation in the I-75 area for the 1-Day 5-Year storm event for the full stormwater management master plan model.

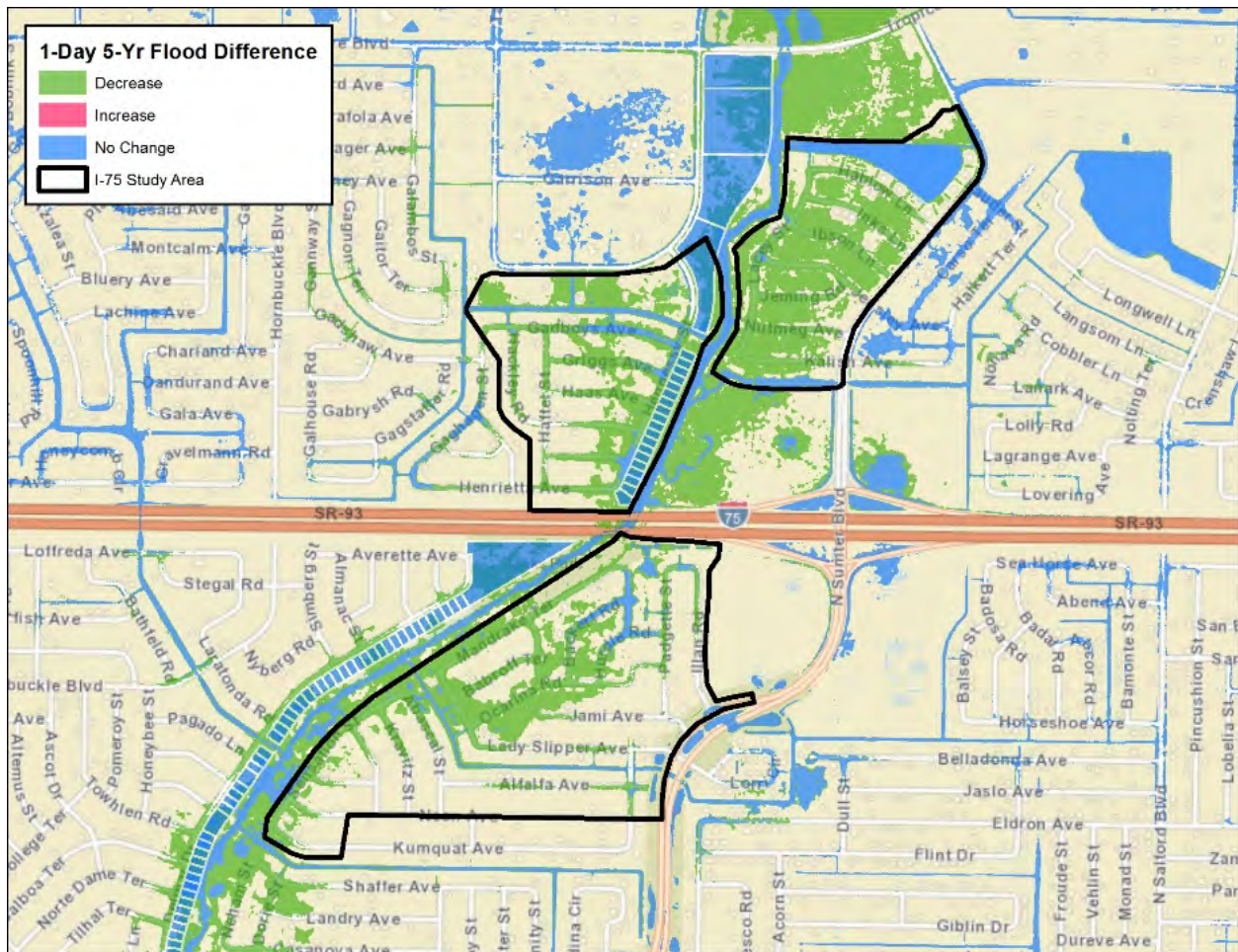


Figure 10: 1-Day 5-Year Flood Difference Map, I-75 Area

Figure 10 illustrates reduced extents of inundation in the I-75 area for the 1-Day 10-Year storm event for the full stormwater management master plan model.

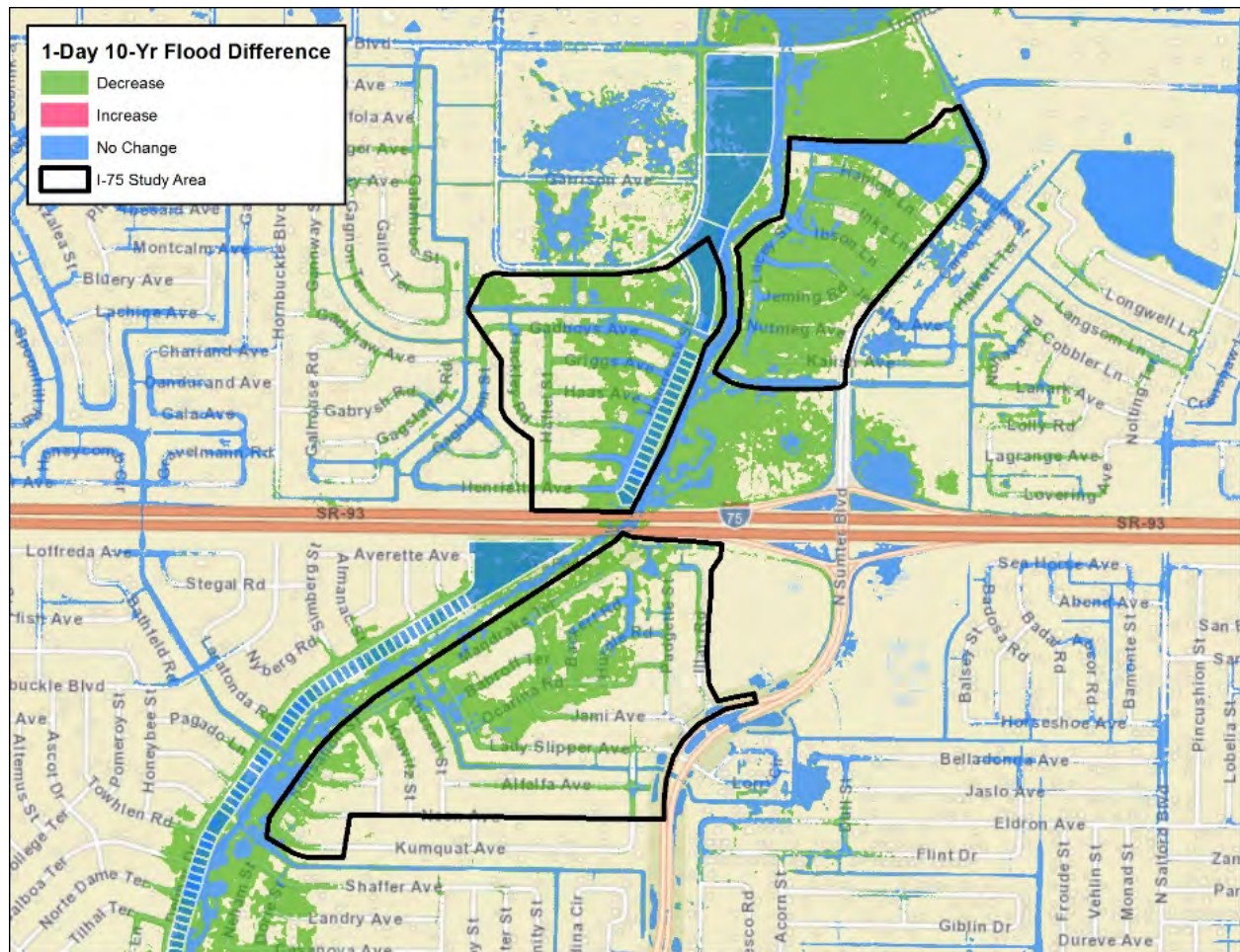


Figure 11: 1-Day 10-Year Flood Difference Map, I-75 Area

Flood Area Reduction for 1-Day 25-Year Event in the I-75 Area

Figure 11 illustrates reduced extents of inundation in the I-75 area for the 1-Day 25-Year storm event for the full stormwater management master plan model.

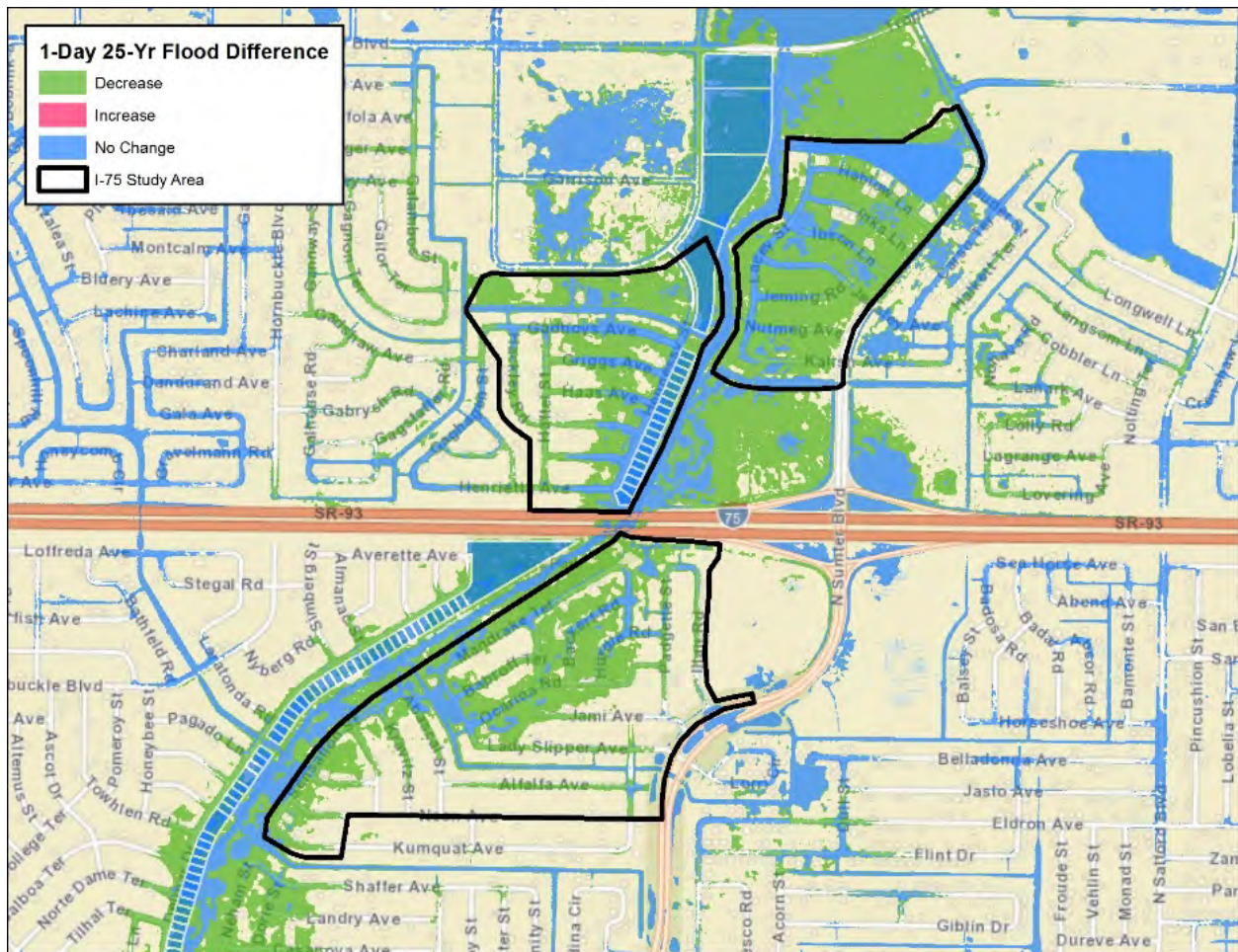


Figure 12: 1-Day 25-Year Flood Difference Map, I-75 Area

Flood Area Reduction for 1-Day 50-Year Event in the I-75 Area

Figure 12 illustrates reduced extents of inundation in the I-75 area for the 1-Day 50-year storm event for the full stormwater management master plan model.

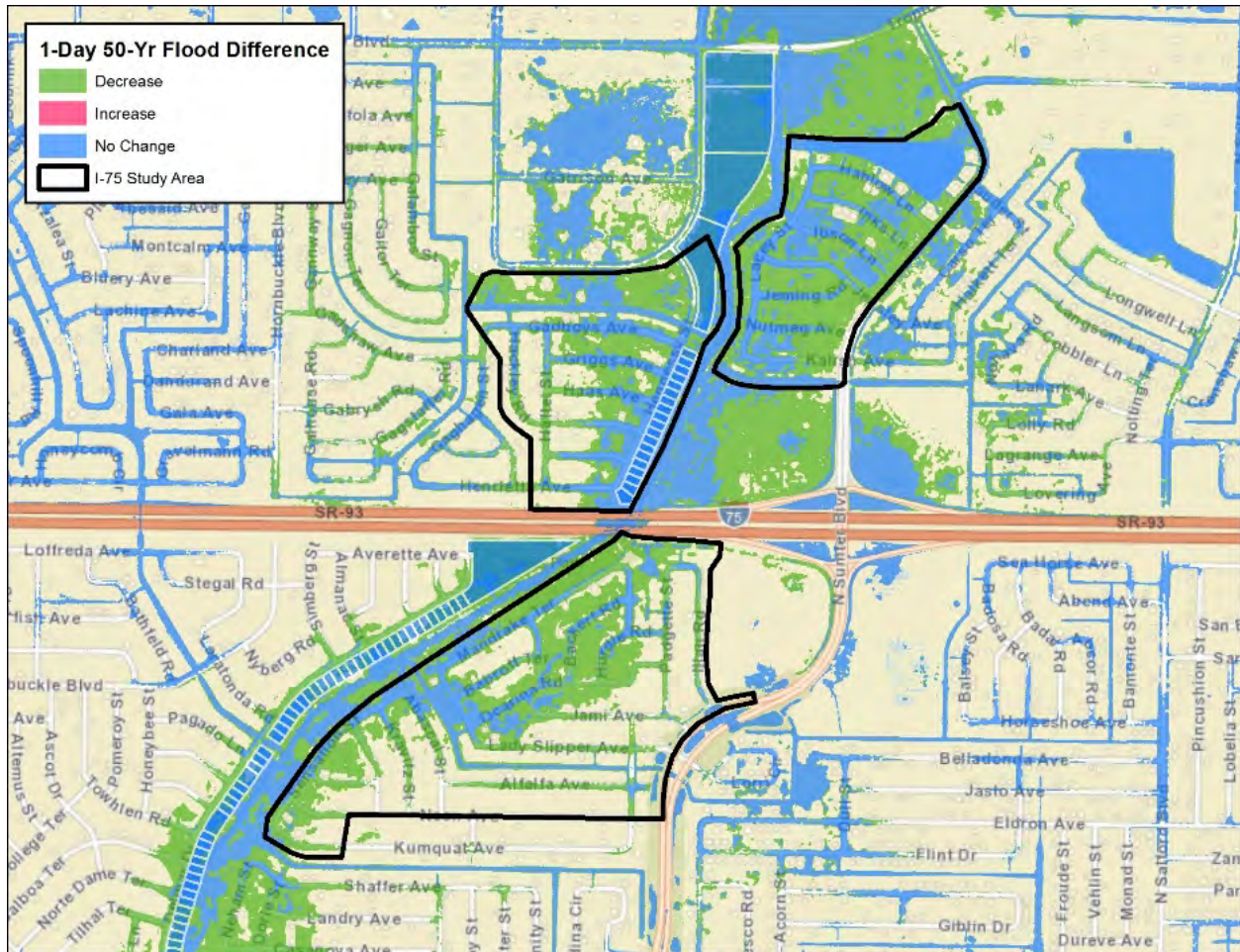


Figure 13: 1-Day 50-Year Flood Difference Map, I-75 Area

Flood Area Reduction for 1-Day 100-Year Event in the I-75 Area

Figure 13 illustrates reduced extents of inundation in the I-75 area for the 1-Day 100-Year storm event for the full stormwater management master plan model.

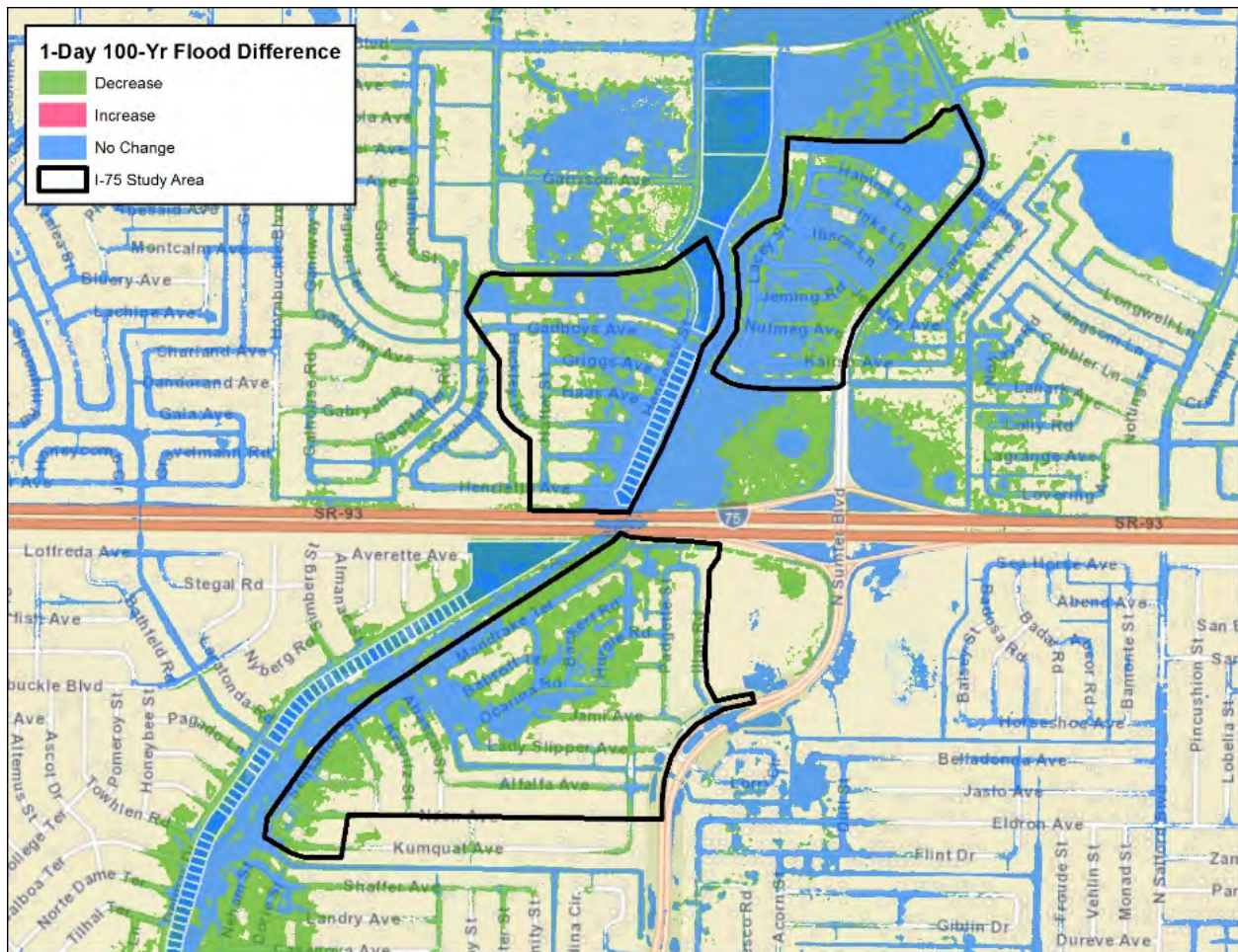


Figure 14: 1-Day 100-Year Flood Difference Map, I-75 Area

Flood Area Reduction for 1-Day Mean Annual Event in the Dorothy Avenue Area

Figure 14 illustrates reduced extents of inundation in the Dorothy Avenue area for the Mean Annual storm event for the full stormwater management master plan model.

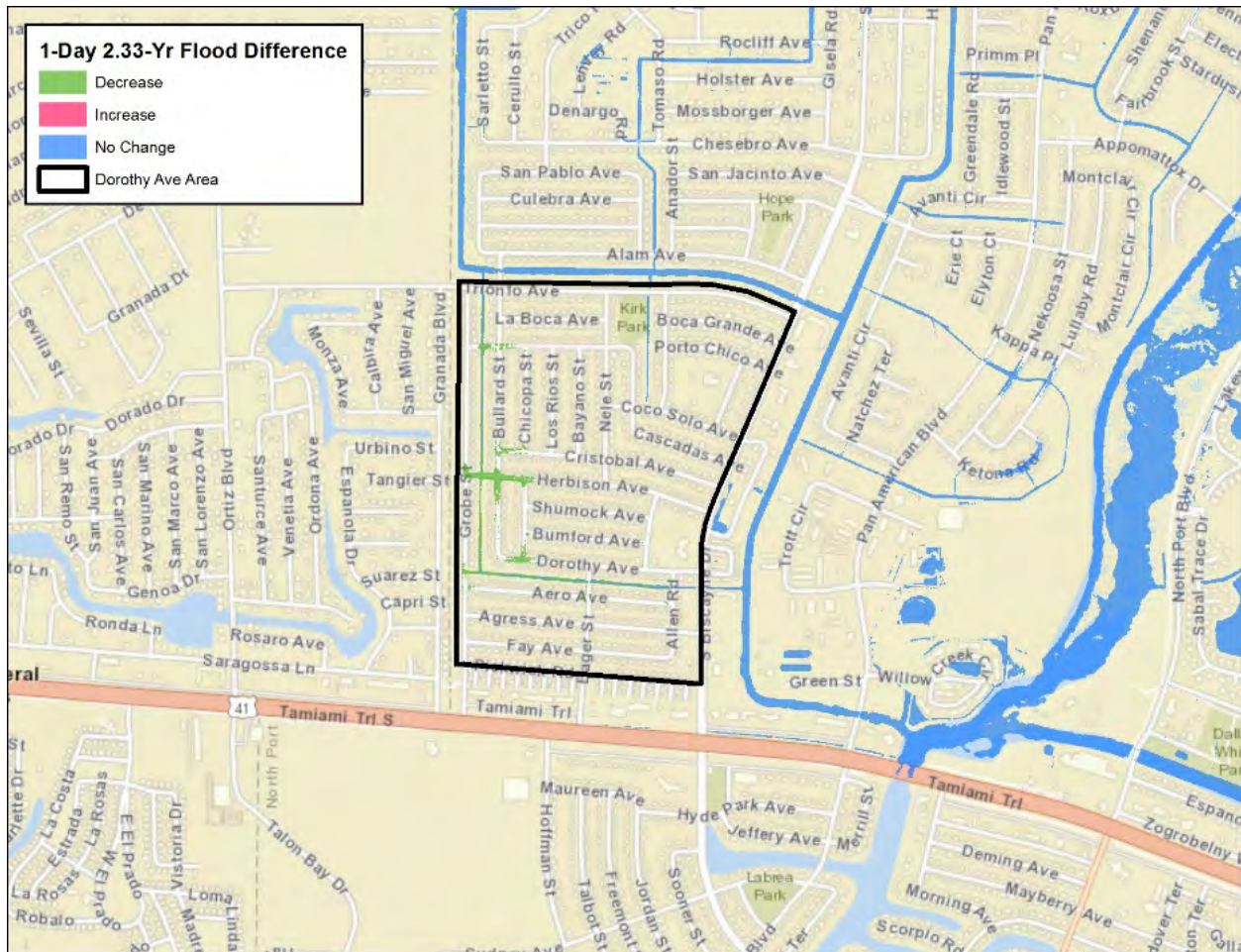


Figure 15: 1-Day 2.33-Year Flood Difference Map, Dorothy Avenue Area

Flood Area Reduction for 1-Day 5-Year Event in the Dorothy Avenue Area

Figure 15 illustrates reduced extents of inundation in the Dorothy Avenue area for the 1-Day 5-Year storm event for the full stormwater management master plan model.

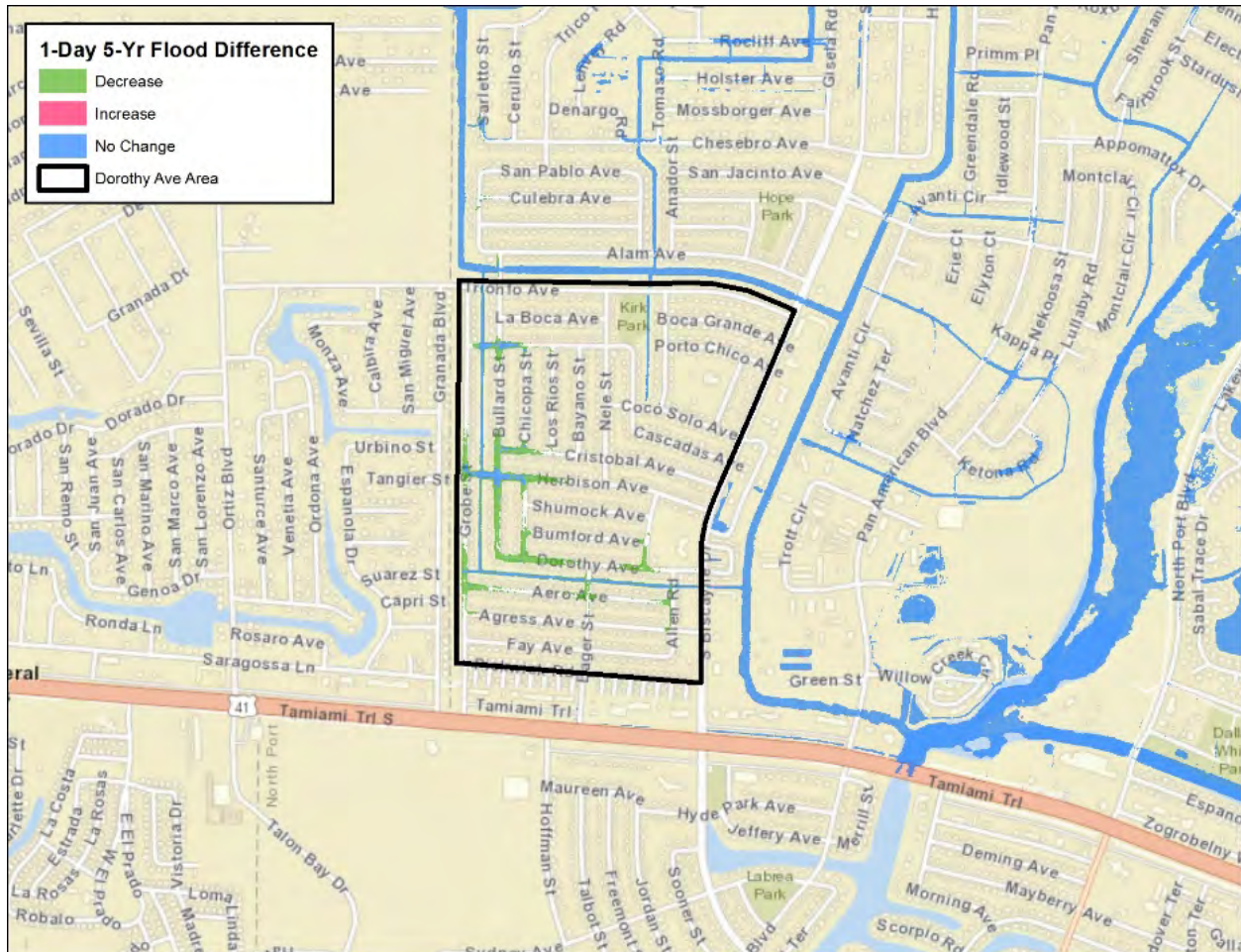


Figure 16: 1-Day 5-Year Flood Difference Map, Dorothy Avenue Area

Flood Area Reduction for 1-Day 10-Year Event in the Dorothy Avenue Area

Figure 16 illustrates reduced extents of inundation in the Dorothy Avenue area for the 1-Day 10-Year storm event for the full stormwater management master plan model.

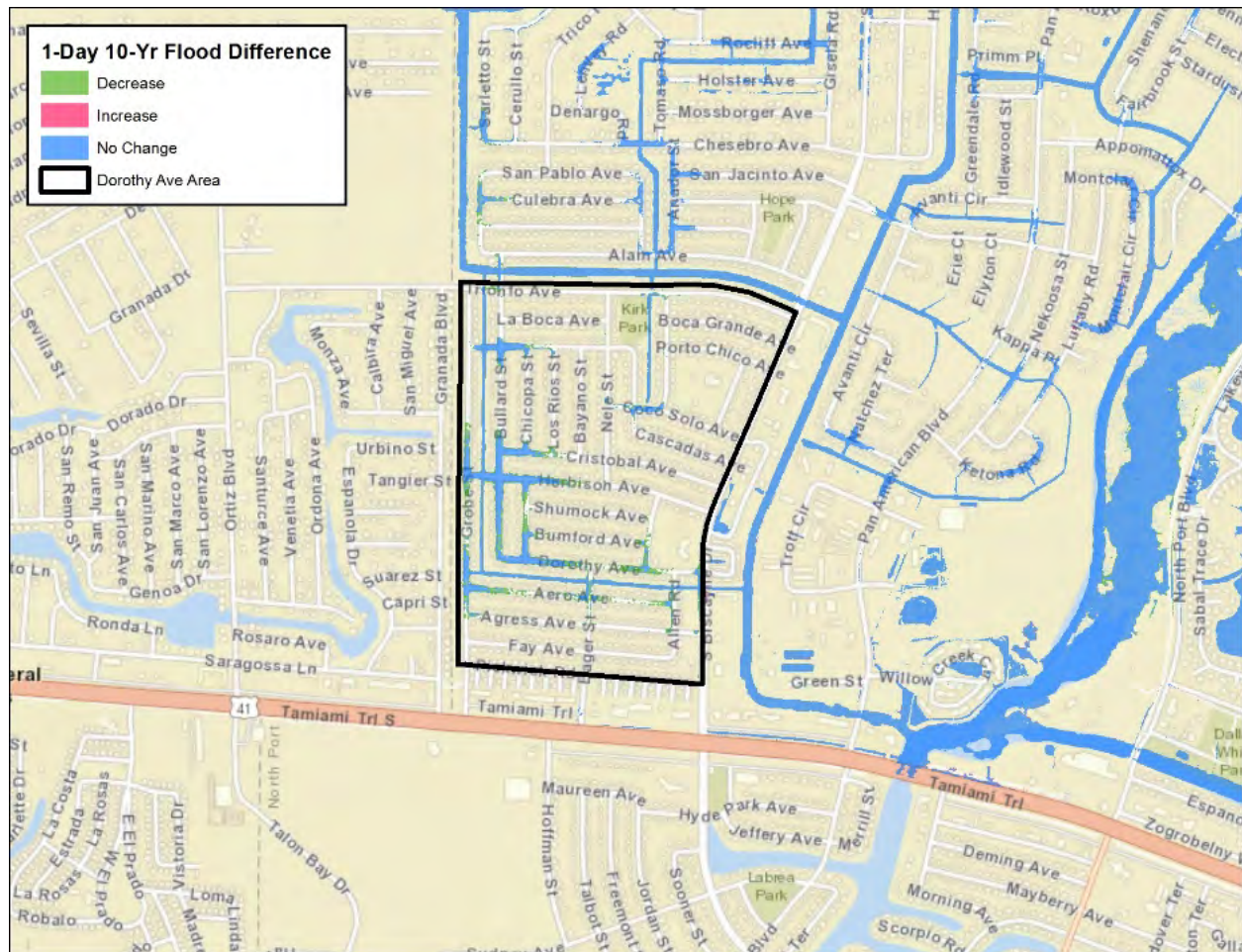


Figure 17: 1-Day 10-Year Flood Difference Map, Dorothy Avenue Area

Flood Area Reduction for 1-Day 25-Year Event in the Dorothy Avenue Area

Figure 17 illustrates reduced extents of inundation in the Dorothy Avenue area for the 1-Day 25-Year storm event for the full stormwater management master plan model.

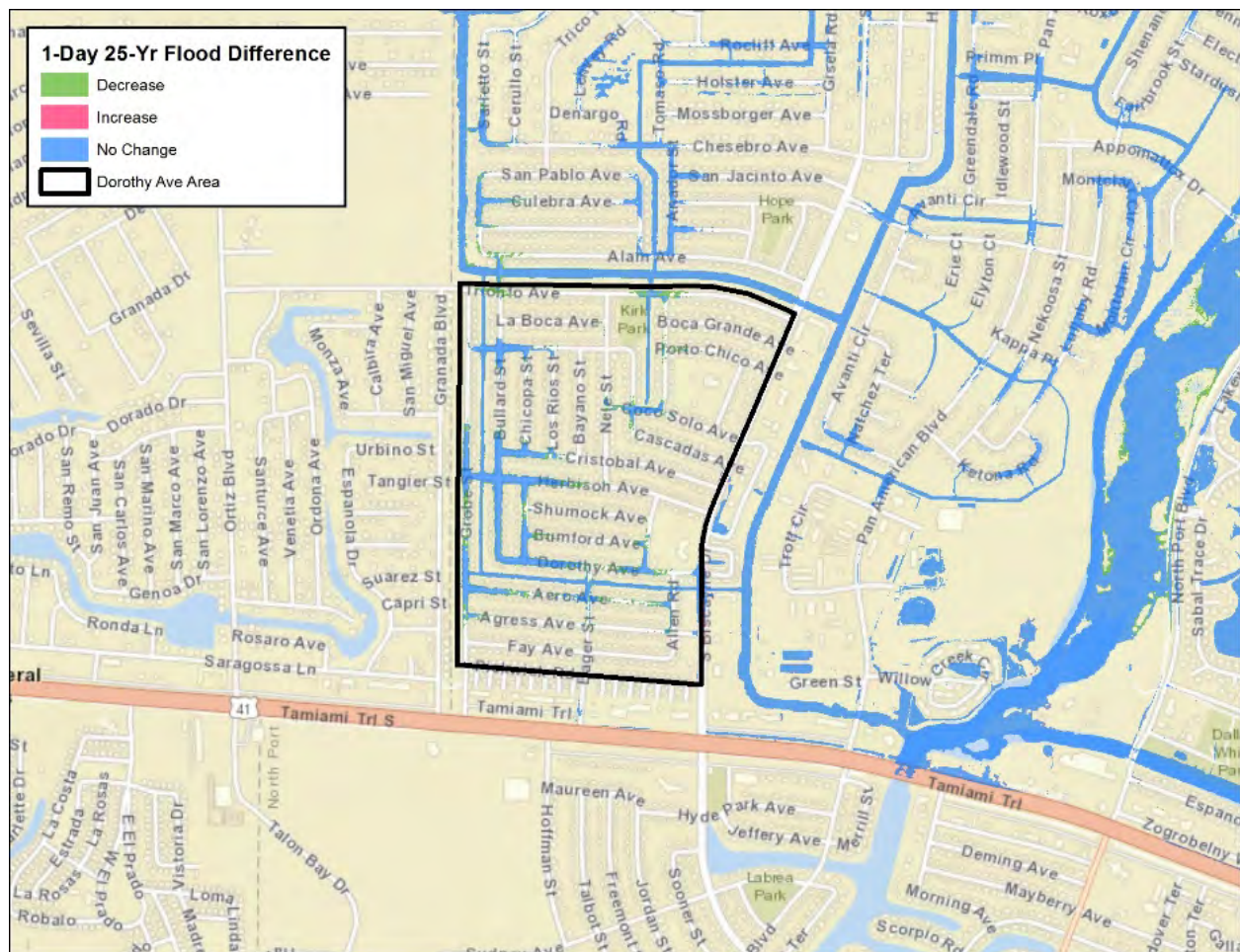


Figure 18: 1-Day 25-Year Flood Difference Map, Dorothy Avenue Area

Flood Area Reduction for 1-Day 50-Year Event in the Dorothy Avenue Area

Figure 18 illustrates reduced extents of inundation in the Dorothy Avenue area for the 1-Day 50-year storm event for the full stormwater management master plan model.

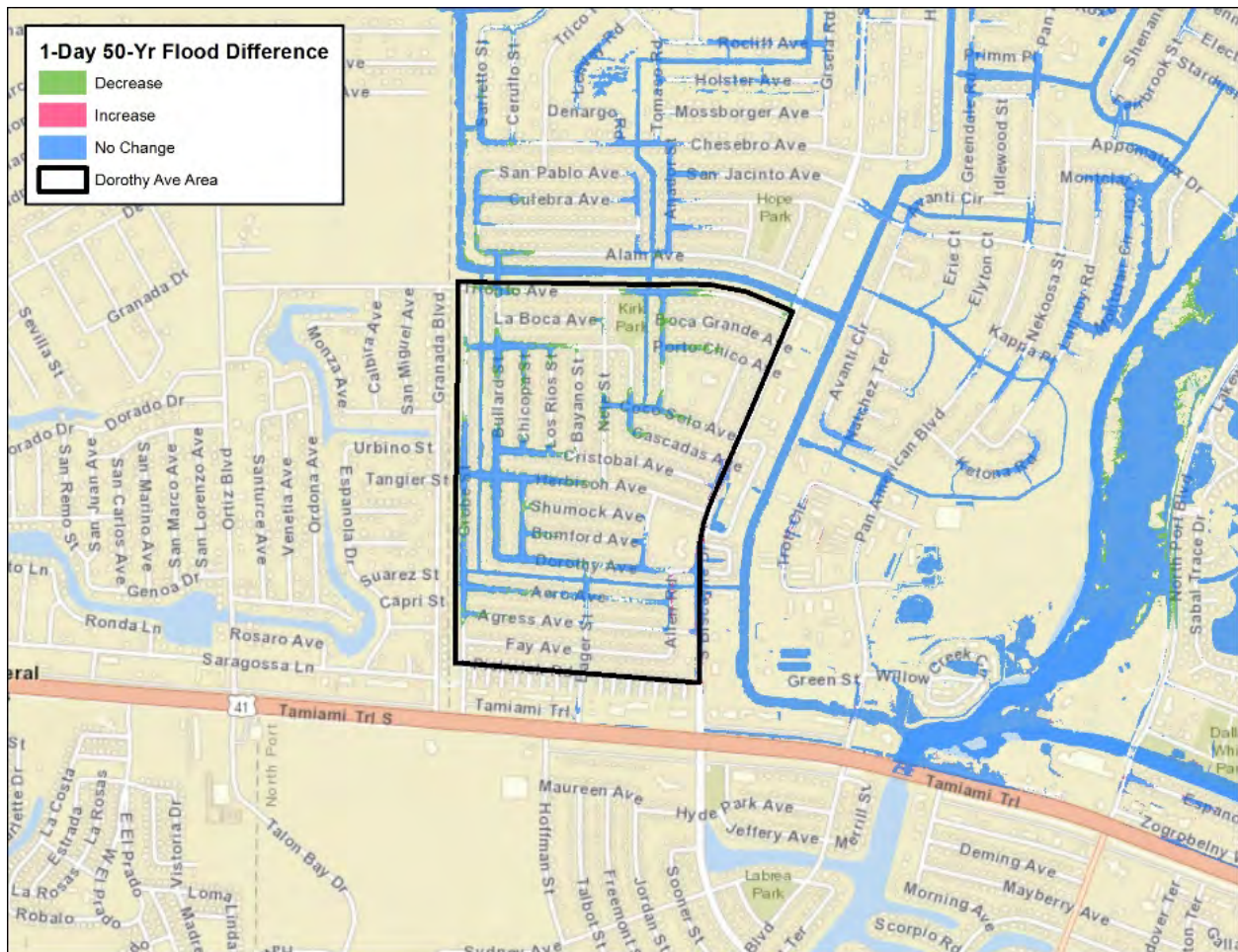


Figure 19: 1-Day 50-Year Flood Difference Map, Dorothy Avenue Area

Flood Area Reduction for 1-Day 100-Year Event in the Dorothy Avenue Area

Figure 19 illustrates reduced extents of inundation in the Dorothy Avenue areas for the 1-Day 100-Year storm event for the full stormwater management master plan model.

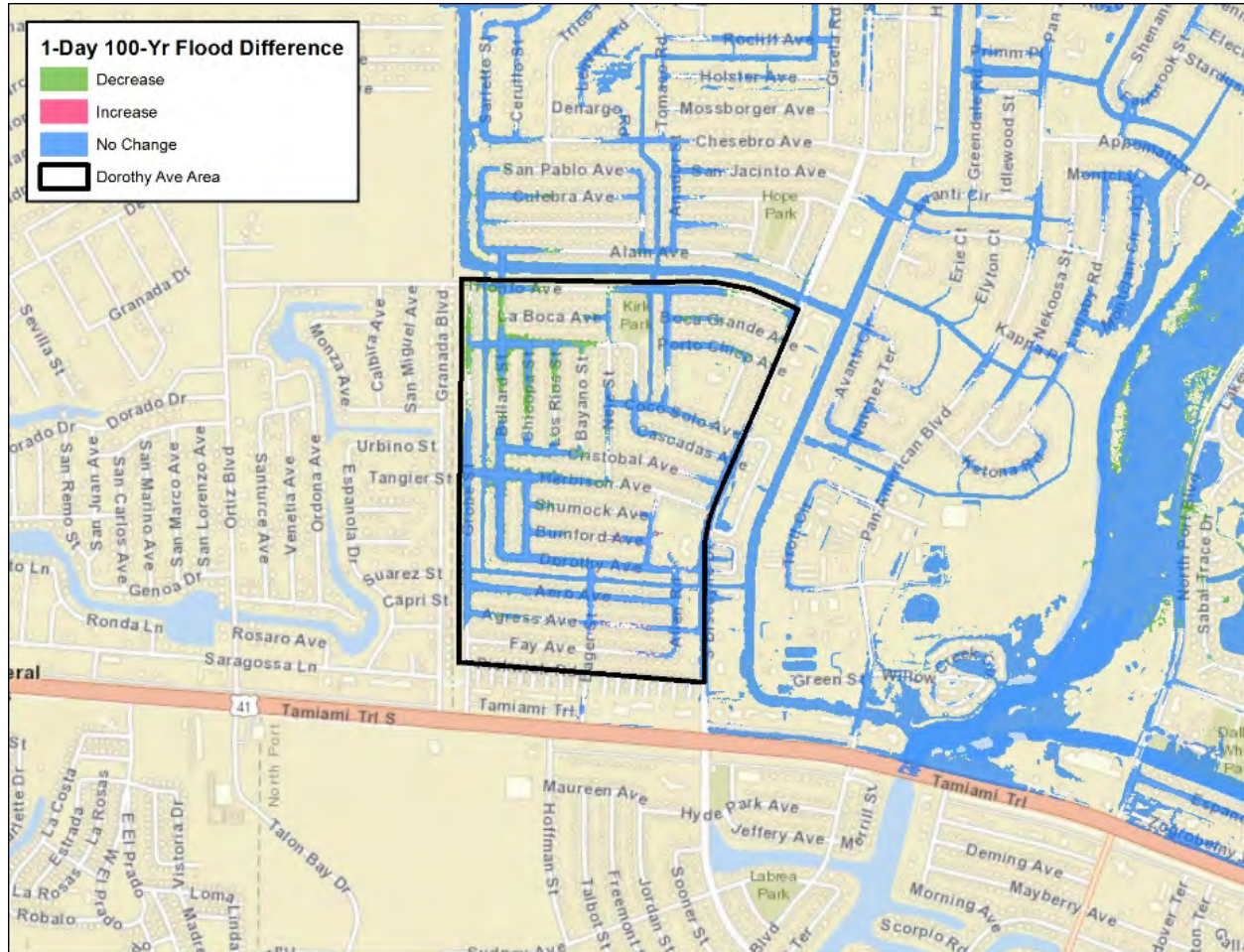


Figure 20: 1-Day 100-Year Flood Difference Map, Dorothy Avenue Area

It should be noted that the set of improvements proposed for the Dorothy Avenue area were conceived to carry higher inflows that would result from R-36 widening, with the primary objective being to carry those inflows without increasing localized flooding. As designed, the Dorothy Avenue area will also see flood reduction benefits. Those local flood reduction benefits are more noticeable for smaller storms. If R-36 widening is not performed, the Dorothy Avenue improvements could be adjusted to provide for local improvement only at lower cost and perhaps improved local flood reduction performance. Additionally, the local collection system was not evaluated for improvement. It is possible that additional flood reduction benefits could be achieved through local collection system improvements in this and other areas affected by the proposed primary conveyance system improvements.

Appendix A

Professional Engineering Services for the Big Slough Flood Reduction Study - Project Plan

DeLoach Engineering Science, PLLC., November 2016



City of North Port

Professional Engineering Services for the Big Slough Flood Reduction Study

**Agreement #2016-48
Department of Public Works**

PROJECT PLAN



November 2016

**DeLoach Engineering Science, PLLC
1845 Ivanhoe Road | Orlando, FL 32804**

DeLoach Engineering Science
water resources and civil engineering

TABLE OF CONTENTS

Introduction	1
Basic Watershed Information	1
Previous Work Completed	5
Potential Issues	6
Outline of This Document	6
Goals and Objectives.....	6
Agency Goals	6
Study Objectives	6
Work Breakdown Structure	7
Project Schedule	9
Critical Path	9
Project Invoice Schedule	9
Project Cost	10
Itemized Cost of Services Performed	10
Staff Allocation.....	10
Description of Project Activities.....	11
Scope of Work.....	11
Project Startup	11
Project Approach	12
Assumptions and Issue Management.....	14
Quality Assurance Plan	14
Quality Assurance	14
Quality Control	15
Communication Plan.....	16
Internal Communication	16
External Communication	16
Meetings	17
Tables	18
Appendices.....	21

Professional Engineering Services for the Big Slough Flood Reduction Study

PROJECT PLAN

The purpose of this project plan is to document the approach to executing pending project tasks and to identify outstanding project-related issues. This is the first draft of project development for the Big Slough Flood Reduction Study. *This document will periodically be revisited to assess overall progress, describe upcoming tasks and deliverables, evaluate staff allocations, and describe deficiencies and recovery actions completed and/or planned.*

Introduction

The Big Slough Flood Reduction Study, cooperatively funded by and between the City of North Port and the Southwest Florida Water Management District (SWFWMD), is being performed for the Department of Public Works under City of North Port Agreement #2016-48. Notice to Proceed to conduct the flood study was issued to DeLoach Engineering Science, PLLC (DES) on October 13, 2016. Per the agreement, DES will evaluate feasibility and cost effectiveness of various solutions intended to reduce flooding in the City of North Port within the Big Slough Watershed.

More specifically, the Big Slough Flood Reduction Feasibility Study is comprised of two distinct parts:

- Part 1 is to evaluate localized flooding along Myakkahatchee Creek within the I-75 and Jockey Club Study Areas and recommend construction projects or other methods to mitigate flooding.
- Part 2 is to evaluate preliminary regional concepts including, but not limited to, those previously developed by others, with the intent to advance large scale solutions to mitigate flooding throughout the City of North Port.

Stormwater evaluations performed by DES will employ data and a watershed model previously developed by Ardaman & Associates, Inc. (Ardaman) for the North Port/Big Slough Watershed Management Program (WMP) project. That prior project was also cooperatively funded by the City of North Port and the SWFWMD and was completed in 2014. The existing watershed model was developed by Ardaman using CHAN Version 2.03 (Aquarian Software, Inc.). All data collected, work products generated, and reports submitted under the prior North Port/Big Slough WMP project will be obtained by the City and provided to DES for use in performing this flood reduction study.

Basic Watershed Information

The Big Slough Watershed is in southeastern Sarasota County and is tributary to the Myakka River. Portions of the City of North Port located east of the Myakka River are within the southern portion of the Big Slough Watershed. The Big Slough Canal (also called Myakkahatchee Creek in its lower reaches) passes from north to south and receives inflows from numerous waterways within the City. Discharge of waters from the City and upstream offsite areas occurs primarily via Myakkahatchee Creek as it passes beneath US 41. Lesser discharges occur southward through several open weirs, drop structures, and culverts along Hillsborough Boulevard into waterways which continue through Port Charlotte. Several of those downstream waterways are controlled by structures while others are tidally influenced.

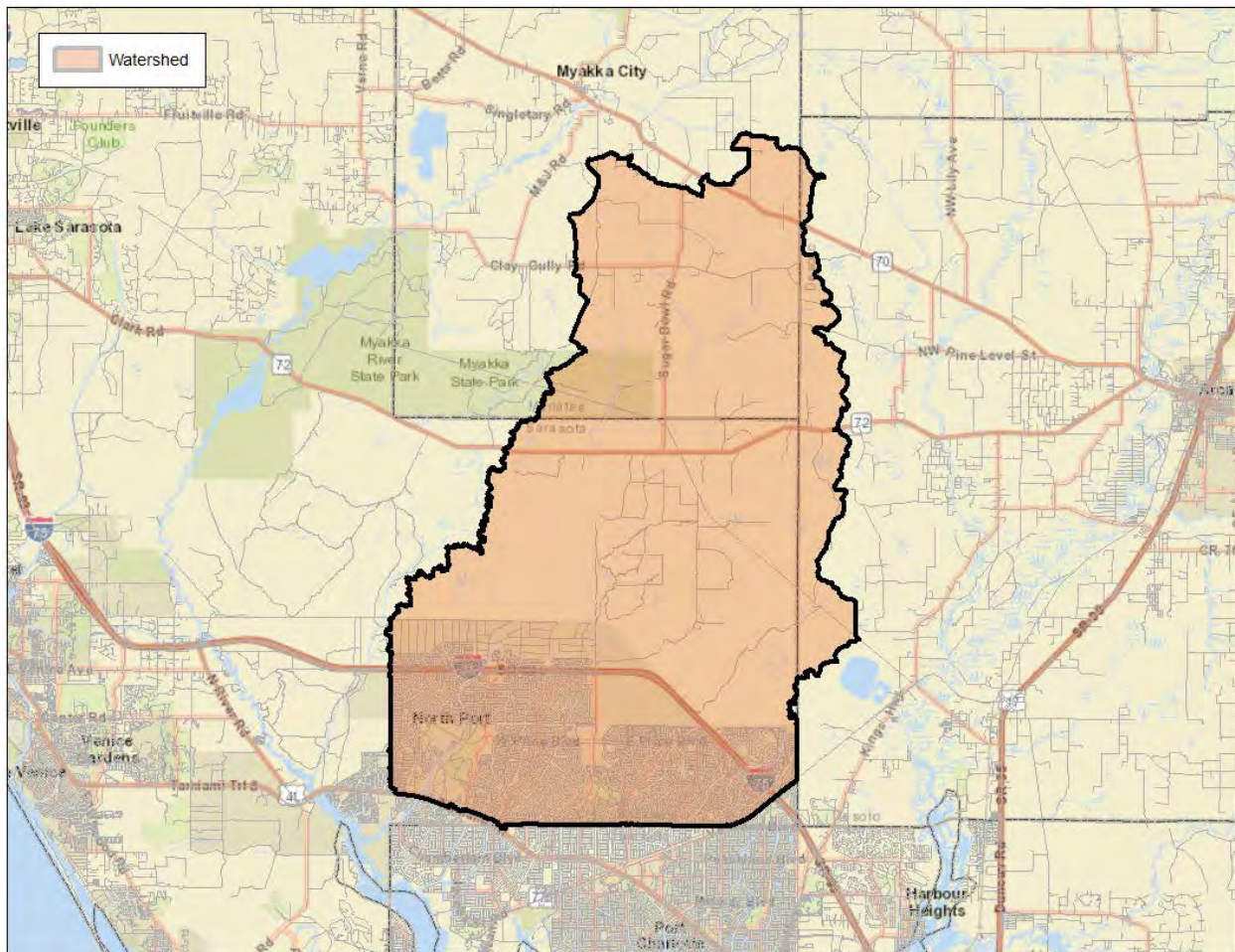


Figure 1: The Big Slough Watershed Area

The City has routinely experienced flooding in the Big Slough Watershed. Two such flood zones are the areas near Myakkahatchee Creek at I-75 and the areas in and around the Jockey Club.

- The Myakkahatchee Creek at I-75 Study Area covers approximately 335 acres adjacent to the Myakkahatchee Creek. The area is bounded on the east by Sumter Boulevard and traversed from east to west by Interstate Highway 75.
- The northern section of the Jockey Club Study Area covers approximately 62 acres and is bounded on the north by Appomattox Drive, on the west by Pan American Boulevard, and on the east by Myakkahatchee Creek. The southern section of the Jockey Club Study Area near Ketona Road is also included and is approximately 82 acres in size.

Figure 2a depicts existing mean annual and 10-year floodplains within the I-75 study area adjacent to Myakkahatchee Creek, both north and south of the interstate, as developed during the North Port/Big Slough WMP project. Figure 2b shows sub-basin delineations and the model network features used to simulate response to rainfall during the WMP project. Figure 2c depicts hydrologic soils groups. Figures 3a, 3b, and 3c illustrate the same information within and surrounding the Jockey Club study area.

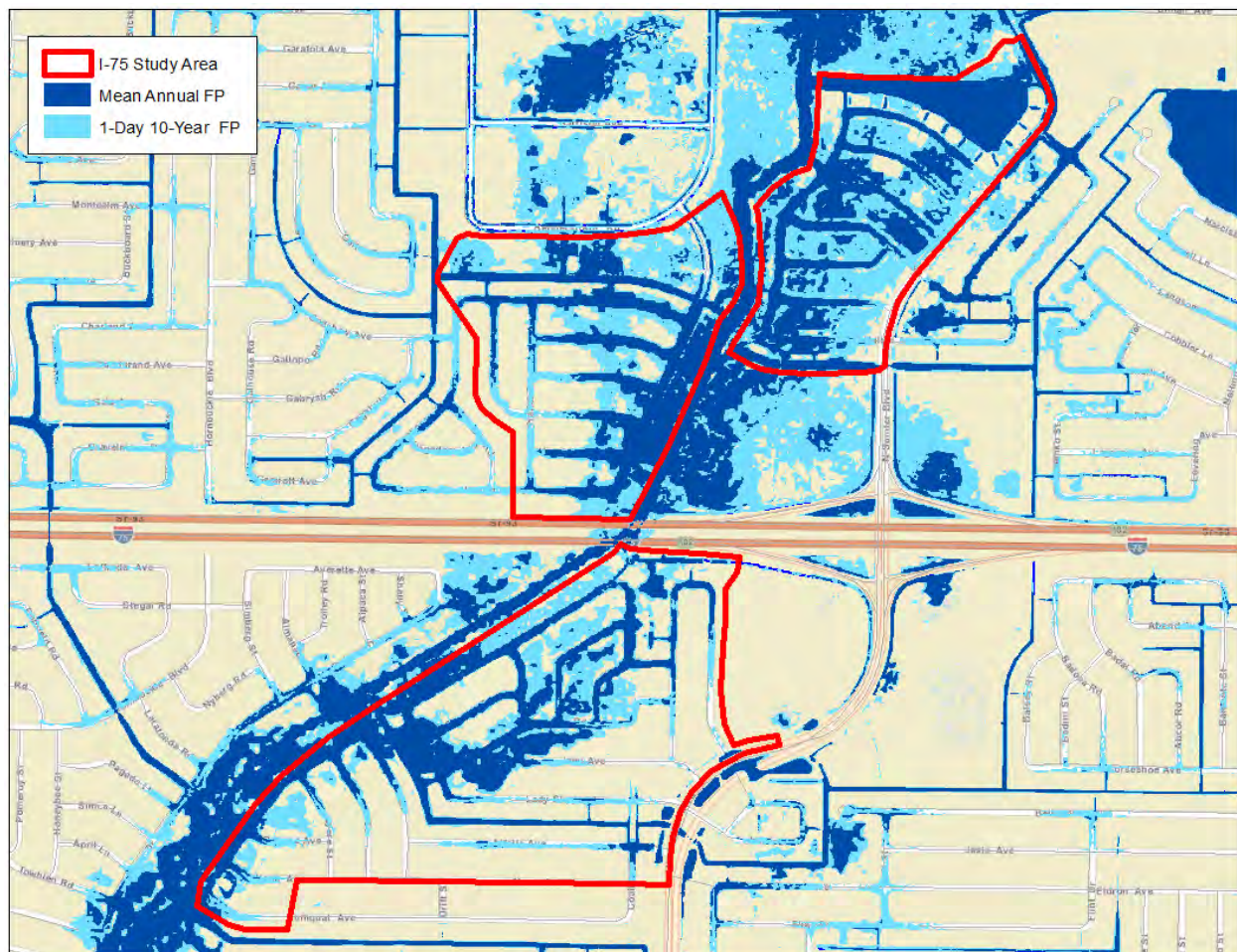


Figure 2a: I-75 Study Area, Mean Annual and 10-Year Floodplains

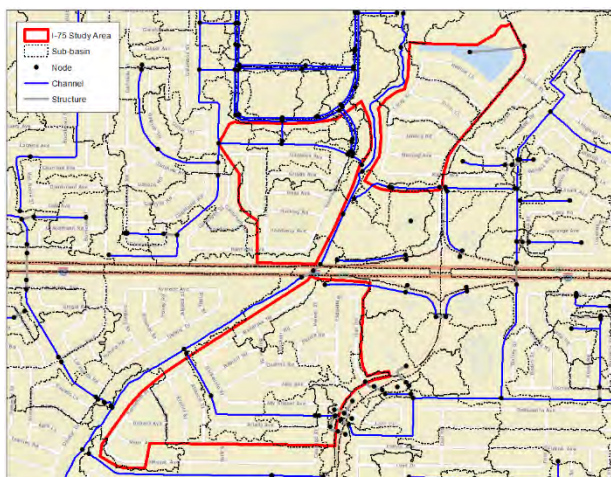


Figure 2b: I-75 Study Area, Model Network

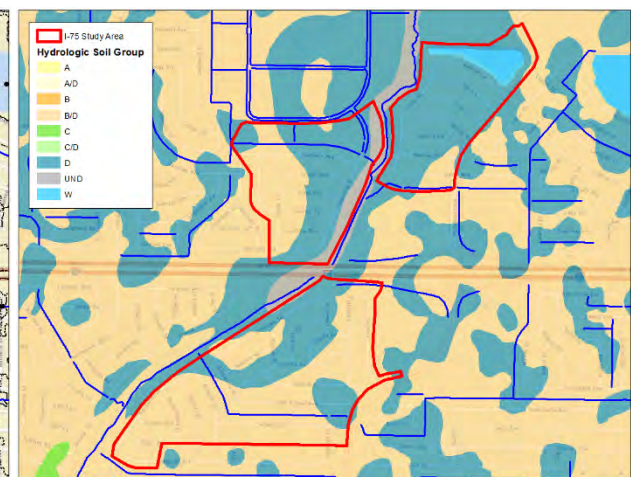


Figure 2c: I-75 Study Area, Hydrologic Soil Groups

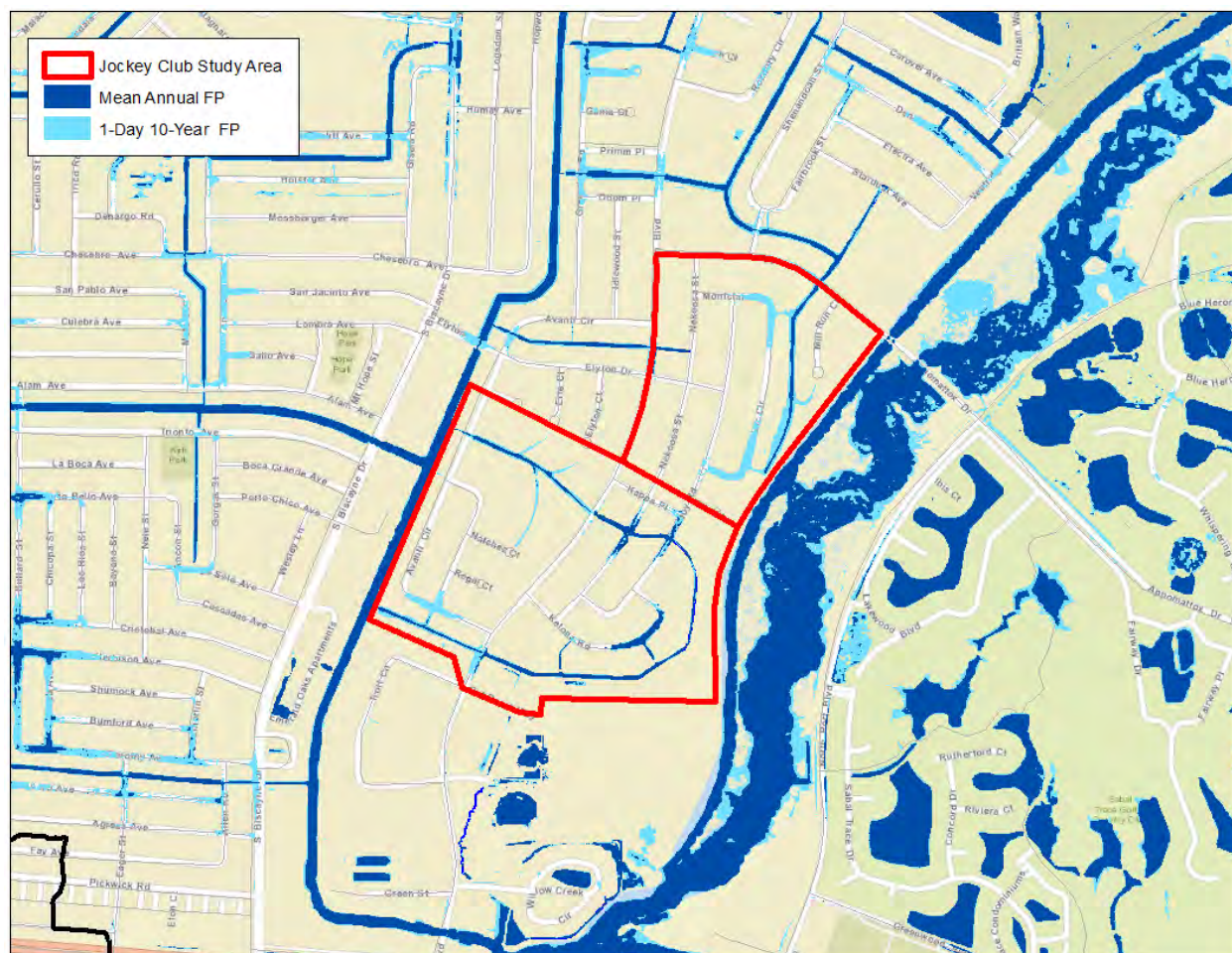


Figure 3a: Jockey Club Study Area, Mean Annual and 10-Year Floodplains

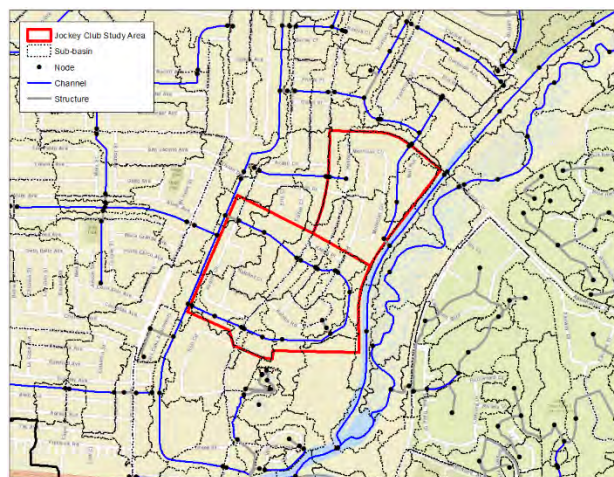


Figure 3b: Jockey Club Study Area, Model Network

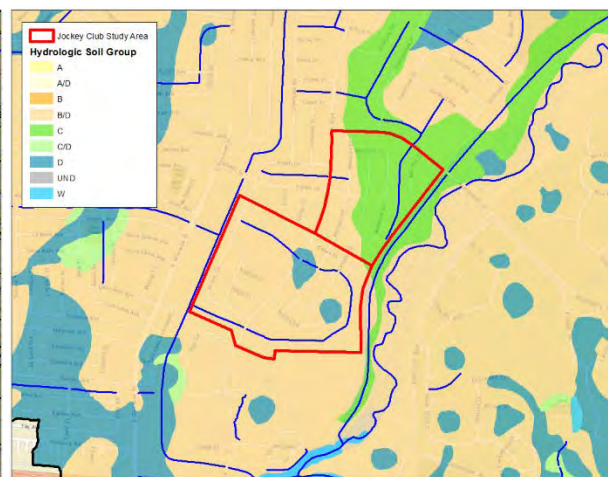


Figure 3c: Jockey Club Study Area, Hydrologic Soil Groups

Previous Work Completed

The Big Slough watershed and City of North Port stormwater management system have been the subjects of prior investigations. Reference will be made to the following reports:

- North Port Water Control District Phase I Report, Inventory and Approach to Analysis, for General Development Utilities, Inc., by R. D. Ghioto & Associates, Inc. (1984) presents data and information that describes NPWCD facilities, their function and condition.
- City of North Port Big Slough Watershed Study Phase III Task 2 Final Report, Stormwater Management Master Plan, by Camp, Dresser & McKee, Inc. (1993) presents conceptual solutions for flooding as well as assessments of potential water supplies and of nonpoint source pollution and describes a stormwater management plan to reduce flooding during extreme storm events.
- Watershed Management Program Consulting Services in the Big Slough Watershed (K883), Best Management Practices (BMP) Analysis Final Report, for Southwest Florida Water Management District and City of North Port, by Ardaman & Associates, Inc. (2014) evaluates BMP alternatives to address flooding conditions based on effectiveness, permissibility, and economic viability.

The 1993 Stormwater Management Master Plan was partially implemented, providing increased local conveyance through replacement of culvert structures at four locations. Those improvements are accounted for in more recent model development. Other plan components were not completed including those for storage and flow diversion, apparently due to regulatory and financial constraints.

Under the WMP project, the 2012 Version of 2004 Condition model was developed and six regional BMP alternatives were evaluated that could potentially reduce flooding through combinations of conveyance improvements, stormwater management storage areas, flood proofing, and flow diversion. Although the regional alternatives developed under the WMP project were not incorporated into a specific plan for implementation, the work provides insight to the system's hydraulic response and BMP limitations.

Additionally, hydraulic performance and effects of potential local conveyance improvements were analyzed at the following sites:

- R-36 Canal at I-75
- Myakkahatchee Creek at I-75
- R-36 Canal at Tropicair Boulevard
- Myakkahatchee Creek at Tropicair Boulevard
- WCS-162 location on the R-36 Canal (possibility of adding gates to the existing structure)
- Price Boulevard drainage system (five alternative sets of improvements)

Results from each BMP evaluation were compared the 24-hour 100-year existing condition model.

The Big Slough Flood Reduction Study will build upon all prior work to advance previously developed and new concepts to achieve flood mitigation in areas where residential structures are shown as flooding in the recently updated Flood Insurance Rate Maps (FIRMs). Performance of proposed improvements will be considered relative to lesser storm events from mean annual up to and including the 100-year storm event to evaluate cost and benefit relationships across a broader range of conditions.

Potential Issues

There are currently no technical issues which would prevent moving forward with the flood reduction study per the project scope of work. When issues do arise, discussion will occur with the City project manager. The project plan will be updated to reflect discussions, corrective actions, and outcomes.

Outline of This Document

This document:

- provides an overview of the Big Slough Flood Reduction Study and includes the following:
 - Goals and Objectives
 - Work Breakdown Structure
 - Project Schedule
 - Project Costs
 - Staff Allocations
- describes the scope of work for all project activities (Task List, Deliverables, and Approach)
- includes a brief narrative describing current assumptions, issues, and issue management
- presents updated plans for Quality Assurance, Quality Control, and Communications

Goals and Objectives

The City of North Port has partnered with SWFWMD through the District's Cooperative Funding Initiative (CFI) to oversee completion of the Big Slough Flood Reduction Study. The CFI allows local governments to share costs for projects that assist in creating sustainable water resources, provide flood protection, and enhance conservation efforts. As such, cooperatively funded WMP projects must meet various goals and objectives of both the District and the local partners.

Agency Goals

Local governments often partner in the District's CFI program because they need better floodplain information to make good land use (building and zoning) decisions. The program also routinely develops recommendations to improve deficiencies in flood protection level of service and to implement BMPs for water quality improvement. The goal of the Big Slough Flood Reduction Study is to develop BMPs to address existing recurrent flooding.

Study Objectives

The flood reduction study will be performed in two distinct parts.

Part 1 is a concentrated effort which considers solutions to reduce flooding through implementing localized improvements within certain identified neighborhoods that are adjacent to Myakkahatchee Creek at I-75 and at the Jockey Club while Part 2 is a broader study which considers a regional approach to reduce flooding in other portions of the City.

More specifically, this study will:

- Develop projects to reduce flooding along Myakkahatchee Creek near I-75 and the Jockey Club

- Produce a conceptual plan for improvements covering multiple sites and facilities serving those two areas and submit a State-wide Environmental Resource Permit (SWERP) for Conceptual Approval of the plan for flood reduction
- Evaluate & advance a set of BMP concepts to reduce flood risk in North Port on a regional scale
- Produce a planning-level document describing a small number of regional projects which exhibit potential flood reduction benefits based upon screening-level hydraulic evaluations
- Produce a planning-level cost estimate that addresses additional (i.e., future) analyses as well as engineering design, environmental permitting, land acquisition, construction, and other costs

Work Breakdown Structure

The Big Slough Flood Reduction Study includes the following major elements:

- Big Slough Flood Reduction Study
 - Project Development
 - Part 1 - Problem Definition, Field Visits, and Team Coordination
 - Part 1 - Alternatives Formulation and Community Outreach
 - Part 1 - Plan Development, Reporting, and Conceptual Permitting
 - Part 2 - Regional Flood Reduction Concept Formulation
 - Part 2 - Performance Evaluation and Agency Outreach
 - Part 2 - Planning Level Report on Regional Improvement Projects

Key project milestones for the Big Slough Flood Reduction Study are as follows:

- 1.1 Project Development
 - 1.1.1 Kickoff Meeting and Initial Field Visit
 - 1.1.2 Data Collection and Assembly
 - 1.1.2.1 CHAN Model from North Port/Big Slough WMP Project
 - 1.1.2.2 Geodatabase from North Port/Big Slough WMP Project
 - 1.1.2.3 Terrain from North Port/Big Slough WMP Project
 - 1.1.2.4 PLS Survey from North Port/Big Slough WMP Project
 - 1.1.2.5 Land Use from North Port/Big Slough WMP Project
 - 1.1.2.6 Parcels from Sarasota County Property Appraiser
 - 1.1.2.7 Utilities from City of North Port (for specific areas)
 - 1.1.3 Summary of Prior Work Performed
 - 1.1.3.1 Ardaman
 - 1.1.3.2 CDM
 - 1.1.4 Project Plan Formulation
- 1.2 Define Existing Flooding Problems
 - 1.2.1 Confirm Ability to Reproduce WMP Project Model Results
 - 1.2.1.1 Simulations of Mean Annual to 100-Year Events
 - 1.2.1.2 Flood Mapping and Comparison to Ardaman Results
 - 1.2.1.3 Update Model to include a Small Number of Prior Conveyance Improvements
 - 1.2.1.4 Flood Mapping and Comparison of Updated Model to Ardaman Results
 - 1.2.2 Characterize Local Flooding Conditions
 - 1.2.2.1 Myakkahatchee Creek at I-75
 - 1.2.2.2 Jockey Club
- 1.3 Operations Staff Meeting and Team Field Visit
 - 1.3.1 Meeting Topics

- 1.3.1.1 Prior Work and Project Plan
- 1.3.1.2 Existing Flooding Problems and Potential Solutions – with Operations Staff Input
- 1.3.1.3 Approach to Evaluation of Hydraulic Performance of Potential Solutions
- 1.3.1.4 Cost-Benefit and Other Project Considerations and Constraints
- 1.3.1.5 Refinements and Development of a Recommended Plan
- 1.3.1.6 Remaining Project Schedule and Upcoming Community Meeting
- 1.4 Formulate List of Potential Solutions for Hydraulic Evaluation
 - 1.4.1 Describe Each Potential Solution and Any Known or Expected Obstacles to Success
 - 1.4.2 Identify Additional Data Needs to Support Hydraulic Evaluation
 - 1.4.3 Meeting to Review and Discuss List of Potential Solutions
 - 1.4.4 Select a Set of Alternatives from Among Potential Solutions for Hydraulic Evaluation
- 1.5 Evaluate Hydraulic Performance of Selected Set of Alternatives
 - 1.5.1 Perform Hydraulic Analyses
 - 1.5.2 Summarize Hydraulic Performance
 - 1.5.3 Meeting to Review and Discuss Performance of Alternatives
 - 1.5.4 Identify Preferred Plan(s) of Improvements
- 1.6 Refine Preferred Plan(s) of Improvements
 - 1.6.1 Evaluate Site Conditions and Design/Permitting Constraints of Preferred Plan(s)
 - 1.6.2 Refine Preferred Plan(s) to Address Site Conditions and Design/Permitting Constraints
 - 1.6.3 Perform Hydraulic Analyses of Refined Plan(s)
 - 1.6.4 Perform Cost-Benefit Analysis of Refined Plan(s)
 - 1.6.5 Meeting to Review and Discuss Refined Plan(s)
 - 1.6.6 Select Recommended Plan
- 1.7 Community Outreach Meeting
 - 1.7.1 Meeting Topics
 - 1.7.1.1 Project Update
 - 1.7.1.2 Summary of Plan Development
 - 1.7.1.3 Description of Recommended Plan
 - 1.7.1.4 Performance of Recommended Plan
 - 1.7.1.5 Cost-Benefit
 - 1.7.1.6 Public Input
 - 1.7.1.7 Remaining Project Schedule and Upcoming Presentation to City
- 1.8 Summarize and Present Recommended Plan of Improvements
 - 1.8.1 Finalize Recommended Plan and Project Deliverables
 - 1.8.1.1 Pre/Post Models and Result Tabulations
 - 1.8.1.2 Conceptual-Level Design Drawings
 - 1.8.1.3 Opinion of Probable Cost (incl. detailed design, permitting, land, and construction)
 - 1.8.1.4 Cost-Benefit
 - 1.8.1.5 Report and Mapping
 - 1.8.1.6 Training City staff in use of CHAN Modeling Software
 - 1.8.2 Meeting with City Administrative Staff
 - 1.8.3 Statewide Environmental Resource Permitting
 - 1.8.3.1 SWFWMD Pre-App Meeting for Statewide Conceptual (or simple Standard) ERP
 - 1.8.3.2 Application Preparation/Submittal and Response to Two (2) Requests for Additional Information (RAIs)
- 2.1 Formulate List of Regional Flood Reduction Concepts
 - 2.1.1 Describe Each Potential Solution and Known or Expected Obstacles to Success
 - 2.1.2 Identify Additional Data Needs to Support Hydraulic Evaluation
 - 2.1.3 Meeting to Review and Discuss List of Potential Solutions
 - 2.1.4 Select a Set of Alternatives for Further Evaluation

- 2.2 Landowner & Regulatory Outreach Meeting(s)
- 2.3 Evaluate Hydraulic Performance of Selected Set of Alternatives
 - 2.3.1 Perform Screening-Level Hydraulic Analyses
 - 2.3.2 Summarize Hydraulic Performance
 - 2.3.3 Meeting to Review and Discuss Performance of Alternatives
 - 2.3.4 Identify Preferred Plans for Regional Improvements
- 2.4 Summarize and Present Preferred Plan(s) for Regional Improvements
 - 2.4.1 Screening-Level Hydraulic Model Pre/Post and Result Tabulations
 - 2.4.2 Conceptual-Level Drawings and Plan Descriptions
 - 2.4.3 Site Conditions and Design Constraints
 - 2.4.4 Relevant Permitting Requirements
 - 2.4.5 Opinion of Probable Cost (for detailed analysis, design, permitting, land, and construction)
 - 2.4.6 Planning-Level Report and Mapping

Project Schedule

An accelerated schedule for the Big Slough Flood Reduction Study dictates completion of all Part 1 and Part 2 tasks within about nine (9) months of receiving Notice to Proceed. Table 1 presents the agreed upon performance schedule for the project. The performance schedule is also depicted in a project Gantt chart, provided in Appendix A.

Generally, the following task durations are expected (Part 1 and Part 2 tasks completed concurrently):

- Project Plan, 1 month
- Part 1 - Problem Definition, Field Visits, and Initial Team Coordination, 1 month
- Part 1 - Alternatives Formulation and Community Outreach, 3 months
- Part 1 - Plan Development, Reporting, and Conceptual Permitting, 4 months
- Part 2 - Regional Flood Reduction Concept Formulation, 2 months
- Part 2 - Performance Evaluation and Agency Outreach, 2 months
- Part 2 - Planning Level Report on Plan(s) for Regional Improvements, 4 months

Critical Path

All project tasks are to be performed expeditiously and in the sequence depicted in the project Gantt chart. Note that Part 1 and Part 2 project tasks are to be performed concurrently. A critical component of the project timeline is the identification and collection of field survey data by a Professional Land Surveyor to support model evaluations of Part 1 flood reduction alternatives. A qualified local PLS firm is to be identified during the second month and field work is to be performed early in the third month of the project. Field survey by a PLS should be completed within 2 weeks.

Project Invoice Schedule

Invoicing for the Big Slough Flood Reduction Study is progress-based with monthly lump sum fee amounts generally aligned with scheduled work product submittals. The lump sum fees are based upon labor estimates and other costs to produce those work products. A projected monthly invoice schedule is presented in Table 2.

Project Cost

The budget for the Big Slough Flood Reduction Study is \$300,000, allocating approximately \$250K for Part 1 activities and \$50K for Part 2 activities.

Itemized Cost of Services Performed

An itemized project cost spreadsheet for all tasks that have been authorized by the City of North Port under Agreement #2016-48 is provided in Appendix B.

The itemized project cost spreadsheet reflects expected staff assignments and man-hour requirements to successfully provide the contracted services, and applies labor rates from the Agreement Consultant Fee Schedule to arrive at cost, by task, to perform the work. Staffing, man-hour requirements, and associated costs contained in the itemized project cost spreadsheet reflect the considered agreement between the City of North Port and DES, attained through discussion and negotiation, as to the level of detail desired and the effort required to satisfactorily complete the Big Slough Flood Reduction Study.

Staff Allocation

Project team members and their roles are summarized in the following:

Agreement #2016-48 identifies **Ms. Elizabeth Wong, PE** and **Mr. David DeLoach, PE** as project managers and prime contacts for the City and DES, respectively. **Ms. Jezabel Pagan Garcia** will serve as the project manager and lead point of contact for the SWFWMD. Ms. Wong, Mr. DeLoach, and Ms. Garcia will collaborate over the course of the project to update the project timeline, resource allocations, and budget in response to circumstances that may arise over the course of completing the project. Project deliverables, technical reviews, and related invoicing will also be managed by these individuals.

DES has assigned **Ms. Trillian Baldassari, PE** as the team's Lead Project Engineer, responsible for technical execution and oversight of project-related activities, as well as for supporting Mr. DeLoach on certain duties related to project management. Ms. Baldassari will serve as Deputy Project Manager, will be knowledgeable in all technical aspects of the project, and will remain cognizant of the project's status, providing the City and District with access to a second, high-level point of contact at DES.

Mr. Christopher Hardin, PE will serve as Project Engineer, responsible for technical execution of select project tasks, and, along with Mr. DeLoach and Ms. Baldassari, will contribute to the performance and timely completion of the project. **Mr. Chris Gilhooley** will serve as GIS Analyst, taking the lead role in geodatabase development, geoprocessing, and GIS deliverables production. **Mr. Rod Ghioto, PE** will serve as a Senior Consultant, also contributing to the performance of project tasks.

Projected staff utilization is provided in Table 3. Generally, utilization is expected to be within desirable levels across all project tasks. Actual utilization and work progress will be closely monitored by Mr. DeLoach to ensure that the schedule is adhered to. As Principal of the company, Mr. DeLoach can make and act upon staffing decisions quickly. He will shift project team member responsibilities or bring additional resources to assist with the project as needed.

Description of Project Activities

Scope of Work

City of North Port Agreement #2016-48 was issued to DES on October 13, 2016 to evaluate feasibility and cost effectiveness of various solutions intended to reduce flooding in the City of North Port within the Big Slough Watershed. The work includes minor model updates, conceptualization and performance evaluation of various BMP alternatives, agency and public outreach, development of plans for improvements, conceptual permitting, and reporting.

Project Startup

Key points about project startup and model preparation are provided in the following:

Project development. DES will meet and coordinate with staff of the City of North Port and SWFWMD to discuss project goals and objectives. The Scope of Work, schedule, and list of deliverables for Agreement #2016-48 will be reviewed during the meeting, with opportunities for all team members to offer input and share concerns regarding any aspect of the project. Based upon those discussions, the Project Plan (this document) will be updated and submitted to the City for approval.

Update of Selected Model Parameters. This project builds upon prior work performed, and utilizes modeling tools previously developed, by others under the SWFWMD WMP. The base model is the SWFWMD Governing Board-approved 2012 Version of 2004 Condition model. DES will utilize field survey data and other information provided by the City to add and/or update a small number of hydraulic features. The resulting model will be called the 2016 Version of 2004 Condition model. It should be noted that this model will not include any other revisions beyond those items listed here:

- For model refinements in the Myakkahatchee at I-75 and at Jockey club areas, DES will:
 - perform engineering-level field visits to review and verify site conditions to be modeled
 - develop local field survey requirements for collection by a third party PLS
 - incorporate collected field survey data into the model to reflect local site conditions
- For model revisions to more accurately reflect current conditions at several sites, DES will:
 - add a single 24-inch PVC pipe from Public Works site to Creighton WW (check)
 - utilize available as-built survey data and add two (2) gates at WCS 101
 - incorporate available survey and storm pipe data in Price Blvd area
 - change 30-inch ADS pipe, flowing from Price Blvd to R-32, to 36-inch ADS
 - add three (3) 48-inch CMP beneath Appomattox Blvd (Stantec plans available)

Update Model Specific Geodatabase. DES will update parameters in the project geodatabase to reflect changes made to selected model parameters (above).

Model Replication and Design Storm Simulations. Simulations will be performed to predict the response of the Big Slough Watershed to a range of synthetic rainfall events with 1-day and 5-day durations and recurrence intervals from 2.33 to 100 years. Depth of rainfall, in inches, for each rainfall event will match those used for the prior WMP work. The Florida Type II Modified Rainfall Distribution provided in the SWFWMD ERP Information Manual will be used to distribute rainfall over 24-hours. Distribution of the rainfall over the 5-day period will be based on a 5-day dimensionless curve also provided by the District.

DES will first confirm that prior simulation results can be replicated within a reasonable tolerance (generally on the order of 0.01 feet) for all design storms using the 2012 Version of 2004 Condition model. The 2016 Version of 2004 Condition model will then be used to simulate response to the same suite of design storms. A table of elevation differences will be developed summarizing computed peak water surface elevations for the original 2012 Version of 2004 Condition model (by Ardaman), the replicated 2012 Version of 2004 Condition model (by DES), and the updated 2016 Version of 2004 Condition model (by DES).

Floodplain Delineation. DES will delineate floodplains without transition zone extents based on digital topographic information and model-predicted peak stages of each storm event. The delineated floodplain area will be compared across the original 2012 Version of 2004 Condition, replicated 2012 Version of 2004 Condition, and updated 2016 Version of 2004 Condition models.

Project Approach

The Big Slough Flood Reduction Feasibility Study will be performed per the project scope of work contained in Agreement #2016-48.

Part 1 activities shall include field surveying, hydraulic modeling, alternatives analyses, and cost benefit assessments needed to evaluate feasibility of options to alleviate flooding in the local neighborhoods. The project shall include community outreach meetings to receive input of concerns from residents. The study shall include a determination of the reasons for flooding, either from conditions within the neighborhoods or from backwater of the Myakkahatchee Creek and interconnected waterways and retention ditches. Solutions may include, but not be limited to: storm sewer construction, pump stations, raised road elevations, flood walls, flood gates, land acquisition, and any combination thereof. The study shall include, but not be limited to, evaluating mean annual, 10-, 25-, and 100-year 1-day and 100-year 5-day storm events.

The CONSULTANT shall determine which solution for these storm events provides the best cost/benefit. In assessing feasibility of various solutions, it should be noted that drainage improvements may not eliminate flooding entirely but instead may reduce the depth, duration, and/or frequency of flooding to levels that still result in reduced annualized damages and a substantial benefit to the community.

The study will focus principally on quantifying hydraulic performance, cost of implementation, and value of benefits derived from reduced flooding and will address other equally important issues qualitatively. For example, hydraulic performance will be summarized with simulation pre vs post peak stage and peak discharge tables for use in demonstrating no adverse impacts in a Statewide Environmental Resource permit (SWERP) application. On the other hand, wetland impacts associated with implementing the various solutions will be addressed qualitatively. For example, while no formal wetland jurisdictional boundary will be developed, potential wetland impacts will be identified based on engineering-level site visits, review of aerial photography, National Wetlands Inventory (NWI), and hydric soil mapping, etc., to estimate potential mitigation requirements and associated costs. Wetland impacts and other factors that are addressed qualitatively during this study would need to be deferred in any Statewide Conceptual ERP application and later resolved during subsequent construction permitting (when final design of the improvements has been completed, wetland jurisdiction has been properly established, wetland impacts and mitigation have been quantified, etc.).

It is anticipated that Part 1 will result in a conceptual plan for improvements covering multiple sites and facilities and that a Statewide Environmental Resource Permit (SWERP) will be submitted for Conceptual Approval of the plan for flood reduction in these areas. The SWERP application would include: conceptual-level drawings and/or diagrams describing the plan for improvements in general terms; a narrative including summary of project purpose, proposed facilities, and pre/post hydraulic performance; and calculations (pre/post storm event simulation results) to demonstrate no adverse impacts with respect to water quantity. Site-specific design and environmental matters (including wetland impacts and mitigation) would be deferred to one or more future SWERP construction applications for implementation of the proposed improvements.

The CONSULTANT shall review and provide a timely response to up to two (2) Requests for Additional Information (RAIs) from SWFWMD. It is expected that District review times will be on the order of one (1) month each and that CONSULTANT response times will be on the order of two (2) weeks each.

Part 2 activities shall include field investigations, hydraulic modeling, alternatives analyses, and cost benefit assessments needed to advance preliminary concepts to achieve flood mitigation in areas where residential structures are shown as flooding in the recently updated Flood Insurance Rate Maps (FIRMs) including, but not limited to, those previously suggested in the North Port/Big Slough WMP project by Ardaman & Associates, Inc. and/or in the Big Slough Watershed Study by Camp Dresser & McKee, Inc. The work will include identification of candidate site(s), citing of relevant permitting requirements for construction and operation of facilities, and providing cost estimates for detailed design, permitting, land acquisition, and construction. The CONSULTANT shall consider mixed use of regional facilities such as, but not limited to, storage for water supply to the City's water treatment plant, recreational activities, and environmental opportunities such as preserves and water quality improvement.

Using the previously developed CHAN model, the CONSULTANT shall perform a limited number of screening-level simulations to evaluate feasibility of regional concepts to achieve flood reduction. In assessing feasibility of various solutions, it should be noted that improvements may not eliminate flooding entirely but instead may reduce the depth, duration, and/or frequency of flooding to levels that nevertheless result in reduced annualized damages and a substantial benefit to the community.

It is anticipated that Part 2 will result in a detailed planning-level document describing a small number of regional projects which exhibit potential flood reduction benefits based upon screening-level hydraulic evaluations performed as part of this project. The planning document would include: conceptual-level drawings and/or diagrams describing the regional plan(s) for improvements in general terms; a narrative including summary of project purpose, proposed facilities, environmental and other constraints, and expected hydraulic performance; and calculations (screening-level pre/post storm event simulation results) to demonstrate anticipated flood reduction and identify potential adverse impacts with respect to water quantity. A project plan and cost estimate for each regional flood reduction concept would be provided along with a discussion on future SWERP application(s) for implementation of the proposed improvements.

Due to the size and scope of those solutions, additional funding would be required to fully develop and implement the regional projects. It should also be noted that additional analyses required to support design and permitting of mixed-use regional solutions may include additional storm event hydraulic modeling as well as continuous simulations, water quality evaluations, hydroperiod analyses, water

quality studies, water supply evaluations, etc. Planning-level cost estimates will address those additional analyses as well as engineering design, environmental permitting, land acquisition, construction, and other costs.

Assumptions and Issue Management

Several assumptions were made in developing this project plan. Key assumptions were related to the magnitude (level of detail) of the work effort, accuracy of available as-built drawings and other supporting data, availability of staff resources, and reliance on a third-party survey firm for performance of certain field data collection tasks.

It is expected that the current level of detail of the model is sufficient to evaluate regional alternatives at a conceptual level, sufficient to develop plans for future, more detailed work. It was also assumed that the amount of additional model detail to be provided in the Myakkahatchee at I-75 and Jockey Club areas is moderate and a \$10,000 estimate was used to allow for supplemental field survey to support model refinement in those areas.

It is assumed that model results will be replicated easily from the prior WMP work. If, for some reason, DES is unable to replicate prior results, then we would rely upon City and District staff to assist in coordination with the prior contractor to resolve the matter quickly.

Staffing and assignment of key personnel to the project is considered appropriate for this project. Any staffing deficiencies that could impact the project timeline or quality of work will be identified quickly and effectively mitigated by shifting of responsibilities and addition of staff, if needed, with City approval. Progress of third-party firms in performing support activities (i.e., for field survey by a PLS) will be monitored and adjustments will be made, if necessary, to adhere to the project schedule.

This Project Plan will be updated periodically. Revisions may include minor editorial changes to clarify project background and goals, changes to better define task objectives and approach to performing the work, and/or updates to Quality Assurance, Quality Control, and Communications.

Quality Assurance Plan

DES is committed to the concept of Total Quality Management (TQM), where everyone involved with development and delivery of our work product is responsible for its quality. TQM requires effort and accountability from management, staff, and all other project participants, and it is the Project Manager's responsibility to ensure that all are capable and eager to deliver a high-quality product.

Quality Assurance

Quality Assurance (QA) is achieved through appropriate assignment of project tasks and responsibilities to team members, staff training, development of and adherence to protocols (including protocols for quality control), adherence to the baseline schedule and budget, and daily task oversight.

Assignment of Team Members. The Big Slough Flood Reduction Feasibility Study consists of a set of discrete project tasks. DES staff members will be assigned to each task team by the Project Manager, taking into consideration capabilities and experience. A Task Leader will be assigned to direct the work

of each task team. In most cases, Ms. Baldassari will serve as Task Leader, and will see that all work is performed in accordance with established protocols.

Development and Adherence to Protocols. Where appropriate, task-specific DES Protocols will be developed and serve as a supplement to the District's WMP Guidance documents, and would include procedures for documentation of work, frequent communication, and quality control checks throughout task completion. Task Protocols indicate team member assignments and encourage acceptance of individual responsibilities. Each protocol includes the following elements:

- Task Name
- Task Description
- Prerequisite Tasks
- Required Data Resources
- Initial Quality Control Procedures
- Approach to Task Completion
- Schedule for Task Completion
- Estimated Cost for Task Completion
- Anticipated Correspondence
- Approach to Quality Assurance
- Task Completion QC Procedures
- Task Reporting, Mapping & Deliverables
- Summary and Sign-off Responsibilities
- Project Debrief Checklist

Prior to initiating work, the associated task protocol document(s) are reviewed by and discussed among assigned team members in a task kickoff meeting. Based on team discussion, a determination is made whether the standard protocols can be applied to the project. Deviations from the standard protocols will be identified and a description provided of the special conditions necessitating those deviations.

Adherence to Baseline Schedule and Budget. An initial project timeline, extending approximately nine (9) months from Notice to Proceed (NTP), was developed and incorporated into Agreement #2016-48. Support documents contain initial staff allocations, man-hour estimates, and associated costs for each discrete task that makes up the overall project. Both the project schedule and the budget contained in the agreement are judged to be accurate, and staff allocations appear sufficient.

DES management and staff fully understand the critical importance of the expeditious completion of the project and are committed to meeting the timeline as it has been developed and within the allocated budget. As work proceeds, DES will provide monthly updates to the City regarding both the schedule and the budget. As project tasks are completed and project needs and data limitations (if any) are better understood, recommendations may be made to the City's Project Manager for changes to staffing allocations and/or project approach, including potential adjustments to the timeline and costs.

Daily Task Oversight. As discussed above, DES has assigned Ms. Trillian Baldassari, PE as the team's Lead Project Engineer. Ms. Baldassari will be responsible for daily oversight of project-related activities. Mr. DeLoach will also be fully engaged in the management of all aspects of the work, and will be intimately involved in the day-to-day operation. As such, two experienced professional engineers will be performing the oversight needed to provide for quality assurance on this important project.

Quality Control

Quality Control (QC) is the process where raw data, data manipulation, and calculations; parameter selection, processing, and computations; reporting, mapping, and deliverables production are subject to verification checks and validation. QC is performed according to well-designed protocols to check for

errors and omissions, to verify that staff are using tools and following procedures correctly and effectively, and to fully understand why certain processes result in certain outcomes.

Project Task Protocols include the District's Guidelines and Specifications and other task-specific procedures for performance and documentation of work performed and results achieved. The protocols also outline task-specific procedures for team communication and for quality control checks at multiple steps through project completion and acceptance.

A rigorous internal peer review will be performed as part of our standard QA/QC protocol for all tasks, consisting of:

- protocol review by Task Leader and team member(s) assigned to a task, prior to start of work
- self-check of work by team members while performing project tasks
- handoff of task materials to QA/QC Team Leader (DeLoach)
- QA review and QC checks by QA/QC Team (Baldassari and/or Hardin)
- return of task materials, comments and QA/QC report from QA/QC Team Leader (DeLoach)
- review of third-party findings by DES Project Manager and DES Task Manager for resolution
- incorporation of QA/QC work products and reports into project deliverables for City review

Communication Plan

Frequent and effective communication, whether internal between project team members or external with City or District staff, will carry a high priority throughout the project. Protocols for each distinct task will include a description of the purpose, frequency, method and participants to be involved, and the DES Project Manager will see that communications requirements are met, documented, and fulfill their intended purpose. Communication responsibilities that are unique to a specific task, if needed, will become part of the protocol for that task, and will be documented in memorandum form.

Internal Communication

Internal communication regarding project work assignments will be conducted by and between the Project Manager, Lead Project Engineer and/or Task Leader, and will primarily be in the form of email exchange. Internal staff meetings will be held for kickoff of each discrete project task, regularly thereafter for team updates to the Project Manager, prior to and following exchanges with the third-party QA/QC consultant, and prior to the delivery of task deliverables to the City.

External Communication

At the onset of the project, the DES Project Manager will communicate with the City Project Manager and others to understand expectations of all involved parties, including City and District staff, other agency officials, and the affected public. The DES Project Manager and Lead Project Engineer will, at a minimum, talk directly with the City Project Manager once each week to discuss progress on current activities, resolve outstanding issues, and coordinate future tasks, and will employ methods and measures to track and report monthly progress relative to scope, schedule, resource allocations, and budget.

External project communications may be in person or via phone/internet (using collaboration software such as GoTo Meeting) at the City's discretion. Routine exchange of written messages and accompanying data will be by email, while exchange of larger documents and data will be accomplished using the City and/or DES FTP sites. Very large data exchanges, as in the transfer of project deliverables, will be made using portable hard drives.

Meetings

The DES Project Manager and Lead Project Engineer will attend regularly-scheduled project status meetings with representatives of the City of North Port and SWFWMD to discuss project goals and objectives and the team's progress toward completing current project tasks. The DES Project Manager, Lead Project Engineer, and other DES staff will attend other task-related meetings as may be deemed necessary by the project team. A brief agenda will be provided for all meetings, and a recap memorandum will be developed by DES staff to document the meeting, ensuing discussion, and resulting action items. Meetings may be in person or via phone/internet (using collaboration software such as GoTo Meeting) at the City's discretion.

Tables

Table 1. Project Schedule		
PART 1		
<u>Task</u>	<u>Start Date</u>	<u>Completion Date</u>
Project Development	October 13, 2016	November 4, 2016
Define Existing Flooding Problems	October 31, 2016	November 18, 2016
Operations Staff Meeting and Team Field Visit	November 14, 2016	November 18, 2016
Formulate Potential Solutions for Hydraulic Evaluation	November 14, 2016	December 9, 2016
Evaluate Performance of Selected Set of Alternatives	December 5, 2016	January 27, 2017
Refine Preferred Plan(s) of Improvements	January 30, 2017	March 31, 2017
Community Outreach Meeting	March 27, 2017	March 31, 2017
Present Recommended Plan of Improvements	April 3, 2017	July 31, 2017
<i>Project Management and QA/QC</i>	<i>October 13, 2016</i>	<i>July 31, 2017</i>
PART 2		
<u>Task</u>	<u>Start Date</u>	<u>Completion Date</u>
Formulate List of Regional Flood Reduction Concepts	December 5, 2016	January 13, 2017
Landowner Outreach (including State agencies)	December 5, 2016	January 13, 2017
Evaluate Performance of Selected Set of Alternatives	January 16, 2017	March 31, 2017
Present Preferred Plan(s) for Regional Improvements	April 3, 2017	May 26, 2017
<i>Project Management and QA/QC</i>	<i>December 5, 2016</i>	<i>May 26, 2017</i>

Table 2. Projected Invoice Schedule, by Month

	Part 1		Part 2		Project		
Month	% Complete	Invoice Amount	% Complete	Invoice Amount	% Complete	Invoice Amount	Cumulative Fees
1	11%	\$28,110	0%	\$0	9%	\$28,110	\$28,110
2	19%	\$18,300	0%	\$0	15%	\$18,300	\$46,410
3	30%	\$29,520	32%	\$15,870	31%	\$45,390	\$91,800
4	36%	\$15,300	32%	\$0	36%	\$15,300	\$107,100
5	54%	\$43,240	63%	\$15,540	55%	\$58,780	\$165,880
6	65%	\$28,860	63%	\$0	65%	\$28,860	\$194,740
7	80%	\$36,040	63%	\$0	77%	\$36,040	\$230,780
8	91%	\$28,760	100%	\$18,620	93%	\$47,380	\$278,160
9	100%	\$21,840	100%	\$0	100%	\$21,840	\$300,000

Table 3. Projected Staff Utilization, by Month

Month	DeLoach	Baldassari	Hardin	Gilhooley	Ghioto
1	26%	26%	13%	26%	26%
2	23%	16%	09%	2%	20%
3	20%	48%	24%	4%	46%
4	13%	15%	8%	10%	18%
5	28%	85%	43%	35%	60%
6	23%	45%	23%	15%	18%
7	13%	60%	30%	35%	25%
8	45%	55%	28%	48%	29%
9	31%	25%	13%	18%	5%
Average	24%	42%	21%	21%	27%

Appendices

Project Plan attachments and appendices, to be added over the course of the project, include progress reports, meeting minutes, memoranda, and other related documents. Project Plan appendices and documents that have been attached to date include the following:

Appendix A

Project Gantt Chart

Appendix B

Itemized Project Cost Spreadsheet

Appendix A

Project Gantt Chart

BIG SLOUGH FLOOD REDUCTION FEASIBILITY STUDY for CITY OF NORTH PORT
DeLoach Engineering Science, PLLC - Project Timeline

Task Descriptions

- 1.1 Project Development
- 1.2 Define Existing Flooding Problems
- 1.3 Operations Staff Meeting and Team Field Visit
- 1.4 Formulate List of Potential Solutions for Hydraulic Evaluation
- 1.5 Evaluate Hydraulic Performance of Selected Set of Alternatives
- 1.6 Refine Preferred Plan(s) of Improvements
- 1.7 Community Outreach Meeting
- 1.8 Summarize and Present Recommended Plan of Improvements
- 2.1 Formulate List of Regional Flood Reduction Concepts
- 2.2 Landowner Outreach Meeting(s) (including State agencies)
- 2.3 Evaluate Hydraulic Performance of Selected Set of Alternatives
- 2.4 Summarize and Present Preferred Plan(s) for Regional Improvements

Month	1			2			3					4				5				6				7				8				9				10						
Date	10/13/16	10/20/16	10/27/16	11/3/16	11/10/16	11/17/16	11/24/16	12/1/16	12/8/16	12/15/16	12/22/16	12/29/16	1/5/17	1/12/17	1/19/17	1/26/17	2/2/17	2/9/17	2/16/17	2/23/17	3/2/17	3/9/17	3/16/17	3/23/17	3/30/17	4/6/17	4/13/17	4/20/17	4/27/17	5/4/17	5/11/17	5/18/17	5/25/17	6/1/17	6/8/17	6/15/17	6/22/17	6/29/17	7/6/17	7/13/17	7/20/17	7/27/17
Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42



Appendix B

Itemized Project Cost Spreadsheet

BIG SLOUGH FLOOD REDUCTION FEASIBILITY STUDY for CITY OF NORTH PORT
DeLoach Engineering Science, PLLC - Project Plan with Timeline, Manhour and Fee Estimate

Task Descriptions	Principal Engineer	Project Engineer	GIS Analyst	Sub-Consultant	Reimb. Expenses	Estimated Fee	Start Date	End Date	Task Duration	Project Duration
1.1 Project Development						\$13,290.00				
1.1.1 Kickoff Meeting and Initial Field Visit	8	8	0	8	\$0.00	\$4,040.00	13-Oct-16	14-Oct-16	2	2
1.1.2 Data Collection and Assembly	4	6	10	4	\$0.00	\$3,290.00	13-Oct-16	21-Oct-16	9	9
1.1.3 Summary of Prior Work Performed, Alternatives and Findings	8	0	0	8	\$0.00	\$2,960.00	13-Oct-16	28-Oct-16	16	16
1.1.4 Project Plan Formulation	12	0	0	4	\$0.00	\$3,000.00	13-Oct-16	4-Nov-16	23	23
1.2 Define Existing Flooding Problems						\$14,820.00				
1.2.1 Confirm Ability to Reproduce WMP Project Model Results	2	32	16	2	\$0.00	\$6,660.00	31-Oct-16	11-Nov-16	12	30
1.2.2 Characterize Local Flooding Conditions	8	16	16	16	\$0.00	\$8,160.00	7-Nov-16	18-Nov-16	12	37
1.3 Operations Staff Meeting and Team Field Visit						\$5,340.00				
1.3.1 Meeting Topics (Preparation, Attendance, and Field Visit)	12	12	0	8	\$0.00	\$5,340.00	14-Nov-16	18-Nov-16	5	37
1.4 Formulate List of Potential Solutions for Hydraulic Evaluation						\$12,960.00				
1.4.1 Describe Each Potential Solution and Any Known or Expected Obstacles to Success	8	8	0	8	\$0.00	\$4,040.00	14-Nov-16	25-Nov-16	12	44
1.4.2 Identify Additional Data Needs to Support Hydraulic Evaluation	4	8	3	4	\$0.00	\$2,860.00	21-Nov-16	25-Nov-16	5	44
1.4.3 Meeting to Review and Discuss List of Potential Solutions	8	8	0	8	\$0.00	\$4,040.00	28-Nov-16	2-Dec-16	5	51
1.4.4 Select a Set of Alternatives from Among Potential Solutions for Hydraulic Evaluation	4	4	0	4	\$0.00	\$2,020.00	28-Nov-16	9-Dec-16	12	58
1.5 Evaluate Hydraulic Performance of Selected Set of Alternatives						\$44,820.00				
1.5.1 Perform Hydraulic Analyses (w/ estimated \$10,000 Field Survey by PLS)	8	80	0	40	\$10,000.00	\$29,520.00	5-Dec-16	30-Dec-16	26	79
1.5.2 Summarize Hydraulic Performance	8	24	16	16	\$0.00	\$9,240.00	2-Jan-17	13-Jan-17	12	93
1.5.3 Meeting to Review and Discuss Performance of Alternatives	8	8	0	8	\$0.00	\$4,040.00	16-Jan-17	20-Jan-17	5	100
1.5.4 Identify Preferred Plan(s) of Improvements	4	4	0	4	\$0.00	\$2,020.00	23-Jan-17	27-Jan-17	5	107
1.6 Refine Preferred Plan(s) of Improvements						\$66,220.00				
1.6.1 Evaluate Site Conditions and Design/Permitting Constraints of Preferred Plan(s)	8	40	16	16	\$0.00	\$11,400.00	30-Jan-17	3-Feb-17	5	114
1.6.2 Refine Preferred Plan(s) to Address Site Conditions and Design/Permitting Constraints	12	40	16	24	\$0.00	\$13,600.00	6-Feb-17	10-Feb-17	5	121
1.6.3 Perform Hydraulic Analyses of Refined Plan(s)	8	80	16	24	\$0.00	\$18,240.00	13-Feb-17	3-Mar-17	19	142
1.6.4 Perform Cost-Benefit Analysis of Refined Plan(s)	12	80	24	8	\$0.00	\$16,920.00	6-Mar-17	17-Mar-17	12	156
1.6.5 Meeting to Review and Discuss Refined Plan(s)	8	8	0	8	\$0.00	\$4,040.00	20-Mar-17	24-Mar-17	5	163
1.6.6 Select Recommended Plan	4	4	0	4	\$0.00	\$2,020.00	27-Mar-17	31-Mar-17	5	170
1.7 Community Outreach Meeting						\$5,880.00				
1.7.1 Meeting Topics	12	16	0	8	\$0.00	\$5,880.00	27-Mar-17	31-Mar-17	5	170
1.8 Summarize and Present Recommended Plan of Improvements						\$86,640.00				
1.8.1 Finalize Recommended Plan and Project Deliverables	0	0	0	0	\$0.00	\$0.00	3-Apr-17	2-Jun-17	61	233
1.8.1.1 Pre/Post Models and Result Tabulations	8	24	0	8	\$0.00	\$6,200.00	3-Apr-17	14-Apr-17	12	184
1.8.1.2 Conceptual-Level Design Drawings	4	60	40	16	\$0.00	\$15,740.00	3-Apr-17	28-Apr-17	26	198
1.8.1.3 Opinion of Probable Cost (incl. detailed design, permitting, land, and construction)	8	60	16	16	\$0.00	\$14,100.00	3-Apr-17	28-Apr-17	26	198
1.8.1.4 Cost-Benefit	8	40	0	8	\$0.00	\$8,360.00	1-May-17	12-May-17	12	212
1.8.1.5 Report and Mapping	32	16	40	16	\$0.00	\$15,120.00	1-May-17	26-May-17	26	226
1.8.1.6 Training City staff in use of CHAN Modeling Software	0	8	0	0	\$0.00	\$1,080.00	1-May-17	26-May-17	26	226
1.8.2 Meeting with City Administrative Staff	8	8	16	0	\$0.00	\$4,200.00	29-May-17	2-Jun-17	5	233
1.8.3 Statewide Environmental Resource Permitting (with Response to 2 RAIs)	50	60	28	8	\$0.00	\$21,840.00	29-May-17	31-Jul-17	64	292
2.1 Formulate List of Regional Flood Reduction Concepts						\$7,790.00				
2.1.1 Describe Each Potential Solution and Known or Expected Obstacles to Success	2	4	2	4	\$0.00	\$1,840.00	5-Dec-16	30-Dec-16	26	79
2.1.2 Identify Additional Data Needs to Support Hydraulic Evaluation	2	8	2	8	\$0.00	\$3,100.00	5-Dec-16	30-Dec-16	26	79
2.1.3 Meeting to Review and Discuss List of Potential Solutions	2	4	2	4	\$0.00	\$1,840.00	5-Dec-16	30-Dec-16	26	79
2.1.4 Select a Set of Alternatives for Further Evaluation	2	2	0	2	\$0.00	\$1,010.00	2-Jan-17	13-Jan-17	12	93
2.2 Landowner Outreach Meeting(s) (including State agencies)						\$8,080.00				
2.2.1 Meeting Topics	16	16	0	16	\$0.00	\$8,080.00	5-Dec-16	13-Jan-17	40	93
2.3 Evaluate Hydraulic Performance of Selected Set of Alternatives						\$15,540.00				
2.3.1 Perform screening-level Hydraulic Analyses	8	24	0	16	\$0.00	\$7,640.00	16-Jan-17	10-Feb-17	26	121
2.3.2 Summarize Hydraulic Performance	2	12	8	8	\$0.00	\$4,240.00	13-Feb-17	24-Feb-17	12	135
2.3.3 Meeting to Review and Discuss Performance of Alternatives	4	4	0	4	\$0.00	\$2,020.00	27-Feb-17	10-Mar-17	12	149
2.3.4 Identify Preferred Plan(s) for Regional Improvements	2	4	0	4	\$0.00	\$1,640.00	13-Mar-17	31-Mar-17	19	170
2.4 Summarize and Present Preferred Plan(s) for Regional Improvements						\$18,620.00				
2.4.1 Screening-Level Hydraulic Model Pre/Post and Result Tabulations	2	12	0	8	\$0.00	\$3,440.00	3-Apr-17	26-May-17	54	226
2.4.2 Conceptual-Level Drawings and Plan Descriptions	2	12	8	2	\$0.00	\$3,160.00	3-Apr-17	28-Apr-17	26	198
2.4.3 Site Conditions and Design Constraints	2	8	8	4	\$0.00	\$2,980.00	3-Apr-17	28-Apr-17	26	198
2.4.4 Relevant Permitting Requirements	2	8	0	4	\$0.00	\$2,180.00	3-Apr-17	28-Apr-17	26	198
2.4.5 Opinion of Probable Cost (for detailed analysis, design, permitting, land, and construction)	8	16	0	0	\$0.00	\$3,680.00	1-May-17	12-May-17	12	212
2.4.6 Planning-Level Report and Mapping	8	4	4	4	\$0.00	\$3,180.00	1-May-17	26-May-17	26	226
Task 4 - Survey (future task)			0	0						
Task 5 - Geotechnical (future task)			0	0						
Task 6 - Design (future task)			0	0						
Task 7 - Permitting (future task)			0	0						
Labor Hours	352	900	307	394						
Hourly Rate	\$190.00	\$135.00	\$100.00	\$180.00						
Labor Fee	\$66,880.00	\$121,500.00	\$30,700.00	\$70,920.00	\$10,000.00					
Total Estimated Fees	Part 1 :	\$249,970.00	Part 2 :	\$50,030.00		\$300,000.00			Total Duration	292

Appendix B

Floodplain Justification Report for Big Slough/City of North Port

Sarasota County, Florida

Ardaman & Associates, Inc., January 2011

**Floodplain Justification Report for
Big Slough/City of North Port
Sarasota County, Florida**

**Prepared for:
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899**

**Prepared by:
Ardaman & Associates, Inc.
8008 South Orange Avenue
Orlando, FL 32809-6712**

January 24, 2011
Project No. 08-189G

David Arnold, P.E.
Southwest Florida Water Management District
2379 Broad Street
Brooksville, Florida 34604-6899

Subject: Watershed Management Program Consulting Services for Maintenance of
Watershed Parameters and Models in the Big Slough Watershed (B206),
SWFWMD Agreement No. 06CC0000044, Work Order No. 7

Dear Mr. Arnold:

Ardaman & Associates, Inc. staff has completed storm event modeling and floodplain delineations for the Big Slough/City of North Port Watershed in Sarasota County, as specified in the subject Work Order. The attached Floodplain Justification Report is accompanied with a copy of our PowerPoint presentation for the Peer Review Consultant.

We trust that this report satisfies your expectations and appreciate the opportunity to work with you on this important project. If you have any questions, or if we can be of further service to you, please do not hesitate to call.

Very Truly Yours,
ARDAMAN & ASSOCIATES, INC.

Nestor Aceituno, P.E.
Project Engineer

David A. DeLoach, P.E.
V.P, Director of Water Resources
Florida License Number 47761

DAD/dad

cc: Elizabeth Wong, City of North Port

TABLE OF CONTENTS

<u>Title</u>	<u>Page</u>
Introduction	1
Guidelines and Specifications	1
Watershed Description	1
Floodplain Model Development and Methodology	2
Verification and Validation Data	3
Modeled Floodplains	4
Floodplain Justification	6
Conclusion	7
References	8

**Floodplain Justification Report
Big Slough/City of North Port Watershed Management Program
Sarasota County, Florida**

Introduction

Ardaman & Associates, Inc. was contracted by the Southwest Florida Water Management District (SWFWMD) to perform Watershed Management Program (WMP) Consulting Services in the Big Slough/City of North Port Watershed. This work was conducted from August, 2003 through November 2010, and involved: development of a LiDAR-based digital terrain model (DTM); performance of a watershed evaluation; and watershed planning, where a storm event hydrologic and hydraulic model was constructed and utilized to identify areas of rainfall-induced flood risk in the watershed. Subsequent to completion of this work, District staff performed an internal review that resulted in minor model and floodplain revisions.

In December 2008, Ardaman staff commenced model maintenance and an overall WMP update at the District's request. The update consisted of the following major tasks:

- 2007 LiDAR QA/QC performed by an Independent Florida Licensed Surveyor and Mapper - Aerial Cartographics of America, Inc (ACA), delivered on May 14, 2009.
- Use of 2007 LiDAR elevation data at select sites (developed parcels in 10 general areas).
- Further sub-basin delineations, with node storage and overflow revisions.
- Creation of Hybrid Terrain (2004-2007)
- Flood risk identification and justification of flood mapping changes.

This report has been submitted along with a complete set of digital WMP deliverables which provide detailed information regarding the model development and delineation of floodplains for the Big Slough/City of North Port Watershed within Sarasota County.

Guidelines and Specifications

WMP activities were conducted in accordance with the 2003 SWFWMD Guidelines and Specifications (G&S) and addendums provided by District staff. In addition, the documentation of supporting technical information conforms to the Federal Emergency Management Agency (FEMA) Guidelines and Specifications for Flood Mapping Partners (2003). Additional information (including white papers, presentations, and technical email correspondence) provided by the District and its subcontractors was utilized, as appropriate, in completing project tasks.

Watershed Description

The Big Slough Watershed is located in southeastern Sarasota County, and is tributary to the Myakka River. Portions of the incorporated City of North Port (those areas east of the Myakka) are located within the southern portion of the watershed. The 195.5 square mile watershed encompasses numerous depressional features, including wetlands and

water bodies, the most prominent of which is the Big Slough Canal (also called Myakkahatchee Creek in its lower reaches). The Big Slough Canal passes from north to south through the City of North Port, and receives inflows from an internal system of waterways which provide surface drainage throughout the City, before discharging beneath U.S. Highway 41 toward its confluence with the Myakka River.

The Big Slough Watershed and portions of the City of North Port are traversed from east to west by Interstate Highway 75. It is generally characterized by flat topography and sandy, shelly and silty sand soils with little organic matter. Its headwaters are rural, consisting primarily of agricultural and undeveloped lands. A vast majority of urban and built up lands occur in the southern portion of the watershed, within the City of North Port. Commercial development is generally limited to main thoroughfares within the city, especially along the US 41 corridor.

Big Slough Canal/ Myakkahatchee Creek begins in the southeastern part of Manatee County (near Edgeville) and flows approximately 21 miles through the City of North Port where it empties to the estuarine portion of the Myakka River. Surface drainage within the City of North Port is provided by an extensive canal system, which discharges primarily to the Big Slough Canal. Some surface drainage occurs via conveyance structures southward into the Port Charlotte conveyance system. Two surface water features unique to the area are Warm Mineral Springs and Little Salt Spring in North Port that are the southernmost springs in the SWFWMD; Refer to Map 1 below.

Floodplain Model Development and Methodology

Activities conducted toward the generation of preliminary floodplains included elements of the Digital Topographic Information, Watershed Evaluation and Watershed Management Plan tasks, according to procedures described in the G&S and as previously reported in project documentation and deliverables. In December 2008, Ardaman staff commenced model maintenance and an overall WMP update. The following briefly describes changes that resulted from that model update.

The model update incorporates Light Detection and Ranging (LiDAR) elevation data that was obtained in late 2007. It also incorporates information extracted from Environmental Resource Permits (ERPs) for recent development projects (constructed between 2004 and 2007). Map 2 illustrates changes in the modified terrain from the original 2004 LiDAR. Using the new terrain and construction data, Ardaman staff updated catchment boundaries, network connectivity, node surface storage, DTM derived cross sections, and natural overflows. Catchments, nodes, and reaches were added to the existing model wherever land use changes occurred or additional model resolution was required to account for storage.

The Big Slough/City of North Port and Watershed model was originally assembled in CHAN and updated using the same hydrodynamic model during this maintenance effort, as requested by District staff. Hydrologic and hydraulic parameters were updated and revised using LiDAR terrain data, land use updates, recent field reconnaissance, a selection of storage areas for modeling, and ERPs for new developments. Below is a summary of elements relative to this watershed model.

Table 1. Summary of Model Elements

Total Area	195.5 Square Miles
Sub-catchments	5015
Nodes	5171
Total Hydraulic Connections	17,872
* Weirs	14,443
* Bridges	55
* Channels	1624
* Riser Culverts	630
* Culverts	1019
* Gates	81
* Orifices	20

The methodology and procedures followed in both initial model development and in the subsequent model update are based on standard engineering practices, SWFWMD and FEMA guidelines and specifications, and best available information describing site conditions. They are considered reasonable for use in estimating the extent of flooding that would result from storm event conditions, and for estimating rainfall-induced flood risk throughout the Big Slough/City of North Port Watershed.

Verification and Validation Data

Limited historical data exists to describe flood conditions that have occurred within the Big Slough/City of North Port Watershed in Sarasota County. The following summarizes available verification and validation data:

High Water Marks: Recorded water level (1992 flood) was provided by the District for a single site within the Big Slough/City of North Port Watershed. This historical high water mark was located in the Big Slough canal immediately north of I-75. The 1992 multi-day event had a total volume of 21.1 inches over a time period of seven days at that location. This was compared to the storm event rainfall-induced flooding predicted by the model, and lends a reasonable level of validation to the model results. The following table shows a comparison of high water marks corresponding to the 1992 flood event compared to the simulation results for the various evaluated (single and multiday) events 100-year and 500-year storm events:

Table 2. Comparison of High Water Marks in Big Slough/City of North Port Watershed

Flood (1992)	HWL Type	HWL Elev	1D 100Y (10.1 in)	5D 100Y (18.5 in)	5D 500Yr (22.7 in)
Big Slough at I-75	Peak	25.05 (NAVD88)	22.8 (NAVD88)	23.94 (NAVD88)	24.52 (NAVD88)

Documented Flooding Areas: Specific areas within the Big Slough/City of North Port Watershed have been identified by local government staff as being prone to flooding. Of those that were identified, model results have been qualitatively reviewed by the City of

North Port to confirm a level of reasonableness and to support the validity of the model as an indicator of flood risk.

Simulated Rainfall: Simulation of a historical event using recorded rainfall data (2003) was performed, and results were compared to field observations following that rainfall event. Model results were found to produce peak elevations concurrent with those observed, and provide a good level of model validation.

Hydrologic Gauge Data: Only three gauges with sufficient stream elevation data exist for verification or validation of model results for rainfall-induced flooding conditions. The results of the 2003 simulation compared to gage data at the various locations are presented in Table 3.

In addition to the 2003 calibration event result comparison, the 5-day 100-year and the 1-day 100-year storm event simulated maximum stages were compared to the observed peak stages during 1992 storm event at various locations within the watershed. Table 4 presents a summary of observed and simulated maximum stages during the event. As shown in the table, observed stages are closer to the multiday maximum stages.

Table. 3. Simulated Peaks Compared to Recorded Levels

USGS 02299410 Big Slough Canal near Myakka City	
Observed Max. Stage 06/25/03	32.57 ft, NAVD88
Modeled Max. Stage	32.20 ft NAVD88
USGS 02299450 Big Slough at Tropicare	
Observed Max. Stage 06/23/03	25.80 ft, NAVD88
Modeled Max. Stage	26.26 ft, NADV88
USGS 02299360 Snover Waterway Canal near Murdock	
Observed Max. Stage 06/24/03	18.80 ft, NAVD88
Modeled Max. Stage	19.66 ft, NADV88

Modeled Floodplains

A variety of synthetic storm events, with durations ranging from one to five days, was used to simulate the response of the watershed and to delineate areas at risk to rainfall-induced flooding. These storm events, each assigned an associated rainfall volume with a 1% annual probability of recurrence, are commonly used for floodplain analysis applications. It is assumed by this application of the storm event for flood risk determination that the recurrence frequency of the flooding is the same as that of the rainfall event, and it is understood that the computed flood elevations and extents are dependent not only on the storm event rainfall volume but also a number of other factors including initial water levels and related surface storage availability at the onset of the storm event.

For the portion of the area defined by the Big Slough conveyance system, the 5-day 100-year storm event is considered as most reasonable to use to delineate areas at risk to rainfall-induced flooding due to the multiday peak recorded stage in high water mark database. For the rest of the watershed, results from the 1-day 100-year storm event

Table 4. Observed Maximum Stages during 1992 Storm Event compared to 5-day 100-year and 1-day 100-year Storm Events Simulated Maximum Stages.

Id	Location	Observed Peak Stage	Simulated Storm Event (Ardaman)	
		1992 Storm Event (ft, NGVD29)	5-Day 100-Year (ft, NGVD29)	1-Day 100-Year (ft, NGVD29)
1	Tropicaire Blvd and Chamberlain Blvd	27.6	28.01	26.16
2	Tropicaire Blvd and Imbe St	28.8	N/A	N/A
3	Tropicaire Blvd and Cosmic Waterway	26.9	28	26.16
4	Albin Ave	27.7	27.32	25.48
5	North Salford Blvd and Albin Ave	26.7	27.27	25.22
6	Lovering Ave and Salford Blvd	25.8	27.12	25.61
7	Sumter Blvd and Ulman St	26.7	27.12	25.61
8	Sumter Blvd and Tropicaire Blvd	26.3	27.22	25.24
9	Coldspring Ln and Reisterstown Rd	26.5	27.5	26.43
10	Reisterstown Rd and Estates Dr	27.4	28.11	27.00
11	Estates Dr and Taneytown Rd	27.7	26.94	26.38
12	Estates Dr and Adbella Ln	27.4	26.32	25.86
13	Adbella Ln and Old Court St	26.4	26.2	25.69
14	Van Camp Street and Olster Dr	27.1	23.55	22.94
15	North Biscayne Dr and Tropicaire Blvd	23.7, 23.9	24.19	24.10
16	Cheseboro Ave and Trico Rd	13.6	N/A	N/A
17	Sarletto Street	13.3	N/A	N/A
18	Gatun St	11.7	N/A	N/A
19	Bullard St at R-36 Canal	11.6	11.44	10.84
20	Bullard St and Herbison Ave	9.8	10.98	10.69
21	Dorothy Ave	10.4	10.97	10.45
22	Sutherlin St	10.5	10.98	10.19
23	Trianfo St	11.2	11.37	10.24
24	Eager St and Tamiami Trl	9.8	N/A	N/A
25	Postma St between McKibben Dr and Maraldo Ave	11.6, 11.8	12.59	11.41
26	Mongite Rd	11.7	12.62	11.82
27	Lingle St and McKibben Dr	11.7	12.72	11.82
28	Sumter and Sylvania Ave	23.1	N/A	N/A

simulation were used since no evidence (elsewhere) of high watermarks were recorded within the historical high water mark data base.

Using GIS mapping techniques in combination with the DEM, floodplains were automatically generated for each sub-basin delineated within this watershed. Due to the variability of the terrain, sometimes this resulted in the inadvertent creation of floodplain polygons that were detached from the primary floodplain. These polygons were termed “spackle” and were generally removed when the footprint they occupied was less than 0.1 acres. Spackle was not removed, however, when a stormwater drainage system connected the spackle to a primary floodplain. In addition to spackle, sometimes gaps were unintentionally generated within the floodplains. These voids were filled whenever the gap was less than 0.1 acres.

The results of floodplain modeling and delineation in comparison to the areas currently designated by FEMA as Special Flood Hazard Areas are shown in Maps 3, 4, 5, 6, and 7. Map 3 illustrates the 100-year floodplain resulting from current modeling efforts. Map 4 illustrates acreage change between FEMA's floodplain and the modeled floodplain. Map 5 illustrates the percent change and Map 6 illustrates the percent change by basin area. Map 7 displays the two floodplains overlain onto the aerial which illustrates the floodplain resulting from a 100-year shows more area of flood risk than is currently designated by FEMA as Special Flood Hazard Areas. FEMA flood risk map were not developed for the eastern portion of the watershed. Refer to table 5 below for FEMA and updated floodplain comparison. Both the FEMA and North Port/Big Slough WMP floodplain layers were intersected with a parcels layer, provided by the City, to generate a count of the number of inundated parcels. This count is not necessarily indicative of structural flooding, as the great majority of homes are constructed on fill.

Table 5. Floodplain Area and Parcel Inundation Comparisons:100-year Recurrence

Data Source	Floodplain Area (ac)	Parcels that Touch Floodplain	Parcels Inundated 25%	Parcels Inundated 50%
FEMA	1,825	2,527	2,433	2,370
City of North Port WMP	13,544	23,715	4,171	2,630

Floodplain Justification

This report is provided to describe engineering practices employed and data available to provide reasonable assurance that those areas of rainfall-induced flood risk have been identified and can be justified. Appendix A contains a table summarizing information on a basin-by-basin basis that includes the peak stages resulting from the model simulations, which storm event was used to generate the floodplain, FEMA Zone, Preliminary Modeled Flood zone, and High Water Mark Elevation (ft, NAVD 88)

Where existing flood risk areas have been identified by FEMA, the results of this study result in a more refined delineation of those areas. However, some of the areas in which rainfall-induced floodplains have been delineated are in areas where no previous FEMA floodplain exists. This is related to the more detailed methodology used in performing this modeling and mapping evaluation as compared to the prior efforts by FEMA to delineate flood risk areas. The newly identified floodplain areas result from the availability of detailed topographic information and from the application of more rigorous engineering analysis, providing a more accurate assessment of flood risk.

Ardaman staff performed an analysis to determine the root cause of differences (horizontal and vertical extents) between the proposed floodplains and currently adopted FEMA floodplain. Based upon the results of this analysis, it was determined that there are four general categories these discrepancies fit into: 1) terrain differences resulting from using more recent and accurate terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail. Map 8 illustrates the basins color coded according to these categories.

About 90% of sub-basins where floodplains have been delineated during this modeling effort have no FEMA floodplains. This is related to the more rigorous approach used to identify storage areas and natural depressions for modeling. No change occurred in the floodplain area for 1% of the sub-basins. Appendix B identifies which of the above categories each falls into as well as the acreage and percent change between the modeled and FEMA flood risk areas

Conclusion

While there was limited historical data with which to assess the accuracy of model results, this modeling effort was confirmed with City of North Port staff who strongly corroborated results of simulation for the 2003 flood event. Also, Ardaman staff visited the area in 2004 (immediately after Hurricane Charley) to gain first hand knowledge and to record findings of flooding issues for later model verifications.

Based on the information provided herein, describing the data, methodology, and procedures employed, and upon review of the accompanying project deliverables, the estimation of flood prone areas is considered reasonable. Based on the reasonableness of the simulation and mapping results, and given the lack of compelling evidence to dictate the use of longer duration storm events, the 100-year 24-hour storm and floodplain maps delineated as described above are to be used for estimation of flood risk in most portions of the watershed, excluding the Big Slough canal stretch. Historical water level data exists to support and justify the use of multi-day storms for the Big Slough Canal within the City of North Port.

References

Federal Emergency Management Agency. (2003). *Guidelines and Specifications for Flood Hazard Mapping Partners – Appendix M: Guidance for Preparing and Maintaining Technical and Administrative Support Data*. Retrieved September 29, 2003, from the Federal Emergency Management Agency website: <http://www.fema.gov/library>.

Southwest Florida Water Management District. (2002). *Watershed Management Program Guidelines and Specifications for Digital Topographic Information, Watershed Evaluation, Watershed Management Plan, and Watershed Management Plan Database Maintenance and Watershed Model Updates*. Retrieved November 22, 2002, from the Southwest Florida Water Management District's website: <http://www.swfwmd.state.fl.us>.

Appendix A

Basin Summary Table

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
A0020	NA0020	100 YR - 1 Day		AE	20.07	22.43	
A0021	NA0021	100 YR - 1 Day		AE	19.51	22.43	
A0022	NA0022	100 YR - 1 Day		AE	19.26	19.55	
A0023	NA0023	100 YR - 1 Day		AE	19.34	20.66	
A0024	NA0024	100 YR - 1 Day		AE	20.11	23.38	
A0026	NA0026	100 YR - 1 Day		AE	19.94	23.38	
A0028	NA0028	100 YR - 1 Day		AE	20.75	22.96	
A0030	NA0030	100 YR - 1 Day		AE	19.26	19.55	
A0035	NA0035	100 YR - 1 Day		AE	20.64	20.50	
A0040	NA0040	100 YR - 1 Day		AE	19.25	19.54	
A0050	NA0050	100 YR - 1 Day			19.23	19.53	
A0055	NA0055	100 YR - 1 Day		AE	20.17	22.35	
A0060	NA0060	100 YR - 1 Day		AE	19.23	19.52	
A0063	NA0063	100 YR - 1 Day		AE	19.76	19.74	
A0066	NA0066	100 YR - 1 Day		AE	20.31	21.85	
A0070	NA0070	100 YR - 1 Day		AE	19.22	19.52	
A0073	NA0073	100 YR - 1 Day		AE	20.26	21.85	
A0077	NA0077	100 YR - 1 Day		AE	20.25	21.69	
A0080	NA0080	100 YR - 1 Day		AE	19.21	19.52	
A0085	NA0085	100 YR - 1 Day		AE	20.22	20.12	
A0090	NA0090	100 YR - 1 Day		AE	19.20	19.51	
A0092	NA0092	100 YR - 1 Day			20.84	20.83	
A0097	NA0097	100 YR - 1 Day		AE	20.04	19.97	
A0098	NA0098	100 YR - 1 Day		AE	20.84	20.83	
A0100	NA0100	100 YR - 1 Day		AE	19.18	19.50	
A0102	NA0102	100 YR - 1 Day		AE	19.82	19.61	
A0103	NA0103	100 YR - 1 Day			20.45	20.44	
A0106	NA0106	100 YR - 1 Day		AE	19.72	19.82	
A0107	NA0107	100 YR - 1 Day		AE	20.45	20.44	
A0108	NA0108	100 YR - 1 Day		AE	19.63	19.60	
A0110	NA0110	100 YR - 1 Day		AE	19.12	19.47	
A0113	NA0113	100 YR - 1 Day		AE	19.16	19.47	
A0116	NA0116	100 YR - 1 Day		AE	19.45	19.55	
A0120	NA0120	100 YR - 1 Day		AE	19.03	19.43	
A0125	NA0125	100 YR - 1 Day		AE	19.07	19.45	
A0130	NA0130	100 YR - 1 Day		AE	18.81	19.33	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
A0132	NA0132	100 YR - 1 Day		AE	20.02	20.06	
A0135	NA0135	100 YR - 1 Day		AE	18.46	19.69	
A0139	NA0139	100 YR - 1 Day		AE	17.95	19.04	
A0140	NA0140	100 YR - 1 Day		AE	17.95	19.01	
A1010	NA1010	100 YR - 1 Day		AE	21.48	21.34	
A1020	NA1020	100 YR - 1 Day		AE	21.48	21.34	
A1030	NA1030	100 YR - 1 Day		AE	21.48	21.34	
A1040	NA1040	100 YR - 1 Day		AE	21.48	21.33	
A1050	NA1050	100 YR - 1 Day		AE	20.16	20.23	
A2010	NA2010	100 YR - 1 Day		AE	20.59	21.61	
A2020	NA2020	100 YR - 1 Day		AE	20.59	21.61	
A2023	NA2023	100 YR - 1 Day		AE	20.59	21.62	
A2027	NA2027	100 YR - 1 Day		AE	20.59	21.61	
A2028	NA2028	100 YR - 1 Day		AE	20.59	21.61	
A2030	NA2030	100 YR - 1 Day		AE	20.59	21.61	
A2040	NA2040	100 YR - 1 Day		AE	20.57	21.60	
A2050	NA2050	100 YR - 1 Day		AE	20.54	21.60	
A2060	NA2060	100 YR - 1 Day		AE	20.53	21.60	
A3010	NA3010	100 YR - 1 Day		AE	20.38	20.28	
A3020	NA3020	100 YR - 1 Day		AE	20.38	20.27	
A3030	NA3030	100 YR - 1 Day		AE	20.34	20.25	
A3040	NA3040	100 YR - 1 Day		AE	20.33	20.23	
A3050	NA3050	100 YR - 1 Day		AE	20.27	20.15	
A3060	NA3060	100 YR - 1 Day		AE	20.26	20.15	
B0630	NB0630	100 YR - 5 Day	AO		26.30	27.50	
B0640	NB0640	100 YR - 5 Day	AO	AE	25.84	26.87	
B0650	NB0650	100 YR - 5 Day	AO	AE	25.80	26.83	
B0660	NB0660	100 YR - 5 Day	AO	AE	25.82	26.85	
B0664	NB0664	100 YR - 5 Day	AO	AE	25.77	26.73	
B0670	NB0670	100 YR - 5 Day	AO	AE	25.63	26.65	
B0680	NB0680	100 YR - 5 Day	AO	AE	25.48	26.52	
B0681	NB0681	100 YR - 1 Day		AE	25.31	26.37	
B0682	NB0682	100 YR - 5 Day		AE	25.31	26.37	
B0685	NB0685	100 YR - 5 Day	AO	AE	25.31	26.38	
B0688	NB0688	100 YR - 5 Day	AO	AE	25.27	26.34	
B0689	NB0689	100 YR - 5 Day	AO	AE	25.27	26.34	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
B0690	NB0690	100 YR - 5 Day	AO	AE	25.25	26.34	
B0700	NB0700	100 YR - 5 Day	AO	AE	24.96	26.16	
B0710	NB0710	100 YR - 5 Day	AO	AE	24.83	26.13	
B0720	NB0720	100 YR - 5 Day	AO	AE	24.73	26.10	
B0722	NB0722	100 YR - 5 Day	AO	AE	24.49	26.00	
B0724	NB0724	100 YR - 5 Day	AO	AE	24.49	26.00	
B0730	NB0730	100 YR - 5 Day	AO	AE	24.28	25.64	
B0740	NB0740	100 YR - 5 Day	AO	AE	24.01	25.39	
B0745	NB0745	100 YR - 5 Day	AO	AE	23.58	24.98	
B0746	NB0746	100 YR - 5 Day	AO	AE	23.84	25.68	
B0747	NB0747	100 YR - 5 Day	AO	AE	23.65	25.04	
B0748	NB0748	100 YR - 5 Day	AO	AE	23.13	24.44	
B0750	NB0750	100 YR - 5 Day	AO		22.80	23.94	25.05 (1992)
B0765	NB0790	100 YR - 5 Day	AO		21.02	21.86	
B0770	NB0770	100 YR - 5 Day	AO	AE	22.25	23.32	
B0775	NB1160	100 YR - 5 Day	AO		21.51	22.50	
B0780	NB0780	100 YR - 5 Day	AO		21.78	22.87	
B0790	NB0790	100 YR - 5 Day	AO	AE	21.02	21.86	
B0800	NB0800	100 YR - 5 Day	AO	AE	20.80	21.64	
B0810	NB0810	100 YR - 5 Day	AO	AE	20.30	21.17	
B0813	NB0813	100 YR - 5 Day	AO	AE	19.94	20.89	
B0817	NB0817	100 YR - 5 Day	AO	AE	19.56	20.46	
B0820	NB0820	100 YR - 5 Day	AO	AE	19.54	20.44	
B0830	NB0830	100 YR - 5 Day	AO	AE	18.21	19.60	
B0835	NB0835	100 YR - 5 Day	AO	AE	17.68	19.36	
B0837	NB0837	100 YR - 5 Day	AO	AE	17.68	19.36	
B0840	NB0840	100 YR - 5 Day	AO	AE	17.68	19.12	
B0860	NB0860	100 YR - 5 Day	A0	AE	17.22	18.71	
B0870	NB0870	100 YR - 5 Day	A0	AE	16.64	18.30	
B0880	NB0880	100 YR - 5 Day	A0	AE	16.58	18.26	
B0886	NB0886	100 YR - 5 Day	A0	AE	16.46	18.14	
B0888	NB0888	100 YR - 5 Day	A3 F	AE	15.59	17.22	
B0890	NB0890	100 YR - 5 Day	A3 F	AE	15.57	17.20	
B0905	NB0905	100 YR - 1 Day		AE	16.84	16.92	
B0907	NB0907	100 YR - 1 Day		AE	16.88	16.98	
B0910	NB0910	100 YR - 5 Day	A3 F	AE	15.41	16.99	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
B0920	NB0920	100 YR - 5 Day	A3 F	AE	15.27	16.82	
B0930	NB0930	100 YR - 5 Day	A3 F		15.10	16.61	
B0931	NB0931	100 YR - 1 Day		AE	14.82	16.24	
B0934	NB0934	100 YR - 1 Day		AE	16.10	16.40	
B0935	NB0935	100 YR - 1 Day		AE	16.03	16.35	
B0936	NB0936	100 YR - 1 Day		AE	16.34	16.44	
B0938	NB0938	100 YR - 1 Day		AE	16.54	16.57	
B0940	NB0940	100 YR - 5 Day	A3 F	AE	14.82	16.23	
B0943	NB0943	100 YR - 1 Day		AE	15.84	16.34	
B0945	NB0945	100 YR - 1 Day		AE	15.92	16.35	
B0950	NB0950	100 YR - 5 Day	A3 F	AE	14.65	16.00	
B0960	NB0960	100 YR - 5 Day	A3 F	AE	14.02	15.29	
B0963	NB0963	100 YR - 5 Day	A3 F	AE	13.72	14.91	
B0965	NB0965	100 YR - 1 Day		AE	15.65	15.57	
B0970	NB0970	100 YR - 5 Day	A3 F	AE	13.45	14.55	
B0980	NB0980	100 YR - 5 Day	A3 F	AE	13.17	14.16	
B0985	NB0985	100 YR - 1 Day	A0	AE	18.00	18.01	
B0990	NB0990	100 YR - 5 Day	A3 F	AE	12.86	13.82	
B1000	NB1000	100 YR - 5 Day	A3 F	AE	12.54	13.59	
B1010	NB1010	100 YR - 5 Day	A3 F	AE	12.21	13.24	
B1020	NB1020	100 YR - 5 Day	A3 F	AE	11.58	12.62	
B1030	NB1030	100 YR - 5 Day	A4 F	AE	10.90	12.33	
B1060	NB1060	100 YR - 5 Day	A8	AE	9.66	11.36	
B1065	NB1065	100 YR - 1 Day		AE	9.78	9.96	
B1070	NB1070	100 YR - 5 Day	A8	AE	8.08	10.02	
B1110	NB1110	100 YR - 5 Day	AO	AE	21.74	23.41	
B1120	NB1120	100 YR - 5 Day	AO	AE	21.41	22.11	
B1130	NB1130	100 YR - 5 Day	AO	AE	21.38	22.05	
B1140	NB1140	100 YR - 5 Day	AO	AE	21.50	22.50	
B1145	NB1145	100 YR - 5 Day	AO	AE	22.55	23.80	
B1150	NB1150	100 YR - 5 Day	AO	AE	21.50	22.50	
B1160	NB1160	100 YR - 5 Day	AO	AE	21.51	22.50	
B3004	NB3004	100 YR - 5 Day	AO	AE	25.50	26.53	
B3006	NB3006	100 YR - 5 Day	AO	AE	25.51	26.54	
B3007	NB3007	100 YR - 5 Day	AO	AE	25.63	26.62	
B3510	NB3510	100 YR - 5 Day	AO	AE	25.82	26.66	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
B3520	NB3520	100 YR - 5 Day	AO	AE	25.82	26.66	
B3523	NB3523	100 YR - 5 Day	AO	AE	25.75	26.44	
B3527	NB3527	100 YR - 5 Day	AO	AE	25.78	26.44	
B3530	NB3530	100 YR - 5 Day	AO	AE	25.79	26.64	
B3540	NB3540	100 YR - 5 Day	AO	AE	25.78	26.64	
B3550	NB3550	100 YR - 5 Day	AO	AE	25.75	26.66	
B3560	NB3560	100 YR - 5 Day	AO	AE	25.72	26.66	
B3610	NB3610	100 YR - 5 Day	AO	AE	24.40	26.22	
B3620	NB3620	100 YR - 5 Day	AO	AE	24.66	26.10	
B3630	NB3630	100 YR - 5 Day	AO	AE	24.88	26.18	
B3640	NB3640	100 YR - 5 Day	AO	AE	25.17	26.31	
B3708	NB3708	100 YR - 5 Day	AO	AE	25.49	26.52	
B3709	NB3709	100 YR - 5 Day	AO	AE	25.36	26.42	
B3710	NB3710	100 YR - 5 Day	AO	AE	25.48	26.51	
B3718	NB3718	100 YR - 5 Day	AO	AE	25.49	26.54	
B3719	NB3719	100 YR - 5 Day	AO	AE	25.42	26.46	
B3720	NB3720	100 YR - 5 Day	AO	AE	25.48	26.49	
B3805	NB3805	100 YR - 1 Day		AE	24.43	25.55	
B3809	NB3809	100 YR - 5 Day		AE	25.15	26.22	
B3810	NB3810	100 YR - 1 Day		AE	24.78	25.78	
B3815	NB3815	100 YR - 1 Day		AE	25.16	26.22	
B3820	NB3820	100 YR - 5 Day	AO	AE	24.94	25.97	
B3905	NB3905	100 YR - 1 Day		AE	24.43	25.54	
B3910	NB3910	100 YR - 1 Day		AE	24.71	25.73	
B3912	NB3912	100 YR - 5 Day		AE	24.50	25.54	
B3920	NB3920	100 YR - 5 Day		AE	24.51	25.56	
B3930	NB3930	100 YR - 5 Day	AO	AE	24.50	25.56	
B3931	NB3931	100 YR - 1 Day		AE	24.67	25.73	
B3940	NB3940	100 YR - 5 Day	AO	AE	24.63	25.73	
B4010	NB4010	100 YR - 1 Day		AE	24.12	26.11	
B4020	NB4020	100 YR - 1 Day		AE	24.12	26.02	
B4023	NB4023	100 YR - 1 Day		AE	24.00	26.03	
B4027	NB4027	100 YR - 1 Day		AE	24.00	26.02	
B4030	NB4030	100 YR - 5 Day	AO	AE	24.11	26.02	
B4031	NB4031	100 YR - 5 Day	AO	AE	24.12	26.00	
B4032	NB4032	100 YR - 5 Day	AO	AE	24.12	26.00	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
B4033	NB4033	100 YR - 5 Day	AO	AE	24.12	26.02	
B4035	NB4035	100 YR - 5 Day	AO	AE	24.11	26.02	
B4039	NB4039	100 YR - 5 Day	AO	AE	24.11	26.02	
B4040	NB4040	100 YR - 5 Day	AO	AE	24.11	26.02	
B4115	NB4115	100 YR - 5 Day	AO	AE	24.11	26.02	
B4117	NB4117	100 YR - 5 Day	AO	AE	24.11	26.02	
B4120	NB4120	100 YR - 5 Day	AO	AE	24.11	26.01	
B4121	NB4121	100 YR - 5 Day	AO	AE	24.11	26.02	
B4122	NB4122	100 YR - 5 Day	AO	AE	24.11	26.02	
B4123	NB4123	100 YR - 5 Day	AO	AE	24.11	26.00	
B4125	NB4125	100 YR - 5 Day	AO	AE	24.11	26.01	
B4130	NB4130	100 YR - 5 Day	AO	AE	24.11	26.01	
B4131	NB4130	100 YR - 5 Day	AO		24.11	26.01	
B4132	NB4121	100 YR - 1 Day			24.11	26.02	
B4211	NB4211	100 YR - 5 Day	AO	AE	24.10	26.00	
B4213	NB4213	100 YR - 5 Day	AO	AE	24.11	26.01	
B4214	NB4214	100 YR - 5 Day	AO	AE	24.11	26.01	
B4217	NB4217	100 YR - 5 Day	AO	AE	24.11	26.01	
B4220	NB4220	100 YR - 5 Day	AO		24.10	26.00	
B4230	NB4230	100 YR - 5 Day	AO		23.80	25.14	
B4235	NB4235	100 YR - 5 Day	AO	AE	23.73	25.06	
B4240	NB4240	100 YR - 5 Day	AO	AE	23.81	25.15	
B4243	NB4243	100 YR - 5 Day	AO	AE	23.73	25.06	
B4250	NB4250	100 YR - 5 Day	AO	AE	23.73	25.07	
B4310	NB4310	100 YR - 1 Day		AE	23.98	25.27	
B4320	NB4320	100 YR - 1 Day		AE	24.01	25.31	
B4325	NB4325	100 YR - 1 Day		AE	24.05	25.33	
B4327	NB4327	100 YR - 1 Day		AE	24.17	25.51	
B4330	NB4330	100 YR - 1 Day		AE	24.01	25.32	
B4332	NB4332	100 YR - 1 Day		AE	24.21	25.51	
B4334	NB4334	100 YR - 1 Day		AE	24.06	25.47	
B4336	NB4336	100 YR - 1 Day		AE	24.06	25.46	
B4338	NB4338	100 YR - 1 Day		AE	24.06	25.44	
B4339	NB4339	100 YR - 1 Day		AE	24.06	25.45	
B4340	NB4340	100 YR - 1 Day		AE	24.01	25.33	
B4344	NB4344	100 YR - 5 Day	AO	AE	24.08	25.50	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
B4345	NB4345	100 YR - 1 Day		AE	24.05	25.48	
B4346	NB4346	100 YR - 1 Day		AE	24.00	25.38	
B4350	NB4350	100 YR - 1 Day		AE	24.00	25.38	
B4355	NB4355	100 YR - 1 Day		AE	23.99	25.31	
B4410	NB4410	100 YR - 1 Day		AE	23.77	25.05	
B4422	NB4422	100 YR - 1 Day		AE	23.80	25.06	
B4424	NB4424	100 YR - 1 Day		AE	23.80	25.06	
B4426	NB4426	100 YR - 1 Day		AE	23.80	25.06	
B4430	NB4430	100 YR - 1 Day		AE	23.80	25.06	
B4440	NB4440	100 YR - 1 Day		AE	23.81	25.08	
B4452	NB4452	100 YR - 1 Day			23.98	25.28	
B4454	NB4454	100 YR - 1 Day		AE	23.98	25.28	
B4458	NB4458	100 YR - 1 Day		AE	23.90	25.16	
B4460	NB4460	100 YR - 1 Day		AE	23.90	25.18	
B4510	NB4510	100 YR - 1 Day		AE	23.92	25.27	
B4524	NB4524	100 YR - 5 Day	AO	AE	23.98	25.37	
B4525	NB4525	100 YR - 1 Day		AE	23.97	25.36	
B4526	NB4526	100 YR - 5 Day	AO	AE	23.98	25.37	
B4527	NB4527	100 YR - 1 Day		AE	23.97	25.34	
B4529	NB4529	100 YR - 5 Day	AO	AE	23.95	25.36	
B4530	NB4530	100 YR - 5 Day	AO	AE	23.95	25.37	
B4531	NB4531	100 YR - 5 Day	AO	AE	23.94	25.32	
B4533	NB4533	100 YR - 5 Day	AO	AE	23.96	25.38	
B4535	NB4535	100 YR - 5 Day	AO	AE	23.95	25.36	
B4537	NB4537	100 YR - 5 Day	AO	AE	23.95	25.33	
B4539	NB4539	100 YR - 5 Day	AO	AE	23.95	25.36	
B4540	NB4540	100 YR - 5 Day	AO	AE	23.95	25.33	
B4541	NB4541	100 YR - 5 Day	AO	AE	24.05	25.43	
B4542	NB4542	100 YR - 5 Day	AO	AE	24.14	25.41	
B4543	NB4543	100 YR - 5 Day	AO	AE	24.05	25.43	
B4544	NB4544	100 YR - 5 Day	AO	AE	24.08	25.41	
B4545	NB4545	100 YR - 5 Day	AO	AE	24.05	25.40	
B4546	NB4546	100 YR - 5 Day	AO	AE	24.04	25.39	
B4547	NB4547	100 YR - 5 Day	AO	AE	24.03	25.37	
B4548	NB4548	100 YR - 5 Day	AO	AE	23.99	25.38	
B4549	NB4549	100 YR - 5 Day	AO	AE	24.05	25.40	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
B4550	NB4550	100 YR - 5 Day	AO	AE	23.97	25.36	
B4551	NB4551	100 YR - 5 Day	AO	AE	23.96	25.34	
B4560	NB4560	100 YR - 5 Day	AO	AE	23.96	25.35	
B4702	NB4702	100 YR - 1 Day	AO	AE	21.89	21.86	
B4703	NB4703	100 YR - 1 Day	AO	AE	21.89	21.86	
B4706	NB4706	100 YR - 1 Day		AE	22.00	21.94	
B4707	NB4707	100 YR - 1 Day		AE	22.00	21.93	
B4708	NB4708	100 YR - 1 Day		AE	21.95	21.90	
B4709	NB4709	100 YR - 1 Day		AE	21.93	21.88	
B4720	NB4720	100 YR - 1 Day		AE	21.88	21.83	
B4735	NB4735	100 YR - 1 Day		AE	21.89	21.83	
B4740	NB4740	100 YR - 1 Day		AE	21.88	21.83	
B4750	NB4750	100 YR - 1 Day		AE	21.75	21.75	
B4810	NB4810	100 YR - 1 Day		AE	21.71	21.72	
B4820	NB4820	100 YR - 1 Day		AE	21.71	21.72	
B4830	NB4830	100 YR - 1 Day		AE	21.70	21.71	
B4845	NB4845	100 YR - 1 Day	AO	AE	21.65	21.63	
B4850	NB4850	100 YR - 1 Day	AO	AE	21.22	21.30	
B4851	NB4851	100 YR - 5 Day	AO	AE	21.39	22.03	
B4852	NB4852	100 YR - 5 Day	AO	AE	21.35	22.02	
B4853	NB4853	100 YR - 1 Day		AE	21.05	21.65	
B4854	NB4854	100 YR - 5 Day	AO	AE	21.29	22.01	
B4855	NB4855	100 YR - 1 Day	AO	AE	21.28	22.01	
B4856	NB4856	100 YR - 1 Day	AO	AE	21.28	21.97	
B4857	NB4857	100 YR - 1 Day		AE	20.91	21.27	
B4858	NB4858	100 YR - 1 Day	AO	AE	21.28	21.99	
B4859	NB4859	100 YR - 1 Day		AE	20.90	21.25	
B4860	NB4860	100 YR - 1 Day		AE	20.74	21.15	
B4870	NB4870	100 YR - 1 Day	AO		20.75	21.13	
B4880	NB4880	100 YR - 1 Day	AO	AE	21.00	21.47	
B4882	NB4882	100 YR - 1 Day	AO	AE	21.75	22.00	
B4883	NB4883	100 YR - 1 Day	AO	AE	20.74	21.15	
B4884	NB4884	100 YR - 1 Day	AO		20.74	21.15	
B4885	NB4885	100 YR - 5 Day	AO	AE	21.29	22.01	
B4890	NB4890	100 YR - 5 Day	AO	AE	21.22	21.84	
B4895	NB4895	100 YR - 1 Day		AE	22.11	22.08	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
B4896	NB4896	100 YR - 1 Day	AO		22.11	22.08	
B4897	NB4897	100 YR - 5 Day	AO	AE	21.22	21.85	
B4900	NB4900	100 YR - 5 Day	AO	AE	21.27	21.89	
B4910	NB4910	100 YR - 5 Day	AO	AE	21.28	21.91	
B4920	NB4920	100 YR - 5 Day	AO	AE	21.46	22.30	
B4930	NB4930	100 YR - 5 Day	AO	AE	21.23	22.05	
B5010	NB5010	100 YR - 1 Day		AE	23.59	24.56	
B5025	NB5025	100 YR - 1 Day		AE	23.70	24.82	
B5030	NB5030	100 YR - 1 Day		AE	23.70	24.83	
B5040	NB5040	100 YR - 1 Day		AE	23.73	24.87	
B5110	NB5110	100 YR - 1 Day		AE	23.98	25.26	
B5115	NB5115	100 YR - 1 Day		AE	24.21	25.17	
B5120	NB5120	100 YR - 1 Day		AE	23.97	25.19	
B5130	NB5130	100 YR - 1 Day		AE	23.95	25.15	
B5132	NB5132	100 YR - 1 Day		AE	23.94	25.06	
B5135	NB5135	100 YR - 1 Day		AE	23.94	25.07	
B5138	NB5138	100 YR - 1 Day		AE	23.94	25.07	
B5140	NB5140	100 YR - 1 Day		AE	23.94	25.11	
B5145	NB5145	100 YR - 1 Day		AE	23.92	25.02	
B5150	NB5150	100 YR - 1 Day		AE	23.92	25.08	
B5160	NB5160	100 YR - 1 Day		AE	23.66	25.07	
B5170	NB5170	100 YR - 1 Day		AE	23.66	25.07	
B5190	NB5190	100 YR - 1 Day		AE	23.66	25.05	
B5195	NB5195	100 YR - 1 Day		AE	23.66	25.02	
B5210	NB5210	100 YR - 1 Day		AE	23.64	25.01	
B5212	NB5212	100 YR - 1 Day		AE	23.64	25.00	
B5315	NB5315	100 YR - 1 Day		AE	23.98	24.79	
B5317	NB5317	100 YR - 1 Day		AE	23.98	24.83	
B5320	NB5320	100 YR - 1 Day		AE	23.98	24.92	
B5325	NB5325	100 YR - 1 Day		AE	23.91	24.92	
B5327	NB5327	100 YR - 1 Day		AE	23.91	24.93	
B5330	NB5330	100 YR - 1 Day		AE	23.91	24.93	
B5332	NB5332	100 YR - 1 Day		AE	23.95	24.99	
B5338	NB5338	100 YR - 1 Day		AE	23.91	24.94	
B5339	NB5339	100 YR - 1 Day		AE	23.90	24.93	
B5340	NB5340	100 YR - 1 Day		AE	23.88	24.93	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
B5360	NB5360	100 YR - 1 Day		AE	23.76	24.93	
B5375	NB5375	100 YR - 1 Day		AE	23.68	24.87	
B5377	NB5377	100 YR - 1 Day		AE	23.68	24.87	
B5380	NB5380	100 YR - 1 Day		AE	23.68	24.88	
B5390	NB5390	100 YR - 1 Day		AE	23.65	24.89	
B5400	NB5400	100 YR - 1 Day		AE	23.64	24.88	
B5410	NB5410	100 YR - 1 Day		AE	23.40	24.77	
B5420	NB5410	100 YR - 1 Day			23.40	24.77	
B5440	NB5440	100 YR - 1 Day		AE	22.06	22.29	
B5450	NB5450	100 YR - 1 Day			21.92	22.13	
B5453	NB5453	100 YR - 1 Day		AE	22.23	22.18	
B5455	NB5455	100 YR - 1 Day		AE	22.05	22.13	
B5457	NB5457	100 YR - 1 Day		AE	21.94	22.13	
B5470	NB5470	100 YR - 1 Day		AE	21.79	21.97	
B5480	NB5480	100 YR - 1 Day	AO	AE	20.88	21.77	
B5490	NB5490	100 YR - 5 Day	AO	AE	20.84	21.70	
B5510	NB5510	100 YR - 5 Day	AO	AE	20.84	21.70	
B5590	NB5590	100 YR - 5 Day			26.15	27.25	
B5610	NB5610	100 YR - 1 Day		X	21.78	21.73	
B5613	NB5613	100 YR - 1 Day		AE	22.14	22.10	
B5617	NB5617	100 YR - 1 Day			21.89	21.79	
B5620	NB5620	100 YR - 1 Day		AE	21.78	21.73	
B5630	NB5630	100 YR - 1 Day		AE	21.78	21.73	
B5635	NB5635	100 YR - 1 Day		AE	21.77	21.71	
B5640	NB5640	100 YR - 1 Day		AE	20.42	20.98	
B5642	NB5642	100 YR - 1 Day		AE	20.58	21.03	
B5644	NB5644	100 YR - 1 Day			20.57	21.62	
B5646	NB5646	100 YR - 1 Day			20.57	21.62	
B5650	NB5650	100 YR - 1 Day		AE	20.43	21.46	
B5655	NB5655	100 YR - 1 Day		AE	20.43	21.47	
B5660	NB5660	100 YR - 1 Day		AE	20.43	21.61	
B5663	NB5663	100 YR - 1 Day		X	24.19	24.12	
B5667	NB5667	100 YR - 1 Day		AE	20.43	21.61	
B5670	NB5670	100 YR - 1 Day		AE	20.43	21.62	
B5675	NB5675	100 YR - 1 Day	AO	AE	20.43	21.62	
B5676	NB5676	100 YR - 5 Day	AO	AE	20.43	21.62	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
B5680	NB5680	100 YR - 5 Day	AO	AE	20.43	21.63	
B5690	NB5690	100 YR - 5 Day	AO	AE	20.29	21.15	
B5695	NB5695	100 YR - 5 Day	AO	AE	25.80	26.83	
B6010	NB6010	100 YR - 1 Day		AE	21.02	20.89	
B6015	NB6015	100 YR - 1 Day		AE	20.99	20.87	
B6020	NB6020	100 YR - 1 Day		AE	20.99	20.87	
B6030	NB6030	100 YR - 1 Day		AE	20.96	20.85	
B6110	NB6110	100 YR - 1 Day		AE	19.62	19.57	
B6116	NB6116	100 YR - 1 Day		AE	19.53	19.40	
B6118	NB6118	100 YR - 1 Day		AE	19.03	18.93	
B6119	NB6119	100 YR - 1 Day		AE	19.01	18.91	
B6120	NB6120	100 YR - 1 Day		AE	18.92	18.86	
B6130	NB6130	100 YR - 1 Day		AE	18.81	18.75	
B6210	NB6210	100 YR - 1 Day		AE	18.33	18.33	
B6220	NB6220	100 YR - 1 Day		AE	18.36	18.35	
B6310	NB6310	100 YR - 1 Day		AE	18.47	18.36	
B6320	NB6320	100 YR - 1 Day		AE	18.44	18.34	
B6330	NB6330	100 YR - 1 Day			18.32	18.28	
B6340	NB6340	100 YR - 1 Day		AE	18.29	18.26	
B6355	NB6355	100 YR - 1 Day		AE	18.07	18.04	
B6359	NB6359	100 YR - 1 Day		AE	18.23	18.19	
B6360	NB6360	100 YR - 1 Day		AE	18.33	18.29	
B6370	NB6370	100 YR - 1 Day		AE	18.42	18.41	
B6385	NB6385	100 YR - 1 Day		AE	18.25	18.52	
B6387	NB6387	100 YR - 1 Day		AE	18.25	18.52	
B6390	NB6390	100 YR - 1 Day		AE	18.25	18.52	
B6393	NB6393	100 YR - 1 Day		AE	18.15	18.15	
B6395	NB6395	100 YR - 1 Day		AE	18.15	18.15	
B6400	NB6400	100 YR - 1 Day		AE	18.23	18.53	
B6403	NB6403	100 YR - 1 Day		AE	18.89	18.89	
B6405	NB6405	100 YR - 1 Day		AE	18.18	18.53	
B6410	NB6410	100 YR - 1 Day		AE	18.12	18.57	
B6510	NB6510	100 YR - 1 Day		AE	21.23	21.15	
B6520	NB6520	100 YR - 1 Day		AE	21.22	21.15	
B6540	NB6540	100 YR - 1 Day		AE	21.21	21.13	
B6550	NB6550	100 YR - 1 Day		AE	21.21	21.12	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
B6552	NB6552	100 YR - 1 Day		AE	21.80	21.77	
B6555	NB6555	100 YR - 1 Day		AE	21.77	21.74	
B6558	NB6558	100 YR - 1 Day		AE	21.40	21.28	
B6559	NB6559	100 YR - 1 Day		AE	21.31	21.20	
B6560	NB6560	100 YR - 1 Day		AE	21.19	21.11	
B6565	NB6565	100 YR - 1 Day		AE	20.91	20.86	
B6568	NB6568	100 YR - 1 Day		AE	20.93	20.88	
B6570	NB6570	100 YR - 1 Day		AE	20.97	20.90	
B6580	NB6580	100 YR - 1 Day		AE	20.88	20.80	
B6585	NB6585	100 YR - 1 Day		AE	20.55	20.46	
B6590	NB6590	100 YR - 1 Day	AO	AE	20.02	19.95	
B6595	NB6595	100 YR - 1 Day		AE	19.28	19.42	
B6598	NB6598	100 YR - 1 Day		AE	19.26	19.42	
B6600	NB6600	100 YR - 1 Day	AO	AE	19.23	19.42	
B6610	NB6610	100 YR - 1 Day	AO	AE	18.74	19.07	
B6620	NB6620	100 YR - 1 Day		AE	17.94	18.58	
B6623	NB6623	100 YR - 1 Day		AE	18.86	18.87	
B6625	NB6625	100 YR - 1 Day			18.86	18.87	
B6630	NB6630	100 YR - 1 Day	A0	AE	16.59	18.45	
B6640	NB6640	100 YR - 5 Day	A0	AE	16.58	18.28	
B7002	NB7002	100 YR - 1 Day		AE	17.62	17.53	
B7004	NB7004	100 YR - 1 Day		AE	16.82	16.81	
B7005	NB7005	100 YR - 1 Day		AE	16.08	16.09	
B7010	NB7010	100 YR - 1 Day		AE	14.18	14.16	
B7110	NB7110	100 YR - 1 Day		AE	14.09	14.07	
B7210	NB7210	100 YR - 1 Day		AE	12.51	12.72	
B7223	NB7223	100 YR - 1 Day		AE	14.06	14.05	
B7227	NB7227	100 YR - 1 Day		AE	13.09	13.74	
B7230	NB7230	100 YR - 1 Day		AE	12.51	12.73	
B7240	NB7240	100 YR - 1 Day		AE	12.51	12.70	
B7250	NB7250	100 YR - 1 Day		AE	12.49	12.66	
B7260	NB7260	100 YR - 1 Day		AE	12.46	12.64	
B7320	NB7320	100 YR - 1 Day		AE	12.33	12.49	
B7330	NB7330	100 YR - 1 Day		AE	12.07	12.23	
B7335	NB7335	100 YR - 1 Day		AE	11.62	11.77	
B7340	NB7340	100 YR - 1 Day		AE	11.60	11.76	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
B7350	NB7350	100 YR - 1 Day		AE	11.60	11.78	
B7360	NB7360	100 YR - 1 Day		AE	11.59	11.78	
B7410	NB7410	100 YR - 1 Day		AE	11.58	11.83	
B7420	NB7420	100 YR - 1 Day		AE	11.58	11.82	
B7430	NB7430	100 YR - 1 Day		AE	11.58	11.79	
B7440	NB7440	100 YR - 1 Day			11.57	11.79	
B7450	NB7450	100 YR - 1 Day			11.53	11.79	
B7460	NB7460	100 YR - 1 Day		AE	11.37	11.79	
B7470	NB7470	100 YR - 1 Day		AE	11.31	11.77	
B7510	NB7510	100 YR - 1 Day		AE	17.71	17.63	
B7512	NB7512	100 YR - 1 Day		AE	17.03	17.01	
B7520	NB7520	100 YR - 1 Day		AE	14.78	14.78	
B8005	NB8005	100 YR - 1 Day		AE	12.23	12.18	
B8010	NB8010	100 YR - 1 Day		AE	12.22	12.19	
B8011	NB8011	100 YR - 1 Day		AE	17.27	17.22	
B8012	NB8012	100 YR - 1 Day			14.44	14.41	
B8014	NB8014	100 YR - 1 Day		AE	13.06	13.02	
B8015	NB8015	100 YR - 1 Day		AE	12.94	12.80	
B8018	NB8018	100 YR - 1 Day		AE	12.56	12.47	
B8020	NB8020	100 YR - 1 Day		AE	12.22	12.18	
B8030	NB8030	100 YR - 1 Day		AE	12.11	12.10	
B8040	NB8040	100 YR - 1 Day		AE	12.11	12.09	
B8110	NB8110	100 YR - 1 Day		AE	10.98	11.24	
B8120	NB8120	100 YR - 1 Day		AE	10.98	11.24	
B8130	NB8130	100 YR - 1 Day		AE	10.94	11.20	
B8140	NB8140	100 YR - 1 Day		AE	10.76	10.87	
B8150	NB8150	100 YR - 1 Day		AE	10.77	10.87	
B8210	NB8210	100 YR - 1 Day		AE	10.42	11.24	
B8220	NB8220	100 YR - 1 Day		AE	10.32	11.19	
B8230	NB8230	100 YR - 1 Day		AE	10.32	11.19	
B8240	NB8240	100 YR - 1 Day		AE	10.28	10.94	
B8250	NB8250	100 YR - 1 Day		AE	10.21	10.83	
B8260	NB8260	100 YR - 1 Day		AE	10.18	10.54	
B8270	NB8270	100 YR - 1 Day		AE	10.18	10.53	
B8310	NB8310	100 YR - 1 Day		AE	10.43	11.25	
B8320	NB8320	100 YR - 1 Day		AE	10.24	11.00	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
B8323	NB8323	100 YR - 1 Day		AE	10.40	10.72	
B8327	NB8327	100 YR - 1 Day		AE	10.41	10.72	
B8330	NB8330	100 YR - 1 Day		AE	10.17	10.72	
B8340	NB8340	100 YR - 1 Day		AE	10.15	10.61	
B8350	NB8350	100 YR - 1 Day		AE	10.09	10.51	
B8360	NB8360	100 YR - 1 Day		AE	10.05	10.43	
B8370	NB8370	100 YR - 1 Day		AE	10.05	10.41	
B8380	NB8380	100 YR - 1 Day		AE	10.04	10.42	
B8390	NB8390	100 YR - 1 Day		AE	10.03	10.41	
B8410	NB8410	100 YR - 1 Day		AE	9.56	9.86	
B8420	NB8420	100 YR - 1 Day		AE	9.52	9.85	
B8430	NB8430	100 YR - 1 Day		AE	9.33	9.85	
B8440	NB8440	100 YR - 1 Day		AE	9.17	9.85	
B8450	NB8450	100 YR - 1 Day			9.07	9.86	
B8460	NB8460	100 YR - 1 Day		AE	8.67	9.86	
B8480	NB8480	100 YR - 1 Day			8.60	9.85	
B8490	NB8490	100 YR - 1 Day		AE	8.54	9.86	
B8502	NB8502	100 YR - 1 Day		AE	15.87	15.82	
B8503	NB8503	100 YR - 1 Day		AE	17.31	17.20	
B8504	NB8504	100 YR - 1 Day		AE	15.71	15.53	
B8505	NB8505	100 YR - 1 Day			14.01	13.99	
B8506	NB8506	100 YR - 1 Day		AE	13.68	13.60	
B8507	NB8507	100 YR - 1 Day			14.78	14.77	
B8508	NB8508	100 YR - 1 Day		AE	13.04	13.02	
B8520	NB8520	100 YR - 1 Day		AE	12.31	12.30	
B8521	NB8521	100 YR - 1 Day		AE	14.40	14.44	
B8522	NB8522	100 YR - 1 Day			13.74	13.81	
B8523	NB8523	100 YR - 1 Day			13.74	13.81	
B8525	NB8525	100 YR - 1 Day		AE	13.36	13.77	
B8530	NB8530	100 YR - 1 Day		AE	11.52	11.62	
B8545	NB8545	100 YR - 1 Day		AE	12.72	12.49	
B8550	NB8550	100 YR - 1 Day		AE	11.10	11.24	
B8552	NB8552	100 YR - 1 Day		AE	11.59	11.71	
B8554	NB8554	100 YR - 1 Day		AE	11.54	11.62	
B8556	NB8556	100 YR - 1 Day		AE	11.54	11.62	
B8558	NB8558	100 YR - 1 Day		AE	11.53	11.61	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
B8560	NB8560	100 YR - 1 Day		AE	11.00	11.14	
B8570	NB8570	100 YR - 1 Day		AE	10.91	11.06	
B8590	NB8590	100 YR - 1 Day		AE	8.41	10.03	
B8600	NB8600	100 YR - 1 Day		AE	8.36	10.01	
B8610	NB8610	100 YR - 1 Day		AE	8.33	10.00	
B8620	NB8620	100 YR - 1 Day		AE	8.04	9.95	
B8630	NB8630	100 YR - 1 Day		AE	7.95	9.93	
B8640	NB8640	100 YR - 1 Day		AE	7.92	9.88	
B8650	NB8650	100 YR - 1 Day		AE	7.86	9.83	
B8660	NB8660	100 YR - 1 Day	A0		7.84	9.79	
B8673	NB8673	100 YR - 1 Day	A0	AE	9.54	9.95	
B8674	NB8674	100 YR - 1 Day	A0	AE	9.54	9.96	
B8675	NB8675	100 YR - 1 Day	A8	AE	8.93	9.96	
B8676	NB8676	100 YR - 1 Day	A8	AE	8.84	9.88	
B8677	NB8677	100 YR - 1 Day	A0	AE	8.83	9.84	
B8910	NB8910	100 YR - 1 Day			7.88	8.05	
B8920	NB8920	100 YR - 1 Day		AE	7.81	9.85	
B8930	NB8930	100 YR - 1 Day		AE	7.81	9.85	
B8940	NB8940	100 YR - 1 Day		AE	7.82	9.81	
B8950	NB8950	100 YR - 5 Day	A8	AE	7.82	9.81	
B9000	NB9000	100 YR - 1 Day		AE	17.63	17.51	
B9004	NB9004	100 YR - 1 Day			17.60	17.52	
B9005	NB9005	100 YR - 1 Day			17.46	17.35	
B9010	NB9010	100 YR - 1 Day		AE	17.38	17.31	
B9015	NB9015	100 YR - 1 Day		AE	18.15	18.15	
B9020	NB9020	100 YR - 1 Day		AE	16.98	16.86	
B9035	NB9035	100 YR - 1 Day		X	18.15	18.15	
B9040	NB9040	100 YR - 1 Day		AE	18.15	18.15	
B9043	NB9043	100 YR - 1 Day		AE	18.15	18.15	
B9045	NB9045	100 YR - 1 Day			18.08	18.09	
B9050	NB9050	100 YR - 1 Day		AE	18.12	18.14	
B9053	NB9053	100 YR - 1 Day		AE	18.26	18.50	
B9055	NB9055	100 YR - 1 Day		AE	18.21	18.50	
B9060	NB9060	100 YR - 1 Day		AE	18.12	18.14	
B9070	NB9070	100 YR - 1 Day		AE	17.33	17.36	
B9073	NB9073	100 YR - 1 Day		AE	17.17	17.18	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
B9075	NB9075	100 YR - 1 Day		AE	17.41	17.29	
B9080	NB9080	100 YR - 1 Day			17.17	17.18	
B9090	NB9090	100 YR - 1 Day		AE	16.48	16.53	
B9095	NB9095	100 YR - 1 Day		AE	16.51	16.64	
B9100	NB9100	100 YR - 1 Day		AE	16.35	16.44	
B9110	NB9110	100 YR - 1 Day			16.10	16.40	
B9120	NB9120	100 YR - 1 Day			16.10	16.40	
B9130	NB9130	100 YR - 1 Day		AE	15.00	14.99	
B9140	NB9140	100 YR - 1 Day		AE	14.84	14.90	
B9145	NB9145	100 YR - 1 Day			12.73	12.76	
B9150	NB9150	100 YR - 1 Day		AE	14.59	14.53	
B9160	NB9160	100 YR - 1 Day		AE	11.25	11.20	
B9170	NB9170	100 YR - 1 Day		AE	11.47	11.37	
B9180	NB9180	100 YR - 1 Day		AE	11.62	11.48	
B9185	NB9185	100 YR - 1 Day			10.24	10.27	
B9200	NB9200	100 YR - 1 Day		AE	11.12	11.08	
B9300	NB9300	100 YR - 1 Day		AE	9.55	9.92	
B9310	NB9310	100 YR - 1 Day		AE	8.17	9.86	
B9400	NB9400	100 YR - 1 Day		X	8.90	9.84	
B9500	NB9500	100 YR - 1 Day		AE	8.83	9.83	
C0006	NC0006	100 YR - 1 Day		AE	23.75	25.34	
C0008	NC0008	100 YR - 1 Day		AE	23.71	25.34	
C0010	NC0010	100 YR - 1 Day		AE	23.71	25.34	
C0012	NC0012	100 YR - 1 Day		AE	24.54	25.30	
C0014	NC0014	100 YR - 1 Day		AE	24.50	25.31	
C0015	NC0015	100 YR - 1 Day		AE	23.70	25.34	
C0016	NC0016	100 YR - 1 Day		AE	24.46	25.31	
C0018	NC0018	100 YR - 1 Day		AE	23.70	25.31	
C0020	NC0020	100 YR - 1 Day		AE	23.69	25.31	
C0023	NC0023	100 YR - 1 Day		AE	23.69	25.29	
C0026	NC0026	100 YR - 1 Day		AE	23.70	25.14	
C0030	NC0030	100 YR - 1 Day			23.69	25.29	
C0037	NC0037	100 YR - 1 Day		AE	23.68	25.27	
C0040	NC0040	100 YR - 1 Day			23.67	25.28	
C0052	NC0052	100 YR - 1 Day		AE	23.67	25.13	
C0056	NC0056	100 YR - 1 Day		AE	23.67	25.07	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
C0058	NC0058	100 YR - 1 Day		AE	23.66	25.10	
C0060	NC0060	100 YR - 1 Day		AE	23.66	25.25	
C0062	NC0062	100 YR - 1 Day		AE	24.28	25.11	
C0064	NC0064	100 YR - 1 Day		AE	24.27	25.11	
C0065	NC0065	100 YR - 1 Day		AE	23.66	25.26	
C0066	NC0066	100 YR - 1 Day		AE	24.24	25.12	
C0068	NC0068	100 YR - 1 Day		AE	23.66	25.11	
C0070	NC0070	100 YR - 1 Day		AE	23.65	25.22	
C0077	NC0077	100 YR - 1 Day		AE	23.65	25.12	
C0080	NC0080	100 YR - 1 Day		AE	23.65	25.22	
C0082	NC0082	100 YR - 1 Day		AE	23.89	25.21	
C0083	NC0083	100 YR - 1 Day		AE	24.05	25.21	
C0085	NC0085	100 YR - 1 Day		AE	23.64	25.22	
C0087	NC0087	100 YR - 1 Day		AE	23.65	25.12	
C0090	NC0090	100 YR - 1 Day		AE	23.64	25.21	
C0092	NC0092	100 YR - 1 Day			23.87	25.02	
C0093	NC0093	100 YR - 1 Day		X	23.86	25.09	
C0094	NC0094	100 YR - 1 Day			23.56	25.10	
C0095	NC0095	100 YR - 1 Day		AE	22.74	25.13	
C0096	NC0096	100 YR - 1 Day			24.40	24.38	
C0097	NC0097	100 YR - 1 Day			23.45	23.42	
C0098	NC0098	100 YR - 1 Day			23.01	22.98	
C0099	NC0099	100 YR - 1 Day		AE	21.90	21.60	
C0100	NC0100	100 YR - 1 Day		AE	21.53	21.29	
C0101	NC0094	100 YR - 1 Day			23.56	25.10	
C0102	NC0105	100 YR - 1 Day			19.57	21.51	
C0103	NC0103	100 YR - 1 Day		AE	22.99	24.74	
C0104	NC0104	100 YR - 1 Day		AE	19.36	20.61	
C0105	NC0105	100 YR - 1 Day		AE	19.57	21.51	
C0106	NC0106	100 YR - 1 Day			19.58	21.01	
C0107	NC0107	100 YR - 1 Day		X	20.54	21.03	
C0108	NC0108	100 YR - 1 Day		AE	21.36	21.33	
C0109	NC0109	100 YR - 1 Day		AE	21.55	21.48	
C0110	NC0110	100 YR - 1 Day			19.13	20.24	
C0111	NC0099	100 YR - 1 Day			21.90	21.60	
C0120	NC0120	100 YR - 1 Day		AE	19.12	20.22	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
C0124	NC0124	100 YR - 1 Day		AE	19.27	20.24	
C0127	NC0127	100 YR - 1 Day		X	19.88	20.27	
C0130	NC0130	100 YR - 1 Day			19.11	20.20	
C0140	NC0140	100 YR - 1 Day			19.09	20.18	
C0147	NC0147	100 YR - 1 Day		AE	19.12	20.25	
C0160	NC0160	100 YR - 1 Day		AE	19.08	20.16	
C0168	NC0168	100 YR - 1 Day		AE	19.09	20.20	
C0170	NC0170	100 YR - 1 Day		AE	19.07	20.16	
C0180	NC0180	100 YR - 1 Day		AE	19.06	20.14	
C0190	NC0190	100 YR - 1 Day		AE	18.25	19.33	
C0193	NC0193	100 YR - 1 Day		AE	18.79	19.48	
C0196	NC0196	100 YR - 1 Day		AE	19.14	19.42	
C0197	NC0197	100 YR - 1 Day		AE	18.78	19.48	
C0210	NC0210	100 YR - 1 Day		AE	18.22	19.30	
C0214	NC0214	100 YR - 1 Day		AE	18.36	19.77	
C0217	NC0217	100 YR - 1 Day		AE	18.31	19.37	
C0218	NC0218	100 YR - 1 Day		AE	18.42	19.32	
C0220	NC0220	100 YR - 1 Day		AE	18.17	19.25	
C0223	NC0223	100 YR - 1 Day		AE	18.15	19.23	
C0226	NC0226	100 YR - 1 Day		AE	18.22	19.43	
C0230	NC0230	100 YR - 1 Day		AE	18.15	19.22	
C0240	NC0240	100 YR - 1 Day		AE	18.11	19.18	
C0243	NC0243	100 YR - 1 Day		AE	18.87	19.53	
C0246	NC0246	100 YR - 1 Day		AE	18.05	19.14	
C0250	NC0250	100 YR - 1 Day		AE	18.05	19.11	
C0260	NC0260	100 YR - 1 Day		AE	17.95	19.01	
C0265	NC0265	100 YR - 1 Day		AE	17.78	18.93	
C0273	NC0273	100 YR - 1 Day		AE	18.76	18.97	
C0275	NC0275	100 YR - 1 Day		AE	17.67	18.78	
C0280	NC0280	100 YR - 1 Day			17.77	18.84	
C0290	NC0290	100 YR - 1 Day		AE	17.71	18.78	
C0300	NC0300	100 YR - 1 Day		AE	17.13	18.18	
C0303	NC0303	100 YR - 1 Day		AE	20.52	20.46	
C0304	NC0304	100 YR - 1 Day		AE	18.57	18.93	
C0305	NC0305	100 YR - 1 Day		AE	18.57	18.92	
C0308	NC0308	100 YR - 1 Day		AE	18.46	18.90	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
C0309	NC0309	100 YR - 1 Day		AE	17.64	18.76	
C0310	NC0310	100 YR - 1 Day		AE	17.07	18.13	
C0320	NC0320	100 YR - 1 Day		AE	17.05	18.11	
C0323	NC0323	100 YR - 1 Day		AE	15.50	17.41	
C0330	NC0330	100 YR - 1 Day		AE	17.05	18.10	
C0340	NC0340	100 YR - 1 Day			16.98	18.03	
C0350	NC0350	100 YR - 1 Day			16.89	17.91	
C0360	NC0360	100 YR - 1 Day		AE	16.72	17.70	
C0363	NC0363	100 YR - 1 Day		AE	16.46	17.58	
C0370	NC0370	100 YR - 1 Day		AE	16.65	17.62	
C0373	NC0373	100 YR - 1 Day		AE	16.04	16.86	
C0380	NC0380	100 YR - 1 Day		AE	16.64	17.60	
C0400	NC0400	100 YR - 1 Day		AE	15.16	16.74	
C0410	NC0410	100 YR - 1 Day		AE	15.03	16.65	
C0420	NC0420	100 YR - 1 Day		AE	15.03	16.66	
C0430	NC0430	100 YR - 1 Day			15.02	16.65	
C0440	NC0440	100 YR - 1 Day		AE	15.00	16.64	
C0450	NC0450	100 YR - 1 Day		AE	14.99	16.62	
C0460	NC0460	100 YR - 1 Day		AE	14.97	16.58	
C0465	NC0465	100 YR - 1 Day		AE	14.93	16.31	
C0470	NC0470	100 YR - 1 Day		AE	14.92	16.45	
C0478	NC0478	100 YR - 1 Day		AE	14.79	16.30	
C0480	NC0480	100 YR - 1 Day		AE	14.78	16.05	
C0495	NC0495	100 YR - 1 Day		AE	16.12	16.44	
C0500	NC0500	100 YR - 1 Day		AE	14.68	15.64	
C0510	NC0510	100 YR - 1 Day		AE	14.61	15.53	
C0515	NC0515	100 YR - 1 Day		AE	15.03	15.51	
C0520	NC0520	100 YR - 1 Day		AE	14.20	14.98	
C0540	NC0540	100 YR - 1 Day		AE	14.08	14.81	
C0560	NC0560	100 YR - 1 Day		AE	13.98	14.71	
C0565	NC0565	100 YR - 1 Day		AE	14.84	15.15	
C0570	NC0570	100 YR - 1 Day		AE	12.76	13.56	
C0580	NC0580	100 YR - 1 Day		AE	12.47	13.30	
C0585	NC0585	100 YR - 1 Day		AE	14.84	15.15	
C0590	NC0590	100 YR - 1 Day		AE	12.29	13.10	
C0597	NC0597	100 YR - 1 Day		AE	12.39	13.32	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
C0600	NC0600	100 YR - 1 Day		AE	12.15	12.92	
C0603	NC0603	100 YR - 1 Day		AE	12.76	13.32	
C0604	NC0604	100 YR - 1 Day		AE	12.44	13.32	
C0606	NC0606	100 YR - 1 Day		AE	12.44	13.32	
C0607	NC0607	100 YR - 1 Day		AE	12.44	13.32	
C0608	NC0608	100 YR - 1 Day		AE	12.43	13.31	
C0609	NC0609	100 YR - 1 Day		AE	11.65	11.70	
C0610	NC0610	100 YR - 1 Day		AE	11.97	12.73	
C0615	NC0615	100 YR - 1 Day		AE	12.46	13.32	
C0617	NC0617	100 YR - 1 Day		AE	11.80	12.54	
C0618	NC0618	100 YR - 1 Day		AE	12.47	13.32	
C0620	NC0620	100 YR - 1 Day		AE	11.80	12.54	
C0623	NC0623	100 YR - 1 Day		AE	11.49	12.00	
C0630	NC0630	100 YR - 1 Day		AE	11.71	12.46	
C0633	NC0633	100 YR - 1 Day		AE	10.90	11.76	
C0640	NC0640	100 YR - 1 Day		AE	11.57	12.30	
C0645	NC0645	100 YR - 1 Day		AE	11.54	12.27	
C0660	NC0660	100 YR - 1 Day		AE	11.17	12.00	
C0665	NC0665	100 YR - 1 Day		AE	11.12	11.95	
C0667	NC0667	100 YR - 1 Day		AE	11.12	11.95	
C0670	NC0670	100 YR - 1 Day		AE	11.12	11.95	
C0675	NC0675	100 YR - 1 Day		AE	10.34	10.64	
C0680	NC0680	100 YR - 1 Day		AE	11.06	11.87	
C0681	NC0681	100 YR - 1 Day		AE	6.44	8.92	
C0685	NC0685	100 YR - 1 Day		AE	10.37	10.55	
C0690	NC0690	100 YR - 1 Day		AE	10.93	11.78	
C0700	NC0700	100 YR - 1 Day		AE	10.84	11.72	
C0730	NC0730	100 YR - 1 Day		AE	10.75	11.68	
C0740	NC0740	100 YR - 1 Day			10.52	11.54	
C0760	NC0760	100 YR - 1 Day			10.49	11.52	
C0770	NC0770	100 YR - 1 Day		AE	10.45	11.50	
C0780	NC0780	100 YR - 1 Day		AE	10.26	11.45	
C0790	NC0790	100 YR - 1 Day			10.22	11.44	
C0810	NC0810	100 YR - 1 Day			10.13	11.42	
C0820	NC0820	100 YR - 1 Day		AE	10.09	11.41	
C0825	NC0825	100 YR - 1 Day		AE	10.11	11.41	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
C0830	NC0830	100 YR - 1 Day		AE	10.06	11.41	
C0840	NC0840	100 YR - 1 Day		AE	10.02	11.40	
C0845	NC0845	100 YR - 1 Day		AE	11.46	11.42	
C0850	NC0850	100 YR - 1 Day		AE	9.85	11.34	
C0860	NC0860	100 YR - 1 Day		AE	9.79	11.32	
C0870	NC0870	100 YR - 1 Day			9.54	11.27	
C0873	NC0873	100 YR - 1 Day		AE	9.54	11.27	
C0900	NC0900	100 YR - 5 Day		AE	9.43	11.24	
C0910	NC0910	100 YR - 5 Day	A8	AE	8.22	10.12	
C0915	NC0915	100 YR - 5 Day	A0	AE	8.06	10.11	
C0920	NC0920	100 YR - 5 Day	A8	AE	8.02	9.95	
C0930	NC0930	100 YR - 5 Day	A8	AE	7.83	9.78	
C0940	NC0940	100 YR - 5 Day	A8	AE	7.82	9.78	
C1010	NC1010	100 YR - 1 Day		AE	24.80	25.35	
C1020	NC1020	100 YR - 1 Day		AE	24.80	25.35	
C1025	NC1025	100 YR - 1 Day		AE	24.45	25.28	
C1030	NC1030	100 YR - 1 Day		AE	24.49	25.28	
C1040	NC1040	100 YR - 1 Day		AE	24.48	25.28	
C1042	NC1042	100 YR - 1 Day			24.48	25.27	
C1043	NC1043	100 YR - 1 Day		AE	24.48	25.27	
C1045	NC1045	100 YR - 1 Day		AE	24.48	25.27	
C1050	NC1050	100 YR - 1 Day		AE	24.46	25.27	
C1060	NC1060	100 YR - 1 Day		AE	24.42	25.27	
C1070	NC1070	100 YR - 1 Day		AE	23.97	25.27	
C1080	NC1080	100 YR - 1 Day		AE	23.68	25.27	
C1510	NC1510	100 YR - 1 Day		AE	21.14	21.27	
C1520	NC1520	100 YR - 1 Day		AE	21.14	21.27	
C1530	NC1530	100 YR - 1 Day		AE	21.13	21.27	
C1540	NC1540	100 YR - 1 Day			21.13	21.27	
C1550	NC1550	100 YR - 1 Day		AE	19.33	20.37	
C2020	NC2020	100 YR - 1 Day		AE	20.64	20.40	
C2040	NC2040	100 YR - 1 Day		AE	20.15	20.29	
C2060	NC2060	100 YR - 1 Day		AE	19.13	20.28	
C2520	NC2520	100 YR - 1 Day			20.48	20.42	
C2530	NC2530	100 YR - 1 Day			20.31	20.33	
C2550	NC2550	100 YR - 1 Day		AE	20.31	20.33	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
C2560	NC2560	100 YR - 1 Day			19.49	20.32	
C3010	NC3010	100 YR - 1 Day		AE	21.52	21.52	
C3023	NC3023	100 YR - 1 Day		AE	21.52	21.52	
C3030	NC3030	100 YR - 1 Day		AE	18.89	19.85	
C3510	NC3510	100 YR - 1 Day			21.33	20.98	
C3520	NC3520	100 YR - 1 Day		AE	21.33	20.98	
C3530	NC3530	100 YR - 1 Day		AE	21.29	20.95	
C4010	NC4010	100 YR - 1 Day			19.44	19.42	
C4020	NC4020	100 YR - 1 Day		AE	18.91	18.67	
C4030	NC4030	100 YR - 1 Day		AE	18.54	18.46	
C4040	NC4040	100 YR - 1 Day		AE	18.42	18.40	
C4050	NC4050	100 YR - 1 Day		AE	18.39	18.38	
C4060	NC4060	100 YR - 1 Day		AE	18.26	18.31	
C4070	NC4070	100 YR - 1 Day		AE	18.26	18.31	
C5010	NC5010	100 YR - 1 Day		AE	20.11	19.99	
C5020	NC5020	100 YR - 1 Day		AE	20.11	19.98	
C5030	NC5030	100 YR - 1 Day		AE	19.96	19.79	
C5040	NC5040	100 YR - 1 Day		AE	19.75	19.62	
C5050	NC5050	100 YR - 1 Day		AE	19.68	19.54	
C5060	NC5060	100 YR - 1 Day		AE	19.46	19.38	
C5070	NC5070	100 YR - 1 Day			18.79	18.63	
C5080	NC5080	100 YR - 1 Day		AE	18.46	18.35	
C5090	NC5090	100 YR - 1 Day		AE	18.25	18.18	
C5100	NC5100	100 YR - 1 Day		AE	17.93	17.90	
C5110	NC5110	100 YR - 1 Day		AE	17.88	17.87	
C5112	NC5112	100 YR - 1 Day		AE	19.14	19.12	
C5115	NC5115	100 YR - 1 Day		AE	17.94	17.90	
C5118	NC5118	100 YR - 1 Day		AE	17.92	17.89	
C5120	NC5120	100 YR - 1 Day		AE	17.88	17.87	
C5130	NC5130	100 YR - 1 Day		AE	17.78	17.83	
C5140	NC5140	100 YR - 1 Day		AE	17.36	17.69	
C5150	NC5150	100 YR - 1 Day		AE	16.93	17.65	
C6010	NC6010	100 YR - 1 Day		AE	17.12	17.17	
C6020	NC6020	100 YR - 1 Day		AE	17.02	17.16	
C6030	NC6030	100 YR - 1 Day		AE	15.90	17.15	
C6040	NC6040	100 YR - 1 Day		AE	15.89	17.15	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
C6050	NC6050	100 YR - 1 Day		AE	15.59	17.22	
C6060	NC6060	100 YR - 1 Day		AE	15.04	16.98	
C6503	NC6503	100 YR - 1 Day		AE	14.85	16.34	
C6505	NC6505	100 YR - 1 Day		AE	16.28	18.00	
C6510	NC6510	100 YR - 1 Day		AE	14.84	16.36	
C6513	NC6513	100 YR - 1 Day		AE	16.04	16.52	
C6518	NC6518	100 YR - 1 Day		AE	14.85	16.35	
C6520	NC6520	100 YR - 1 Day		AE	14.84	16.36	
C6522	NC6522	100 YR - 1 Day		AE	15.31	16.30	
C6523	NC6523	100 YR - 1 Day		AE	16.14	16.55	
C6524	NC6524	100 YR - 1 Day		AE	15.31	16.30	
C6526	NC6526	100 YR - 1 Day		AE	15.31	16.30	
C6527	NC6527	100 YR - 1 Day		AE	16.12	16.52	
C6528	NC6528	100 YR - 1 Day		AE	15.26	16.30	
C6530	NC6530	100 YR - 1 Day		AE	14.84	16.35	
C6540	NC6540	100 YR - 1 Day		AE	14.82	16.33	
C6545	NC6545	100 YR - 1 Day		AE	16.12	16.50	
C6550	NC6550	100 YR - 1 Day		AE	14.82	16.32	
C7010	NC7010	100 YR - 1 Day			15.43	16.27	
C7020	NC7020	100 YR - 1 Day		AE	15.43	16.27	
C7030	NC7030	100 YR - 1 Day		AE	15.44	16.31	
C7040	NC7040	100 YR - 1 Day		AE	15.44	16.41	
C7053	NC7053	100 YR - 1 Day		AE	15.32	16.06	
C7059	NC7059	100 YR - 1 Day		AE	15.32	16.07	
C7062	NC7062	100 YR - 1 Day		AE	15.35	16.25	
C7065	NC7065	100 YR - 1 Day		AE	15.35	16.25	
C7068	NC7068	100 YR - 1 Day		AE	15.35	16.24	
C7070	NC7070	100 YR - 1 Day		AE	15.35	16.21	
C7080	NC7080	100 YR - 1 Day		AE	15.29	16.02	
C7093	NC7093	100 YR - 1 Day		AE	14.89	15.33	
C7097	NC7097	100 YR - 1 Day		AE	14.94	15.43	
C7098	NC7098	100 YR - 1 Day		AE	14.99	15.52	
C7100	NC7100	100 YR - 1 Day		AE	15.01	15.61	
C7110	NC7110	100 YR - 1 Day		AE	14.97	15.46	
C7120	NC7120	100 YR - 1 Day		AE	14.97	15.46	
C8005	NC8005	100 YR - 1 Day		AE	16.34	16.43	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
C8010	NC8010	100 YR - 1 Day		AE	15.30	15.41	
C8012	NC8012	100 YR - 1 Day		AE	15.12	15.35	
C8013	NC8013	100 YR - 1 Day		AE	14.89	15.33	
C8018	NC8018	100 YR - 1 Day		AE	14.88	15.29	
C8020	NC8020	100 YR - 1 Day		AE	14.88	15.29	
C8025	NC8025	100 YR - 1 Day		AE	14.95	15.30	
C8030	NC8030	100 YR - 1 Day		AE	14.88	15.27	
C8040	NC8040	100 YR - 1 Day		AE	14.88	15.26	
C8043	NC8043	100 YR - 1 Day		AE	14.85	15.23	
C8045	NC8045	100 YR - 1 Day		AE	14.85	15.18	
C8046	NC8046	100 YR - 1 Day		AE	14.85	15.18	
C8047	NC8047	100 YR - 1 Day		AE	14.85	15.17	
C8048	NC8048	100 YR - 1 Day		AE	14.85	15.16	
C8050	NC8050	100 YR - 1 Day		AE	14.88	15.27	
C8060	NC8060	100 YR - 1 Day		AE	14.88	15.29	
C8065	NC8065	100 YR - 1 Day		AE	14.88	15.30	
C8070	NC8070	100 YR - 1 Day		AE	14.88	15.29	
C8080	NC8080	100 YR - 1 Day		AE	14.87	15.28	
C8090	NC8090	100 YR - 1 Day		AE	14.87	15.28	
C8100	NC8100	100 YR - 1 Day		AE	14.87	15.28	
C8110	NC8110	100 YR - 1 Day			14.87	15.28	
C8120	NC8120	100 YR - 1 Day		AE	14.86	15.26	
C8140	NC8140	100 YR - 1 Day		AE	14.85	15.16	
C8150	NC8150	100 YR - 1 Day		AE	14.85	15.15	
C8160	NC8160	100 YR - 1 Day		AE	14.84	15.15	
C8170	NC8170	100 YR - 1 Day		AE	14.84	15.13	
C8510	NC8510	100 YR - 1 Day		AE	22.93	22.94	
C8520	NC8520	100 YR - 1 Day		AE	22.64	22.62	
C8530	NC8530	100 YR - 1 Day		AE	22.20	22.30	
C8540	NC8540	100 YR - 1 Day		AE	22.11	22.18	
C8550	NC8550	100 YR - 1 Day		AE	21.01	21.28	
C8560	NC8560	100 YR - 1 Day		AE	21.18	21.27	
C8570	NC8570	100 YR - 1 Day			19.80	19.78	
C8580	NC8580	100 YR - 1 Day		AE	16.34	16.50	
C8590	NC8590	100 YR - 1 Day			15.58	15.64	
C8600	NC8600	100 YR - 1 Day		AE	15.11	15.23	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
C8610	NC8610	100 YR - 1 Day		AE	14.85	15.16	
C8620	NC8620	100 YR - 1 Day		AE	14.84	15.16	
C8630	NC8630	100 YR - 1 Day		AE	14.30	15.04	
C8640	NC8640	100 YR - 1 Day		AE	14.28	15.03	
C9010	NC9010	100 YR - 1 Day			22.08	22.25	
C9020	NC9020	100 YR - 1 Day		AE	22.18	21.97	
C9022	NC9022	100 YR - 1 Day		AE	22.18	21.96	
C9024	NC9024	100 YR - 1 Day		AE	21.58	21.37	
C9030	NC9030	100 YR - 1 Day		AE	21.04	21.05	
C9032	NC9032	100 YR - 1 Day		AE	20.93	20.84	
C9040	NC9040	100 YR - 1 Day		AE	20.92	20.83	
C9050	NC9050	100 YR - 1 Day		AE	20.46	20.46	
C9052	NC9052	100 YR - 1 Day		AE	20.43	20.42	
C9054	NC9054	100 YR - 1 Day			20.43	20.42	
C9056	NC9056	100 YR - 1 Day			19.62	19.60	
C9058	NC9058	100 YR - 1 Day		AE	18.93	19.24	
C9060	NC9060	100 YR - 1 Day		AE	20.42	20.41	
C9070	NC9070	100 YR - 1 Day		AE	18.40	18.39	
C9080	NC9080	100 YR - 1 Day		AE	16.28	16.28	
C9090	NC9090	100 YR - 1 Day			15.03	14.92	
C9100	NC9100	100 YR - 1 Day		AE	14.44	14.42	
C9110	NC9110	100 YR - 1 Day		AE	13.72	13.98	
C9120	NC9120	100 YR - 1 Day		AE	13.70	13.97	
C9130	NC9130	100 YR - 1 Day		AE	15.44	15.37	
C9510	NC9510	100 YR - 1 Day		AE	12.78	13.32	
C9520	NC9520	100 YR - 1 Day		AE	12.54	13.32	
C9530	NC9530	100 YR - 1 Day		AE	12.54	13.33	
C9540	NC9540	100 YR - 1 Day		AE	12.47	13.32	
C9550	NC9550	100 YR - 1 Day		AE	12.47	13.32	
C9560	NC9560	100 YR - 1 Day		AE	12.47	13.32	
C9570	NC9570	100 YR - 1 Day			12.47	13.32	
C9580	NC9580	100 YR - 1 Day		AE	12.47	13.32	
C9600	NC9600	100 YR - 1 Day		AE	10.42	11.40	
C9700	NC9700	100 YR - 1 Day		AE	10.02	11.40	
C9800	NC9800	100 YR - 1 Day		AE	10.28	11.40	
D0004	ND0004	100 YR - 1 Day		AE	20.21	21.02	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
D0006	ND0006	100 YR - 1 Day		AE	20.21	21.02	
D0010	ND0010	100 YR - 1 Day		AE	20.21	21.02	
D0020	ND0020	100 YR - 1 Day		AE	20.18	20.97	
D0030	ND0030	100 YR - 1 Day		AE	20.17	20.95	
D0040	ND0040	100 YR - 1 Day		AE	15.96	16.78	
D0045	ND0045	100 YR - 1 Day		AE	19.83	20.31	
D0050	ND0050	100 YR - 1 Day		AE	19.70	20.26	
D0053	ND0053	100 YR - 1 Day		AE	19.40	20.26	
D0055	ND0055	100 YR - 1 Day		AE	15.95	16.76	
D0057	ND0057	100 YR - 1 Day			16.45	17.02	
D0059	ND0059	100 YR - 1 Day		AE	15.99	16.91	
D0060	ND0060	100 YR - 1 Day		AE	15.93	16.74	
D0063	ND0063	100 YR - 1 Day		AE	15.81	16.56	
D0070	ND0070	100 YR - 1 Day		AE	15.81	16.56	
D0080	ND0080	100 YR - 1 Day		AE	15.76	16.49	
D0082	ND0082	100 YR - 1 Day			16.26	16.41	
D0085	ND0085	100 YR - 1 Day		AE	15.72	16.41	
D0088	ND0088	100 YR - 1 Day		AE	15.72	16.40	
D0090	ND0090	100 YR - 1 Day		AE	15.70	16.40	
D0092	ND0092	100 YR - 1 Day			17.47	17.46	
D0094	ND0094	100 YR - 1 Day		AE	16.77	16.51	
D0096	ND0096	100 YR - 1 Day		AE	15.73	16.41	
D0098	ND0098	100 YR - 1 Day		AE	15.72	16.41	
D0100	ND0100	100 YR - 1 Day		AE	15.70	16.40	
D0103	ND0103	100 YR - 1 Day		AE	15.25	15.37	
D0107	ND0107	100 YR - 1 Day		AE	15.39	15.82	
D0110	ND0110	100 YR - 1 Day		AE	15.44	16.05	
D0112	ND0112	100 YR - 1 Day		AE	15.10	15.19	
D0114	ND0114	100 YR - 1 Day		AE	15.10	15.19	
D0116	ND0116	100 YR - 1 Day		AE	15.32	15.86	
D0118	ND0118	100 YR - 1 Day		AE	15.37	15.95	
D0130	ND0130	100 YR - 1 Day		AE	15.39	15.99	
D0140	ND0140	100 YR - 1 Day		AE	13.91	14.23	
D0152	ND0152	100 YR - 1 Day		AE	13.96	14.26	
D0155	ND0155	100 YR - 1 Day		AE	13.96	14.26	
D0158	ND0158	100 YR - 1 Day		AE	13.77	14.08	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
D0160	ND0160	100 YR - 1 Day		AE	13.68	14.04	
D0162	ND0162	100 YR - 1 Day		AE	13.05	13.25	
D0164	ND0164	100 YR - 1 Day		AE	13.05	13.25	
D0166	ND0166	100 YR - 1 Day		AE	13.17	13.34	
D0168	ND0168	100 YR - 1 Day		AE	13.21	13.36	
D0170	ND0170	100 YR - 1 Day		AE	13.39	13.79	
D0180	ND0180	100 YR - 1 Day		AE	13.16	13.57	
D0190	ND0190	100 YR - 1 Day		AE	12.06	12.63	
D0192	ND0192	100 YR - 1 Day		AE	12.01	12.54	
D0194	ND0194	100 YR - 1 Day		AE	12.01	12.54	
D0196	ND0196	100 YR - 1 Day		AE	12.00	12.54	
D0198	ND0198	100 YR - 1 Day		AE	11.99	12.56	
D0200	ND0200	100 YR - 1 Day		AE	11.97	12.56	
D0202	ND0202	100 YR - 1 Day		AE	11.96	12.38	
D0204	ND0204	100 YR - 1 Day		AE	11.94	12.38	
D0206	ND0206	100 YR - 1 Day		AE	11.91	12.38	
D0208	ND0208	100 YR - 1 Day		AE	11.91	12.43	
D0210	ND0210	100 YR - 1 Day		AE	11.91	12.50	
D0220	ND0220	100 YR - 1 Day		AE	11.58	12.28	
D0230	ND0230	100 YR - 1 Day		AE	11.20	11.94	
D0240	ND0240	100 YR - 1 Day		AE	11.10	11.89	
D1010	ND1010	100 YR - 1 Day		AE	20.18	20.96	
D1020	ND1020	100 YR - 1 Day		AE	20.18	20.96	
D1025	ND1025	100 YR - 1 Day		AE	20.18	20.96	
D1030	ND1030	100 YR - 1 Day		AE	20.18	20.96	
D2010	ND2010	100 YR - 1 Day			18.56	18.54	
D2020	ND2020	100 YR - 1 Day		AE	17.90	17.39	
D2025	ND2025	100 YR - 1 Day			16.53	17.57	
D2030	ND2030	100 YR - 1 Day		AE	15.82	16.66	
D2040	ND2040	100 YR - 1 Day		AE	15.78	16.56	
E0010	NE0010	100 YR - 1 Day		AE	17.79	19.53	
E0020	NE0020	100 YR - 1 Day		AE	16.02	17.80	
E0023	NE0023	100 YR - 1 Day		AE	16.60	17.70	
E0027	NE0027	100 YR - 1 Day			16.61	17.70	
E0030	NE0030	100 YR - 1 Day		AE	15.97	17.72	
E0040	NE0040	100 YR - 1 Day		AE	15.95	17.70	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
E0050	NE0050	100 YR - 1 Day		AE	13.71	14.72	
E0052	NE0052	100 YR - 1 Day		AE	15.56	15.13	
E0054	NE0054	100 YR - 1 Day		AE	13.89	14.62	
E0059	NE0059	100 YR - 1 Day		AE	13.81	14.61	
E0060	NE0060	100 YR - 1 Day		AE	13.65	14.58	
E0061	NE0061	100 YR - 1 Day		AE	13.64	14.37	
E0062	NE0062	100 YR - 1 Day		AE	13.65	14.30	
E0063	NE0063	100 YR - 1 Day		AE	13.64	14.34	
E0064	NE0064	100 YR - 1 Day		AE	16.41	16.29	
E0065	NE0065	100 YR - 1 Day		AE	13.64	14.37	
E0069	NE0069	100 YR - 1 Day		AE	13.60	14.43	
E0070	NE0070	100 YR - 1 Day		AE	13.59	14.46	
E0071	NE0071	100 YR - 1 Day		AE	14.20	14.60	
E0072	NE0072	100 YR - 1 Day			14.10	14.50	
E0074	NE0074	100 YR - 1 Day		AE	13.94	14.46	
E0075	NE0075	100 YR - 1 Day		AE	13.81	14.45	
E0077	NE0077	100 YR - 1 Day		AE	13.53	14.37	
E0079	NE0079	100 YR - 1 Day		AE	13.71	14.43	
E0080	NE0080	100 YR - 1 Day		AE	13.53	14.39	
E0090	NE0090	100 YR - 1 Day		AE	13.49	14.36	
E0100	NE0100	100 YR - 1 Day		AE	11.87	12.80	
E0110	NE0110	100 YR - 1 Day		AE	11.73	12.67	
E0120	NE0120	100 YR - 1 Day		AE	11.55	12.52	
E0125	NE0125	100 YR - 1 Day		AE	11.37	12.39	
E0127	NE0127	100 YR - 1 Day		AE	11.40	12.45	
E0128	NE0128	100 YR - 1 Day		AE	11.40	12.45	
E0129	NE0129	100 YR - 1 Day		AE	11.36	12.37	
E0130	NE0130	100 YR - 1 Day		AE	11.35	12.34	
E0140	NE0140	100 YR - 1 Day		AE	11.21	12.17	
E0145	NE0145	100 YR - 1 Day		AE	11.02	11.88	
E0150	NE0150	100 YR - 1 Day		AE	11.02	11.92	
E0160	NE0160	100 YR - 1 Day		AE	10.99	11.86	
E0165	NE0165	100 YR - 1 Day		AE	11.17	11.94	
E0166	NE0166	100 YR - 1 Day		AE	11.74	11.91	
E0167	NE0167	100 YR - 1 Day		AE	11.74	11.90	
E0168	NE0168	100 YR - 1 Day		AE	11.75	11.91	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
E0170	NE0170	100 YR - 1 Day		AE	10.92	11.76	
E0180	NE0180	100 YR - 1 Day		AE	10.71	11.59	
E0510	NE0510	100 YR - 1 Day		AE	12.77	12.76	
E0520	NE0520	100 YR - 1 Day		AE	12.77	12.76	
E0530	NE0530	100 YR - 1 Day		AE	12.74	12.75	
E0540	NE0540	100 YR - 1 Day		AE	12.74	12.74	
E0555	NE0555	100 YR - 1 Day		AE	11.48	12.77	
E0560	NE0560	100 YR - 1 Day		AE	11.47	12.60	
E0570	NE0570	100 YR - 1 Day		AE	11.44	12.49	
E0580	NE0580	100 YR - 1 Day		AE	11.42	12.44	
E0890	NE0890	100 YR - 1 Day		AE	11.42	12.45	
E2010	NE2010	100 YR - 1 Day		AE	11.19	11.62	
E2020	NE2020	100 YR - 1 Day		AE	10.28	11.56	
E2030	NE2030	100 YR - 1 Day		AE	10.27	11.47	
E2041	NE2041	100 YR - 1 Day		AE	10.70	11.59	
E2043	NE2043	100 YR - 1 Day		AE	10.34	11.47	
E2045	NE2045	100 YR - 1 Day		AE	10.28	11.46	
E2049	NE2049	100 YR - 1 Day		AE	10.27	11.46	
E2050	NE2050	100 YR - 1 Day		AE	10.27	11.46	
E2060	NE2060	100 YR - 1 Day		AE	10.27	11.46	
E2510	NE2510	100 YR - 1 Day		AE	10.23	11.41	
E2530	NE2530	100 YR - 1 Day		AE	10.23	11.41	
E2540	NE2540	100 YR - 1 Day		AE	10.23	11.41	
E3010	NE3010	100 YR - 1 Day		AE	13.35	13.33	
E3015	NE3015	100 YR - 1 Day		AE	13.35	13.33	
E3020	NE3020	100 YR - 1 Day		AE	12.66	12.68	
E3051	NE3051	100 YR - 1 Day		AE	12.17	12.16	
E3053	NE3053	100 YR - 1 Day		AE	12.31	12.32	
E3060	NE3060	100 YR - 1 Day		AE	12.42	12.45	
E3080	NE3080	100 YR - 1 Day		AE	11.93	12.07	
E3090	NE3090	100 YR - 1 Day		AE	11.93	12.07	
E3095	NE3095	100 YR - 1 Day		AE	11.78	11.94	
E3112	NE3112	100 YR - 1 Day		AE	11.80	11.90	
E3113	NE3113	100 YR - 1 Day		AE	11.87	11.91	
E3115	NE3115	100 YR - 1 Day		AE	11.86	11.91	
E3118	NE3118	100 YR - 1 Day		AE	11.86	11.91	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
E3120	NE3120	100 YR - 1 Day		AE	11.65	11.81	
E3125	NE3125	100 YR - 1 Day		AE	11.43	11.59	
E3130	NE3130	100 YR - 1 Day		AE	11.43	11.59	
E3140	NE3140	100 YR - 1 Day		AE	11.05	11.43	
E3150	NE3150	100 YR - 1 Day		AE	11.04	11.43	
E3160	NE3160	100 YR - 1 Day		AE	10.96	11.41	
E3170	NE3170	100 YR - 1 Day		AE	10.94	11.41	
E5010	NE5010	100 YR - 1 Day		AE	17.91	18.20	
E5020	NE5020	100 YR - 1 Day		AE	17.91	18.20	
E5025	NE5025	100 YR - 1 Day		AE	17.22	17.50	
E5030	NE5030	100 YR - 1 Day		AE	17.22	17.37	
E5040	NE5040	100 YR - 1 Day		AE	17.06	17.29	
E5050	NE5050	100 YR - 1 Day		AE	16.96	17.14	
E5053	NE5053	100 YR - 1 Day		AE	17.49	17.64	
E5054	NE5054	100 YR - 1 Day		AE	17.42	17.60	
E5055	NE5055	100 YR - 1 Day			16.97	17.31	
E5056	NE5056	100 YR - 1 Day		AE	16.85	17.30	
E5057	NE5057	100 YR - 1 Day		AE	16.49	17.02	
E5058	NE5058	100 YR - 1 Day		AE	16.46	17.02	
E5059	NE5059	100 YR - 1 Day		AE	16.46	17.02	
E5061	NE5061	100 YR - 1 Day		AE	17.02	17.24	
E5063	NE5063	100 YR - 1 Day		AE	16.81	17.17	
E5069	NE5069	100 YR - 1 Day		AE	16.47	16.48	
E5070	NE5070	100 YR - 1 Day		AE	15.83	16.00	
E5080	NE5080	100 YR - 1 Day		AE	15.81	16.00	
E5085	NE5085	100 YR - 1 Day		AE	15.10	15.18	
E5510	NE5510	100 YR - 1 Day		AE	15.48	15.50	
E5512	NE5512	100 YR - 1 Day		AE	16.47	16.48	
E5515	NE5515	100 YR - 1 Day		AE	16.29	16.30	
E5520	NE5520	100 YR - 1 Day			15.34	15.35	
E5525	NE5525	100 YR - 1 Day		AE	14.88	14.91	
E5527	NE5527	100 YR - 1 Day		AE	14.93	14.97	
E5530	NE5530	100 YR - 1 Day		AE	14.67	14.69	
E5540	NE5540	100 YR - 1 Day		AE	14.64	14.67	
E6010	NE6010	100 YR - 1 Day		AE	16.41	16.76	
E6020	NE6020	100 YR - 1 Day	A3	AE	15.74	16.67	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
E6030	NE6030	100 YR - 1 Day	A3	AE	15.45	15.96	
E6031	NE6031	100 YR - 1 Day		AE	14.84	14.80	
E6032	NE6032	100 YR - 1 Day	A3	AE	13.94	14.33	
E6033	NE6033	100 YR - 1 Day	A3	AE	13.93	14.33	
E6034	NE6034	100 YR - 1 Day		AE	13.91	14.33	
E6035	NE6035	100 YR - 1 Day	A3	AE	13.91	14.33	
E6036	NE6036	100 YR - 1 Day	A3	AE	13.91	14.32	
E6037	NE6037	100 YR - 1 Day		AE	14.67	15.09	
E6038	NE6038	100 YR - 1 Day	A3	AE	14.67	15.09	
E6039	NE6039	100 YR - 1 Day		AE	14.67	15.09	
E6040	NE6040	100 YR - 1 Day		X	13.40	13.37	
E6041	NE6041	100 YR - 1 Day		AE	13.40	13.38	
E6042	NE6042	100 YR - 1 Day		AE	13.40	13.37	
E6043	NE6043	100 YR - 1 Day		AE	13.53	13.45	
E6046	NE6046	100 YR - 1 Day		AE	12.63	12.58	
E6047	NE6047	100 YR - 1 Day		AE	14.55	14.56	
E6048	NE6048	100 YR - 1 Day		AE	13.18	13.58	
E6051	NE6051	100 YR - 1 Day		AE	14.75	15.09	
E6052	NE6052	100 YR - 1 Day		AE	14.75	15.08	
E6053	NE6053	100 YR - 1 Day		X	13.61	13.61	
E6054	NE6054	100 YR - 1 Day		X	13.43	13.41	
E6055	NE6055	100 YR - 1 Day		AE	13.18	13.58	
E6060	NE6060	100 YR - 1 Day		AE	12.64	12.90	
E7010	NE7010	100 YR - 1 Day			16.95	16.95	
E7020	NE7020	100 YR - 1 Day			14.35	14.45	
E7030	NE7030	100 YR - 1 Day		AE	13.80	14.40	
E7040	NE7040	100 YR - 1 Day			13.80	14.40	
E7050	NE7050	100 YR - 1 Day			14.68	14.66	
E7053	NE7053	100 YR - 1 Day		AE	13.67	14.29	
E7055	NE7055	100 YR - 1 Day		AE	13.66	14.28	
E7080	NE7080	100 YR - 1 Day		AE	13.65	14.28	
E7090	NE7090	100 YR - 1 Day		AE	13.57	14.18	
E7100	NE7100	100 YR - 1 Day		AE	13.57	14.03	
E7102	NE7102	100 YR - 1 Day		AE	12.22	12.99	
E7103	NE7103	100 YR - 1 Day		AE	12.22	12.92	
E7104	NE7104	100 YR - 1 Day		AE	12.04	12.80	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
E7105	NE7105	100 YR - 1 Day			12.04	12.80	
E7107	NE7107	100 YR - 1 Day		AE	12.12	12.86	
E7110	NE7110	100 YR - 1 Day		AE	12.04	12.81	
E7120	NE7120	100 YR - 1 Day		AE	12.02	12.77	
E7130	NE7130	100 YR - 1 Day		AE	11.81	12.76	
E7135	NE7135	100 YR - 1 Day		AE	12.49	12.44	
E7138	NE7138	100 YR - 1 Day		AE	11.80	12.74	
E7140	NE7140	100 YR - 1 Day		AE	11.59	12.05	
E7150	NE7150	100 YR - 1 Day			11.54	12.00	
E7505	NE7505	100 YR - 1 Day		AE	17.17	16.85	
E7507	NE7507	100 YR - 1 Day		AE	16.18	16.13	
E7509	NE7509	100 YR - 1 Day			15.33	14.95	
E7510	NE7510	100 YR - 1 Day			13.74	14.31	
E7512	NE7512	100 YR - 1 Day		AE	19.17	19.15	
E7514	NE7514	100 YR - 1 Day		AE	18.87	19.06	
E7516	NE7516	100 YR - 1 Day		AE	18.87	19.05	
E7517	NE7517	100 YR - 1 Day		AE	18.86	19.03	
E7518	NE7518	100 YR - 1 Day		AE	18.49	18.49	
E7519	NE7519	100 YR - 1 Day		AE	16.75	16.69	
E7520	NE7520	100 YR - 1 Day		AE	13.70	14.31	
E7525	NE7525	100 YR - 1 Day		X	17.53	17.37	
E7530	NE7530	100 YR - 1 Day		AE	13.66	14.29	
E7540	NE7540	100 YR - 1 Day		AE	13.66	14.28	
E7545	NE7545	100 YR - 1 Day			14.13	14.55	
E7547	NE7547	100 YR - 1 Day			12.93	13.04	
E7550	NE7550	100 YR - 1 Day		AE	12.67	12.73	
E7560	NE7560	100 YR - 1 Day			12.52	12.51	
E7580	NE7580	100 YR - 1 Day		AE	11.84	12.15	
E9008	NE9008	100 YR - 1 Day		AE	10.94	11.67	
E9009	NE9009	100 YR - 1 Day		AE	10.88	11.80	
E9010	NE9010	100 YR - 1 Day		AE	10.86	11.80	
E9020	NE9020	100 YR - 1 Day		AE	10.89	11.64	
E9025	NE9025	100 YR - 1 Day		AE	10.77	11.64	
E9030	NE9030	100 YR - 1 Day		AE	10.89	11.64	
E9040	NE9040	100 YR - 1 Day		AE	10.89	11.64	
E9045	NE9045	100 YR - 1 Day		AE	11.02	11.64	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
E9047	NE9047	100 YR - 1 Day		AE	11.38	12.07	
E9050	NE9050	100 YR - 1 Day		AE	10.76	11.63	
E9060	NE9060	100 YR - 1 Day		AE	10.76	11.63	
E9065	NE9065	100 YR - 1 Day		AE	10.71	11.63	
E9070	NE9070	100 YR - 1 Day		AE	10.71	11.63	
E9080	NE9080	100 YR - 1 Day		AE	10.44	11.39	
E9090	NE9090	100 YR - 1 Day		AE	10.43	11.39	
E9100	NE9100	100 YR - 1 Day		AE	10.23	11.35	
E9110	NE9110	100 YR - 1 Day		AE	10.23	11.35	
E9510	NE9510	100 YR - 1 Day			10.10	11.24	
E9520	NE9520	100 YR - 1 Day			9.94	11.24	
E9602	NE9602	100 YR - 1 Day		X	12.03	11.99	
E9604	NE9604	100 YR - 1 Day		AE	12.64	12.56	
E9606	NE9606	100 YR - 1 Day		X	12.46	12.22	
E9608	NE9608	100 YR - 1 Day			12.44	12.20	
E9610	NE9610	100 YR - 1 Day		X	12.52	12.24	
E9611	NE9611	100 YR - 1 Day		X	12.55	12.25	
E9612	NE9612	100 YR - 1 Day		AE	12.53	12.22	
E9620	NE9620	100 YR - 1 Day		X	12.55	12.25	
E9626	NE9626	100 YR - 1 Day		X	12.48	12.24	
E9630	NE9630	100 YR - 1 Day		AE	11.96	11.92	
E9700	NE9700	100 YR - 1 Day		AE	12.36	12.38	
F0010	NF0010	100 YR - 1 Day		AE	20.16	20.93	
F0020	NF0020	100 YR - 1 Day		AE	17.50	18.63	
F0022	NF0022	100 YR - 1 Day		AE	18.75	18.86	
F0025	NF0025	100 YR - 1 Day		AE	18.75	18.85	
F0030	NF0030	100 YR - 1 Day		AE	17.47	18.58	
F0032	NF0032	100 YR - 1 Day			19.18	19.48	
F0034	NF0034	100 YR - 1 Day		AE	18.26	18.77	
F0036	NF0036	100 YR - 1 Day		AE	17.69	18.59	
F0038	NF0038	100 YR - 1 Day		AE	17.51	18.59	
F0040	NF0040	100 YR - 1 Day		AE	17.45	18.56	
F0070	NF0070	100 YR - 1 Day		AE	14.58	16.11	
F0082	NF0082	100 YR - 1 Day		AE	17.44	17.27	
F0085	NF0085	100 YR - 1 Day		AE	17.13	16.58	
F0088	NF0088	100 YR - 1 Day		AE	17.07	16.51	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
F0090	NF0090	100 YR - 1 Day		AE	14.23	15.43	
F0092	NF0092	100 YR - 1 Day		AE	18.85	18.71	
F0094	NF0094	100 YR - 1 Day		AE	18.85	18.62	
F0096	NF0096	100 YR - 1 Day		AE	17.73	16.87	
F0098	NF0098	100 YR - 1 Day		AE	14.16	15.32	
F0100	NF0100	100 YR - 1 Day		AE	14.15	15.31	
F0110	NF0110	100 YR - 1 Day		AE	14.06	15.18	
F0120	NF0120	100 YR - 1 Day		AE	13.95	15.05	
F0122	NF0122	100 YR - 1 Day		AE	14.78	15.08	
F0124	NF0124	100 YR - 1 Day		AE	14.32	15.08	
F0126	NF0126	100 YR - 1 Day		AE	13.97	15.08	
F0128	NF0128	100 YR - 1 Day		AE	13.97	15.07	
F0140	NF0140	100 YR - 1 Day		AE	13.82	14.96	
F0150	NF0150	100 YR - 1 Day		AE	11.83	12.94	
F0152	NF0152	100 YR - 1 Day		AE	12.53	12.96	
F0153	NF0153	100 YR - 1 Day		AE	15.06	15.08	
F0154	NF0154	100 YR - 1 Day		AE	11.93	12.92	
F0155	NF0155	100 YR - 1 Day		AE	15.09	15.19	
F0156	NF0156	100 YR - 1 Day		AE	11.85	12.88	
F0158	NF0158	100 YR - 1 Day		AE	11.84	12.86	
F0160	NF0160	100 YR - 1 Day		AE	11.69	12.78	
F0170	NF0170	100 YR - 1 Day		AE	11.62	12.67	
F0180	NF0180	100 YR - 1 Day		AE	11.40	12.45	
F0187	NF0187	100 YR - 1 Day		AE	12.96	12.92	
F0188	NF0188	100 YR - 1 Day		AE	12.98	12.93	
F0190	NF0190	100 YR - 1 Day		AE	11.28	12.26	
F0210	NF0210	100 YR - 1 Day		AE	11.06	12.06	
F0220	NF0220	100 YR - 1 Day		AE	10.96	11.91	
F0229	NF0229	100 YR - 1 Day		AE	17.49	18.58	
F0230	NF0230	100 YR - 1 Day		AE	10.88	11.82	
F1010	NF1010	100 YR - 1 Day		AE	14.23	14.60	
F1020	NF1020	100 YR - 1 Day		AE	14.23	14.61	
F1030	NF1030	100 YR - 1 Day			14.23	14.62	
F1040	NF1040	100 YR - 1 Day		AE	13.95	15.04	
F2010	NF2010	100 YR - 1 Day		AE	12.28	12.87	
F2020	NF2020	100 YR - 1 Day		AE	12.28	12.87	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
F2025	NF2025	100 YR - 1 Day		AE	12.21	12.86	
F2030	NF2030	100 YR - 1 Day		AE	12.18	12.86	
F2040	NF2040	100 YR - 1 Day		AE	11.63	12.69	
F2050	NF2050	100 YR - 1 Day		AE	11.64	12.69	
G0003	NG0003	100 YR - 1 Day		AE	22.57	22.96	
G0008	NG0008	100 YR - 1 Day		AE	22.56	23.39	
G0010	NG0010	100 YR - 1 Day		AE	22.51	22.82	
G0020	NG0020	100 YR - 1 Day		AE	22.50	22.80	
G0030	NG0030	100 YR - 1 Day		AE	22.50	22.78	
G0040	NG0040	100 YR - 1 Day		AE	22.50	22.78	
G0050	NG0050	100 YR - 1 Day			20.64	21.45	
G0053	NG0053	100 YR - 1 Day		AE	21.54	21.68	
G0057	NG0057	100 YR - 1 Day		AE	21.49	21.62	
G0060	NG0060	100 YR - 1 Day		AE	20.63	21.43	
G0080	NG0080	100 YR - 1 Day		AE	20.63	21.38	
G0090	NG0090	100 YR - 1 Day		AE	20.63	21.33	
G0110	NG0110	100 YR - 1 Day		AE	20.61	21.24	
G0120	NG0120	100 YR - 1 Day		AE	19.75	20.99	
G0130	NG0130	100 YR - 1 Day		AE	19.73	20.92	
G0140	NG0140	100 YR - 1 Day		AE	19.68	20.78	
G0150	NG0150	100 YR - 1 Day		AE	19.65	20.70	
G0170	NG0170	100 YR - 1 Day		AE	19.37	20.47	
G0180	NG0180	100 YR - 1 Day		AE	19.34	20.41	
G0190	NG0190	100 YR - 1 Day		AE	19.31	20.31	
G0200	NG0200	100 YR - 1 Day		AE	19.27	20.27	
G0210	NG0210	100 YR - 1 Day		AE	17.53	18.60	
G0215	NG0215	100 YR - 1 Day		AE	17.41	18.48	
G0216	NG0216	100 YR - 1 Day		AE	17.30	18.26	
G0217	NG0217	100 YR - 1 Day		AE	17.18	18.05	
G0218	NG0218	100 YR - 1 Day		AE	18.45	18.45	
G0219	NG0219	100 YR - 1 Day		AE	18.45	18.50	
G0220	NG0220	100 YR - 1 Day		AE	18.16	18.20	
G0221	NG0221	100 YR - 1 Day		AE	18.04	18.08	
G0222	NG0222	100 YR - 1 Day		AE	16.74	16.78	
G0223	NG0223	100 YR - 1 Day		AE	17.16	17.54	
G0224	NG0224	100 YR - 1 Day		AE	17.11	17.53	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
G0226	NG0226	100 YR - 1 Day		AE	16.99	17.53	
G0227	NG0227	100 YR - 1 Day		AE	17.00	17.62	
G0229	NG0229	100 YR - 1 Day		AE	17.00	17.66	
G0230	NG0230	100 YR - 1 Day		AE	17.15	17.93	
G0240	NG0240	100 YR - 1 Day		AE	17.00	17.57	
G0245	NG0245	100 YR - 1 Day		AE	16.03	16.41	
G0250	NG0250	100 YR - 1 Day		AE	16.85	17.32	
G0252	NG0252	100 YR - 1 Day		AE	16.18	16.58	
G0254	NG0254	100 YR - 1 Day		AE	16.23	16.61	
G0256	NG0256	100 YR - 1 Day		AE	15.87	16.16	
G0260	NG0260	100 YR - 1 Day		AE	16.69	17.05	
G0263	NG0263	100 YR - 1 Day		AE	16.23	16.61	
G0266	NG0266	100 YR - 1 Day		AE	15.81	16.07	
G0270	NG0270	100 YR - 1 Day		AE	16.60	16.93	
G0280	NG0280	100 YR - 1 Day		AE	14.67	15.59	
G1010	NG1010	100 YR - 1 Day		AE	21.50	21.99	
G1020	NG1020	100 YR - 1 Day		AE	21.51	21.99	
G1030	NG1030	100 YR - 1 Day		AE	21.55	22.15	
G1040	NG1040	100 YR - 1 Day		AE	21.56	22.16	
G1050	NG1050	100 YR - 1 Day		AE	21.89	22.19	
G1060	NG1060	100 YR - 1 Day		AE	21.90	22.19	
G1510	NG1510	100 YR - 1 Day		AE	22.45	23.01	
G1520	NG1520	100 YR - 1 Day		AE	22.45	23.01	
G1530	NG1530	100 YR - 1 Day		AE	22.45	23.01	
G1540	NG1540	100 YR - 1 Day		AE	22.45	23.01	
G2020	NG2020	100 YR - 1 Day			22.62	22.59	
G2030	NG2030	100 YR - 1 Day		AE	21.96	22.12	
G2032	NG2032	100 YR - 1 Day		AE	22.52	22.52	
G2034	NG2034	100 YR - 1 Day		AE	22.01	22.14	
G2036	NG2036	100 YR - 1 Day		AE	21.99	22.12	
G2040	NG2040	100 YR - 1 Day		AE	21.96	22.12	
G2050	NG2050	100 YR - 1 Day		AE	21.93	22.10	
G2070	NG2070	100 YR - 1 Day		AE	21.38	21.91	
G2080	NG2080	100 YR - 1 Day		AE	21.06	21.90	
G2090	NG2090	100 YR - 1 Day		AE	21.04	21.88	
G2100	NG2100	100 YR - 1 Day		AE	20.99	21.70	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
G2103	NG2103	100 YR - 1 Day		AE	20.90	21.59	
G2107	NG2107	100 YR - 1 Day		AE	20.90	21.59	
G2109	NG2109	100 YR - 1 Day		AE	20.91	21.59	
G2110	NG2110	100 YR - 1 Day		AE	20.91	21.59	
G2130	NG2130	100 YR - 1 Day		AE	20.90	21.58	
G2150	NG2150	100 YR - 1 Day		AE	20.87	21.56	
G3010	NG3010	100 YR - 1 Day		AE	21.26	21.35	
G3020	NG3020	100 YR - 1 Day		AE	21.23	21.34	
G3030	NG3030	100 YR - 1 Day		AE	21.23	21.34	
G3040	NG3040	100 YR - 1 Day		AE	21.23	21.35	
G3050	NG3050	100 YR - 1 Day		AE	21.23	21.35	
G4010	NG4010	100 YR - 1 Day		AE	20.47	20.97	
G4020	NG4020	100 YR - 1 Day		AE	20.47	20.97	
G4023	NG4023	100 YR - 1 Day		AE	20.73	21.41	
G4027	NG4027	100 YR - 1 Day		AE	20.66	21.37	
G4030	NG4030	100 YR - 1 Day		AE	20.62	21.32	
G4040	NG4040	100 YR - 1 Day		AE	20.63	21.33	
G4050	NG4050	100 YR - 1 Day		AE	20.62	21.32	
G5210	NG5210	100 YR - 1 Day		AE	22.04	22.64	
G5220	NG5220	100 YR - 1 Day		AE	22.04	22.64	
G5230	NG5230	100 YR - 1 Day		AE	22.04	22.64	
G5240	NG5240	100 YR - 1 Day		AE	22.04	22.64	
G5510	NG5510	100 YR - 1 Day			22.25	22.90	
G5520	NG5520	100 YR - 1 Day		AE	22.41	22.97	
G5535	NG5535	100 YR - 1 Day		AE	22.41	23.01	
G5540	NG5540	100 YR - 1 Day		AE	22.41	23.01	
G5545	NG5545	100 YR - 1 Day		AE	22.41	23.01	
G5550	NG5550	100 YR - 1 Day		AE	22.41	23.01	
G5560	NG5560	100 YR - 1 Day		AE	22.40	23.01	
G5580	NG5580	100 YR - 1 Day		AE	22.38	23.01	
G5810	NG5810	100 YR - 1 Day		AE	22.03	22.51	
G5815	NG5815	100 YR - 1 Day		AE	22.40	23.24	
G5820	NG5820	100 YR - 1 Day		AE	22.02	22.49	
G5830	NG5830	100 YR - 1 Day		AE	22.02	22.48	
G5835	NG5835	100 YR - 1 Day		AE	22.07	22.63	
G5840	NG5840	100 YR - 1 Day		AE	22.01	22.47	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
G5850	NG5850	100 YR - 1 Day			21.94	22.27	
G5860	NG5860	100 YR - 1 Day			19.81	21.12	
G5863	NG5863	100 YR - 1 Day		X	20.45	21.10	
G5867	NG5867	100 YR - 1 Day		AE	19.81	21.10	
G5870	NG5870	100 YR - 1 Day		AE	19.81	21.10	
G5880	NG5880	100 YR - 1 Day		AE	19.78	21.02	
G5890	NG5890	100 YR - 1 Day		AE	19.75	20.95	
G6010	NG6010	100 YR - 1 Day			20.00	20.82	
G6020	NG6020	100 YR - 1 Day		AE	19.97	20.82	
G6030	NG6030	100 YR - 1 Day		AE	19.87	20.77	
G6050	NG6050	100 YR - 1 Day		AE	19.68	20.77	
G7010	NG7010	100 YR - 1 Day		AE	19.90	20.60	
G7012	NG7012	100 YR - 1 Day		AE	19.90	20.58	
G7015	NG7015	100 YR - 1 Day		AE	19.90	20.59	
G7020	NG7020	100 YR - 1 Day		AE	19.90	20.60	
G7030	NG7030	100 YR - 1 Day			19.89	20.60	
G7040	NG7040	100 YR - 1 Day			19.65	20.67	
G7050	NG7050	100 YR - 1 Day		AE	19.65	20.68	
G8005	NG8005	100 YR - 1 Day		AE	17.44	20.03	
G8010	NG8010	100 YR - 1 Day		AE	17.43	20.03	
G8040	NG8040	100 YR - 1 Day		AE	17.41	18.71	
G8042	NG8042	100 YR - 1 Day		AE	18.68	18.61	
G8044	NG8044	100 YR - 1 Day			17.26	18.14	
G8045	NG8045	100 YR - 1 Day			17.20	17.98	
G8048	NG8048	100 YR - 1 Day		AE	17.00	17.66	
G8050	NG8050	100 YR - 1 Day		AE	17.41	18.66	
H0002	NH0002	100 YR - 1 Day		AE	17.49	18.64	
H0004	NH0004	100 YR - 1 Day		AE	17.49	18.63	
H0006	NH0006	100 YR - 1 Day		AE	17.45	18.60	
H0008	NH0008	100 YR - 1 Day			17.40	18.25	
H0010	NH0010	100 YR - 5 Day	A3 F	AE	15.66	17.52	
H0020	NH0020	100 YR - 5 Day	A3 F	AE	15.43	17.21	
H0030	NH0030	100 YR - 5 Day	A3 F	AE	14.96	16.64	
H0040	NH0040	100 YR - 5 Day	A3 F	AE	14.94	16.61	
H0050	NH0050	100 YR - 5 Day	A3 F	AE	14.79	16.19	
H0060	NH0060	100 YR - 5 Day	A3 F	AE	14.46	15.82	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
H0070	NH0070	100 YR - 5 Day	A3 F	AE	13.78	15.11	
H0072	NH0072	100 YR - 5 Day	A3 F	AE	13.51	14.68	
H0074	NH0074	100 YR - 5 Day	A3 F	AE	13.76	15.10	
H0076	NH0076	100 YR - 5 Day	A3 F	AE	13.46	14.62	
H0080	NH0080	100 YR - 5 Day	A3 F	AE	13.35	14.50	
H0090	NH0090	100 YR - 5 Day	A3 F	AE	12.96	14.02	
H0100	NH0100	100 YR - 5 Day	A3 F	AE	12.81	13.82	
H0110	NH0110	100 YR - 5 Day	A3 F	AE	12.73	13.71	
H0120	NH0120	100 YR - 5 Day	A3 F	AE	12.55	13.51	
H0130	NH0130	100 YR - 5 Day	A3 F	AE	12.25	13.14	
H0140	NH0140	100 YR - 5 Day	A3 F	AE	11.55	12.55	
H0150	NH0150	100 YR - 5 Day	A4 F	AE	11.28	12.42	
H0160	NH0160	100 YR - 5 Day	A4 F	AE	10.89	12.22	
H6010	NH6010	100 YR - 1 Day		AE	11.77	12.40	
H6020	NH6020	100 YR - 1 Day		AE	11.77	12.39	
H6035	NH6035	100 YR - 1 Day		AE	11.77	12.39	
H6050	NH6050	100 YR - 1 Day		AE	11.18	12.39	
H6060	NH6060	100 YR - 1 Day		AE	10.97	12.39	
H6065	NH6065	100 YR - 1 Day		AE	10.97	12.37	
H6080	NH6080	100 YR - 1 Day		AE	10.97	12.39	
H6100	NH6100	100 YR - 1 Day		AE	10.90	12.38	
H6105	NH6105	100 YR - 5 Day	A3	AE	11.30	12.41	
H6110	NH6110	100 YR - 5 Day	A4	AE	10.90	12.42	
H8010	NH8010	100 YR - 1 Day		AE	19.89	19.98	
H8020	NH8020	100 YR - 1 Day		AE	19.82	19.86	
H8030	NH8030	100 YR - 1 Day		AE	19.69	19.71	
H8060	NH8060	100 YR - 1 Day		AE	18.72	18.94	
H8075	NH8075	100 YR - 1 Day		AE	19.40	19.71	
H8077	NH8077	100 YR - 1 Day		AE	19.44	19.72	
H8080	NH8080	100 YR - 1 Day		AE	18.60	18.81	
H8090	NH8090	100 YR - 1 Day	A3	AE	17.92	17.95	
H9000	NH9000	100 YR - 1 Day	A3	AE	12.43	12.67	
I0012	NI0012	100 YR - 1 Day		AE	21.07	21.93	
I0015	NI0015	100 YR - 1 Day		AE	21.07	21.92	
I0016	NI0016	100 YR - 1 Day		AE	22.52	22.58	
I0018	NI0018	100 YR - 1 Day		AE	21.06	21.92	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
I0020	NI0020	100 YR - 1 Day		AE	21.06	21.92	
I0025	NI0025	100 YR - 1 Day		AE	21.10	21.86	
I0030	NI0030	100 YR - 1 Day		AE	21.01	21.86	
I0040	NI0040	100 YR - 1 Day		AE	20.46	21.04	
I0050	NI0050	100 YR - 1 Day		AE	17.76	18.80	
I0055	NI0055	100 YR - 1 Day			18.10	18.77	
I0059	NI0059	100 YR - 1 Day		AE	18.02	18.77	
I0060	NI0060	100 YR - 1 Day		AE	17.73	18.76	
I0062	NI0062	100 YR - 1 Day		AE	20.82	20.93	
I0070	NI0070	100 YR - 1 Day		AE	17.67	18.65	
I0080	NI0080	100 YR - 1 Day		AE	17.63	18.58	
I0082	NI0082	100 YR - 1 Day		AE	20.97	21.05	
I0085	NI0085	100 YR - 1 Day		AE	19.38	19.82	
I0090	NI0090	100 YR - 1 Day		AE	17.57	18.49	
I0095	NI0095	100 YR - 1 Day		AE	18.52	18.81	
I0100	NI0100	100 YR - 1 Day		AE	17.50	18.36	
I0105	NI0105	100 YR - 1 Day		AE	18.39	18.51	
I0110	NI0110	100 YR - 1 Day		AE	17.36	18.07	
I0130	NI0130	100 YR - 1 Day		AE	14.02	14.83	
I0132	NI0132	100 YR - 1 Day		AE	14.56	14.56	
I0133	NI0133	100 YR - 1 Day		AE	17.25	17.42	
I0135	NI0135	100 YR - 1 Day		AE	13.96	14.51	
I0138	NI0138	100 YR - 1 Day		AE	13.86	14.44	
I0140	NI0140	100 YR - 1 Day		AE	13.82	14.37	
I0150	NI0150	100 YR - 1 Day		AE	13.74	14.19	
I0155	NI0155	100 YR - 1 Day		AE	13.26	13.39	
I0160	NI0160	100 YR - 1 Day		AE	13.62	14.08	
I0170	NI0170	100 YR - 1 Day		AE	12.23	13.23	
I0172	NI0172	100 YR - 1 Day		AE	13.05	13.37	
I0174	NI0174	100 YR - 1 Day		AE	13.04	13.36	
I0176	NI0176	100 YR - 1 Day		AE	12.78	13.32	
I0178	NI0178	100 YR - 1 Day		AE	12.47	13.28	
I0180	NI0180	100 YR - 1 Day		AE	12.19	13.17	
I0181	NI0181	100 YR - 1 Day		AE	12.47	13.32	
I0182	NI0182	100 YR - 1 Day		AE	12.06	12.97	
I0183	NI0183	100 YR - 1 Day			11.96	12.89	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
I0185	NI0185	100 YR - 1 Day		AE	11.88	12.64	
I0188	NI0188	100 YR - 1 Day		AE	11.88	12.64	
I0190	NI0190	100 YR - 1 Day		AE	11.93	12.78	
I0192	NI0192	100 YR - 1 Day		AE	12.45	13.31	
I0193	NI0193	100 YR - 1 Day		AE	11.82	12.60	
I0195	NI0195	100 YR - 1 Day		AE	12.45	13.32	
I1010	NI1010	100 YR - 1 Day			15.11	15.84	
I1015	NI1015	100 YR - 1 Day		AE	16.72	16.39	
I1020	NI1020	100 YR - 1 Day		AE	14.73	15.80	
I1030	NI1030	100 YR - 1 Day		AE	14.13	15.69	
I2010	NI2010	100 YR - 1 Day		AE	15.07	15.08	
I2020	NI2020	100 YR - 1 Day		AE	14.70	14.91	
I2030	NI2030	100 YR - 1 Day		AE	14.66	14.85	
I2040	NI2040	100 YR - 1 Day		AE	14.63	14.81	
I2050	NI2050	100 YR - 1 Day		AE	14.59	14.78	
I9020	NI9020	100 YR - 1 Day		AE	20.86	20.99	
I9022	NI9022	100 YR - 1 Day		AE	20.86	20.99	
I9024	NI9024	100 YR - 1 Day		AE	20.84	20.95	
J0005	NJ0005	100 YR - 1 Day		AE	25.29	27.09	
J0010	NJ0010	100 YR - 1 Day		AE	25.12	26.95	
J0020	NJ0020	100 YR - 1 Day		AE	25.04	26.88	
J0030	NJ0030	100 YR - 1 Day		AE	24.10	26.32	
J0040	NJ0040	100 YR - 1 Day		AE	24.01	26.25	
J0050	NJ0050	100 YR - 1 Day		AE	23.86	26.20	
J0070	NJ0070	100 YR - 1 Day		AE	23.75	26.14	
J0080	NJ0080	100 YR - 1 Day		AE	23.68	26.10	
J0090	NJ0090	100 YR - 1 Day		AE	23.60	26.03	
J0100	NJ0100	100 YR - 1 Day		AE	23.57	26.01	
J0103	NJ3520	100 YR - 1 Day			24.58	26.17	
J0104	NJ0080	100 YR - 1 Day			23.68	26.10	
J0105	NJ0100	100 YR - 1 Day			23.57	26.01	
J0110	NJ0110	100 YR - 1 Day		AE	21.89	22.73	
J0120	NJ0120	100 YR - 1 Day		AE	21.75	22.56	
J0130	NJ0130	100 YR - 1 Day		AE	21.58	22.36	
J0140	NJ0140	100 YR - 1 Day		AE	21.49	22.21	
J0142	NJ0142	100 YR - 1 Day		AE	20.97	21.56	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
J0143	NJ0143	100 YR - 1 Day		AE	20.97	21.54	
J0144	NJ0144	100 YR - 1 Day		AE	21.07	21.67	
J0145	NJ0145	100 YR - 1 Day		AE	21.27	21.90	
J0148	NJ0148	100 YR - 1 Day		AE	21.07	21.67	
J0150	NJ0150	100 YR - 1 Day		AE	21.07	21.67	
J0160	NJ0160	100 YR - 1 Day		AE	20.97	21.54	
J0162	NJ0162	100 YR - 1 Day		AE	20.68	21.11	
J0165	NJ0165	100 YR - 1 Day		AE	20.69	21.21	
J0168	NJ0168	100 YR - 1 Day		AE	20.71	21.23	
J0170	NJ0170	100 YR - 1 Day		AE	20.86	21.43	
J0172	NJ0172	100 YR - 1 Day		AE	20.98	21.55	
J0174	NJ0174	100 YR - 1 Day		AE	20.97	21.54	
J0176	NJ0176	100 YR - 1 Day		AE	20.97	21.54	
J0178	NJ0178	100 YR - 1 Day		AE	20.94	21.54	
J0180	NJ0180	100 YR - 1 Day		AE	20.69	21.26	
J0182	NJ0182	100 YR - 1 Day		AE	20.63	21.03	
J0184	NJ0184	100 YR - 1 Day		AE	20.63	21.02	
J0186	NJ0186	100 YR - 1 Day		AE	20.63	21.19	
J0188	NJ0188	100 YR - 1 Day		AE	20.61	21.19	
J0190	NJ0190	100 YR - 1 Day		AE	20.55	21.17	
J0192	NJ0192	100 YR - 1 Day		AE	20.67	21.44	
J0195	NJ0195	100 YR - 1 Day		AE	20.61	21.34	
J0198	NJ0198	100 YR - 1 Day		AE	20.61	21.34	
J0200	NJ0200	100 YR - 1 Day		AE	20.48	21.12	
J0210	NJ0210	100 YR - 1 Day		AE	20.37	21.06	
J1010	NJ1010	100 YR - 1 Day		AE	26.51	26.64	
J1020	NJ1020	100 YR - 1 Day		AE	26.51	26.64	
J1110	NJ1110	100 YR - 1 Day		AE	26.52	26.64	
J1120	NJ1120	100 YR - 1 Day		AE	26.52	26.64	
J1130	NJ1130	100 YR - 1 Day		AE	26.52	26.64	
J1210	NJ1210	100 YR - 1 Day		AE	26.81	26.90	
J1220	NJ1220	100 YR - 1 Day		AE	26.47	26.60	
J1310	NJ1310	100 YR - 1 Day		AE	26.52	26.64	
J1320	NJ1320	100 YR - 1 Day		AE	26.52	26.64	
J1330	NJ1330	100 YR - 1 Day		AE	26.49	26.61	
J1410	NJ1410	100 YR - 1 Day		AE	26.25	26.24	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
J1420	NJ1420	100 YR - 1 Day		AE	26.02	26.21	
J1501	NJ1501	100 YR - 1 Day		AE	26.93	26.95	
J1502	NJ1502	100 YR - 1 Day		AE	26.86	26.86	
J1503	NJ1503	100 YR - 1 Day		AE	26.92	26.93	
J1504	NJ1504	100 YR - 1 Day		AE	26.89	26.90	
J1505	NJ1505	100 YR - 1 Day		AE	26.86	26.86	
J1506	NJ1506	100 YR - 1 Day		AE	26.93	26.96	
J1510	NJ1510	100 YR - 1 Day		AE	26.86	26.86	
J1520	NJ1520	100 YR - 1 Day		AE	26.57	26.70	
J1530	NJ1530	100 YR - 1 Day		AE	26.51	26.64	
J1540	NJ1540	100 YR - 1 Day			26.50	26.62	
J1550	NJ1550	100 YR - 1 Day			26.50	26.62	
J1560	NJ1560	100 YR - 1 Day		AE	26.47	26.60	
J1570	NJ1570	100 YR - 1 Day		AE	26.35	26.46	
J1580	NJ1580	100 YR - 1 Day		AE	26.33	26.45	
J1590	NJ1590	100 YR - 1 Day		AE	26.00	26.21	
J1600	NJ1600	100 YR - 1 Day		AE	24.24	26.20	
J1610	NJ1610	100 YR - 1 Day		AE	23.86	26.20	
J2010	NJ2010	100 YR - 1 Day		AE	25.30	26.22	
J2020	NJ2020	100 YR - 1 Day		AE	25.09	26.22	
J2030	NJ2030	100 YR - 1 Day		AE	25.07	26.23	
J2110	NJ2110	100 YR - 1 Day		AE	24.40	26.22	
J2120	NJ2120	100 YR - 1 Day		AE	24.81	26.22	
J2210	NJ2210	100 YR - 1 Day		AE	24.60	26.18	
J2220	NJ2220	100 YR - 1 Day		AE	24.49	26.20	
J2230	NJ2230	100 YR - 1 Day		AE	24.37	26.20	
J2310	NJ2310	100 YR - 1 Day		AE	24.36	26.20	
J2320	NJ2320	100 YR - 1 Day		AE	24.36	26.20	
J2330	NJ2330	100 YR - 1 Day		AE	24.36	26.20	
J2410	NJ2410	100 YR - 1 Day		AE	25.03	26.26	
J2420	NJ2420	100 YR - 1 Day		AE	25.02	26.23	
J2430	NJ2430	100 YR - 1 Day		AE	25.02	26.21	
J2440	NJ2440	100 YR - 1 Day		AE	24.36	26.21	
J2450	NJ2450	100 YR - 1 Day		AE	24.36	26.20	
J2460	NJ2460	100 YR - 1 Day		AE	24.33	26.20	
J2470	NJ2470	100 YR - 1 Day		AE	24.04	26.15	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
J2480	NJ2480	100 YR - 1 Day		AE	24.03	26.15	
J2510	NJ2510	100 YR - 1 Day		AE	24.12	26.15	
J2520	NJ2520	100 YR - 1 Day		AE	24.12	26.15	
J2530	NJ2530	100 YR - 1 Day		AE	23.97	26.15	
J2540	NJ2540	100 YR - 1 Day		AE	23.94	26.15	
J2550	NJ2550	100 YR - 1 Day		AE	23.91	26.14	
J3010	NJ3010	100 YR - 1 Day		AE	25.17	26.21	
J3020	NJ3020	100 YR - 1 Day		AE	25.04	26.20	
J3030	NJ3030	100 YR - 1 Day		AE	24.82	26.20	
J3210	NJ3210	100 YR - 1 Day		AE	24.82	26.20	
J3520	NJ3520	100 YR - 1 Day		AE	24.58	26.17	
J3530	NJ3530	100 YR - 1 Day		AE	24.58	26.17	
J3540	NJ3540	100 YR - 1 Day		AE	24.55	26.17	
J3550	NJ3550	100 YR - 1 Day		AE	24.54	26.17	
J3810	NJ3810	100 YR - 1 Day		AE	24.97	26.41	
J3820	NJ3820	100 YR - 1 Day		AE	24.88	26.26	
J3830	NJ3830	100 YR - 1 Day		AE	24.87	26.26	
J3835	NJ3835	100 YR - 1 Day		AE	24.87	26.24	
J3838	NJ3838	100 YR - 1 Day		AE	24.87	26.24	
J3840	NJ3840	100 YR - 1 Day		AE	24.87	26.24	
J3850	NJ3850	100 YR - 1 Day		AE	24.82	26.20	
J3870	NJ3870	100 YR - 1 Day		AE	24.81	26.20	
J3880	NJ3880	100 YR - 1 Day		AE	24.71	26.19	
J3890	NJ3890	100 YR - 1 Day		AE	24.11	26.18	
J3900	NJ3900	100 YR - 1 Day		AE	23.75	26.17	
J3910	NJ3910	100 YR - 1 Day		AE	23.75	26.17	
J3920	NJ3920	100 YR - 1 Day		AE	23.75	26.16	
J4010	NJ4010	100 YR - 1 Day		AE	24.00	26.02	
J4020	NJ4020	100 YR - 1 Day		AE	23.91	26.02	
J4030	NJ4030	100 YR - 1 Day		AE	23.91	26.02	
J4040	NJ4040	100 YR - 1 Day		AE	23.84	26.02	
J4050	NJ4050	100 YR - 1 Day		AE	23.62	26.02	
J4060	NJ4060	100 YR - 1 Day		AE	23.61	26.02	
J4503	NJ4530	100 YR - 1 Day			23.83	26.02	
J4505	NB4121	100 YR - 1 Day			24.11	26.02	
J4510	NJ4510	100 YR - 1 Day		AE	24.00	26.02	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
J4520	NJ4520	100 YR - 1 Day		AE	23.84	26.02	
J4530	NJ4530	100 YR - 1 Day		AE	23.83	26.02	
J4540	NJ4540	100 YR - 1 Day		AE	23.71	26.02	
J4550	NJ4550	100 YR - 1 Day		AE	23.70	26.02	
J5005	NJ5005	100 YR - 1 Day			21.88	22.56	
J5015	NJ5015	100 YR - 1 Day		AE	21.81	22.56	
J5020	NJ5020	100 YR - 1 Day		AE	21.75	22.56	
J5022	NJ5022	100 YR - 1 Day		AE	23.12	23.02	
J5025	NJ5025	100 YR - 1 Day			23.08	23.00	
J5030	NJ5030	100 YR - 1 Day		AE	21.75	22.56	
J5040	NJ5040	100 YR - 1 Day		AE	21.75	22.56	
J6010	NJ6010	100 YR - 1 Day			21.71	22.25	
J6020	NJ6020	100 YR - 1 Day		AE	21.50	22.25	
J6030	NJ6030	100 YR - 1 Day		AE	21.50	22.25	
J6040	NJ6040	100 YR - 1 Day		AE	21.50	22.25	
J6050	NJ6050	100 YR - 1 Day		AE	21.50	22.24	
J7010	NJ7010	100 YR - 1 Day		AE	20.98	21.55	
J7013	NJ7013	100 YR - 1 Day		AE	21.55	21.74	
J7017	NJ7017	100 YR - 1 Day		AE	20.98	21.57	
J7020	NJ7020	100 YR - 1 Day		AE	20.98	21.55	
J7022	NJ7022	100 YR - 1 Day		AE	20.97	21.33	
J7025	NJ7025	100 YR - 1 Day		AE	20.97	21.48	
J7028	NJ7028	100 YR - 1 Day		AE	20.97	21.53	
J7030	NJ7030	100 YR - 1 Day		AE	20.97	21.55	
J9000	NJ9000	100 YR - 1 Day		AE	24.17	24.16	
J9100	NJ9100	100 YR - 1 Day		AE	24.17	24.19	
J9200	NJ9200	100 YR - 1 Day		AE	24.17	24.19	
K0005	NK0005	100 YR - 1 Day		AE	24.02	25.69	
K0010	NK0010	100 YR - 1 Day			24.02	25.87	
K0030	NK0030	100 YR - 1 Day			24.00	25.82	
K0035	NK0035	100 YR - 1 Day		AE	24.48	25.81	
K0040	NK0040	100 YR - 1 Day		AE	23.95	25.75	
K0050	NK0050	100 YR - 1 Day		AE	23.91	25.68	
K0070	NK0070	100 YR - 1 Day		AE	23.85	25.61	
K0077	NK0077	100 YR - 1 Day		AE	23.98	25.90	
K0080	NK0080	100 YR - 1 Day			23.83	25.59	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
K0088	NK0088	100 YR - 1 Day		AE	23.79	25.32	
K0090	NK0090	100 YR - 1 Day		AE	23.79	25.55	
K0095	NK0095	100 YR - 1 Day		AE	23.73	25.31	
K0100	NK0100	100 YR - 1 Day		AE	23.76	25.53	
K0110	NK0110	100 YR - 1 Day		AE	23.75	25.53	
K0118	NK0118	100 YR - 1 Day		AE	23.53	25.27	
K0119	NK0119	100 YR - 1 Day		AE	23.73	25.30	
K0120	NK0120	100 YR - 1 Day		AE	23.49	25.50	
K0123	NK0123	100 YR - 1 Day		AE	23.72	25.81	
K0135	NK0135	100 YR - 1 Day		AE	23.83	25.55	
K0140	NK0140	100 YR - 1 Day		AE	21.04	25.26	
K0141	NK0144	100 YR - 1 Day			23.13	25.25	
K0142	NK0142	100 YR - 1 Day		AE	21.44	23.63	
K0143	NK7882	100 YR - 1 Day			23.36	23.15	
K0144	NK0144	100 YR - 1 Day		AE	23.13	25.25	
K0145	NK0140	100 YR - 1 Day			21.04	25.26	
K0146	NK0146	100 YR - 1 Day			22.47	23.63	
K0148	NK0148	100 YR - 1 Day		AE	21.43	23.63	
K0150	NK0150	100 YR - 1 Day		AE	20.83	23.13	
K0158	NK0158	100 YR - 1 Day		AE	20.97	23.63	
K0160	NK0160	100 YR - 1 Day		AE	20.78	22.99	
K0170	NK0170	100 YR - 1 Day		AE	20.74	22.88	
K0174	NK0174	100 YR - 1 Day		AE	20.86	23.54	
K0175	NK0175	100 YR - 1 Day		AE	20.91	22.69	
K0180	NK0180	100 YR - 1 Day		AE	20.72	22.80	
K0185	NK0185	100 YR - 1 Day		AE	20.81	22.62	
K0190	NK0190	100 YR - 1 Day		AE	20.70	22.70	
K0200	NK0200	100 YR - 1 Day		AE	20.68	22.60	
K0210	NK0210	100 YR - 1 Day		AE	20.63	22.54	
K0226	NK0226	100 YR - 1 Day		AE	19.46	21.85	
K0230	NK0230	100 YR - 1 Day		AE	19.36	21.21	
K0233	NK0233	100 YR - 1 Day		AE	19.17	21.85	
K0237	NK0237	100 YR - 1 Day		AE	19.17	21.86	
K0242	NK0242	100 YR - 1 Day		AE	19.43	20.97	
K0245	NK0245	100 YR - 1 Day		AE	19.18	20.97	
K0246	NK0246	100 YR - 1 Day		AE	19.38	21.55	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
K0248	NK0248	100 YR - 1 Day		AE	19.17	20.97	
K0250	NK0250	100 YR - 1 Day		AE	19.17	20.97	
K0274	NK0274	100 YR - 1 Day		AE	18.89	20.62	
K0280	NK0280	100 YR - 1 Day		AE	18.89	20.62	
K0294	NK0294	100 YR - 1 Day		AE	18.59	20.64	
K0300	NK0300	100 YR - 1 Day		AE	18.45	20.00	
K0302	NK0302	100 YR - 1 Day		AE	20.33	20.36	
K0305	NK0305	100 YR - 1 Day		AE	20.32	20.35	
K0308	NK0308	100 YR - 1 Day		AE	20.24	20.31	
K0309	NK0309	100 YR - 1 Day		AE	19.67	20.06	
K0310	NK0310	100 YR - 1 Day		AE	18.02	19.29	
K0314	NK0314	100 YR - 1 Day		AE	17.52	18.68	
K0318	NK0318	100 YR - 1 Day		AE	17.49	18.61	
K0320	NK0320	100 YR - 1 Day		AE	17.49	18.59	
K0323	NK0323	100 YR - 1 Day		AE	18.59	18.71	
K0327	NK0327	100 YR - 1 Day		AE	18.56	18.71	
K0328	NK0328	100 YR - 1 Day		AE	17.22	18.28	
K0330	NK0330	100 YR - 1 Day		AE	17.19	18.27	
K1010	NK1010	100 YR - 1 Day		AE	24.58	25.68	
K1020	NK1020	100 YR - 1 Day		AE	24.58	25.69	
K1030	NK1030	100 YR - 1 Day		AE	24.53	25.69	
K1040	NK1040	100 YR - 1 Day		AE	24.41	25.69	
K1050	NK1050	100 YR - 1 Day		AE	24.37	25.69	
K1510	NK1510	100 YR - 1 Day		AE	24.01	25.81	
K2010	NK2010	100 YR - 1 Day		AE	24.45	25.28	
K2020	NK2020	100 YR - 1 Day		AE	24.27	25.31	
K2040	NK2040	100 YR - 1 Day		AE	24.26	25.31	
K2510	NK2510	100 YR - 1 Day			25.29	25.68	
K2520	NK2520	100 YR - 1 Day		AE	24.93	25.68	
K2530	NK2530	100 YR - 1 Day		AE	24.62	25.68	
K2540	NK2540	100 YR - 1 Day		AE	23.91	25.68	
K3010	NK3010	100 YR - 1 Day		AE	23.89	25.26	
K3020	NK3020	100 YR - 1 Day		AE	23.89	25.26	
K3030	NK3030	100 YR - 1 Day		AE	23.89	25.26	
K3040	NK3040	100 YR - 1 Day		AE	23.89	25.28	
K3050	NK3050	100 YR - 1 Day		AE	23.89	25.31	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
K3070	NK3070	100 YR - 1 Day		AE	23.85	25.31	
K4010	NK4010	100 YR - 1 Day		AE	24.22	25.85	
K4020	NK4020	100 YR - 1 Day		AE	24.22	25.86	
K4030	NK4030	100 YR - 1 Day		AE	24.10	25.86	
K4060	NK4060	100 YR - 1 Day		AE	23.91	25.86	
K4070	NK4070	100 YR - 1 Day		AE	23.80	25.86	
K5010	NK5010	100 YR - 1 Day		AE	21.55	22.64	
K5030	NK5030	100 YR - 1 Day		AE	21.55	22.64	
K5040	NK5040	100 YR - 1 Day		AE	21.54	22.64	
K5050	NK5050	100 YR - 1 Day		AE	21.53	22.64	
K5060	NK5060	100 YR - 1 Day		AE	21.39	22.64	
K6010	NK6010	100 YR - 1 Day		AE	21.93	23.65	
K6030	NK6030	100 YR - 1 Day		AE	21.92	23.64	
K6040	NK6040	100 YR - 1 Day		AE	21.92	23.63	
K6050	NK6050	100 YR - 1 Day		AE	21.91	23.56	
K6060	NK6060	100 YR - 1 Day		AE	21.90	23.56	
K6070	NK6070	100 YR - 1 Day		AE	21.88	23.54	
K6080	NK6080	100 YR - 1 Day		AE	21.85	23.54	
K7020	NK7020	100 YR - 1 Day		AE	20.58	22.35	
K7040	NK7040	100 YR - 1 Day		AE	20.76	21.96	
K7050	NK7050	100 YR - 1 Day		AE	20.76	21.96	
K7060	NK7060	100 YR - 1 Day		AE	20.76	21.96	
K7070	NK7070	100 YR - 1 Day		AE	20.70	21.96	
K7210	NK7210	100 YR - 1 Day		AE	21.57	22.64	
K7220	NK7220	100 YR - 1 Day		AE	21.57	22.64	
K7230	NK7230	100 YR - 1 Day		AE	21.55	22.65	
K7240	NK7240	100 YR - 1 Day		AE	21.58	22.75	
K7250	NK7250	100 YR - 1 Day		AE	21.58	22.75	
K7410	NK7410	100 YR - 1 Day			22.06	22.54	
K7420	NK7420	100 YR - 1 Day			22.06	22.54	
K7430	NK7430	100 YR - 1 Day		AE	22.05	22.55	
K7440	NK7440	100 YR - 1 Day		AE	22.04	22.59	
K7450	NK7450	100 YR - 1 Day		AE	22.04	22.59	
K7460	NK7460	100 YR - 1 Day		AE	22.04	22.59	
K7470	NK7470	100 YR - 1 Day		AE	21.61	22.61	
K7480	NK7480	100 YR - 1 Day		AE	21.21	22.61	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
K7490	NK7490	100 YR - 1 Day		AE	21.15	22.62	
K7610	NK7610	100 YR - 1 Day		AE	21.55	22.63	
K7630	NK7630	100 YR - 1 Day		AE	21.56	22.64	
K7640	NK7640	100 YR - 1 Day		AE	21.55	22.63	
K7650	NK7650	100 YR - 1 Day		AE	21.55	22.62	
K7660	NK7660	100 YR - 1 Day		AE	20.86	22.61	
K7805	NK7805	100 YR - 1 Day		AE	24.12	26.20	
K7810	NK7810	100 YR - 1 Day		AE	24.12	26.21	
K7812	NK7812	100 YR - 1 Day		AE	24.12	26.20	
K7814	NK7814	100 YR - 1 Day		AE	24.12	26.20	
K7816	NK7816	100 YR - 1 Day		AE	24.12	26.20	
K7818	NK7818	100 YR - 1 Day		AE	24.12	26.19	
K7820	NK7820	100 YR - 1 Day		AE	24.12	26.20	
K7830	NK7830	100 YR - 1 Day			24.10	26.14	
K7845	NK7845	100 YR - 1 Day		AE	24.09	26.06	
K7850	NK7850	100 YR - 1 Day		AE	24.09	26.09	
K7855	NK7855	100 YR - 1 Day		AE	24.08	26.09	
K7858	NK7858	100 YR - 1 Day		AE	24.09	25.96	
K7859	NK7859	100 YR - 1 Day		AE	24.08	26.06	
K7860	NK7860	100 YR - 1 Day		AE	24.08	26.06	
K7864	NK7864	100 YR - 1 Day		X	22.63	25.94	
K7865	NK7865	100 YR - 1 Day		AE	23.53	26.05	
K7872	NK7872	100 YR - 1 Day		AE	24.02	25.81	
K7873	NK7873	100 YR - 1 Day		AE	23.90	25.77	
K7874	NK7874	100 YR - 1 Day		AE	22.76	25.89	
K7875	NK7875	100 YR - 1 Day		AE	24.76	26.04	
K7880	NK7880	100 YR - 1 Day		AE	21.89	25.89	
K7881	NK7880	100 YR - 1 Day			21.89	25.89	
K7882	NK7882	100 YR - 1 Day		AE	23.36	23.15	
K7884	NK7884	100 YR - 1 Day		AE	23.53	23.52	
K7885	NK7885	100 YR - 1 Day		AE	22.91	23.15	
K7886	NK7886	100 YR - 1 Day			23.87	24.32	
K7890	NK7890	100 YR - 1 Day		AE	21.58	23.15	
K7893	NK7893	100 YR - 1 Day		AE	22.84	23.14	
K7900	NK7900	100 YR - 1 Day		AE	21.58	23.13	
K7910	NK7910	100 YR - 1 Day		AE	20.95	22.71	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
K7913	NK7913	100 YR - 1 Day		AE	22.11	22.68	
K7917	NK7917	100 YR - 1 Day		AE	22.11	22.68	
K7920	NK7920	100 YR - 1 Day		AE	20.94	22.68	
K7930	NK7930	100 YR - 1 Day		AE	20.93	22.63	
K7932	NK7932	100 YR - 1 Day		AE	21.57	22.64	
K7934	NK7934	100 YR - 1 Day		AE	21.57	22.64	
K7936	NK7936	100 YR - 1 Day		AE	21.56	22.64	
K7938	NK7938	100 YR - 1 Day		AE	21.53	22.64	
K7940	NK7940	100 YR - 1 Day		AE	20.86	22.61	
K7945	NK7945	100 YR - 1 Day		AE	20.83	22.45	
K7947	NK7947	100 YR - 1 Day		AE	20.82	22.57	
K7950	NK7950	100 YR - 1 Day		AE	20.82	22.60	
K7960	NK7960	100 YR - 1 Day		AE	20.71	22.60	
K8010	NK8010	100 YR - 1 Day			21.44	21.50	
K8020	NK8020	100 YR - 1 Day		AE	21.44	21.49	
K8030	NK8030	100 YR - 1 Day		AE	19.45	21.23	
K8040	NK8040	100 YR - 1 Day		AE	19.37	21.21	
K8050	NK8050	100 YR - 1 Day		AE	19.36	21.21	
K9010	NK9010	100 YR - 1 Day		AE	20.93	21.40	
K9020	NK9020	100 YR - 1 Day		AE	20.93	21.38	
K9030	NK9030	100 YR - 1 Day		AE	20.84	21.28	
K9040	NK9040	100 YR - 1 Day		AE	20.61	21.14	
K9050	NK9050	100 YR - 1 Day		AE	19.67	21.08	
K9052	NK9052	100 YR - 1 Day		AE	20.68	20.79	
K9055	NK9055	100 YR - 1 Day			19.57	20.78	
K9058	NK9058	100 YR - 1 Day		AE	19.56	20.79	
K9060	NK9060	100 YR - 1 Day		AE	19.35	20.79	
K9070	NK9070	100 YR - 1 Day		AE	19.13	20.73	
K9510	NK9510	100 YR - 1 Day		AE	20.68	20.99	
K9520	NK9520	100 YR - 1 Day		AE	20.68	20.99	
K9610	NK9610	100 YR - 1 Day		AE	20.68	20.99	
K9630	NK9630	100 YR - 1 Day		AE	20.68	20.99	
K9710	NK9710	100 YR - 1 Day		AE	20.68	20.99	
K9720	NK9720	100 YR - 1 Day		AE	20.68	20.99	
K9730	NK9730	100 YR - 1 Day		AE	20.62	20.98	
L0010	NL0010	100 YR - 1 Day		AE	21.79	21.91	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
L0020	NL0020	100 YR - 1 Day		AE	21.65	21.70	
L0030	NL0030	100 YR - 1 Day			17.95	19.67	
L0035	NL0035	100 YR - 1 Day		AE	17.72	19.54	
L0040	NL0040	100 YR - 1 Day		AE	17.71	19.53	
L0042	NL0042	100 YR - 1 Day		AE	21.10	21.08	
L0045	NL0045	100 YR - 1 Day		AE	20.44	20.37	
L0047	NL0047	100 YR - 1 Day		AE	20.28	20.12	
L0048	NL0048	100 YR - 1 Day		AE	17.73	19.52	
L0050	NL0050	100 YR - 1 Day		AE	17.70	19.52	
L0057	NL0057	100 YR - 1 Day		AE	17.67	19.49	
L0060	NL0060	100 YR - 1 Day		AE	17.67	19.48	
L0063	NL0063	100 YR - 1 Day		AE	17.79	20.31	
L0067	NL0067	100 YR - 1 Day		AE	17.46	20.25	
L0070	NL0070	100 YR - 1 Day		AE	17.45	19.28	
L0073	NL0073	100 YR - 1 Day		AE	20.01	20.05	
L0077	NL0077	100 YR - 1 Day		AE	19.99	20.04	
L0080	NL0080	100 YR - 1 Day		AE	17.27	18.96	
L0083	NL0083	100 YR - 1 Day		AE	19.55	19.64	
L0087	NL0087	100 YR - 1 Day		AE	19.54	19.64	
L0090	NL0090	100 YR - 1 Day		AE	17.05	18.57	
L0100	NL0100	100 YR - 1 Day		AE	16.93	18.32	
L0110	NL0110	100 YR - 1 Day		AE	16.71	17.82	
L1010	NL1010	100 YR - 1 Day		AE	19.87	19.83	
L1013	NL1013	100 YR - 1 Day		AE	21.79	21.76	
L1017	NL1017	100 YR - 1 Day		AE	21.79	21.76	
L1020	NL1020	100 YR - 1 Day		AE	19.08	19.76	
L1021	NL1021	100 YR - 1 Day		AE	18.73	19.73	
L1023	NL1023	100 YR - 1 Day		AE	21.33	21.34	
L1027	NL1027	100 YR - 1 Day		AE	21.32	21.32	
L1030	NL1030	100 YR - 1 Day		AE	18.73	19.73	
L1035	NL1035	100 YR - 1 Day		AE	20.08	20.01	
L1040	NL1040	100 YR - 1 Day		AE	17.98	19.58	
N0009	NN0009	100 YR - 1 Day		AE	27.92	27.93	
N0010	NN0010	100 YR - 1 Day		AE	23.60	25.37	
N0020	NN0020	100 YR - 1 Day		AE	23.25	25.15	
N0030	NN0030	100 YR - 1 Day		AE	23.24	25.14	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
N0035	NN0035	100 YR - 1 Day		AE	24.27	25.12	
N0040	NN0040	100 YR - 1 Day		AE	23.23	25.12	
N0042	NN0042	100 YR - 1 Day		AE	24.46	25.14	
N0045	NN0045	100 YR - 1 Day		AE	25.38	25.34	
N0047	NN0047	100 YR - 1 Day		AE	24.44	25.14	
N0048	NN0048	100 YR - 1 Day		AE	23.25	25.14	
N0049	NN0049	100 YR - 1 Day		AE	23.62	25.06	
N0050	NN0050	100 YR - 1 Day		AE	23.22	25.11	
N0055	NN0055	100 YR - 1 Day		AE	24.46	25.14	
N0060	NN0060	100 YR - 1 Day			23.22	25.10	
N0070	NN0070	100 YR - 1 Day		AE	23.20	25.08	
N0075	NN0075	100 YR - 1 Day		AE	23.24	25.14	
N0080	NN0080	100 YR - 1 Day		AE	23.19	25.07	
N0085	NN0085	100 YR - 1 Day		AE	23.63	25.05	
N0090	NN0090	100 YR - 1 Day		AE	23.18	25.06	
N0092	NN0092	100 YR - 1 Day		AE	23.18	25.04	
N0093	NN0093	100 YR - 1 Day		AE	23.20	25.06	
N0098	NN0098	100 YR - 1 Day		AE	23.18	25.04	
N0100	NN0100	100 YR - 1 Day		AE	23.17	25.04	
N0105	NN0105	100 YR - 1 Day		AE	23.17	25.04	
N0110	NN0110	100 YR - 1 Day		AE	23.16	25.04	
N0115	NN0115	100 YR - 1 Day		X	23.03	24.71	
N0120	NN0120	100 YR - 1 Day		AE	20.29	21.72	
N0121	NN0120	100 YR - 1 Day			20.29	21.72	
N0122	NN5016	100 YR - 1 Day			24.36	24.27	
N0123	NN0123	100 YR - 1 Day		AE	23.93	24.71	
N0124	NN0125	100 YR - 1 Day			23.04	22.76	
N0125	NN0125	100 YR - 1 Day		AE	23.04	22.76	
N0127	NN0127	100 YR - 1 Day		AE	22.60	22.01	
N0130	NN0130	100 YR - 1 Day			19.83	20.99	
N0144	NN0144	100 YR - 1 Day		AE	19.90	21.07	
N0147	NN0147	100 YR - 1 Day		AE	20.38	20.77	
N0150	NN0150	100 YR - 1 Day		AE	19.64	20.74	
N0160	NN0160	100 YR - 1 Day			19.52	20.60	
N0165	NN0165	100 YR - 1 Day		AE	19.49	20.56	
N0170	NN0170	100 YR - 1 Day			19.48	20.56	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
N0171	NN0171	100 YR - 1 Day		AE	19.31	20.57	
N0172	NN0172	100 YR - 1 Day		AE	21.82	21.87	
N0174	NN0174	100 YR - 1 Day		AE	21.82	21.87	
N0176	NN0176	100 YR - 1 Day		AE	21.80	21.85	
N0177	NN0177	100 YR - 1 Day		AE	19.29	20.39	
N0178	NN0178	100 YR - 1 Day		AE	19.78	20.88	
N0180	NN0180	100 YR - 1 Day		AE	19.25	20.31	
N0182	NN0182	100 YR - 1 Day		AE	22.27	22.40	
N0184	NN0184	100 YR - 1 Day		AE	22.27	22.40	
N0185	NN0185	100 YR - 1 Day		AE	19.21	20.38	
N0186	NN0186	100 YR - 1 Day		AE	22.26	22.40	
N0188	NN0188	100 YR - 1 Day		AE	20.29	21.13	
N0190	NN0190	100 YR - 1 Day		AE	19.18	20.25	
N0194	NN0194	100 YR - 1 Day		AE	19.18	20.29	
N0200	NN0200	100 YR - 1 Day		AE	19.11	20.20	
N1010	NN1010	100 YR - 1 Day			25.12	25.25	
N1020	NN1020	100 YR - 1 Day		AE	25.07	25.25	
N1030	NN1030	100 YR - 1 Day		AE	25.02	25.25	
N1040	NN1040	100 YR - 1 Day		AE	24.99	25.25	
N1050	NN1050	100 YR - 1 Day			24.45	25.25	
N1510	NN1510	100 YR - 1 Day		AE	24.41	25.25	
N1520	NN1520	100 YR - 1 Day		AE	24.41	25.25	
N1540	NN1540	100 YR - 1 Day		AE	24.00	25.24	
N2010	NN2010	100 YR - 1 Day		AE	24.16	25.06	
N2020	NN2020	100 YR - 1 Day		AE	24.16	25.05	
N2030	NN2030	100 YR - 1 Day		AE	24.14	25.06	
N2040	NN2040	100 YR - 1 Day		AE	24.14	25.05	
N2510	NN2510	100 YR - 1 Day			24.32	25.05	
N2520	NN2520	100 YR - 1 Day		AE	24.14	25.05	
N2530	NN2530	100 YR - 1 Day		AE	24.01	25.05	
N2540	NN2540	100 YR - 1 Day		AE	23.49	25.06	
N3020	NN3020	100 YR - 1 Day		AE	23.76	25.05	
N3030	NN3030	100 YR - 1 Day		AE	23.74	25.05	
N3040	NN3040	100 YR - 1 Day		AE	23.67	25.05	
N3050	NN3050	100 YR - 1 Day		AE	23.22	25.05	
N3510	NN3510	100 YR - 1 Day		AE	23.99	25.07	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
N3520	NN3520	100 YR - 1 Day		AE	23.99	25.07	
N3530	NN3530	100 YR - 1 Day		AE	23.99	25.07	
N3540	NN3540	100 YR - 1 Day		AE	23.99	25.07	
N3550	NN3550	100 YR - 1 Day		AE	23.25	25.07	
N4010	NN4010	100 YR - 1 Day		AE	24.60	25.04	
N4020	NN4020	100 YR - 1 Day		AE	24.08	25.05	
N4024	NN4024	100 YR - 1 Day		AE	24.78	25.04	
N4026	NN4026	100 YR - 1 Day		AE	24.78	25.04	
N4028	NN4028	100 YR - 1 Day		AE	24.77	25.04	
N4030	NN4030	100 YR - 1 Day		AE	24.02	25.04	
N4040	NN4040	100 YR - 1 Day		AE	23.25	25.04	
N4045	NN4045	100 YR - 1 Day		AE	23.23	25.04	
N4050	NN4050	100 YR - 1 Day		AE	23.20	25.04	
N4060	NN4060	100 YR - 1 Day		AE	23.16	25.04	
N4320	NN4320	100 YR - 1 Day		AE	23.17	25.05	
N4710	NN4710	100 YR - 1 Day		AE	23.20	25.05	
N4720	NN4720	100 YR - 1 Day		AE	23.16	25.05	
N5010	NN5010	100 YR - 1 Day		AE	21.04	23.12	
N5013	NN5013	100 YR - 1 Day			24.13	24.04	
N5015	NN5015	100 YR - 1 Day		AE	20.79	23.00	
N5016	NN5016	100 YR - 1 Day			24.36	24.27	
N5017	NN5017	100 YR - 1 Day		AE	20.65	22.98	
N5020	NN5020	100 YR - 1 Day			20.56	22.96	
N5520	NN5520	100 YR - 1 Day		AE	21.99	22.10	
N5530	NN5530	100 YR - 1 Day		AE	21.98	22.09	
N5540	NN5540	100 YR - 1 Day		AE	21.96	22.08	
N6010	NN6010	100 YR - 1 Day		AE	21.93	21.94	
N6020	NN6020	100 YR - 1 Day		AE	21.93	21.94	
N6030	NN6030	100 YR - 1 Day		AE	21.93	21.94	
N6040	NN6040	100 YR - 1 Day		AE	21.93	21.94	
N6050	NN6050	100 YR - 1 Day		AE	21.92	21.93	
N6060	NN6060	100 YR - 1 Day		AE	21.92	21.93	
N6080	NN6080	100 YR - 1 Day		AE	21.55	21.59	
N6100	NN6100	100 YR - 1 Day			20.17	21.22	
N6510	NN6510	100 YR - 1 Day		AE	21.62	21.59	
N6520	NN6520	100 YR - 1 Day		AE	21.60	21.58	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
N6530	NN6530	100 YR - 1 Day		AE	20.44	21.17	
N7020	NN7020	100 YR - 1 Day		AE	20.89	21.08	
N7030	NN7030	100 YR - 1 Day		AE	20.89	21.08	
N7040	NN7040	100 YR - 1 Day		AE	20.88	21.06	
N7045	NN7045	100 YR - 1 Day		AE	20.88	21.06	
N7050	NN7050	100 YR - 1 Day		AE	20.88	21.05	
N7060	NN7060	100 YR - 1 Day		AE	19.29	20.77	
O0010	NO0010	100 YR - 1 Day		AE	23.15	23.81	
O0012	NO0012	100 YR - 1 Day		AE	22.50	22.96	
O0015	NO0015	100 YR - 1 Day		AE	22.48	23.08	
O0017	NO0017	100 YR - 1 Day		AE	22.48	23.07	
O0020	NO0020	100 YR - 1 Day		AE	22.48	22.87	
O0030	NO0030	100 YR - 1 Day		AE	22.19	22.43	
O0035	NO0035	100 YR - 1 Day		AE	22.59	22.83	
O0040	NO0040	100 YR - 1 Day			22.13	22.33	
O0050	NO0050	100 YR - 1 Day		AE	21.67	22.01	
O0055	NO0055	100 YR - 1 Day		AE	22.33	22.28	
O0060	NO0060	100 YR - 1 Day		AE	21.63	21.96	
O0070	NO0070	100 YR - 1 Day		AE	21.45	21.78	
O0078	NO0078	100 YR - 1 Day		AE	21.36	21.69	
O0080	NO0080	100 YR - 1 Day		AE	21.36	21.69	
O0083	NO0083	100 YR - 1 Day		AE	21.12	21.30	
O0087	NO0087	100 YR - 1 Day		AE	21.15	21.41	
O0090	NO0090	100 YR - 1 Day		AE	21.15	21.49	
O0095	NO0095	100 YR - 1 Day		AE	20.69	20.79	
O0097	NO0097	100 YR - 1 Day		AE	20.83	20.99	
O0100	NO0100	100 YR - 1 Day		AE	21.07	21.40	
O0110	NO0110	100 YR - 1 Day		AE	21.05	21.38	
O0115	NO0115	100 YR - 1 Day		AE	20.83	20.96	
O0116	NO0116	100 YR - 1 Day		AE	20.83	20.96	
O0120	NO0120	100 YR - 1 Day		AE	18.71	19.78	
O0130	NO0130	100 YR - 1 Day		AE	18.54	19.64	
O0133	NO0133	100 YR - 1 Day		AE	18.25	19.42	
O0137	NO0137	100 YR - 1 Day		AE	18.25	19.42	
O0150	NO0150	100 YR - 1 Day		AE	18.25	19.41	
O0160	NO0160	100 YR - 1 Day		AE	17.83	18.88	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
O0170	NO0170	100 YR - 1 Day		AE	17.63	18.60	
O0172	NO0172	100 YR - 1 Day		AE	17.26	18.08	
O0174	NO0174	100 YR - 1 Day		AE	17.26	18.08	
O0176	NO0176	100 YR - 1 Day		AE	17.26	18.23	
O0178	NO0178	100 YR - 1 Day		AE	17.26	18.23	
O0180	NO0180	100 YR - 1 Day		AE	17.40	18.25	
O0190	NO0190	100 YR - 1 Day		AE	17.25	18.03	
O0200	NO0200	100 YR - 1 Day		AE	16.93	17.51	
O0210	NO0210	100 YR - 1 Day		AE	15.18	16.69	
O0213	NO0213	100 YR - 1 Day		AE	16.00	16.92	
O0217	NO0217	100 YR - 1 Day		AE	15.99	16.92	
O0220	NO0220	100 YR - 1 Day		AE	15.14	16.68	
O1010	NO1010	100 YR - 1 Day		AE	23.00	23.01	
O1020	NO1020	100 YR - 1 Day		AE	22.96	22.99	
O1030	NO1030	100 YR - 1 Day		AE	22.96	22.98	
O1040	NO1040	100 YR - 1 Day		AE	22.99	23.05	
O1050	NO1050	100 YR - 1 Day		AE	23.01	23.13	
O1070	NO1070	100 YR - 1 Day		AE	23.11	23.43	
O1510	NO1510	100 YR - 1 Day		AE	23.52	23.58	
O1520	NO1520	100 YR - 1 Day		AE	23.52	23.58	
O1530	NO1530	100 YR - 1 Day		AE	23.52	23.59	
O1540	NO1540	100 YR - 1 Day		AE	23.52	23.59	
O1550	NO1550	100 YR - 1 Day		AE	23.12	23.44	
O1560	NO1560	100 YR - 1 Day		AE	23.12	23.44	
O1570	NO1570	100 YR - 1 Day		AE	23.12	23.44	
O1580	NO1580	100 YR - 1 Day		AE	23.12	23.44	
O1600	NO1600	100 YR - 1 Day		AE	23.12	23.44	
O2010	NO2010	100 YR - 1 Day		AE	22.48	22.82	
O2020	NO2020	100 YR - 1 Day		AE	22.48	22.83	
O2030	NO2030	100 YR - 1 Day		AE	22.48	22.83	
O2050	NO2050	100 YR - 1 Day		AE	22.48	22.83	
O3010	NO3010	100 YR - 1 Day		AE	21.22	21.13	
O3020	NO3020	100 YR - 1 Day		AE	20.75	20.95	
O3030	NO3030	100 YR - 1 Day		AE	20.46	20.88	
O3040	NO3040	100 YR - 1 Day		AE	20.46	20.84	
O3050	NO3050	100 YR - 1 Day		AE	20.43	20.82	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
O4010	NO4010	100 YR - 1 Day		AE	20.38	20.72	
O4020	NO4020	100 YR - 1 Day		AE	20.38	20.72	
O4030	NO4030	100 YR - 1 Day		AE	20.37	20.68	
O4040	NO4040	100 YR - 1 Day		AE	19.44	20.56	
O4050	NO4050	100 YR - 1 Day		AE	19.44	20.54	
O4060	NO4060	100 YR - 1 Day			18.56	20.54	
O5010	NO5010	100 YR - 1 Day			17.64	18.08	
O5020	NO5020	100 YR - 1 Day		AE	17.64	18.08	
O5030	NO5030	100 YR - 1 Day		AE	17.55	18.02	
O5040	NO5040	100 YR - 1 Day		AE	16.65	18.02	
O5050	NO5050	100 YR - 1 Day		AE	16.62	18.02	
P0003	NP0003	100 YR - 1 Day		AE	25.33	26.93	
P0010	NP0010	100 YR - 1 Day		AE	25.33	26.93	
P0013	NP0013	100 YR - 1 Day		AE	28.56	28.52	
P0014	NP0014	100 YR - 1 Day		AE	28.56	28.52	
P0016	NP0016	100 YR - 1 Day		AE	25.63	27.19	
P0018	NP0018	100 YR - 1 Day		AE	28.56	28.52	
P0020	NP0020	100 YR - 1 Day		AE	25.84	27.46	
P0030	NP0030	100 YR - 1 Day		AE	25.87	27.51	
P0040	NP0040	100 YR - 1 Day		AE	25.56	27.38	
P0045	NP0045	100 YR - 1 Day		AE	26.56	27.36	
P0050	NP0050	100 YR - 1 Day		AE	25.58	27.36	
P0060	NP0060	100 YR - 1 Day		AE	25.67	27.34	
P0070	NP0070	100 YR - 5 Day	AO	AE	25.92	27.28	
P0072	NP0072	100 YR - 1 Day		AE	25.80	26.53	
P0074	NP0074	100 YR - 5 Day	AO	AE	25.82	26.66	
P0076	NP0076	100 YR - 5 Day	AO	AE	25.82	26.68	
P0078	NP0078	100 YR - 5 Day	AO	AE	25.89	26.98	
P0080	NP0080	100 YR - 5 Day	AO	AE	25.89	26.98	
P0085	NP0085	100 YR - 5 Day	AO	AE	25.87	26.88	
P0090	NP0090	100 YR - 5 Day	AO	AE	25.87	26.88	
P0100	NP0100	100 YR - 5 Day	AO	AE	25.87	26.89	
P1010	NP1010	100 YR - 1 Day		AE	21.38	23.08	
P1510	NP1510	100 YR - 1 Day		AE	25.56	27.38	
P2010	NP2010	100 YR - 1 Day		AE	26.26	26.93	
P2020	NP2020	100 YR - 1 Day		AE	26.26	26.93	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
P2030	NP2030	100 YR - 1 Day		AE	26.25	26.95	
P2210	NP2210	100 YR - 1 Day		AE	26.25	26.88	
P2220	NP2220	100 YR - 1 Day		AE	26.25	26.89	
P2410	NP2410	100 YR - 1 Day		X	26.83	27.06	
P2420	NP2420	100 YR - 1 Day		AE	26.23	27.06	
P2610	NP2610	100 YR - 5 Day	AO	AE	26.04	26.98	
P2620	NP2620	100 YR - 5 Day	AO	AE	26.04	26.99	
P2810	NP2810	100 YR - 1 Day		AE	26.26	26.80	
P2820	NP2820	100 YR - 5 Day		AE	26.25	26.95	
P2830	NP2830	100 YR - 5 Day		AE	26.24	27.00	
P2840	NP2840	100 YR - 5 Day		AE	26.24	27.00	
P2850	NP2850	100 YR - 5 Day	AO	AE	26.23	27.04	
P2860	NP2860	100 YR - 1 Day		AE	26.22	27.26	
Q0175	NQ0175	100 YR - 1 Day			26.21	27.62	
Q3022	NQ3022	100 YR - 1 Day		AE	27.61	28.46	
Q3024	NQ3024	100 YR - 1 Day		AE	27.61	28.50	
Q3026	NQ3026	100 YR - 1 Day		AE	27.62	28.50	
Q3040	NQ3040	100 YR - 1 Day			27.76	28.52	
Q3041	NQ3041	100 YR - 1 Day		AE	27.72	28.50	
Q3043	NQ3043	100 YR - 1 Day		AE	27.75	28.51	
Q3044	NQ3044	100 YR - 1 Day			27.76	28.52	
Q3048	NQ3048	100 YR - 1 Day			27.76	28.52	
R0170	NR0170	100 YR - 1 Day		AE	22.22	22.33	
R0270	NR0270	100 YR - 1 Day		AE	14.27	14.64	
R1043	NR1043	100 YR - 1 Day		AE	24.45	24.92	
R2560	NR2560	100 YR - 1 Day		AE	25.67	26.64	
R3008	NR3008	100 YR - 5 Day	AO	AE	25.63	26.64	
R3010	NR3010	100 YR - 5 Day	AO	AE	25.89	26.99	
R3020	NR3020	100 YR - 5 Day	AO	AE	25.72	26.69	
R3025	NR3025	100 YR - 5 Day	AO	AE	25.66	26.64	
R3030	NR3030	100 YR - 1 Day		AE	25.48	26.30	
R3036	NR3036	100 YR - 1 Day		AE	25.24	25.79	
R3038	NR3038	100 YR - 1 Day		AE	25.24	25.79	
R3039	NR3039	100 YR - 1 Day		AE	25.12	25.63	
R3040	NR3040	100 YR - 1 Day		AE	25.26	25.82	
R3041	NR3041	100 YR - 1 Day		AE	25.12	25.64	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
R3042	NR3042	100 YR - 1 Day		AE	25.14	25.71	
R3043	NR3043	100 YR - 1 Day		AE	25.17	25.67	
R3044	NR3044	100 YR - 1 Day		AE	25.24	25.79	
R3045	NR3045	100 YR - 1 Day		AE	25.12	25.63	
R3048	NR3048	100 YR - 1 Day		AE	25.19	25.70	
R3049	NR3049	100 YR - 1 Day		AE	25.19	25.71	
R3050	NR3050	100 YR - 1 Day		AE	25.19	25.71	
R3052	NR3052	100 YR - 1 Day		AE	24.68	25.18	
R3054	NR3054	100 YR - 1 Day		AE	24.68	25.18	
R3056	NR3056	100 YR - 1 Day		AE	24.79	25.17	
R3057	NR3057	100 YR - 1 Day		AE	24.88	25.16	
R3058	NR3058	100 YR - 1 Day		AE	24.79	25.17	
R3060	NR3060	100 YR - 1 Day		AE	24.74	25.20	
R3061	NR3061	100 YR - 1 Day		AE	24.88	25.16	
R3062	NR3062	100 YR - 1 Day		AE	24.62	25.17	
R3063	NR3063	100 YR - 1 Day		AE	24.39	24.92	
R3064	NR3064	100 YR - 1 Day		AE	24.55	25.08	
R3065	NR3065	100 YR - 1 Day		AE	24.55	25.09	
R3070	NR3070	100 YR - 1 Day		AE	24.57	25.08	
R3072	NR3072	100 YR - 1 Day			24.39	24.92	
R3073	NR3073	100 YR - 1 Day		AE	24.55	25.08	
R3074	NR3074	100 YR - 1 Day		AE	24.43	24.86	
R3075	NR3075	100 YR - 1 Day		AE	24.50	25.03	
R3076	NR3076	100 YR - 1 Day		AE	24.46	24.97	
R3077	NR3077	100 YR - 1 Day		AE	24.49	25.03	
R3078	NR3078	100 YR - 1 Day		AE	24.43	24.86	
R3079	NR3079	100 YR - 1 Day		AE	24.50	25.01	
R3080	NR3080	100 YR - 1 Day		AE	24.49	25.01	
R3081	NR3081	100 YR - 1 Day		AE	24.19	24.59	
R3082	NR3082	100 YR - 1 Day		AE	24.19	24.59	
R3083	NR3083	100 YR - 1 Day		AE	24.43	24.90	
R3084	NR3084	100 YR - 1 Day		AE	24.87	24.95	
R3085	NR3085	100 YR - 1 Day		AE	24.43	24.90	
R3088	NR3088	100 YR - 1 Day		AE	24.42	24.89	
R3089	NR3089	100 YR - 1 Day		AE	24.43	24.90	
R3090	NR3090	100 YR - 1 Day		AE	24.43	24.91	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
R3094	NR3094	100 YR - 1 Day		AE	24.05	24.32	
R3095	NR3095	100 YR - 1 Day		AE	24.02	24.28	
R3096	NR3096	100 YR - 1 Day		AE	24.32	24.76	
R3097	NR3097	100 YR - 1 Day		AE	24.37	24.84	
R3098	NR3098	100 YR - 1 Day		AE	24.02	24.28	
R3099	NR3099	100 YR - 1 Day		AE	24.37	24.84	
R3100	NR3100	100 YR - 1 Day		AE	24.37	24.84	
R3101	NR3101	100 YR - 1 Day		AE	24.05	24.36	
R3102	NR3102	100 YR - 1 Day		AE	24.05	24.36	
R3107	NR3107	100 YR - 1 Day		AE	23.98	24.45	
R3108	NR3108	100 YR - 1 Day		AE	24.19	24.62	
R3109	NR3109	100 YR - 1 Day		AE	24.19	24.62	
R3110	NR3110	100 YR - 1 Day		AE	24.19	24.62	
R3111	NR3111	100 YR - 1 Day		AE	23.66	24.22	
R3112	NR3112	100 YR - 1 Day		AE	23.66	24.22	
R3113	NR3113	100 YR - 1 Day		AE	24.07	24.23	
R3114	NR3114	100 YR - 1 Day		AE	23.68	24.22	
R3118	NR3118	100 YR - 1 Day		AE	23.78	24.26	
R3119	NR3119	100 YR - 1 Day		AE	23.78	24.25	
R3120	NR3120	100 YR - 1 Day		AE	23.79	24.26	
R3125	NR3125	100 YR - 1 Day		AE	23.38	23.72	
R3128	NR3128	100 YR - 1 Day		AE	23.17	23.49	
R3129	NR3129	100 YR - 1 Day		AE	22.78	22.98	
R3130	NR3130	100 YR - 1 Day		AE	22.78	22.98	
R3138	NR3138	100 YR - 1 Day		AE	22.45	22.54	
R3140	NR3140	100 YR - 1 Day		AE	22.44	22.52	
R3148	NR3148	100 YR - 1 Day		AE	22.26	22.36	
R3150	NR3150	100 YR - 1 Day		AE	22.23	22.32	
R3160	NR3160	100 YR - 1 Day		AE	22.23	22.32	
R3161	NR3161	100 YR - 1 Day		AE	22.98	23.07	
R3162	NR3162	100 YR - 1 Day		AE	22.91	23.00	
R3163	NR3163	100 YR - 1 Day		AE	22.89	22.98	
R3164	NR3164	100 YR - 1 Day		AE	23.24	23.33	
R3165	NR3165	100 YR - 1 Day		AE	23.70	24.10	
R3167	NR3167	100 YR - 1 Day		AE	22.87	22.95	
R3168	NR3168	100 YR - 1 Day		AE	22.26	22.36	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
R3190	NR3190	100 YR - 1 Day		AE	21.78	22.32	
R3193	NR3193	100 YR - 1 Day		AE	21.87	22.52	
R3197	NR3197	100 YR - 1 Day		AE	21.82	22.43	
R3199	NR3199	100 YR - 1 Day		AE	21.82	22.43	
R3200	NR3200	100 YR - 1 Day		AE	21.77	22.32	
R3203	NR3203	100 YR - 1 Day		AE	21.87	22.49	
R3207	NR3207	100 YR - 1 Day		AE	21.78	22.38	
R3210	NR3210	100 YR - 1 Day		AE	21.74	22.31	
R3215	NR3210	100 YR - 1 Day			21.74	22.31	
R3220	NR3220	100 YR - 1 Day		AE	19.54	19.90	
R3223	NR3223	100 YR - 1 Day		AE	20.22	20.24	
R3227	NR3227	100 YR - 1 Day		AE	19.57	19.98	
R3229	NR3229	100 YR - 1 Day		AE	19.16	19.58	
R3230	NR3230	100 YR - 1 Day		AE	19.09	19.46	
R3243	NR3243	100 YR - 1 Day		X	19.00	18.98	
R3244	NR3244	100 YR - 1 Day		AE	18.86	18.95	
R3246	NR3246	100 YR - 1 Day		AE	18.80	18.91	
R3249	NR3249	100 YR - 1 Day		AE	18.22	18.45	
R3250	NR3250	100 YR - 1 Day		AE	18.22	18.44	
R3270	NR3270	100 YR - 1 Day		AE	16.86	17.12	
R3282	NR3282	100 YR - 1 Day		AE	16.38	16.75	
R3283	NR3283	100 YR - 1 Day		AE	16.38	16.76	
R3286	NR3286	100 YR - 1 Day			16.38	16.74	
R3287	NR3287	100 YR - 1 Day		AE	16.37	16.75	
R3288	NR3288	100 YR - 1 Day		AE	16.37	16.81	
R3289	NR3289	100 YR - 1 Day		AE	16.37	16.83	
R3290	NR3290	100 YR - 1 Day		AE	16.37	16.91	
R3300	NR3300	100 YR - 1 Day		AE	15.56	16.20	
R3310	NR3310	100 YR - 1 Day		AE	14.79	15.27	
R3320	NR3320	100 YR - 1 Day		AE	14.21	14.61	
R3330	NR3330	100 YR - 1 Day		AE	13.36	13.90	
R3340	NR3340	100 YR - 1 Day		AE	12.47	13.04	
R3350	NR3350	100 YR - 1 Day		AE	10.08	10.51	
R3360	NR3360	100 YR - 1 Day		AE	9.96	10.42	
R3370	NR3370	100 YR - 1 Day		AE	9.86	10.38	
R3372	NR3372	100 YR - 1 Day		AE	9.57	9.86	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
R3374	NR3374	100 YR - 1 Day		AE	9.58	9.87	
R3376	NR3376	100 YR - 1 Day		AE	9.58	9.87	
R3377	NR3377	100 YR - 1 Day		AE	9.58	9.87	
R3378	NR3378	100 YR - 1 Day		AE	9.73	10.32	
R3380	NR3380	100 YR - 1 Day		AE	9.72	10.32	
R3400	NR3400	100 YR - 1 Day		AE	9.21	10.27	
R3402	NR3402	100 YR - 1 Day		AE	9.57	10.25	
R3404	NR3404	100 YR - 1 Day		AE	9.55	10.25	
R3406	NR3406	100 YR - 1 Day		AE	9.12	10.25	
R3410	NR3410	100 YR - 1 Day		AE	9.11	10.25	
R3420	NR3420	100 YR - 1 Day		AE	8.99	10.22	
R3450	NR3430	100 YR - 1 Day		AE	8.37	10.00	
R3510	NR3510	100 YR - 1 Day		AE	12.72	12.92	
R3520	NR3520	100 YR - 1 Day		AE	12.72	12.92	
R3522	NR3522	100 YR - 1 Day		AE	14.56	14.59	
R3524	NR3524	100 YR - 1 Day		AE	13.65	13.69	
R3526	NR3526	100 YR - 1 Day		AE	13.62	13.65	
R3530	NR3530	100 YR - 1 Day		AE	12.61	12.84	
R3540	NR3540	100 YR - 1 Day		AE	12.52	12.76	
R3550	NR3550	100 YR - 1 Day		AE	12.43	12.67	
R3560	NR3560	100 YR - 1 Day		AE	12.20	12.34	
R3570	NR3570	100 YR - 1 Day		AE	12.13	12.27	
R3610	NR3610	100 YR - 1 Day		AE	12.58	12.32	
R3620	NR3620	100 YR - 1 Day		AE	12.58	12.32	
R3630	NR3630	100 YR - 1 Day		AE	12.40	12.14	
R3640	NR3640	100 YR - 1 Day		AE	12.35	11.98	
R3650	NR3650	100 YR - 1 Day		AE	12.24	11.87	
R3660	NR3660	100 YR - 1 Day		AE	12.09	11.71	
R3670	NR3670	100 YR - 1 Day		AE	11.15	11.02	
R3675	NR3675	100 YR - 1 Day		AE	12.14	12.10	
R3680	NR3680	100 YR - 1 Day		AE	10.88	10.80	
R3690	NR3690	100 YR - 1 Day		AE	10.85	10.77	
R3693	NR3693	100 YR - 1 Day		AE	10.74	10.70	
R3698	NR3698	100 YR - 1 Day		AE	9.41	10.43	
S0005	NS0005	100 YR - 1 Day		AE	24.09	25.45	
S0025	NS0025	100 YR - 1 Day		AE	30.78	31.01	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
S0030	NS0030	100 YR - 1 Day		AE	30.78	30.99	
S0035	NS0035	100 YR - 1 Day		AE	31.28	31.24	
S0036	NS0036	100 YR - 1 Day		AE	31.27	31.23	
S0038	NS0038	100 YR - 1 Day		AE	30.46	30.76	
S0039	NS0039	100 YR - 1 Day		AE	30.25	30.55	
S0040	NS0040	100 YR - 1 Day		AE	30.21	30.55	
S0046	NS0046	100 YR - 1 Day		AE	30.22	30.18	
S0047	NS0047	100 YR - 1 Day		AE	29.95	30.18	
S0048	NS0048	100 YR - 1 Day		AE	29.93	30.07	
S0049	NS0049	100 YR - 1 Day		AE	29.94	30.11	
S0050	NS0050	100 YR - 1 Day		AE	29.95	30.18	
S0059	NS0059	100 YR - 1 Day		AE	29.78	30.11	
S0060	NS0060	100 YR - 1 Day		AE	29.88	30.16	
S0065	NS0065	100 YR - 1 Day		AE	29.87	30.15	
S0070	NS0070	100 YR - 1 Day		AE	29.88	30.15	
S0086	NS0086	100 YR - 1 Day		AE	29.88	30.16	
S0087	NS0087	100 YR - 1 Day		AE	29.88	30.16	
S0088	NS0088	100 YR - 1 Day		AE	29.88	30.16	
S0089	NS0089	100 YR - 1 Day		AE	29.88	30.16	
S0090	NS0090	100 YR - 1 Day		AE	29.89	30.16	
S0100	NS0100	100 YR - 1 Day		AE	29.89	30.16	
S0110	NS0110	100 YR - 1 Day		AE	29.89	30.16	
S0119	NS0119	100 YR - 1 Day		AE	29.89	30.16	
S0120	NS0120	100 YR - 1 Day		AE	29.89	30.16	
S0129	NS0129	100 YR - 1 Day		AE	29.89	30.16	
S0130	NS0130	100 YR - 1 Day		AE	29.89	30.16	
S0134	NS0134	100 YR - 1 Day		AE	29.74	30.10	
S0135	NS0135	100 YR - 1 Day		AE	29.73	30.07	
S0136	NS0136	100 YR - 1 Day		AE	29.73	30.07	
S0137	NS0137	100 YR - 1 Day		AE	29.73	30.07	
S0138	NS0138	100 YR - 1 Day		AE	29.77	30.04	
S0139	NS0139	100 YR - 1 Day		AE	29.72	30.04	
S0140	NS0140	100 YR - 1 Day		AE	29.70	30.00	
S0143	NS0143	100 YR - 1 Day		AE	29.43	29.62	
S0144	NS0144	100 YR - 1 Day		AE	29.43	29.62	
S0145	NS0145	100 YR - 1 Day		AE	29.63	29.86	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
S0146	NS0146	100 YR - 1 Day		AE	29.48	29.63	
S0147	NS0147	100 YR - 1 Day		AE	29.60	29.86	
S0148	NS0148	100 YR - 1 Day		AE	29.65	29.93	
S0149	NS0149	100 YR - 1 Day		AE	29.67	29.95	
S0150	NS0150	100 YR - 1 Day		AE	29.69	29.99	
S0159	NS0159	100 YR - 1 Day		AE	29.70	29.87	
S0160	NS0160	100 YR - 1 Day		AE	29.54	29.86	
S0170	NS0170	100 YR - 1 Day		AE	29.54	29.86	
S0178	NS0178	100 YR - 1 Day		AE	29.00	29.56	
S0179	NS0179	100 YR - 1 Day		AE	29.00	29.56	
S0180	NS0180	100 YR - 1 Day		AE	28.95	29.49	
S0190	NS0190	100 YR - 1 Day		AE	28.48	28.91	
S0200	NS0200	100 YR - 1 Day		AE	28.48	28.90	
S0201	NS0201	100 YR - 1 Day		AE	28.45	28.86	
S0203	NS0203	100 YR - 1 Day		AE	28.15	28.57	
S0205	NS0205	100 YR - 1 Day		AE	27.94	28.31	
S0207	NS0207	100 YR - 1 Day		AE	27.89	28.24	
S0209	NS0209	100 YR - 1 Day		AE	27.33	27.58	
S0210	NS0210	100 YR - 1 Day		AE	27.33	27.58	
S0215	NS0215	100 YR - 1 Day		AE	29.25	29.49	
S0220	NS0220	100 YR - 1 Day		AE	29.25	29.49	
S0230	NS0230	100 YR - 1 Day		AE	28.88	28.88	
S0239	NS0239	100 YR - 1 Day		AE	29.28	29.49	
S0240	NS0240	100 YR - 1 Day		AE	28.26	28.34	
S0250	NS0250	100 YR - 1 Day		AE	28.26	28.34	
S0259	NS0259	100 YR - 1 Day		AE	29.04	29.12	
S0260	NS0260	100 YR - 1 Day		AE	28.26	28.34	
S0265	NS0265	100 YR - 1 Day		AE	28.26	28.31	
S0270	NS0270	100 YR - 1 Day		AE	28.24	28.26	
S0280	NS0280	100 YR - 1 Day		AE	27.28	27.59	
S0290	NS0290	100 YR - 1 Day		AE	27.28	27.59	
S0295	NS0295	100 YR - 1 Day		AE	25.44	25.70	
S0300	NS0300	100 YR - 1 Day		AE	27.26	27.55	
S0310	NS0310	100 YR - 1 Day		AE	26.77	27.47	
S0315	NS0315	100 YR - 1 Day		AE	27.96	27.90	
S0316	NS0316	100 YR - 1 Day		AE	26.92	27.36	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
S0317	NS0317	100 YR - 1 Day		AE	26.92	27.36	
S0318	NS0318	100 YR - 1 Day		AE	26.87	27.36	
S0319	NS0319	100 YR - 1 Day		AE	26.54	27.35	
S0320	NS0320	100 YR - 1 Day		AE	26.42	27.45	
S0330	NS0330	100 YR - 1 Day		AE	26.42	27.47	
S0340	NS0340	100 YR - 1 Day		AE	26.42	27.47	
S0350	NS0350	100 YR - 1 Day		AE	26.42	27.46	
S0367	NS0367	100 YR - 1 Day		AE	22.50	22.79	
S0410	NS0410	100 YR - 1 Day		AE	29.18	29.23	
S0411	NS0411	100 YR - 1 Day		AE	27.55	28.71	
S0416	NS0416	100 YR - 1 Day		AE	29.34	29.30	
S0417	NS0417	100 YR - 1 Day		AE	28.53	28.58	
S0418	NS0418	100 YR - 1 Day		AE	29.00	28.94	
S0419	NS0419	100 YR - 1 Day		AE	29.00	28.94	
S0420	NS0420	100 YR - 1 Day		AE	27.55	28.71	
S0430	NS0430	100 YR - 1 Day		AE	27.52	28.63	
S0436	NS0436	100 YR - 1 Day		AE	28.34	28.30	
S0437	NS0437	100 YR - 1 Day		AE	27.25	27.47	
S0438	NS0438	100 YR - 1 Day		AE	27.26	27.78	
S0439	NS0439	100 YR - 1 Day		AE	27.26	27.82	
S0440	NS0440	100 YR - 1 Day		AE	27.26	27.94	
S0450	NS0450	100 YR - 1 Day		AE	27.25	27.93	
S0455	NS0455	100 YR - 1 Day		AE	27.20	27.86	
S0459	NS0459	100 YR - 1 Day		AE	26.76	27.44	
S0460	NS0460	100 YR - 1 Day		AE	27.20	27.85	
S0530	NS0530	100 YR - 1 Day			31.70	31.88	
S0533	NS0533	100 YR - 1 Day		AE	32.05	31.99	
S0534	NS0534	100 YR - 1 Day		AE	31.75	31.69	
S0535	NS0535	100 YR - 1 Day		AE	31.04	31.16	
S0540	NS0540	100 YR - 1 Day		AE	29.89	30.16	
S0550	NS0550	100 YR - 1 Day			30.01	30.17	
S0585	NS0585	100 YR - 1 Day		AE	21.82	21.91	
S0595	NS0595	100 YR - 1 Day		AE	18.08	19.21	
S0630	NS0630	100 YR - 1 Day			30.39	30.71	
S0635	NS0635	100 YR - 1 Day		AE	29.97	30.30	
S0639	NS0639	100 YR - 1 Day		AE	29.91	30.22	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
S0640	NS0640	100 YR - 1 Day		AE	29.91	30.22	
S0710	NS0710	100 YR - 1 Day		AE	28.00	28.13	
S0720	NS0720	100 YR - 1 Day		AE	28.00	28.13	
S0730	NS0730	100 YR - 1 Day		AE	28.00	28.13	
S0738	NS0738	100 YR - 1 Day		AE	30.06	30.01	
S0739	NS0739	100 YR - 1 Day		AE	28.00	28.13	
S0740	NS0740	100 YR - 1 Day		AE	27.26	27.95	
S0750	NS0750	100 YR - 1 Day		AE	27.26	27.95	
S0760	NS0760	100 YR - 1 Day		AE	27.26	27.95	
S0810	NS0810	100 YR - 1 Day		AE	30.04	30.11	
S0820	NS0820	100 YR - 1 Day		AE	29.94	29.97	
S0828	NS0828	100 YR - 1 Day		AE	29.32	29.31	
S0829	NS0829	100 YR - 1 Day		AE	29.31	29.35	
S0830	NS0830	100 YR - 1 Day		AE	28.86	28.97	
S0840	NS0840	100 YR - 1 Day		AE	28.55	28.60	
S0846	NS0846	100 YR - 1 Day		AE	29.39	29.37	
S0847	NS0847	100 YR - 1 Day		AE	29.27	29.30	
S0848	NS0848	100 YR - 1 Day		AE	29.27	29.30	
S0849	NS0849	100 YR - 1 Day		AE	29.27	29.29	
S0850	NS0850	100 YR - 1 Day		AE	27.16	27.57	
S0857	NS0857	100 YR - 1 Day		AE	28.46	28.46	
S0858	NS0858	100 YR - 1 Day		AE	28.44	28.36	
S0859	NS0859	100 YR - 1 Day		AE	27.07	27.47	
S0860	NS0860	100 YR - 1 Day		AE	27.07	27.47	
S0867	NS0867	100 YR - 1 Day		AE	27.07	27.47	
S0868	NS0868	100 YR - 1 Day		AE	27.07	27.30	
S0869	NS0869	100 YR - 1 Day		AE	27.07	27.48	
S0870	NS0870	100 YR - 1 Day		AE	27.07	27.46	
S1010	NS1010	100 YR - 1 Day		AE	24.62	25.68	
S1020	NS1020	100 YR - 1 Day		AE	24.65	25.67	
S1033	NS1033	100 YR - 1 Day		AE	24.69	25.64	
S1037	NS1037	100 YR - 1 Day		AE	24.67	25.66	
S1038	NS1038	100 YR - 1 Day		AE	24.66	25.67	
S1040	NS1040	100 YR - 1 Day		AE	24.65	25.67	
S1050	NS1050	100 YR - 1 Day		AE	24.65	25.67	
S1070	NS1070	100 YR - 1 Day		AE	24.64	25.67	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
S1080	NS1080	100 YR - 1 Day		AE	24.59	25.67	
S1110	NS1110	100 YR - 1 Day		AE	22.81	23.03	
S1120	NS1120	100 YR - 1 Day		AE	22.81	23.04	
S1130	NS1130	100 YR - 1 Day		AE	22.81	23.04	
S1140	NS1140	100 YR - 1 Day		AE	22.72	23.01	
S1210	NS1210	100 YR - 1 Day		AE	22.41	22.64	
S1220	NS1220	100 YR - 1 Day		AE	22.41	22.64	
S1230	NS1230	100 YR - 1 Day		AE	22.40	22.64	
S1240	NS1240	100 YR - 1 Day		AE	22.39	22.64	
S1250	NS1250	100 YR - 1 Day		AE	22.37	22.64	
S1260	NS1260	100 YR - 1 Day		AE	22.30	22.63	
S1280	NS1280	100 YR - 1 Day		AE	21.88	22.58	
S1310	NS1310	100 YR - 1 Day		AE	21.99	22.25	
S1320	NS1320	100 YR - 1 Day		AE	21.99	22.25	
S1330	NS1330	100 YR - 1 Day		AE	21.87	22.23	
S1340	NS1340	100 YR - 1 Day		AE	21.86	22.23	
S1510	NS1510	100 YR - 1 Day			24.36	25.92	
S1530	NS1530	100 YR - 1 Day		AE	24.36	25.92	
S1540	NS1540	100 YR - 1 Day		AE	24.36	25.93	
S1560	NS1560	100 YR - 1 Day		AE	24.35	25.93	
S1570	NS1570	100 YR - 1 Day		AE	24.30	25.93	
S1575	NS1575	100 YR - 1 Day		AE	24.28	25.93	
S1580	NS1580	100 YR - 1 Day		AE	24.09	25.93	
S1610	NS1610	100 YR - 1 Day		AE	20.22	20.82	
S1620	NS1620	100 YR - 1 Day			18.68	20.80	
S1630	NS1630	100 YR - 1 Day		AE	18.64	20.58	
S1640	NS1640	100 YR - 1 Day		AE	18.63	20.57	
S1710	NS1710	100 YR - 1 Day		AE	20.02	20.96	
S1720	NS1720	100 YR - 1 Day			19.26	20.96	
S1730	NS1730	100 YR - 1 Day		AE	19.03	20.93	
S1740	NS1740	100 YR - 1 Day		AE	18.74	20.53	
S1750	NS1750	100 YR - 1 Day		AE	18.66	20.53	
S1760	NS1760	100 YR - 1 Day		AE	18.65	20.53	
S1810	NS1810	100 YR - 1 Day		AE	19.64	20.96	
S1820	NS1820	100 YR - 1 Day		AE	19.46	20.87	
S1830	NS1830	100 YR - 1 Day		AE	19.39	20.82	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
S1910	NS1910	100 YR - 1 Day		AE	20.66	21.12	
S1920	NS1920	100 YR - 1 Day		AE	20.18	20.96	
S1930	NS1930	100 YR - 1 Day		AE	19.85	20.86	
S2010	NS2010	100 YR - 1 Day		AE	19.51	20.85	
S2020	NS2020	100 YR - 1 Day		AE	19.50	20.84	
S2029	NS2029	100 YR - 1 Day		AE	19.27	20.83	
S2040	NS2040	100 YR - 1 Day		AE	19.03	20.81	
S2045	NS2045	100 YR - 1 Day		AE	18.85	20.64	
S2050	NS2050	100 YR - 1 Day		AE	18.63	20.53	
S2070	NS2070	100 YR - 1 Day		AE	18.22	20.26	
S2510	NS2510	100 YR - 1 Day		AE	24.35	26.08	
S2705	NS2705	100 YR - 1 Day	AO	AE	19.95	20.04	
S2710	NS2710	100 YR - 1 Day	AO	AE	18.62	19.26	
S2717	NS2717	100 YR - 1 Day		AE	19.67	19.65	
S2718	NS2718	100 YR - 1 Day		AE	19.45	19.27	
S2719	NS2719	100 YR - 1 Day		AE	19.28	19.23	
S2720	NS2720	100 YR - 1 Day	AO	AE	17.64	19.14	
S2810	NS2810	100 YR - 1 Day			21.12	21.08	
S2820	NS2820	100 YR - 1 Day		AE	20.07	20.02	
S2830	NS2830	100 YR - 1 Day		AE	19.66	19.65	
S2840	NS2840	100 YR - 1 Day		AE	18.64	19.32	
S2850	NS2850	100 YR - 1 Day		AE	18.59	19.32	
S2910	NS2910	100 YR - 1 Day			21.24	21.31	
S2920	NS2920	100 YR - 1 Day		AE	19.85	19.88	
S2930	NS2930	100 YR - 1 Day			19.66	19.65	
S2940	NS2940	100 YR - 1 Day		AE	18.65	19.32	
S2950	NS2950	100 YR - 1 Day		AE	17.69	19.32	
S3010	NS3010	100 YR - 1 Day		AE	24.48	25.93	
S3020	NS3020	100 YR - 1 Day		AE	24.43	25.93	
S3030	NS3030	100 YR - 1 Day		AE	24.26	25.95	
S3040	NS3040	100 YR - 1 Day		AE	24.19	25.96	
S3050	NS3050	100 YR - 1 Day		AE	24.11	25.96	
S3510	NS3510	100 YR - 1 Day		AE	24.41	25.95	
S3520	NS3520	100 YR - 1 Day		AE	24.12	25.95	
S3525	NS3525	100 YR - 1 Day		AE	24.12	25.96	
S3530	NS3530	100 YR - 1 Day		AE	24.12	25.96	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
S3540	NS3540	100 YR - 1 Day		AE	24.12	25.96	
S4010	NS4010	100 YR - 1 Day		AE	22.78	22.98	
S4020	NS4020	100 YR - 1 Day		AE	22.79	23.04	
S4030	NS4030	100 YR - 1 Day		AE	22.80	23.06	
S4050	NS4050	100 YR - 1 Day		AE	22.82	23.07	
S4510	NS4510	100 YR - 1 Day		AE	23.12	24.21	
S4520	NS4520	100 YR - 1 Day		AE	23.12	24.21	
S4530	NS4530	100 YR - 1 Day		AE	23.12	24.21	
S4540	NS4540	100 YR - 1 Day		AE	23.12	24.17	
S5010	NS5010	100 YR - 1 Day		AE	23.75	25.45	
S5020	NS5020	100 YR - 1 Day		AE	23.94	25.70	
S5030	NS5030	100 YR - 1 Day		AE	23.97	25.76	
S5040	NS5040	100 YR - 1 Day		AE	24.03	25.87	
S5050	NS5050	100 YR - 1 Day		AE	24.03	25.89	
S5059	NS5059	100 YR - 1 Day		AE	25.26	25.83	
S5060	NS5060	100 YR - 1 Day		AE	24.08	26.03	
S5070	NS5070	100 YR - 1 Day		AE	24.10	26.08	
S5080	NS5080	100 YR - 1 Day		AE	24.10	26.13	
S5090	NS5090	100 YR - 1 Day		AE	24.11	26.18	
S5100	NS5100	100 YR - 1 Day		AE	24.12	26.24	
S5109	NS5109	100 YR - 1 Day		AE	24.14	26.24	
S5110	NS5110	100 YR - 1 Day		AE	24.13	26.26	
S5114	NS5114	100 YR - 1 Day		AE	26.63	27.38	
S5116	NS5116	100 YR - 1 Day		AE	24.31	26.31	
S5117	NS5117	100 YR - 1 Day		AE	24.15	26.25	
S5118	NS5118	100 YR - 1 Day		AE	24.14	26.26	
S5119	NS5119	100 YR - 1 Day		AE	26.42	27.33	
S5120	NS5120	100 YR - 1 Day		AE	24.14	26.28	
S5130	NS5130	100 YR - 1 Day		AE	24.14	26.29	
S5142	NS5142	100 YR - 1 Day		AE	24.84	26.33	
S5144	NS5144	100 YR - 1 Day		AE	24.91	26.33	
S5146	NS5146	100 YR - 1 Day		AE	25.10	26.66	
S5150	NS5150	100 YR - 1 Day		AE	26.12	27.34	
S5158	NS5174	100 YR - 1 Day			23.93	24.29	
S5160	NS5150	100 YR - 1 Day			26.12	27.34	
S5162	NS5163	100 YR - 1 Day			23.59	24.32	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
S5163	NS5163	100 YR - 1 Day		AE	23.59	24.32	
S5165	NS5165	100 YR - 1 Day		AE	23.59	24.32	
S5170	NS5170	100 YR - 1 Day			23.59	24.32	
S5173	NS5173	100 YR - 1 Day		AE	26.38	27.46	
S5174	NS5174	100 YR - 1 Day		X	23.93	24.29	
S5175	NS5175	100 YR - 1 Day		AE	23.39	24.17	
S5180	NS5180	100 YR - 1 Day		AE	23.39	24.15	
S5189	NS5189	100 YR - 1 Day		AE	23.95	24.88	
S5198	NS5198	100 YR - 1 Day		AE	23.30	23.52	
S5200	NS5200	100 YR - 1 Day		AE	23.29	23.99	
S5210	NS5210	100 YR - 1 Day		AE	23.19	23.85	
S5220	NS5220	100 YR - 1 Day		AE	23.10	23.72	
S5229	NS5229	100 YR - 1 Day		AE	25.20	25.47	
S5230	NS5230	100 YR - 1 Day		AE	23.07	23.68	
S5238	NS5238	100 YR - 1 Day		AE	22.92	23.49	
S5240	NS5240	100 YR - 1 Day		AE	22.92	23.46	
S5245	NS5245	100 YR - 1 Day		AE	22.78	23.31	
S5250	NS5250	100 YR - 1 Day		AE	22.78	23.24	
S5255	NS5255	100 YR - 1 Day		AE	22.73	23.48	
S5258	NS5258	100 YR - 1 Day		AE	24.37	24.79	
S5260	NS5260	100 YR - 1 Day		AE	22.64	23.05	
S5270	NS5270	100 YR - 1 Day		AE	22.52	22.88	
S5275	NS5275	100 YR - 1 Day		AE	23.48	23.97	
S5278	NS5278	100 YR - 1 Day		AE	25.44	25.70	
S5280	NS5280	100 YR - 1 Day		AE	22.48	22.85	
S5290	NS5290	100 YR - 1 Day		AE	22.41	22.80	
S5295	NS5295	100 YR - 1 Day		AE	22.53	23.57	
S5300	NS5300	100 YR - 1 Day		AE	22.32	22.74	
S5310	NS5310	100 YR - 1 Day		AE	22.23	22.68	
S5313	NS5313	100 YR - 1 Day		AE	25.44	25.70	
S5318	NS5318	100 YR - 1 Day		AE	23.03	23.57	
S5320	NS5320	100 YR - 1 Day		AE	22.13	22.59	
S5325	NS5325	100 YR - 1 Day		AE	23.06	23.07	
S5330	NS5330	100 YR - 1 Day		AE	22.03	22.52	
S5340	NS5340	100 YR - 1 Day		AE	21.86	22.42	
S5348	NS5348	100 YR - 1 Day		AE	24.46	24.82	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
S5349	NS5349	100 YR - 1 Day		AE	24.46	24.83	
S5350	NS5350	100 YR - 1 Day		AE	21.82	22.39	
S5360	NS5360	100 YR - 1 Day		AE	21.43	22.11	
S5368	NS5368	100 YR - 1 Day		AE	23.63	24.89	
S5369	NS5369	100 YR - 1 Day		AE	23.21	24.68	
S5370	NS5370	100 YR - 1 Day		AE	21.41	22.12	
S5378	NS5378	100 YR - 1 Day		AE	23.17	23.22	
S5379	NS5379	100 YR - 1 Day		AE	24.86	25.49	
S5380	NS5380	100 YR - 1 Day		AE	21.36	22.11	
S5388	NS5388	100 YR - 1 Day		AE	22.11	22.25	
S5389	NS5389	100 YR - 1 Day			24.21	24.07	
S5390	NS5390	100 YR - 1 Day			21.33	22.09	
S5400	NS5400	100 YR - 1 Day		AE	21.19	22.02	
S5405	NS5405	100 YR - 1 Day		AE	22.62	22.65	
S5410	NS5410	100 YR - 1 Day		AE	21.09	21.96	
S5420	NS5420	100 YR - 1 Day		AE	20.98	21.89	
S5430	NS5430	100 YR - 1 Day		AE	20.94	21.84	
S5440	NS5440	100 YR - 1 Day		AE	20.32	21.16	
S5450	NS5450	100 YR - 1 Day		AE	20.25	21.10	
S5460	NS5460	100 YR - 1 Day			20.21	21.02	
S5470	NS5470	100 YR - 1 Day			20.19	20.99	
S5480	NS5480	100 YR - 1 Day		AE	20.17	20.94	
S5490	NS5490	100 YR - 1 Day			19.94	20.77	
S5500	NS5500	100 YR - 1 Day		AE	19.85	20.72	
S5520	NS5520	100 YR - 1 Day		AE	17.87	19.62	
S5530	NS5530	100 YR - 1 Day		AE	17.84	19.59	
S5540	NS5540	100 YR - 1 Day		AE	17.80	19.54	
S5545	NS5545	100 YR - 1 Day		AE	18.47	19.52	
S5549	NS5549	100 YR - 1 Day		AE	19.24	19.52	
S5550	NS5550	100 YR - 1 Day		AE	17.79	19.52	
S5560	NS5560	100 YR - 1 Day		AE	17.74	19.39	
S5566	NS5566	100 YR - 1 Day		AE	18.27	18.17	
S5567	NS5567	100 YR - 1 Day			19.12	19.10	
S5570	NS5570	100 YR - 1 Day		AE	17.71	19.32	
S5577	NS5577	100 YR - 1 Day			19.89	19.98	
S5578	NS5578	100 YR - 1 Day		AE	19.23	19.22	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
S5579	NS5579	100 YR - 1 Day		X	20.10	20.02	
S5580	NS5580	100 YR - 1 Day			17.68	19.23	
S5590	NS5590	100 YR - 1 Day		AE	17.64	19.14	
S5600	NS5600	100 YR - 5 Day	A0	AE	17.61	19.09	
S5610	NS5610	100 YR - 5 Day	A0	AE	17.24	18.74	
S9000	NS9000	100 YR - 1 Day		AE	21.07	21.23	
S9050	NS9050	100 YR - 1 Day		AE	26.41	26.88	
S9055	NS9055	100 YR - 1 Day		AE	26.41	26.88	
S9060	NS9060	100 YR - 1 Day		AE	26.35	26.88	
S9065	NS9065	100 YR - 1 Day		AE	26.34	26.74	
S9070	NS9070	100 YR - 1 Day		AE	25.34	25.60	
S9075	NS9075	100 YR - 1 Day		AE	25.88	26.18	
S9080	NS9080	100 YR - 1 Day		AE	25.44	25.64	
S9085	NS9085	100 YR - 1 Day		AE	25.10	25.17	
S9090	NS9090	100 YR - 1 Day		AE	25.44	25.70	
S9095	NS9095	100 YR - 1 Day		AE	20.40	20.38	
S9100	NS9100	100 YR - 1 Day		X	19.88	19.84	
S9110	NS9110	100 YR - 1 Day		X	18.59	19.40	
S9200	NS9200	100 YR - 1 Day		AE	19.78	19.52	
S9610	NS9610	100 YR - 1 Day		AE	25.07	25.17	
S9620	NS9620	100 YR - 1 Day		AE	22.98	23.55	
T0010	NT0010	100 YR - 1 Day		AE	21.38	22.03	
T0013	NT0013	100 YR - 1 Day		AE	23.19	23.24	
T0014	NT0014	100 YR - 1 Day		AE	23.60	23.61	
T0015	NT0015	100 YR - 1 Day		AE	21.40	22.25	
T0016	NT0016	100 YR - 1 Day		AE	23.59	23.62	
T0017	NT0017	100 YR - 1 Day		AE	22.62	23.62	
T0018	NT0018	100 YR - 1 Day		AE	22.62	23.62	
T0019	NT0019	100 YR - 1 Day		AE	22.62	23.62	
T0030	NT0030	100 YR - 1 Day		AE	21.20	21.74	
T0035	NT0035	100 YR - 1 Day		AE	21.38	22.16	
T0040	NT0040	100 YR - 1 Day		AE	21.09	21.55	
T0043	NT0043	100 YR - 1 Day		AE	22.65	22.64	
T0045	NT0045	100 YR - 1 Day		AE	22.92	22.94	
T0050	NT0050	100 YR - 1 Day		AE	21.04	21.45	
T0060	NT0060	100 YR - 1 Day		AE	20.09	21.33	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
T0065	NT0065	100 YR - 1 Day		AE	21.02	21.66	
T0068	NT0068	100 YR - 1 Day		AE	23.04	22.99	
T0069	NT0069	100 YR - 1 Day		AE	22.79	22.74	
T0070	NT0070	100 YR - 1 Day		AE	20.05	21.27	
T0073	NT0073	100 YR - 1 Day		AE	23.03	23.03	
T0077	NT0077	100 YR - 1 Day		AE	22.62	22.64	
T0080	NT0080	100 YR - 1 Day		AE	19.90	21.02	
T0090	NT0090	100 YR - 1 Day		AE	19.79	20.83	
T0092	NT0092	100 YR - 1 Day		AE	21.93	21.96	
T0093	NT0093	100 YR - 1 Day		AE	21.75	21.71	
T0097	NT0097	100 YR - 1 Day		AE	20.19	20.81	
T0100	NT0100	100 YR - 1 Day		AE	19.67	20.65	
T0110	NT0110	100 YR - 1 Day		AE	19.47	20.50	
T0112	NT0112	100 YR - 1 Day			19.34	20.41	
T0115	NT0115	100 YR - 1 Day		AE	19.34	20.41	
T0118	NT0118	100 YR - 1 Day		AE	19.35	20.40	
T0120	NT0120	100 YR - 1 Day		AE	19.37	20.40	
T1010	NT1010	100 YR - 1 Day		AE	22.45	22.47	
T1020	NT1020	100 YR - 1 Day		AE	22.44	22.47	
T1030	NT1030	100 YR - 1 Day		AE	22.41	22.46	
T1040	NT1040	100 YR - 1 Day		AE	22.36	22.44	
T1050	NT1050	100 YR - 1 Day		AE	21.73	22.37	
T2010	NT2010	100 YR - 1 Day			21.72	21.68	
T2020	NT2020	100 YR - 1 Day		AE	21.72	21.68	
T2030	NT2030	100 YR - 1 Day		AE	21.61	21.55	
T2040	NT2040	100 YR - 1 Day		AE	21.26	21.27	
T2050	NT2050	100 YR - 1 Day		AE	21.10	21.18	
T2510	NT2510	100 YR - 1 Day			21.81	21.85	
T2520	NT2520	100 YR - 1 Day			21.54	21.30	
T2530	NT2530	100 YR - 1 Day		AE	21.30	21.19	
T2540	NT2540	100 YR - 1 Day		AE	20.58	20.99	
T2550	NT2550	100 YR - 1 Day		AE	20.56	20.99	
T2560	NT2560	100 YR - 1 Day		AE	20.52	20.97	
T2570	NT2570	100 YR - 1 Day		AE	20.13	20.92	
T2580	NT2580	100 YR - 1 Day		AE	20.12	20.92	
T3006	NT3006	100 YR - 1 Day		AE	19.96	20.83	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
T3008	NT3008	100 YR - 1 Day		AE	19.75	20.80	
T3010	NT3010	100 YR - 1 Day		AE	19.76	20.81	
T3014	NT3014	100 YR - 1 Day		AE	22.11	22.18	
T3015	NT3015	100 YR - 1 Day		AE	22.11	22.18	
T3020	NT3020	100 YR - 1 Day		AE	20.16	21.05	
T3030	NT3030	100 YR - 1 Day		AE	19.79	20.84	
T3040	NT3040	100 YR - 1 Day		AE	19.75	20.80	
T4010	NT4010	100 YR - 1 Day		AE	17.88	18.08	
T4020	NT4020	100 YR - 1 Day		AE	18.70	19.01	
T4021	NT4021	100 YR - 1 Day		AE	20.21	21.27	
T4022	NT4022	100 YR - 1 Day		AE	18.99	19.55	
T4030	NT4030	100 YR - 1 Day		AE	18.74	19.12	
T4040	NT4040	100 YR - 1 Day		AE	19.47	20.48	
T4060	NT4060	100 YR - 1 Day		AE	19.47	20.44	
U0486	NU0486	100 YR - 1 Day			29.55	29.83	
U0487	NU0487	100 YR - 1 Day			29.07	29.59	
U0490	NU0490	100 YR - 1 Day			28.54	29.31	
U0493	NU0493	100 YR - 1 Day		AE	28.71	29.09	
U0494	NU0494	100 YR - 1 Day		AE	28.68	28.91	
U0495	NU0495	100 YR - 1 Day		AE	28.10	28.91	
U0500	NU0500	100 YR - 1 Day		AE	28.10	28.91	
U0507	NU0507	100 YR - 1 Day		AE	28.04	28.82	
U0510	NU0510	100 YR - 1 Day		AE	28.05	28.83	
U0512	NU0512	100 YR - 1 Day		AE	28.04	28.83	
U0515	NU0515	100 YR - 1 Day		AE	28.04	28.83	
U0520	NU0520	100 YR - 1 Day		AE	28.00	28.78	
U0525	NU0525	100 YR - 1 Day		AE	27.75	28.51	
U0530	NU0530	100 YR - 1 Day		AE	27.75	28.50	
U0537	NU0537	100 YR - 1 Day		AE	27.68	28.36	
U0538	NU0538	100 YR - 1 Day		AE	27.68	28.41	
U0540	NU0540	100 YR - 1 Day		AE	27.68	28.41	
U0543	NU0543	100 YR - 1 Day		AE	27.35	28.10	
U0545	NU0545	100 YR - 1 Day		AE	27.35	28.10	
U0550	NU0550	100 YR - 1 Day		AE	27.34	28.09	
U0551	NU0551	100 YR - 1 Day		AE	27.18	27.81	
U0552	NU0552	100 YR - 1 Day		AE	26.97	27.81	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
U0553	NU0553	100 YR - 1 Day		AE	28.25	28.23	
U0554	NU0554	100 YR - 1 Day		AE	27.29	27.95	
U0555	NU0555	100 YR - 1 Day		AE	27.28	27.91	
U0556	NU0556	100 YR - 1 Day		AE	26.96	27.72	
U0557	NU0557	100 YR - 1 Day		AE	26.97	27.75	
U0558	NU0558	100 YR - 1 Day		AE	26.97	27.79	
U0560	NU0560	100 YR - 1 Day		AE	26.97	27.80	
U0570	NU0570	100 YR - 1 Day		AE	26.89	27.73	
U0575	NU0575	100 YR - 1 Day		AE	26.47	27.55	
U0580	NU0580	100 YR - 1 Day		AE	26.47	27.54	
U0590	NU0590	100 YR - 1 Day		AE	26.36	27.48	
U0610	NU0610	100 YR - 1 Day		AE	26.17	27.33	
U0640	NU0640	100 YR - 1 Day		AE	25.82	26.82	
U0645	NU0645	100 YR - 1 Day		AE	25.48	25.48	
U0646	NU0646	100 YR - 1 Day		AE	26.44	27.55	
U0647	NU0648	100 YR - 1 Day			25.27	25.47	
U0648	NU0648	100 YR - 1 Day		AE	25.27	25.47	
U0650	NU0650	100 YR - 1 Day		AE	25.09	25.47	
U0655	NU0655	100 YR - 1 Day		AE	25.15	25.16	
U2610	NU2610	100 YR - 1 Day		AE	28.97	28.95	
U2625	NU2625	100 YR - 1 Day		AE	27.82	28.55	
U2630	NU2630	100 YR - 1 Day		AE	27.82	28.55	
U2710	NU2710	100 YR - 1 Day		AE	28.53	28.82	
U2720	NU2720	100 YR - 1 Day			28.04	28.82	
U2730	NU2730	100 YR - 1 Day		AE	28.04	28.82	
U2735	NU2735	100 YR - 1 Day		AE	28.04	28.78	
U2737	NU2737	100 YR - 1 Day		AE	28.04	28.82	
U2740	NU2740	100 YR - 1 Day		AE	28.04	28.81	
U2745	NU2745	100 YR - 1 Day		AE	28.04	28.82	
U2750	NU2750	100 YR - 1 Day		AE	28.04	28.82	
U2753	NU2753	100 YR - 1 Day			28.04	28.82	
U2755	NU2755	100 YR - 1 Day		AE	28.04	28.82	
U2756	NU2756	100 YR - 1 Day			28.04	28.82	
U2757	NU2757	100 YR - 1 Day		AE	28.04	28.82	
U2760	NU2760	100 YR - 1 Day		AE	28.04	28.82	
U2770	NU2770	100 YR - 1 Day			28.04	28.82	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
U3126	NU3126	100 YR - 1 Day		AE	31.36	31.33	
U3130	NU3130	100 YR - 1 Day			30.32	30.47	
U3135	NU3135	100 YR - 1 Day		AE	29.99	30.31	
U3140	NU3140	100 YR - 1 Day		AE	29.89	30.13	
U3150	NU3150	100 YR - 1 Day		AE	29.66	29.85	
U3160	NU3160	100 YR - 1 Day		AE	29.57	29.72	
U3163	NU3163	100 YR - 1 Day		AE	30.00	29.96	
U3165	NU3165	100 YR - 1 Day		AE	29.43	29.49	
U3170	NU3170	100 YR - 1 Day		AE	29.14	29.37	
U3255	NU3255	100 YR - 1 Day		AE	30.10	30.28	
U3260	NU3260	100 YR - 1 Day			30.08	30.28	
U3270	NU3270	100 YR - 1 Day		AE	29.66	29.83	
U3490	NU3490	100 YR - 1 Day			28.39	29.18	
U3510	NU3510	100 YR - 1 Day		AE	28.17	28.99	
U3810	NU3810	100 YR - 1 Day		AE	28.69	28.68	
U3815	NU3815	100 YR - 1 Day		AE	27.97	28.68	
U3820	NU3820	100 YR - 1 Day		AE	27.97	28.68	
U3825	NU3825	100 YR - 1 Day		AE	27.97	28.68	
U3830	NU3830	100 YR - 1 Day		AE	27.97	28.68	
U3840	NU3840	100 YR - 1 Day		AE	27.97	28.66	
U3843	NU3843	100 YR - 1 Day		AE	29.28	29.24	
U3845	NU3845	100 YR - 1 Day		AE	28.93	28.87	
U3848	NU3848	100 YR - 1 Day		AE	27.97	28.66	
U3850	NU3850	100 YR - 1 Day		AE	27.97	28.66	
U3910	NU3910	100 YR - 1 Day		AE	28.96	28.92	
U3915	NU3915	100 YR - 1 Day		AE	28.52	28.52	
U3920	NU3920	100 YR - 1 Day		AE	28.33	28.52	
U3930	NU3930	100 YR - 1 Day		AE	28.33	28.52	
U3940	NU3940	100 YR - 1 Day		AE	27.75	28.50	
U4010	NU4010	100 YR - 1 Day		AE	29.03	29.42	
U4020	NU4020	100 YR - 1 Day		AE	29.65	29.62	
U4030	NU4030	100 YR - 1 Day		AE	29.56	29.55	
U4040	NU4040	100 YR - 1 Day		AE	29.45	29.51	
U4050	NU4050	100 YR - 1 Day		AE	28.98	29.40	
U4052	NU4052	100 YR - 1 Day		AE	28.56	29.32	
U4053	NU4053	100 YR - 1 Day		AE	28.55	29.30	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
U4054	NU4054	100 YR - 1 Day		AE	28.55	29.31	
U4055	NU4055	100 YR - 1 Day		AE	28.55	29.31	
U4060	NU4060	100 YR - 1 Day		AE	28.93	29.32	
U4070	NU4070	100 YR - 1 Day		AE	29.11	29.35	
U4080	NU4080	100 YR - 1 Day		AE	28.29	28.82	
U4082	NU4082	100 YR - 1 Day		AE	28.29	28.78	
U4084	NU4084	100 YR - 1 Day		AE	28.29	28.82	
U4087	NU4087	100 YR - 1 Day		AE	28.99	29.00	
U4090	NU4090	100 YR - 1 Day		AE	28.24	28.78	
U4100	NU4100	100 YR - 1 Day		AE	28.16	28.72	
U4105	NU4105	100 YR - 1 Day		AE	27.97	28.66	
U4110	NU4110	100 YR - 1 Day		AE	27.94	28.57	
U4112	NU4112	100 YR - 1 Day		AE	27.81	28.42	
U4113	NU4113	100 YR - 1 Day		AE	27.81	28.42	
U4115	NU4115	100 YR - 1 Day		AE	27.60	28.28	
U4117	NU4117	100 YR - 1 Day		AE	27.78	28.24	
U4124	NU4124	100 YR - 1 Day		AE	27.64	28.53	
U4125	NU4125	100 YR - 1 Day		AE	27.52	28.07	
U4126	NU4126	100 YR - 1 Day		AE	27.57	28.32	
U4128	NU4128	100 YR - 1 Day		AE	27.52	28.08	
U4130	NU4130	100 YR - 1 Day		AE	27.52	28.23	
U4140	NU4140	100 YR - 1 Day		AE	27.11	28.02	
U4150	NU4150	100 YR - 1 Day		AE	26.96	27.84	
U4155	NU4155	100 YR - 1 Day		AE	26.89	27.73	
U4160	NU4160	100 YR - 1 Day		AE	26.89	27.73	
U4165	NU4165	100 YR - 1 Day		AE	26.90	27.74	
U4210	NU4210	100 YR - 1 Day		AE	26.72	27.61	
U4220	NU4220	100 YR - 1 Day		AE	26.69	27.59	
U4225	NU4225	100 YR - 1 Day		AE	26.69	27.59	
U4230	NU4230	100 YR - 1 Day		AE	26.56	27.54	
U4240	NU4240	100 YR - 1 Day		AE	26.51	27.52	
U4250	NU4250	100 YR - 1 Day		AE	26.47	27.51	
U4260	NU4260	100 YR - 1 Day		AE	26.42	27.47	
U4410	NU4410	100 YR - 1 Day		AE	29.31	29.55	
U4420	NU4420	100 YR - 1 Day		AE	29.31	29.54	
U4430	NU4430	100 YR - 1 Day		AE	29.40	29.44	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
U4440	NU4440	100 YR - 1 Day		AE	29.40	29.44	
U4445	NU4445	100 YR - 1 Day		AE	29.77	29.74	
U4450	NU4450	100 YR - 1 Day		AE	29.40	29.44	
U4610	NU4610	100 YR - 1 Day		AE	27.39	28.17	
U4615	NU4615	100 YR - 1 Day		AE	27.83	28.29	
U4620	NU4620	100 YR - 1 Day		AE	27.39	28.22	
U4623	NU4623	100 YR - 1 Day		AE	27.39	28.07	
U4627	NU4627	100 YR - 1 Day		AE	27.39	28.05	
U4630	NU4630	100 YR - 1 Day		AE	27.39	28.05	
U4640	NU4640	100 YR - 1 Day		AE	27.39	28.04	
U4642	NU4640	100 YR - 1 Day			27.39	28.04	
U4644	NU4644	100 YR - 1 Day		AE	27.63	28.21	
U4646	NU4646	100 YR - 1 Day		AE	27.46	28.09	
U4660	NU4660	100 YR - 1 Day		AE	26.81	27.30	
U4675	NU4675	100 YR - 1 Day		AE	26.10	26.40	
U4677	NU4677	100 YR - 1 Day		AE	26.10	26.40	
U4680	NU4680	100 YR - 1 Day		AE	26.10	26.40	
U4710	NU4710	100 YR - 1 Day		AE	26.87	27.70	
U4720	NU4720	100 YR - 1 Day		AE	26.86	27.70	
U4725	NU4720	100 YR - 1 Day			26.86	27.70	
U4730	NU4730	100 YR - 1 Day		AE	26.10	26.14	
U4740	NU4740	100 YR - 1 Day		AE	26.08	26.12	
U4750	NU4750	100 YR - 1 Day		AE	25.99	26.03	
U4760	NU4760	100 YR - 1 Day		AE	25.99	26.03	
U4770	NU4770	100 YR - 1 Day		AE	25.67	25.89	
U4810	NU4810	100 YR - 1 Day		AE	27.42	27.93	
U4820	NU4820	100 YR - 1 Day		AE	26.98	27.65	
U4830	NU4830	100 YR - 1 Day		AE	27.36	27.67	
U4840	NU4840	100 YR - 1 Day		AE	26.52	27.39	
U4844	NU4844	100 YR - 1 Day		AE	26.29	26.62	
U4850	NU4850	100 YR - 1 Day		AE	25.45	25.71	
U4857	NU4857	100 YR - 1 Day		AE	25.57	25.76	
U4860	NU4860	100 YR - 1 Day		AE	25.45	25.71	
U4870	NU4870	100 YR - 1 Day		AE	25.45	25.70	
U4910	NU4910	100 YR - 1 Day		AE	25.92	26.21	
U4920	NU4920	100 YR - 1 Day		AE	25.90	26.10	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
U5010	NU5010	100 YR - 1 Day		AE	25.67	25.96	
U5020	NU5020	100 YR - 1 Day			26.21	26.16	
U5030	NU5030	100 YR - 1 Day			26.00	25.96	
U5040	NU5040	100 YR - 1 Day		AE	25.45	25.70	
U5050	NU5050	100 YR - 1 Day		AE	25.45	25.70	
U5060	NU5060	100 YR - 1 Day		X	26.80	26.77	
U5080	NU5080	100 YR - 1 Day		X	26.80	26.77	
U5090	NU5090	100 YR - 1 Day		AE	25.45	25.70	
U5095	NU5095	100 YR - 1 Day		AE	25.44	25.70	
U5185	NU5185	100 YR - 1 Day		AE	28.04	28.82	
U5202	NU5202	100 YR - 1 Day			28.04	28.82	
U5203	NU5203	100 YR - 1 Day		AE	28.04	28.81	
U5205	NU5205	100 YR - 1 Day		AE	28.04	28.82	
U5207	NU5207	100 YR - 1 Day		AE	28.04	28.82	
U5210	NU5210	100 YR - 1 Day		AE	28.04	28.82	
U5220	NU5220	100 YR - 1 Day		AE	28.04	28.82	
U5410	NU5410	100 YR - 1 Day		AE	27.80	28.56	
U5420	NU5420	100 YR - 1 Day		AE	27.79	28.55	
U5421	NU5421	100 YR - 1 Day		AE	27.79	28.53	
U5422	NU5422	100 YR - 1 Day		AE	28.16	28.58	
U5423	NU5423	100 YR - 1 Day		AE	27.84	28.58	
U5424	NU5424	100 YR - 1 Day		AE	27.85	28.63	
U5425	NU5425	100 YR - 1 Day		AE	28.03	28.81	
U5426	NU5426	100 YR - 1 Day		AE	27.85	28.63	
U5427	NU5427	100 YR - 1 Day		AE	27.80	28.55	
U5428	NU5428	100 YR - 1 Day		AE	27.80	28.56	
U5429	NU5429	100 YR - 1 Day		AE	27.79	28.54	
U5430	NU5430	100 YR - 1 Day		AE	27.79	28.53	
U5440	NU5440	100 YR - 1 Day		AE	27.79	28.52	
U5450	NU5450	100 YR - 1 Day		AE	27.70	28.36	
U5455	NU5455	100 YR - 1 Day		AE	27.69	28.29	
U5457	NU5457	100 YR - 1 Day		AE	27.69	28.34	
U5460	NU5460	100 YR - 1 Day		AE	27.64	28.23	
U5470	NU5470	100 YR - 1 Day		AE	27.64	28.23	
U5480	NU5480	100 YR - 1 Day		AE	27.64	28.23	
U5482	NU5482	100 YR - 1 Day		AE	28.49	28.54	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
U5484	NU5484	100 YR - 1 Day		AE	28.44	28.47	
U5486	NU5486	100 YR - 1 Day		AE	28.40	28.44	
U5487	NU5487	100 YR - 1 Day		AE	28.40	28.44	
U5488	NU5488	100 YR - 1 Day		AE	27.64	28.21	
U5490	NU5490	100 YR - 1 Day		AE	27.64	28.22	
U5495	NU5495	100 YR - 1 Day		AE	27.64	28.21	
U5500	NU5500	100 YR - 1 Day		AE	27.64	28.21	
U5520	NU5520	100 YR - 1 Day		AE	27.64	28.21	
U5525	NU5525	100 YR - 1 Day		AE	27.77	27.80	
U5530	NU5530	100 YR - 1 Day		AE	27.19	27.73	
U5540	NU5540	100 YR - 1 Day		AE	26.35	26.77	
U5545	NU5545	100 YR - 1 Day		X	25.83	25.81	
U5550	NU5550	100 YR - 1 Day		AE	26.35	26.77	
U5555	NU5555	100 YR - 1 Day		AE	25.57	25.79	
U5570	NU5570	100 YR - 1 Day		AE	25.57	25.79	
U5580	NU5580	100 YR - 1 Day		AE	25.52	25.76	
U5590	NU5590	100 YR - 1 Day		AE	25.52	25.76	
U5595	NU5595	100 YR - 1 Day		AE	25.45	25.71	
U5610	NU5610	100 YR - 1 Day		AE	25.54	25.46	
U5620	NU5620	100 YR - 1 Day			25.86	25.84	
U5630	NU5630	100 YR - 1 Day			25.86	25.84	
U5640	NU5640	100 YR - 1 Day		AE	25.15	25.34	
U5710	NU5710	100 YR - 1 Day			26.30	26.28	
U5720	NU5720	100 YR - 1 Day		X	26.30	26.27	
U5730	NU5730	100 YR - 1 Day		AE	26.35	26.31	
U5810	NU5810	100 YR - 1 Day		AE	28.48	28.53	
U5820	NU5820	100 YR - 1 Day		AE	28.48	28.53	
U5825	NU5825	100 YR - 1 Day		AE	28.97	28.95	
U5830	NU5830	100 YR - 1 Day		AE	28.48	28.53	
U5835	NU5835	100 YR - 1 Day		AE	28.43	28.53	
U5840	NU5840	100 YR - 1 Day		AE	27.75	28.48	
U5845	NU5845	100 YR - 1 Day		AE	28.65	28.59	
U5850	NU5850	100 YR - 1 Day		AE	27.40	28.46	
U5870	NU5870	100 YR - 1 Day		AE	27.40	28.46	
U5910	NU5910	100 YR - 1 Day		AE	27.87	28.46	
U5915	NU5915	100 YR - 1 Day		AE	27.78	28.46	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
U5920	NU5920	100 YR - 1 Day		AE	27.78	28.46	
U5930	NU5930	100 YR - 1 Day		AE	27.32	28.46	
U5940	NU5940	100 YR - 1 Day		AE	27.32	28.46	
U6010	NU6010	100 YR - 1 Day		AE	27.68	28.17	
U6020	NU6020	100 YR - 1 Day		AE	27.68	28.17	
U6021	NU6021	100 YR - 1 Day		AE	27.32	28.45	
U6022	NU6022	100 YR - 1 Day		AE	28.06	28.29	
U6023	NU6023	100 YR - 1 Day		AE	27.97	28.25	
U6024	NU6024	100 YR - 1 Day		AE	28.01	28.17	
U6026	NU6026	100 YR - 1 Day		AE	27.68	28.17	
U6030	NU6030	100 YR - 1 Day		AE	27.68	28.17	
U6040	NU6030	100 YR - 1 Day			27.68	28.17	
U6070	NU6070	100 YR - 1 Day		AE	27.13	27.17	
U6080	NU6080	100 YR - 1 Day		AE	26.42	26.78	
U6090	NU6090	100 YR - 1 Day		AE	26.40	26.77	
U6095	NU6095	100 YR - 1 Day		AE	27.11	27.11	
U6100	NU6100	100 YR - 1 Day		AE	26.40	26.77	
U6103	NU6103	100 YR - 1 Day		AE	26.80	26.81	
U6107	NU6107	100 YR - 1 Day		AE	26.35	26.77	
U6110	NU6110	100 YR - 1 Day		AE	26.35	26.77	
U6310	NU6310	100 YR - 1 Day		AE	27.85	28.45	
U6320	NU6320	100 YR - 1 Day		AE	27.36	28.45	
U6330	NU6330	100 YR - 1 Day		AE	27.36	28.45	
U6335	NU6335	100 YR - 1 Day		AE	27.38	28.45	
U6340	NU6340	100 YR - 1 Day		AE	27.22	28.43	
U6350	NU6350	100 YR - 1 Day		AE	27.22	28.43	
U6360	NU6360	100 YR - 1 Day		AE	27.22	28.43	
U6361	NU6360	100 YR - 1 Day			27.22	28.43	
U6362	NU6362	100 YR - 1 Day		AE	27.22	28.43	
U6370	NU6370	100 YR - 1 Day		AE	27.22	28.43	
U6380	NU6380	100 YR - 1 Day		AE	27.22	28.43	
U6383	NU6383	100 YR - 1 Day		AE	27.26	28.43	
U6385	NU6385	100 YR - 1 Day			26.14	26.65	
U6387	NU6387	100 YR - 1 Day		AE	26.41	26.66	
U6390	NU6390	100 YR - 1 Day		AE	25.30	26.65	
U6410	NU6410	100 YR - 1 Day		AE	26.99	27.40	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
U6416	NU6416	100 YR - 1 Day		AE	28.03	28.01	
U6420	NU6420	100 YR - 1 Day		AE	26.90	27.40	
U6607	NU6607	100 YR - 1 Day		AE	26.99	27.40	
U6612	NU6612	100 YR - 1 Day			26.58	26.70	
U6620	NU6620	100 YR - 1 Day		AE	26.59	26.71	
U6630	NU6630	100 YR - 1 Day		AE	26.58	26.69	
U6640	NU6640	100 YR - 1 Day		AE	26.58	26.69	
U6650	NU6650	100 YR - 1 Day		AE	26.58	26.69	
U6655	NU6655	100 YR - 1 Day		AE	25.74	26.13	
U6660	NU6660	100 YR - 1 Day			25.74	26.13	
U6666	NU6666	100 YR - 1 Day		AE	25.74	26.14	
U6670	NU6670	100 YR - 1 Day		AE	25.74	26.13	
U6680	NU6680	100 YR - 1 Day		AE	25.66	25.95	
U6690	NU6690	100 YR - 1 Day		AE	25.57	25.78	
U6700	NU6700	100 YR - 1 Day			24.87	25.52	
U6810	NU6810	100 YR - 1 Day		AE	25.95	26.21	
U6820	NU6820	100 YR - 1 Day			26.77	26.76	
U6825	NU6825	100 YR - 1 Day		X	26.78	26.76	
U6830	NU6830	100 YR - 1 Day			26.64	26.59	
U6834	NU6834	100 YR - 1 Day		X	26.63	26.59	
U6840	NU6840	100 YR - 1 Day		AE	26.57	26.51	
U6850	NU6850	100 YR - 1 Day		X	26.51	26.47	
U6860	NU6860	100 YR - 1 Day		X	26.52	26.48	
U6870	NU6870	100 YR - 1 Day		AE	25.95	26.21	
U6880	NU6880	100 YR - 1 Day		AE	25.95	26.21	
U6890	NU6890	100 YR - 1 Day		X	26.43	26.39	
U6900	NU6900	100 YR - 1 Day		AE	25.95	26.21	
U6910	NU6910	100 YR - 1 Day		X	26.45	26.41	
U6915	NU6915	100 YR - 1 Day		X	26.43	26.39	
U6920	NU6920	100 YR - 1 Day			26.45	26.40	
U6930	NU6930	100 YR - 1 Day		AE	25.95	26.21	
U6940	NU6940	100 YR - 1 Day		X	26.09	26.21	
U6945	NU6945	100 YR - 1 Day		X	26.13	26.21	
U6950	NU6950	100 YR - 1 Day		X	26.26	26.20	
U6960	NU6960	100 YR - 1 Day		AE	26.47	26.45	
U6970	NU6970	100 YR - 1 Day		AE	26.20	26.14	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
U6975	NU6975	100 YR - 1 Day		AE	25.07	25.62	
U7010	NU7010	100 YR - 1 Day		AE	25.68	26.01	
U7110	NU7110	100 YR - 1 Day		AE	25.95	26.21	
U7210	NU7210	100 YR - 1 Day		X	26.43	26.39	
U7220	NU7220	100 YR - 1 Day		AE	26.10	26.20	
U7230	NU7230	100 YR - 1 Day		AE	25.94	26.20	
U7310	NU7310	100 YR - 1 Day		AE	26.63	26.74	
U7320	NU7320	100 YR - 1 Day		AE	26.62	26.72	
U7330	NU7330	100 YR - 1 Day		AE	26.59	26.70	
U7355	NU7355	100 YR - 1 Day		AE	25.95	26.21	
U7360	NU7360	100 YR - 1 Day		AE	25.95	26.21	
U7363	NU7363	100 YR - 1 Day		AE	26.54	26.61	
U7365	NU7365	100 YR - 1 Day		AE	25.95	26.21	
U7367	NU7367	100 YR - 1 Day		AE	25.95	26.21	
U7370	NU7370	100 YR - 1 Day		AE	25.95	26.21	
U7375	NU7375	100 YR - 1 Day		AE	25.94	26.20	
U7380	NU7380	100 YR - 1 Day		AE	25.95	26.21	
U7390	NU7390	100 YR - 1 Day		AE	25.94	26.20	
U7400	NU7400	100 YR - 1 Day		AE	25.67	25.96	
U7510	NU7510	100 YR - 1 Day		AE	25.95	26.21	
U7520	NU7520	100 YR - 1 Day		X	25.75	26.14	
U7530	NU7530	100 YR - 1 Day		AE	25.74	26.14	
U7540	NU7540	100 YR - 1 Day			25.74	26.14	
U7550	NU7550	100 YR - 1 Day		AE	25.95	26.21	
U7560	NU7560	100 YR - 1 Day		AE	25.95	26.21	
U7570	NU7570	100 YR - 1 Day		AE	25.95	26.22	
U8210	NU8210	100 YR - 1 Day		AE	26.88	27.03	
U8220	NU8220	100 YR - 1 Day		AE	25.95	26.21	
U8230	NU8230	100 YR - 1 Day		AE	25.67	25.96	
U8240	NU8240	100 YR - 1 Day		AE	25.14	25.24	
U8250	NU8250	100 YR - 1 Day		AE	25.14	25.24	
U8260	NU8260	100 YR - 1 Day		AE	25.14	25.24	
U9000	NU9000	100 YR - 1 Day		AE	25.71	28.55	
U9002	NU9002	100 YR - 1 Day		AE	26.61	26.72	
U9003	NU9003	100 YR - 1 Day		AE	27.52	27.38	
U9004	NU9004	100 YR - 1 Day		AE	25.57	25.76	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
U9005	NU9005	100 YR - 1 Day		AE	27.56	27.87	
U9006	NU9006	100 YR - 1 Day		AE	26.33	26.76	
U9007	NU9007	100 YR - 1 Day		AE	25.64	26.28	
U9008	NU9008	100 YR - 1 Day		AE	25.01	25.88	
U9009	NU9009	100 YR - 1 Day		AE	26.10	26.40	
U9011	NU9011	100 YR - 1 Day		AE	27.16	27.25	
U9012	NU9012	100 YR - 1 Day		AE	25.99	26.40	
U9013	NU9013	100 YR - 1 Day		AE	26.79	27.17	
U9014	NU9014	100 YR - 1 Day		AE	27.21	27.13	
U9015	NU9015	100 YR - 1 Day		AE	27.52	27.44	
U9016	NU9016	100 YR - 1 Day		AE	27.22	27.05	
U9017	NU9017	100 YR - 1 Day		AE	26.88	27.03	
U9018	NU9018	100 YR - 1 Day		AE	26.87	27.03	
U9019	NU9019	100 YR - 1 Day		AE	26.53	26.71	
U9021	NU9021	100 YR - 1 Day		AE	26.10	26.40	
U9022	NU9022	100 YR - 1 Day		AE	27.53	27.44	
U9023	NU9023	100 YR - 1 Day		AE	27.87	27.99	
U9024	NU9024	100 YR - 1 Day		AE	27.35	27.48	
U9025	NU9025	100 YR - 1 Day		AE	26.58	26.69	
U9026	NU9026	100 YR - 1 Day		AE	26.78	27.28	
U9027	NU9027	100 YR - 1 Day		X	25.97	26.21	
U9028	NU9028	100 YR - 1 Day		AE	25.95	26.21	
U9029	NU9029	100 YR - 1 Day		AE	25.95	26.21	
U9030	NU9030	100 YR - 1 Day		AE	26.47	26.61	
U9031	NU9031	100 YR - 1 Day		AE	27.41	27.84	
U9032	NU9032	100 YR - 1 Day		AE	26.54	26.61	
U9033	NU9033	100 YR - 1 Day		AE	26.62	26.72	
U9034	NU9034	100 YR - 1 Day		AE	28.56	28.55	
U9035	NU9035	100 YR - 1 Day		AE	25.98	26.21	
U9036	NU9036	100 YR - 1 Day		AE	26.62	26.72	
U9037	NU9037	100 YR - 1 Day		AE	27.42	27.93	
U9038	NU9038	100 YR - 1 Day		AE	28.32	28.27	
U9039	NU9039	100 YR - 1 Day		AE	27.42	27.93	
U9040	NU9040	100 YR - 1 Day		AE	26.81	27.29	
U9041	NU9041	100 YR - 1 Day		X	26.53	26.58	
U9042	NU9042	100 YR - 1 Day		AE	27.42	27.93	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
U9043	NU9043	100 YR - 1 Day		AE	27.42	27.93	
U9044	NU9044	100 YR - 1 Day		AE	27.60	27.72	
U9045	NU9045	100 YR - 1 Day		AE	27.81	27.70	
U9046	NU9046	100 YR - 1 Day		AE	27.36	27.67	
U9051	NU9051	100 YR - 1 Day		AE	27.36	27.68	
U9052	NU9052	100 YR - 1 Day		AE	26.98	27.65	
U9053	NU9053	100 YR - 1 Day		AE	27.05	27.65	
U9054	NU9054	100 YR - 1 Day		AE	26.98	27.65	
U9055	NU9055	100 YR - 1 Day		AE	27.07	27.65	
U9056	NU9056	100 YR - 1 Day		AE	26.98	27.65	
U9057	NU9057	100 YR - 1 Day		AE	26.98	27.65	
U9058	NU9058	100 YR - 1 Day		AE	26.36	26.62	
U9059	NU9059	100 YR - 1 Day		AE	26.36	26.70	
U9061	NU9061	100 YR - 1 Day		AE	26.29	26.62	
U9062	NU9062	100 YR - 1 Day		AE	27.33	27.45	
U9065	NU9065	100 YR - 1 Day		AE	25.45	25.71	
U9066	NU9066	100 YR - 1 Day		AE	25.45	25.71	
U9067	NU9067	100 YR - 1 Day		AE	27.43	27.34	
U9068	NU9068	100 YR - 1 Day		AE	26.88	26.86	
U9069	NU9069	100 YR - 1 Day		AE	26.30	26.62	
U9070	NU9070	100 YR - 1 Day		AE	26.38	26.57	
U9071	NU9071	100 YR - 1 Day		AE	25.47	25.72	
U9072	NU9072	100 YR - 1 Day		AE	26.52	26.49	
U9073	NU9073	100 YR - 1 Day		AE	26.30	26.62	
U9074	NU9074	100 YR - 1 Day		AE	26.31	26.63	
U9080	NU9080	100 YR - 1 Day		AE	25.67	25.89	
U9081	NU9081	100 YR - 1 Day		AE	26.29	26.62	
U9082	NU9082	100 YR - 1 Day		AE	27.99	27.95	
U9083	NU9083	100 YR - 1 Day		AE	28.13	28.13	
U9084	NU9084	100 YR - 1 Day		AE	27.62	27.72	
U9085	NU9085	100 YR - 1 Day		AE	25.57	25.79	
U9086	NU9086	100 YR - 1 Day		AE	25.57	25.79	
U9087	NU9087	100 YR - 1 Day		AE	27.13	27.13	
U9088	NU9088	100 YR - 1 Day			26.99	27.39	
U9089	NU9089	100 YR - 1 Day		AE	27.76	27.71	
U9090	NU9090	100 YR - 1 Day		AE	25.67	25.89	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
U9091	NU9091	100 YR - 1 Day		AE	27.05	27.19	
U9092	NU9092	100 YR - 1 Day		AE	28.33	28.21	
U9093	NU9093	100 YR - 1 Day		AE	26.97	27.40	
U9094	NU9094	100 YR - 1 Day		AE	28.15	27.99	
U9095	NU9095	100 YR - 1 Day		AE	27.12	27.19	
U9096	NU9096	100 YR - 1 Day		X	27.33	27.24	
U9097	NU9097	100 YR - 1 Day		AE	27.34	27.24	
U9098	NU9098	100 YR - 1 Day		AE	27.75	27.62	
U9100	NU9100	100 YR - 1 Day		AE	28.04	28.82	
U9101	NU9101	100 YR - 1 Day		X	27.41	27.44	
U9110	NU9110	100 YR - 1 Day		AE	26.27	26.17	
U9115	NU9115	100 YR - 1 Day		AE	26.70	26.72	
U9120	NU9120	100 YR - 1 Day		AE	27.07	27.30	
U9125	NU9125	100 YR - 1 Day		AE	27.44	27.43	
U9130	NU9130	100 YR - 1 Day		AE	27.48	27.41	
U9135	NU9135	100 YR - 1 Day		X	26.87	26.84	
U9140	NU9140	100 YR - 1 Day		AE	27.88	27.59	
U9145	NU9145	100 YR - 1 Day		AE	26.80	26.57	
U9155	NU9155	100 YR - 1 Day			27.62	27.41	
U9160	NU9160	100 YR - 1 Day			27.81	27.47	
U9201	NU9201	100 YR - 1 Day		AE	27.40	27.37	
U9301	NU9301	100 YR - 1 Day		X	26.41	26.38	
U9400	NU9400	100 YR - 1 Day		AE	26.10	26.40	
U9450	NU9450	100 YR - 1 Day		AE	26.83	27.09	
U9500	NU9500	100 YR - 1 Day		AE	25.67	25.89	
U9600	NU9600	100 YR - 1 Day		AE	26.10	26.40	
U9700	NU9700	100 YR - 1 Day		AE	25.67	25.88	
U9800	NU9800	100 YR - 1 Day		AE	25.67	25.88	
U9810	NU9810	100 YR - 1 Day		AE	25.97	26.02	
U9820	NU9820	100 YR - 1 Day		AE	26.33	26.70	
U9830	NU9830	100 YR - 1 Day		AE	25.23	25.48	
U9900	NU9900	100 YR - 1 Day		AE	25.67	25.86	
U9910	NU9910	100 YR - 1 Day		AE	25.68	25.86	
V0001	NV0001	100 YR - 1 Day		AE	28.39	28.35	
V0002	NV0002	100 YR - 1 Day		AE	28.39	28.35	
V0003	NV0003	100 YR - 1 Day		AE	27.51	28.29	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
V0004	NV0004	100 YR - 1 Day			27.60	28.22	
V0005	NV0005	100 YR - 1 Day		AE	27.54	28.37	
V0006	NV0006	100 YR - 1 Day		AE	27.54	28.37	
V0007	NV0007	100 YR - 1 Day		AE	27.54	28.37	
V0008	NV0008	100 YR - 1 Day		AE	27.54	28.35	
V0009	NV0009	100 YR - 1 Day		AE	27.75	28.35	
V0011	NV0011	100 YR - 1 Day		AE	27.68	28.35	
V0012	NV0012	100 YR - 1 Day		AE	27.56	28.34	
V0014	NV0014	100 YR - 1 Day		AE	25.32	26.89	
V0015	NV0015	100 YR - 1 Day			25.32	26.89	
V0020	NV0020	100 YR - 1 Day		AE	25.32	26.89	
V0029	NV0029	100 YR - 1 Day		AE	25.32	27.08	
V0030	NV0030	100 YR - 1 Day		AE	25.32	26.89	
V0040	NV0040	100 YR - 1 Day		AE	25.30	26.78	
V0045	NV0045	100 YR - 1 Day		AE	23.38	24.35	
V0050	NV0050	100 YR - 1 Day		AE	25.30	26.75	
V0051	NV0051	100 YR - 1 Day		AE	21.86	22.82	
V0055	NV0055	100 YR - 1 Day		AE	25.30	27.00	
V0060	NV0060	100 YR - 1 Day		AE	25.30	26.73	
V0062	NV0062	100 YR - 1 Day			25.27	26.50	
V0064	NV0064	100 YR - 1 Day		AE	25.27	26.50	
V0065	NV0065	100 YR - 1 Day		AE	25.27	26.56	
V0066	NV0066	100 YR - 1 Day		AE	25.27	26.50	
V0068	NV0068	100 YR - 1 Day		AE	25.27	26.50	
V0070	NV0070	100 YR - 1 Day		AE	25.27	26.65	
V0073	NV0073	100 YR - 1 Day		AE	25.20	26.49	
V0077	NV0077	100 YR - 1 Day		AE	25.21	26.50	
V0080	NV0080	100 YR - 1 Day		AE	25.23	26.58	
V0090	NV0090	100 YR - 1 Day		AE	25.21	26.54	
V0100	NV0100	100 YR - 1 Day		AE	23.75	24.18	
V0110	NV0110	100 YR - 1 Day		AE	23.72	24.14	
V0120	NV0120	100 YR - 1 Day			23.71	24.11	
V0130	NV0130	100 YR - 1 Day			22.12	23.15	
V0135	NV0135	100 YR - 1 Day		AE	22.39	24.11	
V0140	NV0140	100 YR - 1 Day		AE	22.06	23.08	
V0160	NV0160	100 YR - 1 Day		AE	21.78	22.71	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
V0170	NV0170	100 YR - 1 Day		AE	21.71	22.62	
V0180	NV0180	100 YR - 1 Day		AE	21.64	22.53	
V0187	NV0187	100 YR - 1 Day		AE	21.53	22.54	
V0190	NV0190	100 YR - 1 Day		AE	21.52	22.46	
V0200	NV0200	100 YR - 1 Day		AE	21.48	22.42	
V0205	NV0205	100 YR - 1 Day		AE	21.49	22.53	
V0210	NV0210	100 YR - 1 Day		AE	21.39	22.33	
V0220	NV0220	100 YR - 1 Day		AE	21.32	22.24	
V0230	NV0230	100 YR - 1 Day		AE	21.25	22.16	
V0240	NV0240	100 YR - 1 Day		AE	21.20	22.12	
V0250	NV0250	100 YR - 1 Day		AE	21.14	22.04	
V1010	NV1010	100 YR - 1 Day			27.82	28.55	
V1015	NV1015	100 YR - 1 Day		AE	27.75	28.51	
V1033	NV1033	100 YR - 1 Day		AE	27.75	28.51	
V1037	NV1037	100 YR - 1 Day		AE	27.40	28.46	
V1040	NV1040	100 YR - 1 Day		AE	27.31	28.46	
V1043	NV1043	100 YR - 1 Day		AE	27.31	28.46	
V1047	NV1047	100 YR - 1 Day		AE	27.30	28.45	
V1050	NV1050	100 YR - 1 Day		AE	27.26	28.43	
V1080	NV1080	100 YR - 1 Day		AE	25.60	27.01	
V1090	NV1090	100 YR - 1 Day		AE	25.48	26.91	
V2011	NV2011	100 YR - 1 Day		AE	25.80	25.70	
V2015	NV2015	100 YR - 1 Day		AE	24.18	24.32	
V2210	NV2210	100 YR - 1 Day		AE	24.18	24.33	
V2220	NV2220	100 YR - 1 Day		AE	24.16	24.32	
V2520	NV2520	100 YR - 1 Day		AE	24.29	24.34	
V2530	NV2530	100 YR - 1 Day		AE	24.29	24.34	
V2540	NV2540	100 YR - 1 Day		AE	24.28	24.34	
V2550	NV2550	100 YR - 1 Day		AE	24.27	24.33	
V2560	NV2560	100 YR - 1 Day		AE	24.27	24.33	
V2570	NV2570	100 YR - 1 Day		AE	24.25	24.32	
V2590	NV2590	100 YR - 1 Day		AE	24.20	24.31	
V2600	NV2600	100 YR - 1 Day		AE	24.17	24.30	
V2610	NV2610	100 YR - 1 Day		AE	24.15	24.30	
V2810	NV2810	100 YR - 1 Day		AE	24.14	24.31	
V2830	NV2830	100 YR - 1 Day		AE	24.14	24.31	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
V2840	NV2840	100 YR - 1 Day		AE	24.12	24.30	
V2850	NV2850	100 YR - 1 Day		AE	24.06	24.28	
V2853	NV2853	100 YR - 1 Day		AE	23.99	24.24	
V2857	NV2857	100 YR - 1 Day		AE	23.99	24.24	
V2860	NV2860	100 YR - 1 Day		AE	23.99	24.25	
V2880	NV2880	100 YR - 1 Day		AE	23.78	24.17	
V2890	NV2890	100 YR - 1 Day		AE	23.77	24.16	
V3010	NV3010	100 YR - 1 Day		AE	23.01	23.24	
V3020	NV3020	100 YR - 1 Day		AE	22.25	23.20	
V3042	NV3042	100 YR - 1 Day		AE	27.75	28.51	
V3060	NV3060	100 YR - 1 Day		AE	22.07	23.10	
V3510	NV3510	100 YR - 1 Day			23.75	23.97	
V3520	NV3520	100 YR - 1 Day		AE	22.92	23.03	
V3530	NV3530	100 YR - 1 Day		AE	22.96	23.03	
V3540	NV3540	100 YR - 1 Day		AE	22.95	23.03	
V3550	NV3550	100 YR - 1 Day		AE	23.11	23.07	
V4020	NV4020	100 YR - 1 Day		AE	26.07	26.06	
V4025	NV4025	100 YR - 1 Day		AE	26.95	27.01	
V4030	NV4030	100 YR - 1 Day			25.55	25.55	
V4035	NV4035	100 YR - 1 Day		AE	23.75	24.17	
V4040	NV4040	100 YR - 1 Day			25.55	25.54	
V4050	NV4050	100 YR - 1 Day			25.57	25.56	
V4060	NV4060	100 YR - 1 Day			25.57	25.56	
V4070	NV4070	100 YR - 1 Day		AE	25.58	25.79	
V4080	NV4080	100 YR - 1 Day		AE	25.57	25.79	
V4090	NV4090	100 YR - 1 Day		AE	25.56	25.74	
V4100	NV4100	100 YR - 1 Day		AE	25.56	25.74	
V4110	NV4110	100 YR - 1 Day			25.55	25.70	
V4120	NV4120	100 YR - 1 Day		AE	25.55	25.70	
V4130	NV4130	100 YR - 1 Day		AE	25.50	25.59	
V4140	NV4140	100 YR - 1 Day		AE	25.50	25.59	
V4150	NV4150	100 YR - 1 Day		AE	25.49	25.58	
V4160	NV4160	100 YR - 1 Day		AE	25.49	25.58	
V4170	NV4170	100 YR - 1 Day		AE	24.86	25.03	
V4180	NV4180	100 YR - 1 Day		AE	24.84	25.02	
V4190	NV4190	100 YR - 1 Day		AE	24.23	24.11	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
X0004	NX0004	100 YR - 1 Day		AE	24.14	24.79	
X0006	NX0006	100 YR - 1 Day		AE	24.12	24.80	
X0008	NX0008	100 YR - 1 Day		AE	24.03	24.92	
X0010	NX0010	100 YR - 1 Day		AE	24.01	24.92	
X0035	NX0035	100 YR - 1 Day		AE	25.52	25.60	
X0040	NX0040	100 YR - 1 Day		AE	23.97	24.77	
X0050	NX0050	100 YR - 1 Day		AE	23.38	23.65	
X0055	NX0055	100 YR - 1 Day		AE	23.41	23.74	
X0060	NX0060	100 YR - 1 Day		AE	23.36	23.63	
X0070	NX0070	100 YR - 1 Day		AE	23.28	23.50	
X0510	NX0510	100 YR - 1 Day		AE	23.19	23.23	
X0519	NX0519	100 YR - 1 Day		AE	23.34	23.50	
X0520	NX0520	100 YR - 1 Day		AE	23.34	23.52	
X1005	NX1005	100 YR - 1 Day			25.20	25.16	
X1010	NX1010	100 YR - 1 Day		AE	24.22	25.17	
X1020	NX1020	100 YR - 1 Day			24.26	25.11	
X1030	NX1030	100 YR - 1 Day		AE	24.26	24.99	
X1040	NX1040	100 YR - 1 Day		AE	24.12	24.99	
X1045	NX1045	100 YR - 1 Day		AE	24.36	24.92	
X1050	NX1050	100 YR - 1 Day		AE	24.07	24.98	
X1505	NX1505	100 YR - 1 Day		AE	25.14	25.61	
X1510	NX1510	100 YR - 1 Day		AE	24.21	25.16	
X1524	NX1524	100 YR - 1 Day		AE	25.54	25.49	
X1525	NX1525	100 YR - 1 Day		AE	26.14	26.13	
X1530	NX1530	100 YR - 1 Day		AE	24.36	25.31	
X1540	NX1540	100 YR - 1 Day		AE	24.09	25.31	
X1541	NX1541	100 YR - 1 Day		AE	26.14	26.35	
X1542	NX1542	100 YR - 1 Day		AE	25.31	26.35	
X1543	NX1543	100 YR - 1 Day		AE	25.31	26.35	
X1544	NX1544	100 YR - 1 Day		AE	25.06	25.58	
X1545	NX1545	100 YR - 1 Day		AE	25.09	25.62	
X1547	NX1547	100 YR - 1 Day		AE	24.21	25.52	
X1548	NX1548	100 YR - 1 Day		AE	24.19	25.51	
X1549	NX1549	100 YR - 1 Day		AE	24.05	25.34	
X1550	NX1550	100 YR - 1 Day		AE	24.05	25.33	
X3005	NX3005	100 YR - 1 Day			25.60	26.43	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
X3010	NX3010	100 YR - 1 Day		X	25.48	26.33	
X3020	NX3020	100 YR - 1 Day			25.95	26.36	
X3030	NX3030	100 YR - 1 Day		AE	25.31	26.36	
X3031	NX3031	100 YR - 1 Day		AE	25.31	26.35	
X3032	NX3032	100 YR - 1 Day			25.93	26.35	
X3033	NX3033	100 YR - 1 Day			25.31	26.35	
Y0010	NY0010	100 YR - 1 Day		AE	22.17	22.73	
Y0020	NY0010	100 YR - 1 Day			22.17	22.73	
Y0040	NY0040	100 YR - 1 Day			21.64	21.72	
Y0050	NY0050	100 YR - 1 Day		AE	21.63	21.72	
Y0063	NY0063	100 YR - 1 Day		AE	20.99	21.26	
Y0067	NY0067	100 YR - 1 Day		AE	21.02	21.30	
Y0070	NY0070	100 YR - 1 Day		AE	20.98	21.18	
Y0073	NY0073	100 YR - 1 Day		AE	20.97	21.19	
Y0077	NY0077	100 YR - 1 Day		AE	20.97	21.18	
Y0080	NY0080	100 YR - 1 Day		AE	20.94	21.13	
Y0083	NY0083	100 YR - 1 Day		AE	20.75	20.89	
Y0087	NY0087	100 YR - 1 Day		AE	20.75	20.89	
Y0090	NY0090	100 YR - 1 Day		AE	20.74	20.89	
Y0093	NY0093	100 YR - 1 Day			20.64	20.75	
Y0097	NY0097	100 YR - 1 Day		AE	20.64	20.75	
Y0100	NY0100	100 YR - 1 Day		AE	20.64	20.75	
Y0103	NY0103	100 YR - 1 Day		AE	20.49	20.55	
Y0107	NY0107	100 YR - 1 Day		AE	20.47	20.53	
Y0120	NY0120	100 YR - 1 Day		AE	20.46	20.52	
Y0130	NY0130	100 YR - 1 Day		AE	19.58	19.82	
Y0140	NY0140	100 YR - 1 Day		AE	19.13	19.27	
Y0150	NY0150	100 YR - 1 Day		AE	18.63	18.70	
Y0160	NY0160	100 YR - 1 Day		AE	18.39	18.45	
Y0162	NY0162	100 YR - 1 Day		AE	18.13	18.14	
Y0165	NY0165	100 YR - 1 Day		AE	18.12	18.14	
Y0168	NY0168	100 YR - 1 Day		AE	18.12	18.14	
Y0170	NY0170	100 YR - 1 Day		AE	18.27	18.31	
Y0180	NY0180	100 YR - 1 Day		AE	18.21	18.24	
Y0190	NY0190	100 YR - 1 Day		AE	16.43	16.47	
Y0200	NY0200	100 YR - 1 Day		AE	16.31	16.34	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
Y0203	NY0203	100 YR - 1 Day		AE	16.34	16.34	
Y0207	NY0207	100 YR - 1 Day		AE	16.34	16.34	
Y0208	NY0208	100 YR - 1 Day		AE	16.32	16.34	
Y0210	NY0210	100 YR - 1 Day		AE	16.09	16.12	
Y0220	NY0220	100 YR - 1 Day			16.03	16.06	
Y0230	NY0230	100 YR - 1 Day		AE	15.06	15.16	
Y0240	NY0240	100 YR - 1 Day		AE	15.00	15.11	
Y0250	NY0250	100 YR - 1 Day		AE	14.87	14.97	
Y0260	NY0260	100 YR - 1 Day		AE	14.46	14.79	
Y1003	NY1003	100 YR - 1 Day		AE	23.21	23.44	
Y1005	NY1005	100 YR - 1 Day		AE	22.56	23.12	
Y1007	NY1007	100 YR - 1 Day		AE	22.61	23.11	
Y1010	NY1010	100 YR - 1 Day		AE	22.62	23.11	
Y1020	NY1020	100 YR - 1 Day		AE	22.45	23.07	
Y1310	NY1310	100 YR - 1 Day		AE	23.01	23.75	
Y1320	NY1320	100 YR - 1 Day		AE	22.89	23.74	
Y1330	NY1330	100 YR - 1 Day		AE	22.60	23.73	
Y1332	NY1332	100 YR - 1 Day		AE	23.55	24.54	
Y1335	NY1335	100 YR - 1 Day		AE	23.46	24.51	
Y1338	NY1338	100 YR - 1 Day			22.57	23.27	
Y1340	NY1340	100 YR - 1 Day		AE	22.53	23.24	
Y1348	NY1348	100 YR - 1 Day		AE	22.47	23.07	
Y1350	NY1350	100 YR - 1 Day		AE	22.24	22.78	
Y1510	NY1510	100 YR - 1 Day		AE	22.49	22.80	
Y1520	NY1520	100 YR - 1 Day		AE	22.49	22.80	
Y1530	NY1530	100 YR - 1 Day		AE	22.30	22.80	
Y1535	NY1535	100 YR - 1 Day		AE	22.21	22.72	
Y1537	NY1537	100 YR - 1 Day		AE	22.21	22.74	
Y1540	NY1540	100 YR - 1 Day		AE	22.21	22.77	
Y1550	NY1550	100 YR - 1 Day		AE	22.17	22.72	
Y1555	NY1560	100 YR - 1 Day			22.07	22.57	
Y1560	NY1560	100 YR - 1 Day		AE	22.07	22.57	
Y2010	NY2010	100 YR - 1 Day		AE	21.63	21.71	
Y2015	NY2015	100 YR - 1 Day		AE	22.56	22.54	
Y2020	NY2020	100 YR - 1 Day		AE	21.63	21.70	
Y2510	NY2510	100 YR - 1 Day		AE	21.53	21.60	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
Y2512	NY2512	100 YR - 1 Day		AE	21.87	21.81	
Y2513	NY2513	100 YR - 1 Day		AE	21.41	21.44	
Y2517	NY2517	100 YR - 1 Day		AE	21.45	21.49	
Y2520	NY2520	100 YR - 1 Day			21.53	21.60	
Y2540	NY2540	100 YR - 1 Day		AE	21.60	21.67	
Y2550	NY2550	100 YR - 1 Day		AE	21.63	21.71	
Y3010	NY3010	100 YR - 1 Day		AE	19.87	19.84	
Y3310	NY3310	100 YR - 1 Day		AE	19.86	19.83	
Y3710	NY3710	100 YR - 1 Day		AE	19.86	19.83	
Y3720	NY3720	100 YR - 1 Day		AE	19.77	19.74	
Y3730	NY3730	100 YR - 1 Day		AE	19.67	19.65	
Y3740	NY3740	100 YR - 1 Day		AE	19.22	19.35	
Y4010	NY4010	100 YR - 1 Day		AE	16.10	16.08	
Y4020	NY4020	100 YR - 1 Day		AE	16.29	16.26	
Y4030	NY4030	100 YR - 1 Day		AE	16.09	16.08	
Y4040	NY4040	100 YR - 1 Day		AE	15.85	15.85	
Y4050	NY4050	100 YR - 1 Day		AE	15.85	15.85	
Y4060	NY4060	100 YR - 1 Day		AE	15.00	15.11	
Z0010	NZ0010	100 YR - 1 Day			23.17	23.18	
Z0020	NZ0020	100 YR - 1 Day		AE	23.17	23.18	
Z0025	NZ0025	100 YR - 1 Day		AE	23.15	23.16	
Z0030	NZ0030	100 YR - 1 Day		AE	20.28	21.22	
Z0033	NZ0033	100 YR - 1 Day		AE	20.27	21.22	
Z0037	NZ0037	100 YR - 1 Day		AE	20.27	21.21	
Z0040	NZ0040	100 YR - 1 Day		AE	20.27	21.21	
Z0043	NZ0043	100 YR - 1 Day		AE	20.27	21.20	
Z0047	NZ0047	100 YR - 1 Day		AE	20.27	21.20	
Z0050	NZ0050	100 YR - 1 Day		AE	20.27	21.20	
Z0060	NZ0060	100 YR - 1 Day		AE	20.27	21.19	
Z0070	NZ0070	100 YR - 1 Day		AE	20.26	21.13	
Z1010	NZ1010	100 YR - 1 Day		AE	23.29	23.31	
Z1020	NZ1020	100 YR - 1 Day		AE	22.75	22.87	
Z1040	NZ1040	100 YR - 1 Day		AE	22.58	22.63	
Z1510	NZ1510	100 YR - 1 Day		AE	22.31	22.18	
Z1520	NZ1520	100 YR - 1 Day		AE	22.31	22.17	
Z1540	NZ1540	100 YR - 1 Day		AE	22.29	22.16	

Subbasin Name	Node Name	Modeled Storm Event Used for Floodplain	FEMA Zone	Preliminary Modeled Floodzone	100Yr1D Max Stage ft. NAVD88	100Yr5D Max Stage ft. NAVD88	High Water Mark Elevation (ft, NAVD 88)
Z1550	NZ1550	100 YR - 1 Day		AE	21.71	21.84	
Z1560	NZ1560	100 YR - 1 Day		AE	21.28	21.66	
Z1570	NZ1570	100 YR - 1 Day		AE	20.29	21.31	
Z2010	NZ2010	100 YR - 1 Day		AE	21.36	21.37	
Z2020	NZ2020	100 YR - 1 Day		AE	20.84	21.37	
Z2310	NZ2310	100 YR - 1 Day		AE	20.90	21.39	
Z2320	NZ2320	100 YR - 1 Day		AE	20.89	21.38	
Z2710	NZ2710	100 YR - 1 Day		AE	20.69	21.41	
Z2720	NZ2720	100 YR - 1 Day		AE	20.60	21.37	
Z2740	NZ2740	100 YR - 1 Day		AE	20.33	21.37	
Z2750	NZ2750	100 YR - 1 Day		AE	20.30	21.32	
Z2760	NZ2760	100 YR - 1 Day		AE	20.29	21.30	
Z3010	NZ3010	100 YR - 1 Day		AE	20.86	21.46	
Z3020	NZ3020	100 YR - 1 Day		AE	20.86	21.47	
Z3030	NZ3030	100 YR - 1 Day		AE	20.78	21.44	
Z3040	NZ3040	100 YR - 1 Day		AE	20.78	21.43	
Z3050	NZ3050	100 YR - 1 Day		AE	20.76	21.33	
Z3060	NZ3060	100 YR - 1 Day		AE	20.26	21.18	

Appendix B

Floodplain Comparison Table

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
A0020	3.02	0.10	0.00	0.10	-	3.15	No detailed FEMA Floodplain data available for this area.
A0021	1.22	0.09	0.00	0.09	-	7.73	No detailed FEMA Floodplain data available for this area.
A0022	15.24	1.83	0.00	1.83	-	12.02	No detailed FEMA Floodplain data available for this area.
A0023	8.91	0.44	0.00	0.44	-	4.93	No detailed FEMA Floodplain data available for this area.
A0024	8.52	0.15	0.00	0.15	-	1.78	No detailed FEMA Floodplain data available for this area.
A0026	8.64	0.21	0.00	0.21	-	2.45	No detailed FEMA Floodplain data available for this area.
A0028	15.24	1.38	0.00	1.38	-	9.04	No detailed FEMA Floodplain data available for this area.
A0030	8.92	1.62	0.00	1.62	-	18.21	No detailed FEMA Floodplain data available for this area.
A0035	1.96	0.16	0.00	0.16	-	8.35	No detailed FEMA Floodplain data available for this area.
A0040	2.65	0.76	0.00	0.76	-	28.84	No detailed FEMA Floodplain data available for this area.
A0050	3.50	0.48	0.00	0.48	-	13.78	No detailed FEMA Floodplain data available for this area.
A0055	7.68	0.50	0.00	0.50	-	6.52	No detailed FEMA Floodplain data available for this area.
A0060	2.53	1.23	0.00	1.23	-	48.70	No detailed FEMA Floodplain data available for this area.
A0063	20.72	0.28	0.00	0.28	-	1.35	No detailed FEMA Floodplain data available for this area.
A0066	8.76	0.14	0.00	0.14	-	1.65	No detailed FEMA Floodplain data available for this area.
A0070	2.87	1.33	0.00	1.33	-	46.20	No detailed FEMA Floodplain data available for this area.
A0073	19.19	3.00	0.00	3.00	-	15.65	No detailed FEMA Floodplain data available for this area.
A0077	10.84	1.21	0.00	1.21	-	11.12	No detailed FEMA Floodplain data available for this area.
A0080	2.95	1.52	0.00	1.52	-	51.60	No detailed FEMA Floodplain data available for this area.
A0085	11.39	0.16	0.00	0.16	-	1.42	No detailed FEMA Floodplain data available for this area.
A0090	4.30	1.87	0.00	1.87	-	43.50	No detailed FEMA Floodplain data available for this area.
A0092	10.08	0.53	0.00	0.53	-	5.22	No detailed FEMA Floodplain data available for this area.
A0097	20.80	0.42	0.00	0.42	-	2.02	No detailed FEMA Floodplain data available for this area.
A0098	11.24	1.24	0.00	1.24	-	11.05	No detailed FEMA Floodplain data available for this area.
A0100	4.42	2.51	0.00	2.51	-	56.73	No detailed FEMA Floodplain data available for this area.
A0102	6.30	0.21	0.00	0.21	-	3.30	No detailed FEMA Floodplain data available for this area.
A0103	14.59	0.24	0.00	0.24	-	1.63	No detailed FEMA Floodplain data available for this area.
A0106	21.87	0.74	0.00	0.74	-	3.37	No detailed FEMA Floodplain data available for this area.
A0107	0.82	0.26	0.00	0.26	-	31.43	No detailed FEMA Floodplain data available for this area.
A0108	6.97	0.13	0.00	0.13	-	1.89	No detailed FEMA Floodplain data available for this area.
A0110	6.24	2.54	0.00	2.54	-	40.67	No detailed FEMA Floodplain data available for this area.
A0113	13.25	0.32	0.00	0.32	-	2.38	No detailed FEMA Floodplain data available for this area.
A0116	15.22	0.22	0.00	0.22	-	1.42	No detailed FEMA Floodplain data available for this area.
A0120	6.96	2.19	0.00	2.19	-	31.44	No detailed FEMA Floodplain data available for this area.
A0125	19.18	0.37	0.00	0.37	-	1.94	No detailed FEMA Floodplain data available for this area.
A0130	7.32	2.57	0.00	2.57	-	35.07	No detailed FEMA Floodplain data available for this area.
A0132	28.62	1.92	0.00	1.92	-	6.72	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
A0135	5.42	0.12	0.00	0.12	-	2.28	No detailed FEMA Floodplain data available for this area.
A0139	9.55	0.15	0.00	0.15	-	1.59	No detailed FEMA Floodplain data available for this area.
A0140	4.00	1.95	0.00	1.95	-	48.72	No detailed FEMA Floodplain data available for this area.
A1010	1.50	0.17	0.00	0.17	-	11.60	No detailed FEMA Floodplain data available for this area.
A1020	9.17	0.65	0.00	0.65	-	7.04	No detailed FEMA Floodplain data available for this area.
A1030	7.86	0.91	0.00	0.91	-	11.57	No detailed FEMA Floodplain data available for this area.
A1040	4.77	0.40	0.00	0.40	-	8.46	No detailed FEMA Floodplain data available for this area.
A1050	1.36	0.08	0.00	0.08	-	6.04	No detailed FEMA Floodplain data available for this area.
A2010	6.80	1.73	0.00	1.73	-	25.44	No detailed FEMA Floodplain data available for this area.
A2020	14.01	2.91	0.00	2.91	-	20.76	No detailed FEMA Floodplain data available for this area.
A2023	3.24	0.17	0.00	0.17	-	5.29	No detailed FEMA Floodplain data available for this area.
A2027	5.48	0.73	0.00	0.73	-	13.34	No detailed FEMA Floodplain data available for this area.
A2028	1.47	0.45	0.00	0.45	-	30.51	No detailed FEMA Floodplain data available for this area.
A2030	19.84	1.00	0.00	1.00	-	5.02	No detailed FEMA Floodplain data available for this area.
A2040	6.54	0.87	0.00	0.87	-	13.30	No detailed FEMA Floodplain data available for this area.
A2050	10.41	0.98	0.00	0.98	-	9.38	No detailed FEMA Floodplain data available for this area.
A2060	0.97	0.39	0.00	0.39	-	39.92	No detailed FEMA Floodplain data available for this area.
A3010	15.02	0.55	0.00	0.55	-	3.68	No detailed FEMA Floodplain data available for this area.
A3020	36.00	5.20	0.00	5.20	-	14.43	No detailed FEMA Floodplain data available for this area.
A3030	15.01	1.71	0.00	1.71	-	11.38	No detailed FEMA Floodplain data available for this area.
A3040	5.79	0.76	0.00	0.76	-	13.15	No detailed FEMA Floodplain data available for this area.
A3050	2.66	0.51	0.00	0.51	-	19.26	No detailed FEMA Floodplain data available for this area.
A3060	0.33	0.20	0.00	0.20	-	61.64	No detailed FEMA Floodplain data available for this area.
B0630	0.22	0.21	0.02	0.19	1178.53	88.90	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0640	2.25	2.25	2.22	0.03	1.27	1.25	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0650	1.96	1.96	1.96	0.00	0.00	0.00	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0660	8.61	8.61	8.61	0.00	0.00	0.00	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0664	15.82	15.82	15.82	0.00	0.00	0.00	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0670	35.59	35.59	35.59	0.00	0.00	0.00	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0680	58.50	57.83	58.50	0.67	1.14	1.14	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0681	4.95	1.55	0.00	1.55	-	31.27	No detailed FEMA Floodplain data available for this area.
B0682	23.66	13.85	0.00	13.85	-	58.53	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0685	3.84	3.84	0.37	3.47	940.66	90.39	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0688	18.94	18.94	13.95	4.99	35.78	26.35	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0689	0.25	0.25	0.25	0.00	0.00	0.00	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0690	37.15	37.06	36.59	0.47	1.28	1.26	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0700	4.98	4.54	4.98	0.44	8.86	8.86	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
B0880	3.94	3.73	3.89	0.16	4.14	4.09	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0886	1.89	1.85	1.42	0.43	29.90	22.46	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0888	0.93	0.90	0.70	0.21	29.62	22.22	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0890	1.94	1.75	1.05	0.70	66.76	35.96	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0905	8.50	7.53	0.00	7.53	-	88.54	No detailed FEMA Floodplain data available for this area.
B0907	14.17	0.62	0.00	0.62	-	4.38	No detailed FEMA Floodplain data available for this area.
B0910	4.02	3.85	3.20	0.65	20.16	16.06	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0920	2.09	1.97	1.34	0.63	46.75	30.02	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0930	1.05	0.79	0.43	0.36	84.03	34.54	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0931	0.23	0.06	0.00	0.06	-	27.18	No detailed FEMA Floodplain data available for this area.
B0934	0.70	0.62	0.00	0.62	-	88.87	No detailed FEMA Floodplain data available for this area.
B0935	8.05	2.75	0.00	2.75	-	34.19	No detailed FEMA Floodplain data available for this area.
B0936	0.53	0.44	0.00	0.44	-	82.38	No detailed FEMA Floodplain data available for this area.
B0938	1.11	0.28	0.00	0.28	-	25.33	No detailed FEMA Floodplain data available for this area.
B0940	0.79	0.65	0.05	0.60	1207.95	75.36	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0943	1.56	0.27	0.00	0.27	-	17.28	No detailed FEMA Floodplain data available for this area.
B0945	6.85	1.14	0.00	1.14	-	16.58	No detailed FEMA Floodplain data available for this area.
B0950	3.22	2.33	0.19	2.14	1131.65	66.47	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0960	6.69	4.28	1.09	3.19	292.51	47.67	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0963	1.04	0.88	0.24	0.64	267.53	61.06	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0965	17.79	3.46	0.00	3.46	-	19.46	No detailed FEMA Floodplain data available for this area.
B0970	5.62	5.09	1.99	3.10	155.84	55.12	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0980	9.82	6.77	2.05	4.72	229.84	48.05	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B0985	18.59	4.26	0.13	4.13	3179.63	22.20	No detailed FEMA Floodplain data available for this area.
B0990	6.73	5.97	1.34	4.63	344.81	68.71	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B1000	6.81	3.77	0.01	3.76	32715.55	55.18	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B1010	2.81	2.49	0.05	2.43	4612.77	86.72	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B1020	6.16	5.82	1.29	4.54	353.11	73.68	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B1030	10.16	6.37	7.18	0.81	11.31	7.99	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B1060	12.58	9.70	9.77	0.07	0.74	0.58	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B1065	7.15	1.87	0.00	1.87	-	26.08	No detailed FEMA Floodplain data available for this area.
B1070	37.47	7.92	4.53	3.39	74.78	9.04	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B1110	4.80	1.45	4.80	3.35	69.77	69.77	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B1120	10.89	4.64	10.89	6.25	57.36	57.36	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B1130	4.86	1.86	4.86	2.99	61.68	61.68	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B1140	7.02	5.02	7.02	2.00	28.54	28.54	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B1145	5.06	1.84	5.06	3.22	63.62	63.62	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.

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Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
B4338	1.37	0.44	0.00	0.44	-	32.42	No detailed FEMA Floodplain data available for this area.
B4339	1.58	0.58	0.00	0.58	-	36.34	No detailed FEMA Floodplain data available for this area.
B4340	5.93	1.52	0.00	1.52	-	25.60	No detailed FEMA Floodplain data available for this area.
B4344	41.19	38.53	2.29	36.24	1580.23	87.99	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4345	0.80	0.64	0.00	0.64	-	79.13	No detailed FEMA Floodplain data available for this area.
B4346	1.16	0.35	0.00	0.35	-	29.76	No detailed FEMA Floodplain data available for this area.
B4350	2.22	0.58	0.00	0.58	-	26.00	No detailed FEMA Floodplain data available for this area.
B4355	22.55	6.12	0.00	6.12	-	27.14	No detailed FEMA Floodplain data available for this area.
B4410	9.79	2.75	0.00	2.75	-	28.14	No detailed FEMA Floodplain data available for this area.
B4422	3.58	1.12	0.00	1.12	-	31.34	No detailed FEMA Floodplain data available for this area.
B4424	7.63	2.14	0.00	2.14	-	28.11	No detailed FEMA Floodplain data available for this area.
B4426	2.03	0.79	0.00	0.79	-	39.00	No detailed FEMA Floodplain data available for this area.
B4430	18.62	7.68	0.00	7.68	-	41.23	No detailed FEMA Floodplain data available for this area.
B4440	23.69	8.26	0.00	8.26	-	34.87	No detailed FEMA Floodplain data available for this area.
B4452	6.17	1.34	0.00	1.34	-	21.76	No detailed FEMA Floodplain data available for this area.
B4454	13.36	3.24	0.00	3.24	-	24.23	No detailed FEMA Floodplain data available for this area.
B4458	30.92	7.53	0.00	7.53	-	24.35	No detailed FEMA Floodplain data available for this area.
B4460	4.10	1.48	0.00	1.48	-	36.22	No detailed FEMA Floodplain data available for this area.
B4510	35.40	13.62	0.00	13.62	-	38.48	No detailed FEMA Floodplain data available for this area.
B4524	7.10	6.95	7.10	0.15	2.11	2.11	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4525	2.59	0.65	0.00	0.65	-	25.14	No detailed FEMA Floodplain data available for this area.
B4526	13.25	12.12	8.24	3.88	47.03	29.26	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4527	1.07	0.53	0.00	0.53	-	49.02	No detailed FEMA Floodplain data available for this area.
B4529	5.79	5.64	4.35	1.30	29.84	22.41	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4530	0.37	0.37	0.36	0.00	0.20	0.20	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4531	13.68	13.27	9.03	4.24	47.01	31.01	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4533	0.70	0.70	0.70	0.00	0.00	0.00	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4535	2.46	2.46	2.46	0.00	0.00	0.00	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4537	0.22	0.22	0.22	0.00	0.00	0.00	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4539	1.00	1.00	1.00	0.00	0.00	0.00	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4540	10.04	9.99	8.01	1.97	24.64	19.66	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4541	1.40	1.32	1.16	0.16	13.64	11.25	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4542	0.18	0.18	0.14	0.04	26.75	21.11	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4543	1.44	1.44	1.26	0.17	13.55	11.93	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4544	1.49	1.49	1.41	0.08	5.42	5.14	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4545	2.17	1.95	2.17	0.21	9.82	9.83	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4546	3.52	3.35	3.52	0.18	5.08	5.08	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
B4547	0.74	0.74	0.74	0.00	0.00	0.00	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4548	2.16	2.16	2.16	0.00	0.00	0.00	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4549	0.91	0.91	0.89	0.02	1.91	1.87	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4550	0.62	0.62	0.62	0.00	0.00	0.00	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4551	3.84	3.84	3.84	0.00	0.00	0.00	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4560	0.13	0.13	0.13	0.00	0.00	0.00	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4702	9.08	0.62	0.22	0.40	183.89	4.44	No detailed FEMA Floodplain data available for this area.
B4703	5.55	0.81	0.74	0.07	9.79	1.31	No detailed FEMA Floodplain data available for this area.
B4706	20.47	0.99	0.00	0.99	-	4.82	No detailed FEMA Floodplain data available for this area.
B4707	4.99	0.86	0.00	0.86	-	17.18	No detailed FEMA Floodplain data available for this area.
B4708	0.94	0.30	0.00	0.30	-	31.57	No detailed FEMA Floodplain data available for this area.
B4709	2.37	0.39	0.00	0.39	-	16.63	No detailed FEMA Floodplain data available for this area.
B4720	0.96	0.23	0.00	0.23	-	23.54	No detailed FEMA Floodplain data available for this area.
B4735	7.45	0.70	0.00	0.70	-	9.43	No detailed FEMA Floodplain data available for this area.
B4740	9.59	1.14	0.00	1.14	-	11.93	No detailed FEMA Floodplain data available for this area.
B4750	6.03	0.73	0.00	0.73	-	12.14	No detailed FEMA Floodplain data available for this area.
B4810	11.63	1.83	0.00	1.83	-	15.77	No detailed FEMA Floodplain data available for this area.
B4820	21.88	2.97	0.00	2.97	-	13.59	No detailed FEMA Floodplain data available for this area.
B4830	19.86	3.60	0.00	3.60	-	18.12	No detailed FEMA Floodplain data available for this area.
B4845	13.00	1.71	10.39	8.69	83.59	66.85	No detailed FEMA Floodplain data available for this area.
B4850	47.00	6.00	8.25	2.25	27.30	4.79	No detailed FEMA Floodplain data available for this area.
B4851	16.01	4.29	15.89	11.60	72.98	72.43	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4852	9.55	3.16	1.73	1.42	82.11	14.91	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4853	1.82	0.09	0.00	0.09	-	4.71	No detailed FEMA Floodplain data available for this area.
B4854	4.26	1.56	4.26	2.70	63.45	63.45	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4855	2.39	0.76	2.39	1.63	68.16	67.97	No detailed FEMA Floodplain data available for this area.
B4856	0.79	0.15	0.51	0.36	70.52	45.48	No detailed FEMA Floodplain data available for this area.
B4857	0.52	0.21	0.00	0.21	-	40.66	No detailed FEMA Floodplain data available for this area.
B4858	1.36	0.86	0.17	0.68	396.15	50.15	No detailed FEMA Floodplain data available for this area.
B4859	0.52	0.27	0.00	0.27	-	52.01	No detailed FEMA Floodplain data available for this area.
B4860	25.30	8.67	0.00	8.67	-	34.27	No detailed FEMA Floodplain data available for this area.
B4870	13.87	4.42	0.05	4.37	8817.57	31.53	No detailed FEMA Floodplain data available for this area.
B4880	0.23	0.07	0.23	0.16	69.91	69.91	No detailed FEMA Floodplain data available for this area.
B4882	1.31	0.47	1.31	0.84	64.22	64.22	No detailed FEMA Floodplain data available for this area.
B4883	2.76	0.41	0.59	0.18	30.66	6.55	No detailed FEMA Floodplain data available for this area.
B4884	0.54	0.00	0.54	0.54	100.00	100.00	No detailed FEMA Floodplain data available for this area.
B4885	2.79	1.02	2.79	1.78	63.62	63.62	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.

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B4890	0.32	0.19	0.32	0.13	41.31	41.31	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4895	3.07	0.63	0.00	0.63	-	20.59	No detailed FEMA Floodplain data available for this area.
B4896	1.32	0.00	0.28	0.28	100.00	20.90	No detailed FEMA Floodplain data available for this area.
B4897	3.24	0.43	0.86	0.43	50.56	13.43	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4900	9.36	3.28	9.08	5.80	63.87	61.99	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4910	9.07	3.54	9.07	5.54	61.00	61.00	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4920	48.36	37.11	48.36	11.24	23.25	23.25	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B4930	0.60	0.60	0.60	0.00	0.00	0.00	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B5010	20.91	2.91	0.00	2.91	-	13.92	No detailed FEMA Floodplain data available for this area.
B5025	9.22	1.11	0.00	1.11	-	12.08	No detailed FEMA Floodplain data available for this area.
B5030	19.33	5.03	0.00	5.03	-	26.03	No detailed FEMA Floodplain data available for this area.
B5040	5.27	1.60	0.00	1.60	-	30.29	No detailed FEMA Floodplain data available for this area.
B5110	8.54	1.60	0.00	1.60	-	18.68	No detailed FEMA Floodplain data available for this area.
B5115	6.59	1.59	0.00	1.59	-	24.14	No detailed FEMA Floodplain data available for this area.
B5120	1.37	0.47	0.00	0.47	-	34.03	No detailed FEMA Floodplain data available for this area.
B5130	9.48	1.41	0.00	1.41	-	14.88	No detailed FEMA Floodplain data available for this area.
B5132	13.77	2.02	0.00	2.02	-	14.67	No detailed FEMA Floodplain data available for this area.
B5135	4.10	0.89	0.00	0.89	-	21.73	No detailed FEMA Floodplain data available for this area.
B5138	2.94	0.51	0.00	0.51	-	17.27	No detailed FEMA Floodplain data available for this area.
B5140	1.16	0.61	0.00	0.61	-	52.21	No detailed FEMA Floodplain data available for this area.
B5145	15.12	2.94	0.00	2.94	-	19.48	No detailed FEMA Floodplain data available for this area.
B5150	2.31	0.86	0.00	0.86	-	37.17	No detailed FEMA Floodplain data available for this area.
B5160	7.66	0.98	0.00	0.98	-	12.76	No detailed FEMA Floodplain data available for this area.
B5170	11.33	1.75	0.00	1.75	-	15.42	No detailed FEMA Floodplain data available for this area.
B5190	28.05	6.05	0.00	6.05	-	21.58	No detailed FEMA Floodplain data available for this area.
B5195	14.26	3.36	0.00	3.36	-	23.54	No detailed FEMA Floodplain data available for this area.
B5210	14.95	3.59	0.00	3.59	-	24.02	No detailed FEMA Floodplain data available for this area.
B5212	1.19	0.41	0.00	0.41	-	34.35	No detailed FEMA Floodplain data available for this area.
B5315	21.23	1.64	0.00	1.64	-	7.74	No detailed FEMA Floodplain data available for this area.
B5317	1.75	0.25	0.00	0.25	-	13.99	No detailed FEMA Floodplain data available for this area.
B5320	11.91	3.08	0.00	3.08	-	25.86	No detailed FEMA Floodplain data available for this area.
B5325	12.98	1.14	0.00	1.14	-	8.77	No detailed FEMA Floodplain data available for this area.
B5327	1.31	0.24	0.00	0.24	-	18.73	No detailed FEMA Floodplain data available for this area.
B5330	10.14	2.65	0.00	2.65	-	26.16	No detailed FEMA Floodplain data available for this area.
B5332	12.42	2.46	0.00	2.46	-	19.81	No detailed FEMA Floodplain data available for this area.
B5338	30.48	8.97	0.00	8.97	-	29.42	No detailed FEMA Floodplain data available for this area.
B5339	1.00	0.48	0.00	0.48	-	47.83	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
B5340	10.42	2.71	0.00	2.71	-	25.96	No detailed FEMA Floodplain data available for this area.
B5360	26.04	5.06	0.00	5.06	-	19.44	No detailed FEMA Floodplain data available for this area.
B5375	17.31	4.30	0.00	4.30	-	24.83	No detailed FEMA Floodplain data available for this area.
B5377	0.28	0.15	0.00	0.15	-	55.59	No detailed FEMA Floodplain data available for this area.
B5380	16.92	5.20	0.00	5.20	-	30.71	No detailed FEMA Floodplain data available for this area.
B5390	9.21	2.88	0.00	2.88	-	31.30	No detailed FEMA Floodplain data available for this area.
B5400	5.76	1.87	0.00	1.87	-	32.48	No detailed FEMA Floodplain data available for this area.
B5410	16.49	1.75	0.00	1.75	-	10.63	No detailed FEMA Floodplain data available for this area.
B5420	12.58	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
B5440	14.36	0.82	0.00	0.82	-	5.72	No detailed FEMA Floodplain data available for this area.
B5450	10.10	1.64	0.00	1.64	-	16.25	No detailed FEMA Floodplain data available for this area.
B5453	24.15	0.69	0.00	0.69	-	2.85	No detailed FEMA Floodplain data available for this area.
B5455	7.28	0.56	0.00	0.56	-	7.74	No detailed FEMA Floodplain data available for this area.
B5457	3.73	0.18	0.00	0.18	-	4.89	No detailed FEMA Floodplain data available for this area.
B5470	22.95	2.35	0.00	2.35	-	10.25	No detailed FEMA Floodplain data available for this area.
B5480	20.86	0.79	1.48	0.68	46.19	3.27	No detailed FEMA Floodplain data available for this area.
B5490	15.58	5.47	10.86	5.39	49.62	34.58	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B5510	4.70	4.70	4.70	0.00	0.00	0.00	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B5590	0.48	0.47	0.00	0.47	-	99.07	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B5610	0.75	0.06	0.00	0.06	-	8.20	No detailed FEMA Floodplain data available for this area.
B5613	0.37	0.03	0.00	0.03	-	7.02	No detailed FEMA Floodplain data available for this area.
B5617	0.96	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
B5620	2.41	0.62	0.00	0.62	-	25.56	No detailed FEMA Floodplain data available for this area.
B5630	2.93	0.96	0.00	0.96	-	32.93	No detailed FEMA Floodplain data available for this area.
B5635	4.90	1.29	0.00	1.29	-	26.31	No detailed FEMA Floodplain data available for this area.
B5640	24.44	3.15	0.00	3.15	-	12.90	No detailed FEMA Floodplain data available for this area.
B5642	3.23	0.40	0.00	0.40	-	12.44	No detailed FEMA Floodplain data available for this area.
B5644	2.68	0.25	0.00	0.25	-	9.27	No detailed FEMA Floodplain data available for this area.
B5646	4.00	0.44	0.00	0.44	-	10.87	No detailed FEMA Floodplain data available for this area.
B5650	0.19	0.03	0.00	0.03	-	14.98	No detailed FEMA Floodplain data available for this area.
B5655	0.13	0.06	0.00	0.06	-	44.63	No detailed FEMA Floodplain data available for this area.
B5660	1.78	0.56	0.00	0.56	-	31.31	No detailed FEMA Floodplain data available for this area.
B5663	0.52	0.03	0.00	0.03	-	5.30	No detailed FEMA Floodplain data available for this area.
B5667	2.53	0.57	0.00	0.57	-	22.64	No detailed FEMA Floodplain data available for this area.
B5670	1.05	0.40	0.00	0.40	-	38.26	No detailed FEMA Floodplain data available for this area.
B5675	33.69	1.19	0.50	0.69	136.83	2.04	No detailed FEMA Floodplain data available for this area.
B5676	1.79	1.00	0.80	0.20	25.44	11.40	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.

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B5680	84.48	23.81	72.08	48.27	66.97	57.13	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B5690	20.66	15.54	20.66	5.12	24.79	24.79	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B5695	2.97	2.97	2.48	0.49	19.60	16.39	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B6010	20.64	0.42	0.00	0.42	-	2.05	No detailed FEMA Floodplain data available for this area.
B6015	6.89	0.11	0.00	0.11	-	1.54	No detailed FEMA Floodplain data available for this area.
B6020	17.14	0.68	0.00	0.68	-	3.97	No detailed FEMA Floodplain data available for this area.
B6030	1.22	0.18	0.00	0.18	-	15.04	No detailed FEMA Floodplain data available for this area.
B6110	59.57	6.02	0.00	6.02	-	10.11	No detailed FEMA Floodplain data available for this area.
B6116	14.09	0.85	0.00	0.85	-	6.05	No detailed FEMA Floodplain data available for this area.
B6118	0.97	0.07	0.00	0.07	-	7.13	No detailed FEMA Floodplain data available for this area.
B6119	0.81	0.13	0.00	0.13	-	16.30	No detailed FEMA Floodplain data available for this area.
B6120	5.31	1.06	0.00	1.06	-	20.02	No detailed FEMA Floodplain data available for this area.
B6130	1.65	0.50	0.00	0.50	-	30.07	No detailed FEMA Floodplain data available for this area.
B6210	30.69	5.83	0.00	5.83	-	19.00	No detailed FEMA Floodplain data available for this area.
B6220	0.96	0.24	0.00	0.24	-	25.46	No detailed FEMA Floodplain data available for this area.
B6310	15.70	0.74	0.00	0.74	-	4.70	No detailed FEMA Floodplain data available for this area.
B6320	42.99	1.46	0.00	1.46	-	3.40	No detailed FEMA Floodplain data available for this area.
B6330	14.56	1.91	0.00	1.91	-	13.08	No detailed FEMA Floodplain data available for this area.
B6340	17.34	3.15	0.00	3.15	-	18.17	No detailed FEMA Floodplain data available for this area.
B6355	16.33	3.61	0.00	3.61	-	22.09	No detailed FEMA Floodplain data available for this area.
B6359	26.31	5.81	0.00	5.81	-	22.07	No detailed FEMA Floodplain data available for this area.
B6360	30.68	4.68	0.00	4.68	-	15.27	No detailed FEMA Floodplain data available for this area.
B6370	39.85	3.35	0.00	3.35	-	8.40	No detailed FEMA Floodplain data available for this area.
B6385	27.50	1.72	0.00	1.72	-	6.24	No detailed FEMA Floodplain data available for this area.
B6387	1.10	0.35	0.00	0.35	-	32.09	No detailed FEMA Floodplain data available for this area.
B6390	28.15	6.23	0.00	6.23	-	22.14	No detailed FEMA Floodplain data available for this area.
B6393	16.44	2.08	0.00	2.08	-	12.64	No detailed FEMA Floodplain data available for this area.
B6395	6.24	2.66	0.00	2.66	-	42.72	No detailed FEMA Floodplain data available for this area.
B6400	18.02	4.06	0.00	4.06	-	22.55	No detailed FEMA Floodplain data available for this area.
B6403	16.31	6.82	0.00	6.82	-	41.78	No detailed FEMA Floodplain data available for this area.
B6405	8.11	3.68	0.00	3.68	-	45.34	No detailed FEMA Floodplain data available for this area.
B6410	11.73	3.70	0.00	3.70	-	31.54	No detailed FEMA Floodplain data available for this area.
B6510	16.68	1.77	0.00	1.77	-	10.59	No detailed FEMA Floodplain data available for this area.
B6520	24.38	4.02	0.00	4.02	-	16.48	No detailed FEMA Floodplain data available for this area.
B6540	23.63	2.67	0.00	2.67	-	11.29	No detailed FEMA Floodplain data available for this area.
B6550	15.47	2.79	0.00	2.79	-	18.06	No detailed FEMA Floodplain data available for this area.
B6552	35.83	1.35	0.00	1.35	-	3.78	No detailed FEMA Floodplain data available for this area.

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B6555	16.20	1.86	0.00	1.86	-	11.51	No detailed FEMA Floodplain data available for this area.
B6558	12.79	0.92	0.00	0.92	-	7.23	No detailed FEMA Floodplain data available for this area.
B6559	9.20	0.64	0.00	0.64	-	6.92	No detailed FEMA Floodplain data available for this area.
B6560	9.47	2.00	0.00	2.00	-	21.12	No detailed FEMA Floodplain data available for this area.
B6565	43.12	4.63	0.00	4.63	-	10.73	No detailed FEMA Floodplain data available for this area.
B6568	1.33	0.40	0.00	0.40	-	30.10	No detailed FEMA Floodplain data available for this area.
B6570	1.90	0.61	0.00	0.61	-	32.15	No detailed FEMA Floodplain data available for this area.
B6580	14.49	2.51	0.00	2.51	-	17.33	No detailed FEMA Floodplain data available for this area.
B6585	36.56	2.17	0.00	2.17	-	5.94	No detailed FEMA Floodplain data available for this area.
B6590	18.69	1.15	2.28	1.13	49.66	6.06	No detailed FEMA Floodplain data available for this area.
B6595	32.43	1.41	0.00	1.41	-	4.35	No detailed FEMA Floodplain data available for this area.
B6598	16.38	0.56	0.00	0.56	-	3.40	No detailed FEMA Floodplain data available for this area.
B6600	37.66	3.97	20.52	16.55	80.67	43.94	No detailed FEMA Floodplain data available for this area.
B6610	68.35	8.79	1.91	6.88	360.18	10.07	No detailed FEMA Floodplain data available for this area.
B6620	3.93	2.03	0.00	2.03	-	51.58	No detailed FEMA Floodplain data available for this area.
B6623	10.13	2.94	0.00	2.94	-	29.04	No detailed FEMA Floodplain data available for this area.
B6625	1.69	0.03	0.00	0.03	-	1.63	No detailed FEMA Floodplain data available for this area.
B6630	15.03	2.53	1.20	1.32	109.95	8.81	No detailed FEMA Floodplain data available for this area.
B6640	2.44	1.87	2.25	0.38	16.75	15.43	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B7002	5.91	1.41	0.00	1.41	-	23.91	No detailed FEMA Floodplain data available for this area.
B7004	23.86	3.08	0.00	3.08	-	12.89	No detailed FEMA Floodplain data available for this area.
B7005	1.24	0.86	0.00	0.86	-	69.43	No detailed FEMA Floodplain data available for this area.
B7010	4.81	0.39	0.00	0.39	-	8.10	No detailed FEMA Floodplain data available for this area.
B7110	24.14	0.87	0.00	0.87	-	3.60	No detailed FEMA Floodplain data available for this area.
B7210	2.81	0.36	0.00	0.36	-	12.95	No detailed FEMA Floodplain data available for this area.
B7223	0.73	0.47	0.00	0.47	-	64.32	No detailed FEMA Floodplain data available for this area.
B7227	0.50	0.16	0.00	0.16	-	32.36	No detailed FEMA Floodplain data available for this area.
B7230	2.63	1.18	0.00	1.18	-	44.93	No detailed FEMA Floodplain data available for this area.
B7240	10.50	2.58	0.00	2.58	-	24.63	No detailed FEMA Floodplain data available for this area.
B7250	21.97	2.87	0.00	2.87	-	13.08	No detailed FEMA Floodplain data available for this area.
B7260	2.16	0.50	0.00	0.50	-	23.29	No detailed FEMA Floodplain data available for this area.
B7320	2.46	0.76	0.00	0.76	-	30.77	No detailed FEMA Floodplain data available for this area.
B7330	10.92	1.92	0.00	1.92	-	17.55	No detailed FEMA Floodplain data available for this area.
B7335	1.22	0.14	0.00	0.14	-	11.20	No detailed FEMA Floodplain data available for this area.
B7340	4.91	1.43	0.00	1.43	-	29.15	No detailed FEMA Floodplain data available for this area.
B7350	3.02	0.68	0.00	0.68	-	22.59	No detailed FEMA Floodplain data available for this area.
B7360	9.81	1.26	0.00	1.26	-	12.84	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
B7410	5.81	0.23	0.00	0.23	-	3.88	No detailed FEMA Floodplain data available for this area.
B7420	10.68	0.49	0.00	0.49	-	4.61	No detailed FEMA Floodplain data available for this area.
B7430	3.78	0.93	0.00	0.93	-	24.61	No detailed FEMA Floodplain data available for this area.
B7440	3.72	0.72	0.00	0.72	-	19.26	No detailed FEMA Floodplain data available for this area.
B7450	18.30	4.84	0.00	4.84	-	26.47	No detailed FEMA Floodplain data available for this area.
B7460	11.21	2.23	0.00	2.23	-	19.90	No detailed FEMA Floodplain data available for this area.
B7470	16.87	4.54	0.00	4.54	-	26.93	No detailed FEMA Floodplain data available for this area.
B7510	21.04	4.64	0.00	4.64	-	22.04	No detailed FEMA Floodplain data available for this area.
B7512	11.75	3.10	0.00	3.10	-	26.35	No detailed FEMA Floodplain data available for this area.
B7520	61.59	2.01	0.00	2.01	-	3.27	No detailed FEMA Floodplain data available for this area.
B8005	6.45	0.94	0.00	0.94	-	14.65	No detailed FEMA Floodplain data available for this area.
B8010	5.18	0.41	0.00	0.41	-	7.96	No detailed FEMA Floodplain data available for this area.
B8011	13.08	2.80	0.00	2.80	-	21.41	No detailed FEMA Floodplain data available for this area.
B8012	43.95	0.32	0.00	0.32	-	0.73	No detailed FEMA Floodplain data available for this area.
B8014	0.47	0.20	0.00	0.20	-	42.20	No detailed FEMA Floodplain data available for this area.
B8015	4.64	0.31	0.00	0.31	-	6.58	No detailed FEMA Floodplain data available for this area.
B8018	2.95	0.56	0.00	0.56	-	19.13	No detailed FEMA Floodplain data available for this area.
B8020	3.80	0.98	0.00	0.98	-	25.71	No detailed FEMA Floodplain data available for this area.
B8030	7.21	1.96	0.00	1.96	-	27.16	No detailed FEMA Floodplain data available for this area.
B8040	1.78	0.55	0.00	0.55	-	30.93	No detailed FEMA Floodplain data available for this area.
B8110	4.68	0.13	0.00	0.13	-	2.76	No detailed FEMA Floodplain data available for this area.
B8120	10.97	0.82	0.00	0.82	-	7.52	No detailed FEMA Floodplain data available for this area.
B8130	10.47	1.33	0.00	1.33	-	12.74	No detailed FEMA Floodplain data available for this area.
B8140	13.52	1.40	0.00	1.40	-	10.38	No detailed FEMA Floodplain data available for this area.
B8150	0.87	0.32	0.00	0.32	-	36.94	No detailed FEMA Floodplain data available for this area.
B8210	6.70	0.71	0.00	0.71	-	10.66	No detailed FEMA Floodplain data available for this area.
B8220	3.29	0.44	0.00	0.44	-	13.45	No detailed FEMA Floodplain data available for this area.
B8230	7.04	0.54	0.00	0.54	-	7.63	No detailed FEMA Floodplain data available for this area.
B8240	4.28	0.37	0.00	0.37	-	8.55	No detailed FEMA Floodplain data available for this area.
B8250	6.74	0.73	0.00	0.73	-	10.79	No detailed FEMA Floodplain data available for this area.
B8260	22.27	1.73	0.00	1.73	-	7.78	No detailed FEMA Floodplain data available for this area.
B8270	3.59	0.31	0.00	0.31	-	8.60	No detailed FEMA Floodplain data available for this area.
B8310	4.90	0.46	0.00	0.46	-	9.32	No detailed FEMA Floodplain data available for this area.
B8320	3.05	0.29	0.00	0.29	-	9.37	No detailed FEMA Floodplain data available for this area.
B8323	2.85	0.25	0.00	0.25	-	8.81	No detailed FEMA Floodplain data available for this area.
B8327	4.59	0.50	0.00	0.50	-	10.95	No detailed FEMA Floodplain data available for this area.
B8330	3.33	0.64	0.00	0.64	-	19.14	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
B8340	17.06	1.07	0.00	1.07	-	6.28	No detailed FEMA Floodplain data available for this area.
B8350	4.15	0.33	0.00	0.33	-	8.01	No detailed FEMA Floodplain data available for this area.
B8360	3.96	0.37	0.00	0.37	-	9.45	No detailed FEMA Floodplain data available for this area.
B8370	1.70	0.57	0.00	0.57	-	33.79	No detailed FEMA Floodplain data available for this area.
B8380	12.91	2.18	0.00	2.18	-	16.90	No detailed FEMA Floodplain data available for this area.
B8390	1.01	0.38	0.00	0.38	-	37.52	No detailed FEMA Floodplain data available for this area.
B8410	10.52	2.94	0.00	2.94	-	27.95	No detailed FEMA Floodplain data available for this area.
B8420	24.63	6.35	0.00	6.35	-	25.77	No detailed FEMA Floodplain data available for this area.
B8430	6.83	1.18	0.00	1.18	-	17.29	No detailed FEMA Floodplain data available for this area.
B8440	4.28	0.77	0.00	0.77	-	17.98	No detailed FEMA Floodplain data available for this area.
B8450	25.35	2.07	0.00	2.07	-	8.16	No detailed FEMA Floodplain data available for this area.
B8460	10.68	0.92	0.00	0.92	-	8.58	No detailed FEMA Floodplain data available for this area.
B8480	9.91	0.90	0.00	0.90	-	9.03	No detailed FEMA Floodplain data available for this area.
B8490	0.29	0.08	0.00	0.08	-	26.74	No detailed FEMA Floodplain data available for this area.
B8502	1.04	0.01	0.00	0.01	-	0.63	No detailed FEMA Floodplain data available for this area.
B8503	14.67	2.79	0.00	2.79	-	19.04	No detailed FEMA Floodplain data available for this area.
B8504	1.04	0.16	0.00	0.16	-	15.63	No detailed FEMA Floodplain data available for this area.
B8505	1.39	0.12	0.00	0.12	-	8.40	No detailed FEMA Floodplain data available for this area.
B8506	9.73	0.30	0.00	0.30	-	3.13	No detailed FEMA Floodplain data available for this area.
B8507	2.33	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
B8508	23.47	0.51	0.00	0.51	-	2.18	No detailed FEMA Floodplain data available for this area.
B8520	28.61	0.72	0.00	0.72	-	2.51	No detailed FEMA Floodplain data available for this area.
B8521	12.76	2.33	0.00	2.33	-	18.29	No detailed FEMA Floodplain data available for this area.
B8522	0.76	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
B8523	0.50	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
B8525	18.05	2.32	0.00	2.32	-	12.83	No detailed FEMA Floodplain data available for this area.
B8530	14.98	1.60	0.00	1.60	-	10.70	No detailed FEMA Floodplain data available for this area.
B8545	13.92	1.57	0.00	1.57	-	11.24	No detailed FEMA Floodplain data available for this area.
B8550	11.84	2.29	0.00	2.29	-	19.30	No detailed FEMA Floodplain data available for this area.
B8552	5.11	0.68	0.00	0.68	-	13.40	No detailed FEMA Floodplain data available for this area.
B8554	8.71	1.36	0.00	1.36	-	15.60	No detailed FEMA Floodplain data available for this area.
B8556	8.64	1.93	0.00	1.93	-	22.33	No detailed FEMA Floodplain data available for this area.
B8558	1.89	0.54	0.00	0.54	-	28.46	No detailed FEMA Floodplain data available for this area.
B8560	22.85	2.80	0.00	2.80	-	12.25	No detailed FEMA Floodplain data available for this area.
B8570	29.65	2.87	0.00	2.87	-	9.66	No detailed FEMA Floodplain data available for this area.
B8590	2.09	0.56	0.00	0.56	-	26.77	No detailed FEMA Floodplain data available for this area.
B8600	3.86	1.02	0.00	1.02	-	26.42	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
B8610	13.11	1.66	0.00	1.66	-	12.69	No detailed FEMA Floodplain data available for this area.
B8620	5.59	1.58	0.00	1.58	-	28.20	No detailed FEMA Floodplain data available for this area.
B8630	27.83	1.24	0.00	1.24	-	4.44	No detailed FEMA Floodplain data available for this area.
B8640	19.56	4.64	0.00	4.64	-	23.74	No detailed FEMA Floodplain data available for this area.
B8650	13.24	1.82	0.00	1.82	-	13.72	No detailed FEMA Floodplain data available for this area.
B8660	3.60	0.72	0.00	0.72	-	20.14	No detailed FEMA Floodplain data available for this area.
B8673	4.34	1.68	0.00	1.68	-	38.68	No detailed FEMA Floodplain data available for this area.
B8674	0.17	0.05	0.00	0.05	-	29.16	No detailed FEMA Floodplain data available for this area.
B8675	8.05	1.87	0.14	1.73	1275.90	21.52	No detailed FEMA Floodplain data available for this area.
B8676	1.63	0.16	0.16	0.00	2.45	0.24	No detailed FEMA Floodplain data available for this area.
B8677	2.56	0.57	0.00	0.57	-	22.38	No detailed FEMA Floodplain data available for this area.
B8910	25.90	0.24	0.00	0.24	-	0.94	No detailed FEMA Floodplain data available for this area.
B8920	5.77	0.24	0.00	0.24	-	4.20	No detailed FEMA Floodplain data available for this area.
B8930	6.86	0.53	0.00	0.53	-	7.68	No detailed FEMA Floodplain data available for this area.
B8940	0.98	0.11	0.00	0.11	-	11.53	No detailed FEMA Floodplain data available for this area.
B8950	1.12	0.33	0.02	0.32	1972.81	28.09	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
B9000	0.99	0.40	0.00	0.40	-	39.85	No detailed FEMA Floodplain data available for this area.
B9004	2.16	0.33	0.00	0.33	-	15.22	No detailed FEMA Floodplain data available for this area.
B9005	3.46	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
B9010	2.27	1.80	0.00	1.80	-	79.17	No detailed FEMA Floodplain data available for this area.
B9015	0.79	0.06	0.00	0.06	-	7.94	No detailed FEMA Floodplain data available for this area.
B9020	15.57	1.49	0.00	1.49	-	9.58	No detailed FEMA Floodplain data available for this area.
B9035	0.32	0.03	0.00	0.03	-	10.59	No detailed FEMA Floodplain data available for this area.
B9040	13.67	3.09	0.00	3.09	-	22.62	No detailed FEMA Floodplain data available for this area.
B9043	8.59	4.05	0.00	4.05	-	47.15	No detailed FEMA Floodplain data available for this area.
B9045	0.57	0.36	0.00	0.36	-	63.08	No detailed FEMA Floodplain data available for this area.
B9050	0.53	0.31	0.00	0.31	-	57.86	No detailed FEMA Floodplain data available for this area.
B9053	10.63	1.43	0.00	1.43	-	13.42	No detailed FEMA Floodplain data available for this area.
B9055	10.65	5.05	0.00	5.05	-	47.41	No detailed FEMA Floodplain data available for this area.
B9060	0.39	0.34	0.00	0.34	-	85.90	No detailed FEMA Floodplain data available for this area.
B9070	0.73	0.39	0.00	0.39	-	52.76	No detailed FEMA Floodplain data available for this area.
B9073	2.23	0.64	0.00	0.64	-	28.71	No detailed FEMA Floodplain data available for this area.
B9075	1.72	0.57	0.00	0.57	-	33.31	No detailed FEMA Floodplain data available for this area.
B9080	1.04	0.56	0.00	0.56	-	53.53	No detailed FEMA Floodplain data available for this area.
B9090	0.85	0.42	0.00	0.42	-	49.58	No detailed FEMA Floodplain data available for this area.
B9095	0.77	0.17	0.00	0.17	-	21.84	No detailed FEMA Floodplain data available for this area.
B9100	0.66	0.48	0.00	0.48	-	73.34	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
B9110	0.70	0.55	0.00	0.55	-	77.50	No detailed FEMA Floodplain data available for this area.
B9120	0.51	0.24	0.00	0.24	-	45.88	No detailed FEMA Floodplain data available for this area.
B9130	11.74	3.29	0.00	3.29	-	28.02	No detailed FEMA Floodplain data available for this area.
B9140	9.02	1.79	0.00	1.79	-	19.85	No detailed FEMA Floodplain data available for this area.
B9145	0.44	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
B9150	25.84	4.44	0.00	4.44	-	17.17	No detailed FEMA Floodplain data available for this area.
B9160	0.38	0.14	0.00	0.14	-	35.99	No detailed FEMA Floodplain data available for this area.
B9170	0.45	0.01	0.00	0.01	-	3.31	No detailed FEMA Floodplain data available for this area.
B9180	1.11	0.25	0.00	0.25	-	22.19	No detailed FEMA Floodplain data available for this area.
B9185	5.71	0.19	0.00	0.19	-	3.35	No detailed FEMA Floodplain data available for this area.
B9200	2.79	0.91	0.00	0.91	-	32.64	No detailed FEMA Floodplain data available for this area.
B9300	6.91	0.56	0.00	0.56	-	8.07	No detailed FEMA Floodplain data available for this area.
B9310	19.13	0.02	0.00	0.02	-	0.11	No detailed FEMA Floodplain data available for this area.
B9400	2.47	0.00	0.00	0.00	-	0.13	No detailed FEMA Floodplain data available for this area.
B9500	3.64	0.05	0.00	0.05	-	1.45	No detailed FEMA Floodplain data available for this area.
C0006	9.86	0.15	0.00	0.15	-	1.54	No detailed FEMA Floodplain data available for this area.
C0008	29.19	0.55	0.00	0.55	-	1.87	No detailed FEMA Floodplain data available for this area.
C0010	10.91	5.70	0.00	5.70	-	52.29	No detailed FEMA Floodplain data available for this area.
C0012	33.50	1.69	0.00	1.69	-	5.03	No detailed FEMA Floodplain data available for this area.
C0014	3.69	1.37	0.00	1.37	-	37.18	No detailed FEMA Floodplain data available for this area.
C0015	12.44	0.30	0.00	0.30	-	2.39	No detailed FEMA Floodplain data available for this area.
C0016	5.60	0.95	0.00	0.95	-	16.89	No detailed FEMA Floodplain data available for this area.
C0018	2.85	0.70	0.00	0.70	-	24.40	No detailed FEMA Floodplain data available for this area.
C0020	17.27	7.52	0.00	7.52	-	43.55	No detailed FEMA Floodplain data available for this area.
C0023	6.19	0.44	0.00	0.44	-	7.16	No detailed FEMA Floodplain data available for this area.
C0026	6.09	0.37	0.00	0.37	-	6.09	No detailed FEMA Floodplain data available for this area.
C0030	1.25	0.94	0.00	0.94	-	74.85	No detailed FEMA Floodplain data available for this area.
C0037	20.85	1.69	0.00	1.69	-	8.11	No detailed FEMA Floodplain data available for this area.
C0040	5.22	2.72	0.00	2.72	-	52.23	No detailed FEMA Floodplain data available for this area.
C0052	16.16	0.71	0.00	0.71	-	4.38	No detailed FEMA Floodplain data available for this area.
C0056	41.86	3.68	0.00	3.68	-	8.79	No detailed FEMA Floodplain data available for this area.
C0058	7.28	0.36	0.00	0.36	-	4.90	No detailed FEMA Floodplain data available for this area.
C0060	9.18	5.53	0.00	5.53	-	60.24	No detailed FEMA Floodplain data available for this area.
C0062	20.04	1.48	0.00	1.48	-	7.36	No detailed FEMA Floodplain data available for this area.
C0064	25.67	2.79	0.00	2.79	-	10.87	No detailed FEMA Floodplain data available for this area.
C0065	24.78	2.27	0.00	2.27	-	9.17	No detailed FEMA Floodplain data available for this area.
C0066	1.84	0.63	0.00	0.63	-	33.95	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
C0068	2.27	0.58	0.00	0.58	-	25.66	No detailed FEMA Floodplain data available for this area.
C0070	6.96	4.68	0.00	4.68	-	67.27	No detailed FEMA Floodplain data available for this area.
C0077	8.19	1.40	0.00	1.40	-	17.12	No detailed FEMA Floodplain data available for this area.
C0080	21.30	10.42	0.00	10.42	-	48.90	No detailed FEMA Floodplain data available for this area.
C0082	5.60	1.55	0.00	1.55	-	27.65	No detailed FEMA Floodplain data available for this area.
C0083	14.88	3.13	0.00	3.13	-	21.06	No detailed FEMA Floodplain data available for this area.
C0085	21.94	3.82	0.00	3.82	-	17.43	No detailed FEMA Floodplain data available for this area.
C0087	10.81	1.27	0.00	1.27	-	11.76	No detailed FEMA Floodplain data available for this area.
C0090	0.68	0.49	0.00	0.49	-	71.89	No detailed FEMA Floodplain data available for this area.
C0092	2.80	1.31	0.00	1.31	-	46.56	No detailed FEMA Floodplain data available for this area.
C0093	1.91	0.11	0.00	0.11	-	5.57	No detailed FEMA Floodplain data available for this area.
C0094	1.19	0.07	0.00	0.07	-	5.88	No detailed FEMA Floodplain data available for this area.
C0095	13.62	2.52	0.00	2.52	-	18.53	No detailed FEMA Floodplain data available for this area.
C0096	1.30	0.61	0.00	0.61	-	47.11	No detailed FEMA Floodplain data available for this area.
C0097	1.24	0.28	0.00	0.28	-	22.14	No detailed FEMA Floodplain data available for this area.
C0098	6.48	1.20	0.00	1.20	-	18.50	No detailed FEMA Floodplain data available for this area.
C0099	3.23	0.22	0.00	0.22	-	6.96	No detailed FEMA Floodplain data available for this area.
C0100	0.72	0.15	0.00	0.15	-	21.21	No detailed FEMA Floodplain data available for this area.
C0101	1.80	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
C0102	3.36	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
C0103	20.43	2.66	0.00	2.66	-	13.04	No detailed FEMA Floodplain data available for this area.
C0104	9.45	0.20	0.00	0.20	-	2.13	No detailed FEMA Floodplain data available for this area.
C0105	0.55	0.18	0.00	0.18	-	32.64	No detailed FEMA Floodplain data available for this area.
C0106	1.89	0.19	0.00	0.19	-	10.21	No detailed FEMA Floodplain data available for this area.
C0107	7.22	0.14	0.00	0.14	-	1.95	No detailed FEMA Floodplain data available for this area.
C0108	2.02	0.22	0.00	0.22	-	10.81	No detailed FEMA Floodplain data available for this area.
C0109	14.82	0.29	0.00	0.29	-	1.94	No detailed FEMA Floodplain data available for this area.
C0110	5.46	2.01	0.00	2.01	-	36.77	No detailed FEMA Floodplain data available for this area.
C0111	3.51	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
C0120	8.01	4.73	0.00	4.73	-	59.10	No detailed FEMA Floodplain data available for this area.
C0124	9.91	0.19	0.00	0.19	-	1.91	No detailed FEMA Floodplain data available for this area.
C0127	5.72	0.05	0.00	0.05	-	0.81	No detailed FEMA Floodplain data available for this area.
C0130	11.48	2.60	0.00	2.60	-	22.63	No detailed FEMA Floodplain data available for this area.
C0140	12.61	1.69	0.00	1.69	-	13.37	No detailed FEMA Floodplain data available for this area.
C0147	15.24	0.18	0.00	0.18	-	1.17	No detailed FEMA Floodplain data available for this area.
C0160	8.12	5.70	0.00	5.70	-	70.27	No detailed FEMA Floodplain data available for this area.
C0168	7.34	0.14	0.00	0.14	-	1.91	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
C0170	8.44	4.29	0.00	4.29	-	50.81	No detailed FEMA Floodplain data available for this area.
C0180	2.20	1.23	0.00	1.23	-	56.19	No detailed FEMA Floodplain data available for this area.
C0190	3.29	2.06	0.00	2.06	-	62.65	No detailed FEMA Floodplain data available for this area.
C0193	10.45	0.25	0.00	0.25	-	2.38	No detailed FEMA Floodplain data available for this area.
C0196	5.14	0.08	0.00	0.08	-	1.53	No detailed FEMA Floodplain data available for this area.
C0197	10.55	0.23	0.00	0.23	-	2.15	No detailed FEMA Floodplain data available for this area.
C0210	8.51	4.48	0.00	4.48	-	52.64	No detailed FEMA Floodplain data available for this area.
C0214	12.01	0.15	0.00	0.15	-	1.28	No detailed FEMA Floodplain data available for this area.
C0217	12.00	0.11	0.00	0.11	-	0.94	No detailed FEMA Floodplain data available for this area.
C0218	5.62	0.09	0.00	0.09	-	1.51	No detailed FEMA Floodplain data available for this area.
C0220	7.64	4.71	0.00	4.71	-	61.70	No detailed FEMA Floodplain data available for this area.
C0223	3.49	0.18	0.00	0.18	-	5.02	No detailed FEMA Floodplain data available for this area.
C0226	25.76	0.35	0.00	0.35	-	1.35	No detailed FEMA Floodplain data available for this area.
C0230	4.39	3.19	0.00	3.19	-	72.74	No detailed FEMA Floodplain data available for this area.
C0240	2.94	1.60	0.00	1.60	-	54.41	No detailed FEMA Floodplain data available for this area.
C0243	10.64	0.30	0.00	0.30	-	2.83	No detailed FEMA Floodplain data available for this area.
C0246	8.19	0.11	0.00	0.11	-	1.35	No detailed FEMA Floodplain data available for this area.
C0250	4.99	2.86	0.00	2.86	-	57.37	No detailed FEMA Floodplain data available for this area.
C0260	15.93	6.50	0.00	6.50	-	40.78	No detailed FEMA Floodplain data available for this area.
C0265	13.64	0.28	0.00	0.28	-	2.08	No detailed FEMA Floodplain data available for this area.
C0273	15.60	0.25	0.00	0.25	-	1.58	No detailed FEMA Floodplain data available for this area.
C0275	6.72	0.27	0.00	0.27	-	4.00	No detailed FEMA Floodplain data available for this area.
C0280	6.46	3.81	0.00	3.81	-	59.02	No detailed FEMA Floodplain data available for this area.
C0290	0.27	0.13	0.00	0.13	-	47.71	No detailed FEMA Floodplain data available for this area.
C0300	2.82	1.68	0.00	1.68	-	59.39	No detailed FEMA Floodplain data available for this area.
C0303	14.93	2.32	0.00	2.32	-	15.51	No detailed FEMA Floodplain data available for this area.
C0304	0.74	0.15	0.00	0.15	-	20.59	No detailed FEMA Floodplain data available for this area.
C0305	21.22	0.68	0.00	0.68	-	3.19	No detailed FEMA Floodplain data available for this area.
C0308	11.37	0.47	0.00	0.47	-	4.11	No detailed FEMA Floodplain data available for this area.
C0309	3.79	0.13	0.00	0.13	-	3.48	No detailed FEMA Floodplain data available for this area.
C0310	5.03	2.80	0.00	2.80	-	55.59	No detailed FEMA Floodplain data available for this area.
C0320	3.80	2.26	0.00	2.26	-	59.42	No detailed FEMA Floodplain data available for this area.
C0323	5.17	0.20	0.00	0.20	-	3.86	No detailed FEMA Floodplain data available for this area.
C0330	6.32	3.38	0.00	3.38	-	53.52	No detailed FEMA Floodplain data available for this area.
C0340	25.09	1.53	0.00	1.53	-	6.12	No detailed FEMA Floodplain data available for this area.
C0350	28.10	2.95	0.00	2.95	-	10.49	No detailed FEMA Floodplain data available for this area.
C0360	6.92	5.03	0.00	5.03	-	72.73	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
C0363	7.97	0.20	0.00	0.20	-	2.49	No detailed FEMA Floodplain data available for this area.
C0370	7.18	5.87	0.00	5.87	-	81.76	No detailed FEMA Floodplain data available for this area.
C0373	7.01	0.22	0.00	0.22	-	3.08	No detailed FEMA Floodplain data available for this area.
C0380	45.14	9.69	0.00	9.69	-	21.46	No detailed FEMA Floodplain data available for this area.
C0400	3.93	3.02	0.00	3.02	-	76.72	No detailed FEMA Floodplain data available for this area.
C0410	14.46	4.61	0.00	4.61	-	31.84	No detailed FEMA Floodplain data available for this area.
C0420	2.62	1.87	0.00	1.87	-	71.43	No detailed FEMA Floodplain data available for this area.
C0430	1.74	1.02	0.00	1.02	-	58.70	No detailed FEMA Floodplain data available for this area.
C0440	17.79	3.94	0.00	3.94	-	22.15	No detailed FEMA Floodplain data available for this area.
C0450	17.83	5.46	0.00	5.46	-	30.62	No detailed FEMA Floodplain data available for this area.
C0460	4.23	0.35	0.00	0.35	-	8.20	No detailed FEMA Floodplain data available for this area.
C0465	6.20	0.32	0.00	0.32	-	5.13	No detailed FEMA Floodplain data available for this area.
C0470	6.30	3.10	0.00	3.10	-	49.17	No detailed FEMA Floodplain data available for this area.
C0478	10.49	0.41	0.00	0.41	-	3.89	No detailed FEMA Floodplain data available for this area.
C0480	9.12	5.93	0.00	5.93	-	65.06	No detailed FEMA Floodplain data available for this area.
C0495	5.85	1.93	0.00	1.93	-	32.93	No detailed FEMA Floodplain data available for this area.
C0500	10.66	2.50	0.00	2.50	-	23.50	No detailed FEMA Floodplain data available for this area.
C0510	7.07	4.86	0.00	4.86	-	68.76	No detailed FEMA Floodplain data available for this area.
C0515	11.71	2.07	0.00	2.07	-	17.70	No detailed FEMA Floodplain data available for this area.
C0520	5.93	3.15	0.00	3.15	-	53.17	No detailed FEMA Floodplain data available for this area.
C0540	9.71	1.64	0.00	1.64	-	16.85	No detailed FEMA Floodplain data available for this area.
C0560	0.77	0.57	0.00	0.57	-	73.87	No detailed FEMA Floodplain data available for this area.
C0565	8.76	5.19	0.00	5.19	-	59.17	No detailed FEMA Floodplain data available for this area.
C0570	2.88	2.08	0.00	2.08	-	72.30	No detailed FEMA Floodplain data available for this area.
C0580	6.15	3.92	0.00	3.92	-	63.75	No detailed FEMA Floodplain data available for this area.
C0585	5.99	3.00	0.00	3.00	-	50.10	No detailed FEMA Floodplain data available for this area.
C0590	7.04	1.87	0.00	1.87	-	26.58	No detailed FEMA Floodplain data available for this area.
C0597	7.23	0.60	0.00	0.60	-	8.31	No detailed FEMA Floodplain data available for this area.
C0600	4.56	2.77	0.00	2.77	-	60.75	No detailed FEMA Floodplain data available for this area.
C0603	2.32	0.16	0.00	0.16	-	7.00	No detailed FEMA Floodplain data available for this area.
C0604	10.03	1.61	0.00	1.61	-	16.08	No detailed FEMA Floodplain data available for this area.
C0606	22.70	2.83	0.00	2.83	-	12.45	No detailed FEMA Floodplain data available for this area.
C0607	22.08	3.58	0.00	3.58	-	16.21	No detailed FEMA Floodplain data available for this area.
C0608	1.29	0.32	0.00	0.32	-	25.05	No detailed FEMA Floodplain data available for this area.
C0609	5.41	0.42	0.00	0.42	-	7.69	No detailed FEMA Floodplain data available for this area.
C0610	6.81	4.63	0.00	4.63	-	67.97	No detailed FEMA Floodplain data available for this area.
C0615	14.75	3.26	0.00	3.26	-	22.13	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
C0617	3.13	0.27	0.00	0.27	-	8.53	No detailed FEMA Floodplain data available for this area.
C0618	8.65	1.54	0.00	1.54	-	17.82	No detailed FEMA Floodplain data available for this area.
C0620	9.54	6.31	0.00	6.31	-	66.12	No detailed FEMA Floodplain data available for this area.
C0623	3.29	0.12	0.00	0.12	-	3.67	No detailed FEMA Floodplain data available for this area.
C0630	37.50	13.87	0.00	13.87	-	36.99	No detailed FEMA Floodplain data available for this area.
C0633	3.90	0.09	0.00	0.09	-	2.30	No detailed FEMA Floodplain data available for this area.
C0640	41.45	8.80	0.00	8.80	-	21.23	No detailed FEMA Floodplain data available for this area.
C0645	0.96	0.53	0.00	0.53	-	55.53	No detailed FEMA Floodplain data available for this area.
C0660	40.34	7.54	0.00	7.54	-	18.69	No detailed FEMA Floodplain data available for this area.
C0665	61.14	6.31	0.00	6.31	-	10.32	No detailed FEMA Floodplain data available for this area.
C0667	23.88	6.13	0.00	6.13	-	25.69	No detailed FEMA Floodplain data available for this area.
C0670	11.56	7.36	0.00	7.36	-	63.65	No detailed FEMA Floodplain data available for this area.
C0675	5.87	1.47	0.00	1.47	-	25.08	No detailed FEMA Floodplain data available for this area.
C0680	12.52	9.09	0.00	9.09	-	72.63	No detailed FEMA Floodplain data available for this area.
C0681	0.12	0.01	0.00	0.01	-	12.36	No detailed FEMA Floodplain data available for this area.
C0685	7.99	2.18	0.00	2.18	-	27.34	No detailed FEMA Floodplain data available for this area.
C0690	19.67	8.23	0.00	8.23	-	41.83	No detailed FEMA Floodplain data available for this area.
C0700	5.06	2.90	0.00	2.90	-	57.40	No detailed FEMA Floodplain data available for this area.
C0730	46.47	18.18	0.00	18.18	-	39.13	No detailed FEMA Floodplain data available for this area.
C0740	18.16	4.42	0.00	4.42	-	24.34	No detailed FEMA Floodplain data available for this area.
C0760	10.52	3.06	0.00	3.06	-	29.09	No detailed FEMA Floodplain data available for this area.
C0770	16.78	9.67	0.00	9.67	-	57.63	No detailed FEMA Floodplain data available for this area.
C0780	30.23	15.67	0.00	15.67	-	51.83	No detailed FEMA Floodplain data available for this area.
C0790	2.38	1.85	0.00	1.85	-	77.77	No detailed FEMA Floodplain data available for this area.
C0810	10.63	1.86	0.00	1.86	-	17.53	No detailed FEMA Floodplain data available for this area.
C0820	8.45	2.53	0.00	2.53	-	29.88	No detailed FEMA Floodplain data available for this area.
C0825	13.78	1.34	0.00	1.34	-	9.74	No detailed FEMA Floodplain data available for this area.
C0830	2.29	1.75	0.00	1.75	-	76.53	No detailed FEMA Floodplain data available for this area.
C0840	9.15	3.63	0.00	3.63	-	39.66	No detailed FEMA Floodplain data available for this area.
C0845	2.46	0.96	0.00	0.96	-	38.85	No detailed FEMA Floodplain data available for this area.
C0850	8.82	4.89	0.00	4.89	-	55.43	No detailed FEMA Floodplain data available for this area.
C0860	36.13	7.28	0.00	7.28	-	20.14	No detailed FEMA Floodplain data available for this area.
C0870	23.09	4.53	0.00	4.53	-	19.64	No detailed FEMA Floodplain data available for this area.
C0873	7.61	0.30	0.00	0.30	-	3.97	No detailed FEMA Floodplain data available for this area.
C0900	11.52	6.05	0.00	6.05	-	52.53	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
C0910	5.73	4.24	1.36	2.88	211.31	50.20	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
C0915	5.72	1.86	0.00	1.86	-	32.57	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
C0920	7.26	5.84	6.72	0.88	13.05	12.07	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
C0930	7.08	5.35	2.40	2.95	123.03	41.69	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
C0940	13.15	4.88	2.01	2.87	142.40	21.79	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
C1010	5.21	0.48	0.00	0.48	-	9.24	No detailed FEMA Floodplain data available for this area.
C1020	43.70	3.51	0.00	3.51	-	8.03	No detailed FEMA Floodplain data available for this area.
C1025	9.17	1.43	0.00	1.43	-	15.60	No detailed FEMA Floodplain data available for this area.
C1030	7.32	1.08	0.00	1.08	-	14.81	No detailed FEMA Floodplain data available for this area.
C1040	10.70	2.45	0.00	2.45	-	22.93	No detailed FEMA Floodplain data available for this area.
C1042	9.41	0.94	0.00	0.94	-	10.04	No detailed FEMA Floodplain data available for this area.
C1043	5.84	1.86	0.00	1.86	-	31.80	No detailed FEMA Floodplain data available for this area.
C1045	3.50	0.44	0.00	0.44	-	12.54	No detailed FEMA Floodplain data available for this area.
C1050	43.64	4.80	0.00	4.80	-	11.01	No detailed FEMA Floodplain data available for this area.
C1060	0.80	0.38	0.00	0.38	-	47.67	No detailed FEMA Floodplain data available for this area.
C1070	12.22	5.15	0.00	5.15	-	42.13	No detailed FEMA Floodplain data available for this area.
C1080	2.26	0.46	0.00	0.46	-	20.31	No detailed FEMA Floodplain data available for this area.
C1510	13.32	1.04	0.00	1.04	-	7.80	No detailed FEMA Floodplain data available for this area.
C1520	12.89	1.02	0.00	1.02	-	7.90	No detailed FEMA Floodplain data available for this area.
C1530	8.45	0.39	0.00	0.39	-	4.60	No detailed FEMA Floodplain data available for this area.
C1540	1.14	0.27	0.00	0.27	-	23.47	No detailed FEMA Floodplain data available for this area.
C1550	2.88	0.05	0.00	0.05	-	1.81	No detailed FEMA Floodplain data available for this area.
C2020	9.19	0.21	0.00	0.21	-	2.32	No detailed FEMA Floodplain data available for this area.
C2040	6.97	0.49	0.00	0.49	-	7.03	No detailed FEMA Floodplain data available for this area.
C2060	5.42	0.05	0.00	0.05	-	0.96	No detailed FEMA Floodplain data available for this area.
C2520	13.24	0.19	0.00	0.19	-	1.42	No detailed FEMA Floodplain data available for this area.
C2530	4.48	0.18	0.00	0.18	-	3.99	No detailed FEMA Floodplain data available for this area.
C2550	4.57	0.28	0.00	0.28	-	6.20	No detailed FEMA Floodplain data available for this area.
C2560	3.27	0.00	0.00	0.00	-	0.02	No detailed FEMA Floodplain data available for this area.
C3010	8.01	0.79	0.00	0.79	-	9.91	No detailed FEMA Floodplain data available for this area.
C3023	31.14	4.86	0.00	4.86	-	15.61	No detailed FEMA Floodplain data available for this area.
C3030	0.93	0.34	0.00	0.34	-	36.76	No detailed FEMA Floodplain data available for this area.
C3510	5.31	0.46	0.00	0.46	-	8.60	No detailed FEMA Floodplain data available for this area.
C3520	7.95	1.12	0.00	1.12	-	14.07	No detailed FEMA Floodplain data available for this area.
C3530	4.26	0.40	0.00	0.40	-	9.36	No detailed FEMA Floodplain data available for this area.
C4010	2.72	0.15	0.00	0.15	-	5.55	No detailed FEMA Floodplain data available for this area.
C4020	20.88	1.34	0.00	1.34	-	6.42	No detailed FEMA Floodplain data available for this area.
C4030	3.09	0.68	0.00	0.68	-	22.11	No detailed FEMA Floodplain data available for this area.
C4040	20.69	0.96	0.00	0.96	-	4.66	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
C4050	4.98	0.99	0.00	0.99	-	19.87	No detailed FEMA Floodplain data available for this area.
C4060	18.29	3.17	0.00	3.17	-	17.31	No detailed FEMA Floodplain data available for this area.
C4070	3.33	0.90	0.00	0.90	-	26.97	No detailed FEMA Floodplain data available for this area.
C5010	17.84	0.76	0.00	0.76	-	4.27	No detailed FEMA Floodplain data available for this area.
C5020	22.60	1.90	0.00	1.90	-	8.41	No detailed FEMA Floodplain data available for this area.
C5030	26.29	3.29	0.00	3.29	-	12.52	No detailed FEMA Floodplain data available for this area.
C5040	19.14	1.90	0.00	1.90	-	9.94	No detailed FEMA Floodplain data available for this area.
C5050	15.34	1.29	0.00	1.29	-	8.41	No detailed FEMA Floodplain data available for this area.
C5060	23.79	1.93	0.00	1.93	-	8.11	No detailed FEMA Floodplain data available for this area.
C5070	14.83	1.14	0.00	1.14	-	7.65	No detailed FEMA Floodplain data available for this area.
C5080	20.34	3.41	0.00	3.41	-	16.75	No detailed FEMA Floodplain data available for this area.
C5090	12.85	3.48	0.00	3.48	-	27.11	No detailed FEMA Floodplain data available for this area.
C5100	7.94	2.46	0.00	2.46	-	31.01	No detailed FEMA Floodplain data available for this area.
C5110	5.29	4.77	0.00	4.77	-	90.12	No detailed FEMA Floodplain data available for this area.
C5112	6.74	0.10	0.00	0.10	-	1.55	No detailed FEMA Floodplain data available for this area.
C5115	3.47	0.44	0.00	0.44	-	12.75	No detailed FEMA Floodplain data available for this area.
C5118	34.39	1.82	0.00	1.82	-	5.29	No detailed FEMA Floodplain data available for this area.
C5120	8.22	2.44	0.00	2.44	-	29.65	No detailed FEMA Floodplain data available for this area.
C5130	2.26	1.11	0.00	1.11	-	48.98	No detailed FEMA Floodplain data available for this area.
C5140	10.01	2.78	0.00	2.78	-	27.80	No detailed FEMA Floodplain data available for this area.
C5150	14.11	1.98	0.00	1.98	-	14.05	No detailed FEMA Floodplain data available for this area.
C6010	27.15	0.61	0.00	0.61	-	2.23	No detailed FEMA Floodplain data available for this area.
C6020	28.64	0.64	0.00	0.64	-	2.23	No detailed FEMA Floodplain data available for this area.
C6030	0.38	0.01	0.00	0.01	-	2.40	No detailed FEMA Floodplain data available for this area.
C6040	37.55	0.55	0.00	0.55	-	1.46	No detailed FEMA Floodplain data available for this area.
C6050	27.42	1.31	0.00	1.31	-	4.78	No detailed FEMA Floodplain data available for this area.
C6060	12.21	0.43	0.00	0.43	-	3.52	No detailed FEMA Floodplain data available for this area.
C6503	7.57	0.28	0.00	0.28	-	3.73	No detailed FEMA Floodplain data available for this area.
C6505	7.09	0.77	0.00	0.77	-	10.81	No detailed FEMA Floodplain data available for this area.
C6510	4.14	0.61	0.00	0.61	-	14.80	No detailed FEMA Floodplain data available for this area.
C6513	18.53	3.14	0.00	3.14	-	16.94	No detailed FEMA Floodplain data available for this area.
C6518	7.07	0.23	0.00	0.23	-	3.32	No detailed FEMA Floodplain data available for this area.
C6520	11.96	2.73	0.00	2.73	-	22.80	No detailed FEMA Floodplain data available for this area.
C6522	2.37	0.14	0.00	0.14	-	5.74	No detailed FEMA Floodplain data available for this area.
C6523	10.30	3.48	0.00	3.48	-	33.74	No detailed FEMA Floodplain data available for this area.
C6524	14.35	0.74	0.00	0.74	-	5.17	No detailed FEMA Floodplain data available for this area.
C6526	11.36	0.99	0.00	0.99	-	8.76	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
C6527	10.70	3.36	0.00	3.36	-	31.40	No detailed FEMA Floodplain data available for this area.
C6528	2.00	0.36	0.00	0.36	-	18.22	No detailed FEMA Floodplain data available for this area.
C6530	2.92	1.76	0.00	1.76	-	60.29	No detailed FEMA Floodplain data available for this area.
C6540	1.26	0.66	0.00	0.66	-	51.86	No detailed FEMA Floodplain data available for this area.
C6545	12.18	4.59	0.00	4.59	-	37.66	No detailed FEMA Floodplain data available for this area.
C6550	1.53	0.87	0.00	0.87	-	56.96	No detailed FEMA Floodplain data available for this area.
C7010	4.65	0.17	0.00	0.17	-	3.58	No detailed FEMA Floodplain data available for this area.
C7020	6.91	0.59	0.00	0.59	-	8.47	No detailed FEMA Floodplain data available for this area.
C7030	5.89	0.78	0.00	0.78	-	13.28	No detailed FEMA Floodplain data available for this area.
C7040	17.83	1.69	0.00	1.69	-	9.48	No detailed FEMA Floodplain data available for this area.
C7053	7.35	1.96	0.00	1.96	-	26.74	No detailed FEMA Floodplain data available for this area.
C7059	1.37	0.59	0.00	0.59	-	43.22	No detailed FEMA Floodplain data available for this area.
C7062	1.15	0.35	0.00	0.35	-	30.45	No detailed FEMA Floodplain data available for this area.
C7065	14.09	2.14	0.00	2.14	-	15.16	No detailed FEMA Floodplain data available for this area.
C7068	2.85	0.79	0.00	0.79	-	27.93	No detailed FEMA Floodplain data available for this area.
C7070	6.59	1.96	0.00	1.96	-	29.79	No detailed FEMA Floodplain data available for this area.
C7080	12.57	1.77	0.00	1.77	-	14.11	No detailed FEMA Floodplain data available for this area.
C7093	10.12	2.39	0.00	2.39	-	23.61	No detailed FEMA Floodplain data available for this area.
C7097	13.08	1.29	0.00	1.29	-	9.89	No detailed FEMA Floodplain data available for this area.
C7098	1.49	0.42	0.00	0.42	-	28.15	No detailed FEMA Floodplain data available for this area.
C7100	18.12	2.58	0.00	2.58	-	14.22	No detailed FEMA Floodplain data available for this area.
C7110	5.11	2.41	0.00	2.41	-	47.09	No detailed FEMA Floodplain data available for this area.
C7120	13.75	6.34	0.00	6.34	-	46.11	No detailed FEMA Floodplain data available for this area.
C8005	8.79	0.94	0.00	0.94	-	10.65	No detailed FEMA Floodplain data available for this area.
C8010	8.99	0.76	0.00	0.76	-	8.43	No detailed FEMA Floodplain data available for this area.
C8012	5.30	0.71	0.00	0.71	-	13.47	No detailed FEMA Floodplain data available for this area.
C8013	3.41	0.60	0.00	0.60	-	17.74	No detailed FEMA Floodplain data available for this area.
C8018	9.96	0.72	0.00	0.72	-	7.19	No detailed FEMA Floodplain data available for this area.
C8020	15.16	1.68	0.00	1.68	-	11.05	No detailed FEMA Floodplain data available for this area.
C8025	4.20	0.92	0.00	0.92	-	21.86	No detailed FEMA Floodplain data available for this area.
C8030	1.65	0.78	0.00	0.78	-	47.38	No detailed FEMA Floodplain data available for this area.
C8040	5.39	1.47	0.00	1.47	-	27.32	No detailed FEMA Floodplain data available for this area.
C8043	6.01	1.59	0.00	1.59	-	26.49	No detailed FEMA Floodplain data available for this area.
C8045	7.45	2.37	0.00	2.37	-	31.88	No detailed FEMA Floodplain data available for this area.
C8046	6.77	1.92	0.00	1.92	-	28.43	No detailed FEMA Floodplain data available for this area.
C8047	8.86	2.95	0.00	2.95	-	33.33	No detailed FEMA Floodplain data available for this area.
C8048	12.10	6.38	0.00	6.38	-	52.77	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
C8050	4.01	0.47	0.00	0.47	-	11.67	No detailed FEMA Floodplain data available for this area.
C8060	9.32	1.35	0.00	1.35	-	14.49	No detailed FEMA Floodplain data available for this area.
C8065	9.29	2.90	0.00	2.90	-	31.26	No detailed FEMA Floodplain data available for this area.
C8070	1.44	0.47	0.00	0.47	-	32.71	No detailed FEMA Floodplain data available for this area.
C8080	0.79	0.16	0.00	0.16	-	20.24	No detailed FEMA Floodplain data available for this area.
C8090	1.47	0.48	0.00	0.48	-	32.47	No detailed FEMA Floodplain data available for this area.
C8100	19.66	5.48	0.00	5.48	-	27.89	No detailed FEMA Floodplain data available for this area.
C8110	2.11	0.92	0.00	0.92	-	43.76	No detailed FEMA Floodplain data available for this area.
C8120	13.08	7.82	0.00	7.82	-	59.76	No detailed FEMA Floodplain data available for this area.
C8140	6.15	2.44	0.00	2.44	-	39.64	No detailed FEMA Floodplain data available for this area.
C8150	20.91	10.03	0.00	10.03	-	48.00	No detailed FEMA Floodplain data available for this area.
C8160	1.02	0.48	0.00	0.48	-	47.19	No detailed FEMA Floodplain data available for this area.
C8170	1.17	1.02	0.00	1.02	-	87.48	No detailed FEMA Floodplain data available for this area.
C8510	5.93	2.50	0.00	2.50	-	42.12	No detailed FEMA Floodplain data available for this area.
C8520	3.55	0.68	0.00	0.68	-	19.06	No detailed FEMA Floodplain data available for this area.
C8530	13.04	1.79	0.00	1.79	-	13.70	No detailed FEMA Floodplain data available for this area.
C8540	4.49	2.24	0.00	2.24	-	50.01	No detailed FEMA Floodplain data available for this area.
C8550	3.15	1.20	0.00	1.20	-	38.16	No detailed FEMA Floodplain data available for this area.
C8560	16.84	3.16	0.00	3.16	-	18.78	No detailed FEMA Floodplain data available for this area.
C8570	1.01	0.15	0.00	0.15	-	15.12	No detailed FEMA Floodplain data available for this area.
C8580	2.00	0.27	0.00	0.27	-	13.76	No detailed FEMA Floodplain data available for this area.
C8590	4.26	0.62	0.00	0.62	-	14.48	No detailed FEMA Floodplain data available for this area.
C8600	5.91	1.86	0.00	1.86	-	31.40	No detailed FEMA Floodplain data available for this area.
C8610	2.51	1.03	0.00	1.03	-	41.02	No detailed FEMA Floodplain data available for this area.
C8620	2.60	1.41	0.00	1.41	-	54.23	No detailed FEMA Floodplain data available for this area.
C8630	1.58	0.28	0.00	0.28	-	17.84	No detailed FEMA Floodplain data available for this area.
C8640	1.09	0.33	0.00	0.33	-	30.19	No detailed FEMA Floodplain data available for this area.
C9010	9.87	3.00	0.00	3.00	-	30.40	No detailed FEMA Floodplain data available for this area.
C9020	1.21	0.16	0.00	0.16	-	12.97	No detailed FEMA Floodplain data available for this area.
C9022	1.34	0.23	0.00	0.23	-	17.03	No detailed FEMA Floodplain data available for this area.
C9024	3.79	0.46	0.00	0.46	-	12.06	No detailed FEMA Floodplain data available for this area.
C9030	6.27	0.77	0.00	0.77	-	12.29	No detailed FEMA Floodplain data available for this area.
C9032	1.27	0.11	0.00	0.11	-	9.00	No detailed FEMA Floodplain data available for this area.
C9040	1.42	0.12	0.00	0.12	-	8.15	No detailed FEMA Floodplain data available for this area.
C9050	5.17	0.42	0.00	0.42	-	8.12	No detailed FEMA Floodplain data available for this area.
C9052	1.29	0.18	0.00	0.18	-	13.80	No detailed FEMA Floodplain data available for this area.
C9054	0.89	0.12	0.00	0.12	-	13.81	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
C9056	1.16	0.10	0.00	0.10	-	8.96	No detailed FEMA Floodplain data available for this area.
C9058	0.54	0.24	0.00	0.24	-	45.65	No detailed FEMA Floodplain data available for this area.
C9060	5.49	2.26	0.00	2.26	-	41.21	No detailed FEMA Floodplain data available for this area.
C9070	10.10	0.89	0.00	0.89	-	8.82	No detailed FEMA Floodplain data available for this area.
C9080	14.59	1.28	0.00	1.28	-	8.80	No detailed FEMA Floodplain data available for this area.
C9090	9.82	1.35	0.00	1.35	-	13.76	No detailed FEMA Floodplain data available for this area.
C9100	18.97	3.20	0.00	3.20	-	16.85	No detailed FEMA Floodplain data available for this area.
C9110	1.38	0.23	0.00	0.23	-	16.78	No detailed FEMA Floodplain data available for this area.
C9120	1.39	0.26	0.00	0.26	-	18.77	No detailed FEMA Floodplain data available for this area.
C9130	10.46	1.05	0.00	1.05	-	10.01	No detailed FEMA Floodplain data available for this area.
C9510	6.93	0.21	0.00	0.21	-	3.01	No detailed FEMA Floodplain data available for this area.
C9520	18.41	3.22	0.00	3.22	-	17.51	No detailed FEMA Floodplain data available for this area.
C9530	19.28	1.91	0.00	1.91	-	9.91	No detailed FEMA Floodplain data available for this area.
C9540	21.64	3.92	0.00	3.92	-	18.11	No detailed FEMA Floodplain data available for this area.
C9550	1.85	0.48	0.00	0.48	-	25.70	No detailed FEMA Floodplain data available for this area.
C9560	18.26	4.52	0.00	4.52	-	24.73	No detailed FEMA Floodplain data available for this area.
C9570	2.47	0.74	0.00	0.74	-	30.07	No detailed FEMA Floodplain data available for this area.
C9580	0.87	0.60	0.00	0.60	-	68.63	No detailed FEMA Floodplain data available for this area.
C9600	2.83	0.31	0.00	0.31	-	10.89	No detailed FEMA Floodplain data available for this area.
C9700	1.37	0.58	0.00	0.58	-	42.26	No detailed FEMA Floodplain data available for this area.
C9800	3.60	0.59	0.00	0.59	-	16.51	No detailed FEMA Floodplain data available for this area.
D0004	27.88	0.97	0.00	0.97	-	3.48	No detailed FEMA Floodplain data available for this area.
D0006	13.01	0.72	0.00	0.72	-	5.54	No detailed FEMA Floodplain data available for this area.
D0010	46.06	4.75	0.00	4.75	-	10.31	No detailed FEMA Floodplain data available for this area.
D0020	40.31	4.78	0.00	4.78	-	11.85	No detailed FEMA Floodplain data available for this area.
D0030	12.05	1.35	0.00	1.35	-	11.21	No detailed FEMA Floodplain data available for this area.
D0040	3.87	0.41	0.00	0.41	-	10.46	No detailed FEMA Floodplain data available for this area.
D0045	66.38	2.48	0.00	2.48	-	3.74	No detailed FEMA Floodplain data available for this area.
D0050	22.58	1.36	0.00	1.36	-	6.02	No detailed FEMA Floodplain data available for this area.
D0053	49.96	1.27	0.00	1.27	-	2.55	No detailed FEMA Floodplain data available for this area.
D0055	1.62	0.72	0.00	0.72	-	44.39	No detailed FEMA Floodplain data available for this area.
D0057	4.92	0.28	0.00	0.28	-	5.66	No detailed FEMA Floodplain data available for this area.
D0059	1.42	0.23	0.00	0.23	-	16.30	No detailed FEMA Floodplain data available for this area.
D0060	25.73	2.45	0.00	2.45	-	9.51	No detailed FEMA Floodplain data available for this area.
D0063	63.95	2.18	0.00	2.18	-	3.41	No detailed FEMA Floodplain data available for this area.
D0070	39.27	4.66	0.00	4.66	-	11.87	No detailed FEMA Floodplain data available for this area.
D0080	21.85	1.76	0.00	1.76	-	8.07	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
D0082	5.81	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
D0085	34.44	0.92	0.00	0.92	-	2.68	No detailed FEMA Floodplain data available for this area.
D0088	55.61	2.67	0.00	2.67	-	4.81	No detailed FEMA Floodplain data available for this area.
D0090	2.97	1.28	0.00	1.28	-	43.32	No detailed FEMA Floodplain data available for this area.
D0092	21.41	1.25	0.00	1.25	-	5.85	No detailed FEMA Floodplain data available for this area.
D0094	14.61	0.45	0.00	0.45	-	3.10	No detailed FEMA Floodplain data available for this area.
D0096	11.26	0.80	0.00	0.80	-	7.14	No detailed FEMA Floodplain data available for this area.
D0098	17.94	0.63	0.00	0.63	-	3.50	No detailed FEMA Floodplain data available for this area.
D0100	7.09	2.86	0.00	2.86	-	40.30	No detailed FEMA Floodplain data available for this area.
D0103	28.27	3.14	0.00	3.14	-	11.12	No detailed FEMA Floodplain data available for this area.
D0107	5.31	0.59	0.00	0.59	-	11.04	No detailed FEMA Floodplain data available for this area.
D0110	40.37	2.70	0.00	2.70	-	6.68	No detailed FEMA Floodplain data available for this area.
D0112	16.56	1.20	0.00	1.20	-	7.23	No detailed FEMA Floodplain data available for this area.
D0114	50.06	4.24	0.00	4.24	-	8.47	No detailed FEMA Floodplain data available for this area.
D0116	28.79	1.73	0.00	1.73	-	6.03	No detailed FEMA Floodplain data available for this area.
D0118	2.06	0.59	0.00	0.59	-	28.82	No detailed FEMA Floodplain data available for this area.
D0130	1.57	0.66	0.00	0.66	-	41.88	No detailed FEMA Floodplain data available for this area.
D0140	51.32	3.53	0.00	3.53	-	6.88	No detailed FEMA Floodplain data available for this area.
D0152	9.76	1.63	0.00	1.63	-	16.74	No detailed FEMA Floodplain data available for this area.
D0155	59.13	6.07	0.00	6.07	-	10.26	No detailed FEMA Floodplain data available for this area.
D0158	19.48	4.28	0.00	4.28	-	21.95	No detailed FEMA Floodplain data available for this area.
D0160	46.45	7.76	0.00	7.76	-	16.71	No detailed FEMA Floodplain data available for this area.
D0162	5.67	1.97	0.00	1.97	-	34.75	No detailed FEMA Floodplain data available for this area.
D0164	49.01	8.47	0.00	8.47	-	17.27	No detailed FEMA Floodplain data available for this area.
D0166	30.58	5.01	0.00	5.01	-	16.38	No detailed FEMA Floodplain data available for this area.
D0168	17.49	3.62	0.00	3.62	-	20.69	No detailed FEMA Floodplain data available for this area.
D0170	37.88	7.05	0.00	7.05	-	18.62	No detailed FEMA Floodplain data available for this area.
D0180	19.69	4.47	0.00	4.47	-	22.72	No detailed FEMA Floodplain data available for this area.
D0190	2.21	1.28	0.00	1.28	-	58.03	No detailed FEMA Floodplain data available for this area.
D0192	10.93	3.27	0.00	3.27	-	29.93	No detailed FEMA Floodplain data available for this area.
D0194	36.84	7.01	0.00	7.01	-	19.03	No detailed FEMA Floodplain data available for this area.
D0196	61.63	9.92	0.00	9.92	-	16.09	No detailed FEMA Floodplain data available for this area.
D0198	33.50	3.36	0.00	3.36	-	10.04	No detailed FEMA Floodplain data available for this area.
D0200	40.06	5.46	0.00	5.46	-	13.63	No detailed FEMA Floodplain data available for this area.
D0202	4.61	0.42	0.00	0.42	-	9.18	No detailed FEMA Floodplain data available for this area.
D0204	50.50	4.39	0.00	4.39	-	8.69	No detailed FEMA Floodplain data available for this area.
D0206	26.41	5.22	0.00	5.22	-	19.79	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
D0208	1.23	0.53	0.00	0.53	-	42.76	No detailed FEMA Floodplain data available for this area.
D0210	3.87	1.91	0.00	1.91	-	49.25	No detailed FEMA Floodplain data available for this area.
D0220	66.14	11.43	0.00	11.43	-	17.28	No detailed FEMA Floodplain data available for this area.
D0230	65.48	12.83	0.00	12.83	-	19.60	No detailed FEMA Floodplain data available for this area.
D0240	75.40	22.66	0.00	22.66	-	30.05	No detailed FEMA Floodplain data available for this area.
D1010	8.23	0.91	0.00	0.91	-	11.02	No detailed FEMA Floodplain data available for this area.
D1020	44.26	3.90	0.00	3.90	-	8.80	No detailed FEMA Floodplain data available for this area.
D1025	1.27	0.35	0.00	0.35	-	27.14	No detailed FEMA Floodplain data available for this area.
D1030	30.66	5.00	0.00	5.00	-	16.32	No detailed FEMA Floodplain data available for this area.
D2010	12.28	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
D2020	14.90	0.27	0.00	0.27	-	1.80	No detailed FEMA Floodplain data available for this area.
D2025	29.11	0.07	0.00	0.07	-	0.23	No detailed FEMA Floodplain data available for this area.
D2030	4.55	0.42	0.00	0.42	-	9.19	No detailed FEMA Floodplain data available for this area.
D2040	2.49	0.44	0.00	0.44	-	17.86	No detailed FEMA Floodplain data available for this area.
E0010	0.63	0.50	0.00	0.50	-	79.19	No detailed FEMA Floodplain data available for this area.
E0020	21.59	1.77	0.00	1.77	-	8.18	No detailed FEMA Floodplain data available for this area.
E0023	34.62	0.80	0.00	0.80	-	2.32	No detailed FEMA Floodplain data available for this area.
E0027	9.16	0.24	0.00	0.24	-	2.61	No detailed FEMA Floodplain data available for this area.
E0030	15.99	2.87	0.00	2.87	-	17.95	No detailed FEMA Floodplain data available for this area.
E0040	43.05	1.57	0.00	1.57	-	3.64	No detailed FEMA Floodplain data available for this area.
E0050	21.42	1.40	0.00	1.40	-	6.56	No detailed FEMA Floodplain data available for this area.
E0052	39.75	0.49	0.00	0.49	-	1.24	No detailed FEMA Floodplain data available for this area.
E0054	4.32	0.49	0.00	0.49	-	11.23	No detailed FEMA Floodplain data available for this area.
E0059	16.18	0.35	0.00	0.35	-	2.17	No detailed FEMA Floodplain data available for this area.
E0060	15.80	2.86	0.00	2.86	-	18.11	No detailed FEMA Floodplain data available for this area.
E0061	0.89	0.23	0.00	0.23	-	25.78	No detailed FEMA Floodplain data available for this area.
E0062	14.44	2.66	0.00	2.66	-	18.41	No detailed FEMA Floodplain data available for this area.
E0063	17.21	2.73	0.00	2.73	-	15.87	No detailed FEMA Floodplain data available for this area.
E0064	1.99	0.39	0.00	0.39	-	19.77	No detailed FEMA Floodplain data available for this area.
E0065	5.04	1.50	0.00	1.50	-	29.66	No detailed FEMA Floodplain data available for this area.
E0069	3.68	1.03	0.00	1.03	-	27.93	No detailed FEMA Floodplain data available for this area.
E0070	74.55	2.18	0.00	2.18	-	2.92	No detailed FEMA Floodplain data available for this area.
E0071	33.64	2.34	0.00	2.34	-	6.95	No detailed FEMA Floodplain data available for this area.
E0072	25.42	0.20	0.00	0.20	-	0.77	No detailed FEMA Floodplain data available for this area.
E0074	1.69	0.24	0.00	0.24	-	14.13	No detailed FEMA Floodplain data available for this area.
E0075	9.36	0.87	0.00	0.87	-	9.32	No detailed FEMA Floodplain data available for this area.
E0077	14.77	2.46	0.00	2.46	-	16.68	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
E0079	13.29	0.51	0.00	0.51	-	3.85	No detailed FEMA Floodplain data available for this area.
E0080	1.93	1.12	0.00	1.12	-	58.20	No detailed FEMA Floodplain data available for this area.
E0090	0.80	0.47	0.00	0.47	-	58.76	No detailed FEMA Floodplain data available for this area.
E0100	13.62	1.19	0.00	1.19	-	8.77	No detailed FEMA Floodplain data available for this area.
E0110	32.12	3.62	0.00	3.62	-	11.29	No detailed FEMA Floodplain data available for this area.
E0120	59.61	4.48	0.00	4.48	-	7.52	No detailed FEMA Floodplain data available for this area.
E0125	21.05	0.68	0.00	0.68	-	3.23	No detailed FEMA Floodplain data available for this area.
E0127	30.37	0.74	0.00	0.74	-	2.44	No detailed FEMA Floodplain data available for this area.
E0128	9.97	0.23	0.00	0.23	-	2.27	No detailed FEMA Floodplain data available for this area.
E0129	0.98	0.30	0.00	0.30	-	31.06	No detailed FEMA Floodplain data available for this area.
E0130	10.31	3.23	0.00	3.23	-	31.33	No detailed FEMA Floodplain data available for this area.
E0140	51.25	6.25	0.00	6.25	-	12.19	No detailed FEMA Floodplain data available for this area.
E0145	22.39	0.52	0.00	0.52	-	2.32	No detailed FEMA Floodplain data available for this area.
E0150	15.24	2.50	0.00	2.50	-	16.42	No detailed FEMA Floodplain data available for this area.
E0160	151.41	41.68	0.00	41.68	-	27.53	No detailed FEMA Floodplain data available for this area.
E0165	12.79	2.06	0.00	2.06	-	16.15	No detailed FEMA Floodplain data available for this area.
E0166	0.83	0.14	0.00	0.14	-	16.51	No detailed FEMA Floodplain data available for this area.
E0167	17.22	5.70	0.00	5.70	-	33.07	No detailed FEMA Floodplain data available for this area.
E0168	10.82	2.07	0.00	2.07	-	19.13	No detailed FEMA Floodplain data available for this area.
E0170	42.13	15.40	0.00	15.40	-	36.56	No detailed FEMA Floodplain data available for this area.
E0180	25.50	10.13	0.00	10.13	-	39.72	No detailed FEMA Floodplain data available for this area.
E0510	6.85	0.36	0.00	0.36	-	5.20	No detailed FEMA Floodplain data available for this area.
E0520	20.71	2.17	0.00	2.17	-	10.50	No detailed FEMA Floodplain data available for this area.
E0530	4.93	0.92	0.00	0.92	-	18.68	No detailed FEMA Floodplain data available for this area.
E0540	2.10	0.30	0.00	0.30	-	14.34	No detailed FEMA Floodplain data available for this area.
E0555	13.19	0.29	0.00	0.29	-	2.22	No detailed FEMA Floodplain data available for this area.
E0560	22.41	0.86	0.00	0.86	-	3.86	No detailed FEMA Floodplain data available for this area.
E0570	20.68	1.31	0.00	1.31	-	6.33	No detailed FEMA Floodplain data available for this area.
E0580	20.79	1.81	0.00	1.81	-	8.70	No detailed FEMA Floodplain data available for this area.
E0890	3.93	0.57	0.00	0.57	-	14.51	No detailed FEMA Floodplain data available for this area.
E2010	9.05	0.38	0.00	0.38	-	4.22	No detailed FEMA Floodplain data available for this area.
E2020	33.16	0.86	0.00	0.86	-	2.59	No detailed FEMA Floodplain data available for this area.
E2030	20.74	2.07	0.00	2.07	-	9.99	No detailed FEMA Floodplain data available for this area.
E2041	11.81	3.92	0.00	3.92	-	33.20	No detailed FEMA Floodplain data available for this area.
E2043	12.47	2.92	0.00	2.92	-	23.41	No detailed FEMA Floodplain data available for this area.
E2045	10.08	2.54	0.00	2.54	-	25.22	No detailed FEMA Floodplain data available for this area.
E2049	2.60	1.18	0.00	1.18	-	45.21	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
E2050	2.41	1.04	0.00	1.04	-	43.08	No detailed FEMA Floodplain data available for this area.
E2060	2.33	1.17	0.00	1.17	-	50.19	No detailed FEMA Floodplain data available for this area.
E2510	18.82	4.31	0.00	4.31	-	22.89	No detailed FEMA Floodplain data available for this area.
E2530	1.80	0.22	0.00	0.22	-	12.11	No detailed FEMA Floodplain data available for this area.
E2540	18.77	0.60	0.00	0.60	-	3.18	No detailed FEMA Floodplain data available for this area.
E3010	26.22	6.24	0.00	6.24	-	23.80	No detailed FEMA Floodplain data available for this area.
E3015	0.44	0.10	0.00	0.10	-	24.01	No detailed FEMA Floodplain data available for this area.
E3020	1.18	0.35	0.00	0.35	-	29.99	No detailed FEMA Floodplain data available for this area.
E3051	19.36	3.92	0.00	3.92	-	20.27	No detailed FEMA Floodplain data available for this area.
E3053	4.64	1.32	0.00	1.32	-	28.37	No detailed FEMA Floodplain data available for this area.
E3060	10.34	5.36	0.00	5.36	-	51.85	No detailed FEMA Floodplain data available for this area.
E3080	3.19	1.64	0.00	1.64	-	51.29	No detailed FEMA Floodplain data available for this area.
E3090	2.09	0.70	0.00	0.70	-	33.32	No detailed FEMA Floodplain data available for this area.
E3095	0.46	0.19	0.00	0.19	-	41.33	No detailed FEMA Floodplain data available for this area.
E3112	29.69	7.55	0.00	7.55	-	25.44	No detailed FEMA Floodplain data available for this area.
E3113	12.69	1.66	0.00	1.66	-	13.09	No detailed FEMA Floodplain data available for this area.
E3115	13.98	5.73	0.00	5.73	-	40.98	No detailed FEMA Floodplain data available for this area.
E3118	0.92	0.25	0.00	0.25	-	27.25	No detailed FEMA Floodplain data available for this area.
E3120	22.16	9.59	0.00	9.59	-	43.29	No detailed FEMA Floodplain data available for this area.
E3125	1.61	0.88	0.00	0.88	-	54.90	No detailed FEMA Floodplain data available for this area.
E3130	2.34	1.14	0.00	1.14	-	48.69	No detailed FEMA Floodplain data available for this area.
E3140	7.67	2.41	0.00	2.41	-	31.48	No detailed FEMA Floodplain data available for this area.
E3150	7.42	1.84	0.00	1.84	-	24.83	No detailed FEMA Floodplain data available for this area.
E3160	5.73	0.92	0.00	0.92	-	16.10	No detailed FEMA Floodplain data available for this area.
E3170	9.49	1.00	0.00	1.00	-	10.57	No detailed FEMA Floodplain data available for this area.
E5010	5.78	1.61	0.00	1.61	-	27.86	No detailed FEMA Floodplain data available for this area.
E5020	21.39	7.46	0.00	7.46	-	34.86	No detailed FEMA Floodplain data available for this area.
E5025	6.25	2.91	0.00	2.91	-	46.50	No detailed FEMA Floodplain data available for this area.
E5030	15.13	5.56	0.00	5.56	-	36.74	No detailed FEMA Floodplain data available for this area.
E5040	12.45	4.10	0.00	4.10	-	32.97	No detailed FEMA Floodplain data available for this area.
E5050	11.82	4.80	0.00	4.80	-	40.60	No detailed FEMA Floodplain data available for this area.
E5053	3.11	0.94	0.00	0.94	-	30.29	No detailed FEMA Floodplain data available for this area.
E5054	2.66	0.75	0.00	0.75	-	28.23	No detailed FEMA Floodplain data available for this area.
E5055	0.28	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
E5056	11.85	3.23	0.00	3.23	-	27.24	No detailed FEMA Floodplain data available for this area.
E5057	6.68	1.49	0.00	1.49	-	22.27	No detailed FEMA Floodplain data available for this area.
E5058	0.87	0.38	0.00	0.38	-	43.10	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
E5059	7.97	3.71	0.00	3.71	-	46.55	No detailed FEMA Floodplain data available for this area.
E5061	11.79	4.65	0.00	4.65	-	39.41	No detailed FEMA Floodplain data available for this area.
E5063	14.86	4.44	0.00	4.44	-	29.88	No detailed FEMA Floodplain data available for this area.
E5069	8.20	1.55	0.00	1.55	-	18.88	No detailed FEMA Floodplain data available for this area.
E5070	19.62	11.37	0.00	11.37	-	57.96	No detailed FEMA Floodplain data available for this area.
E5080	1.65	0.97	0.00	0.97	-	58.72	No detailed FEMA Floodplain data available for this area.
E5085	1.99	1.28	0.00	1.28	-	64.33	No detailed FEMA Floodplain data available for this area.
E5510	32.15	9.93	0.00	9.93	-	30.89	No detailed FEMA Floodplain data available for this area.
E5512	9.07	2.49	0.00	2.49	-	27.43	No detailed FEMA Floodplain data available for this area.
E5515	4.56	0.71	0.00	0.71	-	15.61	No detailed FEMA Floodplain data available for this area.
E5520	0.95	0.03	0.00	0.03	-	3.57	No detailed FEMA Floodplain data available for this area.
E5525	1.04	0.75	0.00	0.75	-	72.64	No detailed FEMA Floodplain data available for this area.
E5527	7.35	4.05	0.00	4.05	-	55.09	No detailed FEMA Floodplain data available for this area.
E5530	3.51	1.78	0.00	1.78	-	50.79	No detailed FEMA Floodplain data available for this area.
E5540	3.17	2.17	0.00	2.17	-	68.26	No detailed FEMA Floodplain data available for this area.
E6010	7.49	2.33	0.00	2.33	-	31.16	No detailed FEMA Floodplain data available for this area.
E6020	14.86	1.94	2.91	0.97	33.33	6.52	No detailed FEMA Floodplain data available for this area.
E6030	16.87	5.64	0.13	5.50	4095.75	32.61	No detailed FEMA Floodplain data available for this area.
E6031	9.08	3.30	0.00	3.30	-	36.31	No detailed FEMA Floodplain data available for this area.
E6032	1.43	1.13	0.65	0.48	73.87	33.63	No detailed FEMA Floodplain data available for this area.
E6033	5.43	2.54	3.30	0.76	23.01	14.00	No detailed FEMA Floodplain data available for this area.
E6034	4.21	1.23	0.00	1.23	-	29.26	No detailed FEMA Floodplain data available for this area.
E6035	2.62	1.68	1.30	0.38	28.86	14.35	No detailed FEMA Floodplain data available for this area.
E6036	4.98	2.80	1.53	1.27	82.55	25.43	No detailed FEMA Floodplain data available for this area.
E6037	2.41	0.64	0.00	0.64	-	26.47	No detailed FEMA Floodplain data available for this area.
E6038	17.10	3.16	0.01	3.16	52729.61	18.45	No detailed FEMA Floodplain data available for this area.
E6039	5.97	1.45	0.00	1.45	-	24.23	No detailed FEMA Floodplain data available for this area.
E6040	15.31	3.72	0.00	3.72	-	24.29	No detailed FEMA Floodplain data available for this area.
E6041	2.76	1.09	0.00	1.09	-	39.46	No detailed FEMA Floodplain data available for this area.
E6042	13.78	0.88	0.00	0.88	-	6.35	No detailed FEMA Floodplain data available for this area.
E6043	10.04	1.62	0.00	1.62	-	16.18	No detailed FEMA Floodplain data available for this area.
E6046	9.75	1.90	0.00	1.90	-	19.50	No detailed FEMA Floodplain data available for this area.
E6047	22.11	4.02	0.00	4.02	-	18.19	No detailed FEMA Floodplain data available for this area.
E6048	12.47	2.58	0.00	2.58	-	20.69	No detailed FEMA Floodplain data available for this area.
E6051	7.41	0.74	0.00	0.74	-	10.02	No detailed FEMA Floodplain data available for this area.
E6052	2.40	0.50	0.00	0.50	-	20.73	No detailed FEMA Floodplain data available for this area.
E6053	4.28	1.65	0.00	1.65	-	38.57	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
E6054	2.51	0.69	0.00	0.69	-	27.49	No detailed FEMA Floodplain data available for this area.
E6055	15.74	7.21	0.00	7.21	-	45.82	No detailed FEMA Floodplain data available for this area.
E6060	15.26	3.00	0.00	3.00	-	19.65	No detailed FEMA Floodplain data available for this area.
E7010	5.41	1.80	0.00	1.80	-	33.24	No detailed FEMA Floodplain data available for this area.
E7020	16.31	0.35	0.00	0.35	-	2.17	No detailed FEMA Floodplain data available for this area.
E7030	3.65	0.73	0.00	0.73	-	19.91	No detailed FEMA Floodplain data available for this area.
E7040	1.11	0.06	0.00	0.06	-	5.18	No detailed FEMA Floodplain data available for this area.
E7050	2.03	0.32	0.00	0.32	-	15.60	No detailed FEMA Floodplain data available for this area.
E7053	0.85	0.20	0.00	0.20	-	23.84	No detailed FEMA Floodplain data available for this area.
E7055	0.84	0.29	0.00	0.29	-	34.28	No detailed FEMA Floodplain data available for this area.
E7080	1.88	1.26	0.00	1.26	-	67.36	No detailed FEMA Floodplain data available for this area.
E7090	3.07	0.80	0.00	0.80	-	26.00	No detailed FEMA Floodplain data available for this area.
E7100	2.67	0.64	0.00	0.64	-	24.11	No detailed FEMA Floodplain data available for this area.
E7102	4.46	0.22	0.00	0.22	-	4.93	No detailed FEMA Floodplain data available for this area.
E7103	11.00	1.77	0.00	1.77	-	16.05	No detailed FEMA Floodplain data available for this area.
E7104	5.23	0.59	0.00	0.59	-	11.26	No detailed FEMA Floodplain data available for this area.
E7105	1.97	0.39	0.00	0.39	-	19.56	No detailed FEMA Floodplain data available for this area.
E7107	3.72	0.66	0.00	0.66	-	17.75	No detailed FEMA Floodplain data available for this area.
E7110	1.95	0.50	0.00	0.50	-	25.67	No detailed FEMA Floodplain data available for this area.
E7120	2.25	0.31	0.00	0.31	-	13.67	No detailed FEMA Floodplain data available for this area.
E7130	3.67	0.51	0.00	0.51	-	13.95	No detailed FEMA Floodplain data available for this area.
E7135	4.43	1.60	0.00	1.60	-	36.10	No detailed FEMA Floodplain data available for this area.
E7138	2.41	0.66	0.00	0.66	-	27.16	No detailed FEMA Floodplain data available for this area.
E7140	6.57	0.78	0.00	0.78	-	11.90	No detailed FEMA Floodplain data available for this area.
E7150	8.22	1.71	0.00	1.71	-	20.79	No detailed FEMA Floodplain data available for this area.
E7505	1.29	0.10	0.00	0.10	-	8.02	No detailed FEMA Floodplain data available for this area.
E7507	0.72	0.09	0.00	0.09	-	11.78	No detailed FEMA Floodplain data available for this area.
E7509	0.78	0.07	0.00	0.07	-	8.75	No detailed FEMA Floodplain data available for this area.
E7510	0.92	0.00	0.00	0.00	-	0.00	No detailed FEMA Floodplain data available for this area.
E7512	1.74	0.16	0.00	0.16	-	9.13	No detailed FEMA Floodplain data available for this area.
E7514	0.22	0.06	0.00	0.06	-	27.08	No detailed FEMA Floodplain data available for this area.
E7516	0.34	0.08	0.00	0.08	-	22.77	No detailed FEMA Floodplain data available for this area.
E7517	4.41	1.89	0.00	1.89	-	42.85	No detailed FEMA Floodplain data available for this area.
E7518	11.01	3.70	0.00	3.70	-	33.62	No detailed FEMA Floodplain data available for this area.
E7519	4.20	1.16	0.00	1.16	-	27.69	No detailed FEMA Floodplain data available for this area.
E7520	8.46	0.81	0.00	0.81	-	9.57	No detailed FEMA Floodplain data available for this area.
E7525	2.75	2.29	0.00	2.29	-	83.19	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
E7530	5.41	0.79	0.00	0.79	-	14.57	No detailed FEMA Floodplain data available for this area.
E7540	5.87	1.90	0.00	1.90	-	32.42	No detailed FEMA Floodplain data available for this area.
E7545	4.09	1.12	0.00	1.12	-	27.41	No detailed FEMA Floodplain data available for this area.
E7547	1.59	0.05	0.00	0.05	-	3.02	No detailed FEMA Floodplain data available for this area.
E7550	2.49	0.07	0.00	0.07	-	2.62	No detailed FEMA Floodplain data available for this area.
E7560	1.94	0.20	0.00	0.20	-	10.08	No detailed FEMA Floodplain data available for this area.
E7580	4.44	0.73	0.00	0.73	-	16.40	No detailed FEMA Floodplain data available for this area.
E9008	4.83	0.69	0.00	0.69	-	14.30	No detailed FEMA Floodplain data available for this area.
E9009	2.40	0.44	0.00	0.44	-	18.27	No detailed FEMA Floodplain data available for this area.
E9010	10.57	3.18	0.00	3.18	-	30.05	No detailed FEMA Floodplain data available for this area.
E9020	6.04	1.59	0.00	1.59	-	26.26	No detailed FEMA Floodplain data available for this area.
E9025	7.52	3.77	0.00	3.77	-	50.19	No detailed FEMA Floodplain data available for this area.
E9030	9.91	2.96	0.00	2.96	-	29.81	No detailed FEMA Floodplain data available for this area.
E9040	18.10	2.92	0.00	2.92	-	16.11	No detailed FEMA Floodplain data available for this area.
E9045	18.37	3.45	0.00	3.45	-	18.78	No detailed FEMA Floodplain data available for this area.
E9047	12.14	2.49	0.00	2.49	-	20.49	No detailed FEMA Floodplain data available for this area.
E9050	2.09	0.62	0.00	0.62	-	29.69	No detailed FEMA Floodplain data available for this area.
E9060	1.36	0.56	0.00	0.56	-	41.42	No detailed FEMA Floodplain data available for this area.
E9065	3.57	0.66	0.00	0.66	-	18.38	No detailed FEMA Floodplain data available for this area.
E9070	2.49	0.71	0.00	0.71	-	28.43	No detailed FEMA Floodplain data available for this area.
E9080	6.04	0.53	0.00	0.53	-	8.76	No detailed FEMA Floodplain data available for this area.
E9090	2.32	0.37	0.00	0.37	-	15.81	No detailed FEMA Floodplain data available for this area.
E9100	0.47	0.17	0.00	0.17	-	36.94	No detailed FEMA Floodplain data available for this area.
E9110	4.56	0.36	0.00	0.36	-	7.82	No detailed FEMA Floodplain data available for this area.
E9510	15.25	0.47	0.00	0.47	-	3.06	No detailed FEMA Floodplain data available for this area.
E9520	0.68	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
E9602	0.36	0.03	0.00	0.03	-	7.49	No detailed FEMA Floodplain data available for this area.
E9604	0.77	0.49	0.00	0.49	-	63.50	No detailed FEMA Floodplain data available for this area.
E9606	0.29	0.13	0.00	0.13	-	45.63	No detailed FEMA Floodplain data available for this area.
E9608	0.19	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
E9610	0.43	0.02	0.00	0.02	-	5.69	No detailed FEMA Floodplain data available for this area.
E9611	0.46	0.07	0.00	0.07	-	16.02	No detailed FEMA Floodplain data available for this area.
E9612	0.46	0.08	0.00	0.08	-	18.20	No detailed FEMA Floodplain data available for this area.
E9620	0.78	0.06	0.00	0.06	-	7.45	No detailed FEMA Floodplain data available for this area.
E9626	0.47	0.02	0.00	0.02	-	3.77	No detailed FEMA Floodplain data available for this area.
E9630	1.14	0.12	0.00	0.12	-	10.89	No detailed FEMA Floodplain data available for this area.
E9700	7.35	0.50	0.00	0.50	-	6.82	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
F0010	0.49	0.29	0.00	0.29	-	60.55	No detailed FEMA Floodplain data available for this area.
F0020	24.09	1.94	0.00	1.94	-	8.06	No detailed FEMA Floodplain data available for this area.
F0022	12.69	0.77	0.00	0.77	-	6.10	No detailed FEMA Floodplain data available for this area.
F0025	10.31	1.53	0.00	1.53	-	14.80	No detailed FEMA Floodplain data available for this area.
F0030	29.41	1.98	0.00	1.98	-	6.73	No detailed FEMA Floodplain data available for this area.
F0032	26.62	1.08	0.00	1.08	-	4.05	No detailed FEMA Floodplain data available for this area.
F0034	54.51	1.52	0.00	1.52	-	2.78	No detailed FEMA Floodplain data available for this area.
F0036	24.62	1.21	0.00	1.21	-	4.91	No detailed FEMA Floodplain data available for this area.
F0038	6.16	0.17	0.00	0.17	-	2.79	No detailed FEMA Floodplain data available for this area.
F0040	19.23	2.15	0.00	2.15	-	11.18	No detailed FEMA Floodplain data available for this area.
F0070	9.00	0.26	0.00	0.26	-	2.93	No detailed FEMA Floodplain data available for this area.
F0082	4.86	0.04	0.00	0.04	-	0.85	No detailed FEMA Floodplain data available for this area.
F0085	19.68	0.73	0.00	0.73	-	3.70	No detailed FEMA Floodplain data available for this area.
F0088	22.26	2.00	0.00	2.00	-	8.99	No detailed FEMA Floodplain data available for this area.
F0090	25.99	1.15	0.00	1.15	-	4.41	No detailed FEMA Floodplain data available for this area.
F0092	5.06	0.21	0.00	0.21	-	4.06	No detailed FEMA Floodplain data available for this area.
F0094	12.22	1.12	0.00	1.12	-	9.19	No detailed FEMA Floodplain data available for this area.
F0096	57.55	1.04	0.00	1.04	-	1.81	No detailed FEMA Floodplain data available for this area.
F0098	4.31	0.35	0.00	0.35	-	8.21	No detailed FEMA Floodplain data available for this area.
F0100	18.19	1.61	0.00	1.61	-	8.84	No detailed FEMA Floodplain data available for this area.
F0110	83.01	2.83	0.00	2.83	-	3.41	No detailed FEMA Floodplain data available for this area.
F0120	24.84	3.27	0.00	3.27	-	13.15	No detailed FEMA Floodplain data available for this area.
F0122	13.68	0.29	0.00	0.29	-	2.09	No detailed FEMA Floodplain data available for this area.
F0124	1.41	0.25	0.00	0.25	-	17.55	No detailed FEMA Floodplain data available for this area.
F0126	24.04	1.61	0.00	1.61	-	6.69	No detailed FEMA Floodplain data available for this area.
F0128	0.76	0.21	0.00	0.21	-	27.76	No detailed FEMA Floodplain data available for this area.
F0140	15.58	2.15	0.00	2.15	-	13.83	No detailed FEMA Floodplain data available for this area.
F0150	3.87	0.91	0.00	0.91	-	23.61	No detailed FEMA Floodplain data available for this area.
F0152	25.49	0.11	0.00	0.11	-	0.43	No detailed FEMA Floodplain data available for this area.
F0153	25.46	4.89	0.00	4.89	-	19.20	No detailed FEMA Floodplain data available for this area.
F0154	13.94	0.44	0.00	0.44	-	3.13	No detailed FEMA Floodplain data available for this area.
F0155	3.07	1.22	0.00	1.22	-	39.84	No detailed FEMA Floodplain data available for this area.
F0156	16.59	0.55	0.00	0.55	-	3.33	No detailed FEMA Floodplain data available for this area.
F0158	20.73	0.32	0.00	0.32	-	1.52	No detailed FEMA Floodplain data available for this area.
F0160	14.38	1.43	0.00	1.43	-	9.92	No detailed FEMA Floodplain data available for this area.
F0170	21.90	2.38	0.00	2.38	-	10.86	No detailed FEMA Floodplain data available for this area.
F0180	31.42	4.62	0.00	4.62	-	14.72	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
F0187	0.46	0.08	0.00	0.08	-	17.12	No detailed FEMA Floodplain data available for this area.
F0188	6.58	0.75	0.00	0.75	-	11.38	No detailed FEMA Floodplain data available for this area.
F0190	40.06	5.10	0.00	5.10	-	12.74	No detailed FEMA Floodplain data available for this area.
F0210	83.20	9.56	0.00	9.56	-	11.48	No detailed FEMA Floodplain data available for this area.
F0220	76.67	13.44	0.00	13.44	-	17.53	No detailed FEMA Floodplain data available for this area.
F0229	0.32	0.05	0.00	0.05	-	16.99	No detailed FEMA Floodplain data available for this area.
F0230	67.27	14.82	0.00	14.82	-	22.03	No detailed FEMA Floodplain data available for this area.
F1010	31.46	1.28	0.00	1.28	-	4.05	No detailed FEMA Floodplain data available for this area.
F1020	19.89	1.69	0.00	1.69	-	8.51	No detailed FEMA Floodplain data available for this area.
F1030	8.05	0.35	0.00	0.35	-	4.41	No detailed FEMA Floodplain data available for this area.
F1040	1.43	0.05	0.00	0.05	-	3.31	No detailed FEMA Floodplain data available for this area.
F2010	27.14	2.36	0.00	2.36	-	8.71	No detailed FEMA Floodplain data available for this area.
F2020	2.48	0.44	0.00	0.44	-	17.82	No detailed FEMA Floodplain data available for this area.
F2025	10.00	0.65	0.00	0.65	-	6.51	No detailed FEMA Floodplain data available for this area.
F2030	9.31	0.56	0.00	0.56	-	6.01	No detailed FEMA Floodplain data available for this area.
F2040	4.68	0.19	0.00	0.19	-	4.02	No detailed FEMA Floodplain data available for this area.
F2050	0.35	0.07	0.00	0.07	-	19.48	No detailed FEMA Floodplain data available for this area.
G0003	27.70	0.76	0.00	0.76	-	2.76	No detailed FEMA Floodplain data available for this area.
G0008	10.99	0.15	0.00	0.15	-	1.40	No detailed FEMA Floodplain data available for this area.
G0010	1.83	1.27	0.00	1.27	-	69.24	No detailed FEMA Floodplain data available for this area.
G0020	2.74	1.43	0.00	1.43	-	52.10	No detailed FEMA Floodplain data available for this area.
G0030	1.67	1.20	0.00	1.20	-	71.82	No detailed FEMA Floodplain data available for this area.
G0040	3.72	1.30	0.00	1.30	-	34.79	No detailed FEMA Floodplain data available for this area.
G0050	14.19	2.48	0.00	2.48	-	17.45	No detailed FEMA Floodplain data available for this area.
G0053	31.43	2.30	0.00	2.30	-	7.32	No detailed FEMA Floodplain data available for this area.
G0057	25.61	3.68	0.00	3.68	-	14.35	No detailed FEMA Floodplain data available for this area.
G0060	30.21	4.31	0.00	4.31	-	14.28	No detailed FEMA Floodplain data available for this area.
G0080	15.40	2.54	0.00	2.54	-	16.49	No detailed FEMA Floodplain data available for this area.
G0090	16.42	3.40	0.00	3.40	-	20.70	No detailed FEMA Floodplain data available for this area.
G0110	17.71	3.54	0.00	3.54	-	19.97	No detailed FEMA Floodplain data available for this area.
G0120	35.81	3.60	0.00	3.60	-	10.05	No detailed FEMA Floodplain data available for this area.
G0130	44.88	9.48	0.00	9.48	-	21.13	No detailed FEMA Floodplain data available for this area.
G0140	54.87	8.96	0.00	8.96	-	16.32	No detailed FEMA Floodplain data available for this area.
G0150	33.13	5.37	0.00	5.37	-	16.22	No detailed FEMA Floodplain data available for this area.
G0170	24.01	4.18	0.00	4.18	-	17.42	No detailed FEMA Floodplain data available for this area.
G0180	11.76	4.31	0.00	4.31	-	36.63	No detailed FEMA Floodplain data available for this area.
G0190	34.65	11.55	0.00	11.55	-	33.33	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
G0200	0.49	0.28	0.00	0.28	-	55.78	No detailed FEMA Floodplain data available for this area.
G0210	0.89	0.53	0.00	0.53	-	59.26	No detailed FEMA Floodplain data available for this area.
G0215	22.43	3.89	0.00	3.89	-	17.34	No detailed FEMA Floodplain data available for this area.
G0216	2.39	1.30	0.00	1.30	-	54.65	No detailed FEMA Floodplain data available for this area.
G0217	7.60	2.00	0.00	2.00	-	26.29	No detailed FEMA Floodplain data available for this area.
G0218	22.86	1.96	0.00	1.96	-	8.56	No detailed FEMA Floodplain data available for this area.
G0219	18.52	2.71	0.00	2.71	-	14.65	No detailed FEMA Floodplain data available for this area.
G0220	17.32	2.96	0.00	2.96	-	17.11	No detailed FEMA Floodplain data available for this area.
G0221	7.67	3.35	0.00	3.35	-	43.66	No detailed FEMA Floodplain data available for this area.
G0222	3.37	0.59	0.00	0.59	-	17.51	No detailed FEMA Floodplain data available for this area.
G0223	13.54	2.00	0.00	2.00	-	14.78	No detailed FEMA Floodplain data available for this area.
G0224	0.40	0.14	0.00	0.14	-	34.19	No detailed FEMA Floodplain data available for this area.
G0226	4.27	1.08	0.00	1.08	-	25.35	No detailed FEMA Floodplain data available for this area.
G0227	0.39	0.30	0.00	0.30	-	76.32	No detailed FEMA Floodplain data available for this area.
G0229	0.49	0.28	0.00	0.28	-	57.11	No detailed FEMA Floodplain data available for this area.
G0230	3.29	2.12	0.00	2.12	-	64.32	No detailed FEMA Floodplain data available for this area.
G0240	5.26	2.35	0.00	2.35	-	44.67	No detailed FEMA Floodplain data available for this area.
G0245	7.29	0.79	0.00	0.79	-	10.80	No detailed FEMA Floodplain data available for this area.
G0250	4.69	2.94	0.00	2.94	-	62.68	No detailed FEMA Floodplain data available for this area.
G0252	7.57	2.03	0.00	2.03	-	26.81	No detailed FEMA Floodplain data available for this area.
G0254	4.59	1.93	0.00	1.93	-	42.19	No detailed FEMA Floodplain data available for this area.
G0256	9.08	1.29	0.00	1.29	-	14.16	No detailed FEMA Floodplain data available for this area.
G0260	5.02	3.27	0.00	3.27	-	65.20	No detailed FEMA Floodplain data available for this area.
G0263	6.74	2.62	0.00	2.62	-	38.86	No detailed FEMA Floodplain data available for this area.
G0266	5.55	2.15	0.00	2.15	-	38.80	No detailed FEMA Floodplain data available for this area.
G0270	2.54	1.87	0.00	1.87	-	73.53	No detailed FEMA Floodplain data available for this area.
G0280	1.93	0.72	0.00	0.72	-	37.09	No detailed FEMA Floodplain data available for this area.
G1010	2.50	0.95	0.00	0.95	-	37.94	No detailed FEMA Floodplain data available for this area.
G1020	3.28	0.58	0.00	0.58	-	17.66	No detailed FEMA Floodplain data available for this area.
G1030	15.64	0.49	0.00	0.49	-	3.11	No detailed FEMA Floodplain data available for this area.
G1040	0.44	0.26	0.00	0.26	-	59.47	No detailed FEMA Floodplain data available for this area.
G1050	0.32	0.15	0.00	0.15	-	47.42	No detailed FEMA Floodplain data available for this area.
G1060	3.45	0.80	0.00	0.80	-	23.27	No detailed FEMA Floodplain data available for this area.
G1510	4.05	0.57	0.00	0.57	-	14.17	No detailed FEMA Floodplain data available for this area.
G1520	23.35	3.82	0.00	3.82	-	16.37	No detailed FEMA Floodplain data available for this area.
G1530	11.68	1.68	0.00	1.68	-	14.38	No detailed FEMA Floodplain data available for this area.
G1540	3.94	0.80	0.00	0.80	-	20.29	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
G2020	3.28	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
G2030	5.45	0.83	0.00	0.83	-	15.13	No detailed FEMA Floodplain data available for this area.
G2032	18.03	0.52	0.00	0.52	-	2.91	No detailed FEMA Floodplain data available for this area.
G2034	11.34	0.98	0.00	0.98	-	8.69	No detailed FEMA Floodplain data available for this area.
G2036	8.97	0.81	0.00	0.81	-	9.07	No detailed FEMA Floodplain data available for this area.
G2040	25.72	1.81	0.00	1.81	-	7.03	No detailed FEMA Floodplain data available for this area.
G2050	3.67	0.56	0.00	0.56	-	15.28	No detailed FEMA Floodplain data available for this area.
G2070	5.96	0.81	0.00	0.81	-	13.59	No detailed FEMA Floodplain data available for this area.
G2080	4.28	0.87	0.00	0.87	-	20.22	No detailed FEMA Floodplain data available for this area.
G2090	28.67	4.78	0.00	4.78	-	16.67	No detailed FEMA Floodplain data available for this area.
G2100	39.16	9.18	0.00	9.18	-	23.44	No detailed FEMA Floodplain data available for this area.
G2103	11.39	1.91	0.00	1.91	-	16.76	No detailed FEMA Floodplain data available for this area.
G2107	12.65	2.05	0.00	2.05	-	16.17	No detailed FEMA Floodplain data available for this area.
G2109	1.66	0.31	0.00	0.31	-	18.69	No detailed FEMA Floodplain data available for this area.
G2110	7.47	2.29	0.00	2.29	-	30.71	No detailed FEMA Floodplain data available for this area.
G2130	17.51	3.61	0.00	3.61	-	20.63	No detailed FEMA Floodplain data available for this area.
G2150	1.52	0.70	0.00	0.70	-	45.74	No detailed FEMA Floodplain data available for this area.
G3010	9.15	0.46	0.00	0.46	-	5.01	No detailed FEMA Floodplain data available for this area.
G3020	8.78	1.24	0.00	1.24	-	14.14	No detailed FEMA Floodplain data available for this area.
G3030	8.20	1.94	0.00	1.94	-	23.69	No detailed FEMA Floodplain data available for this area.
G3040	5.43	1.83	0.00	1.83	-	33.69	No detailed FEMA Floodplain data available for this area.
G3050	0.85	0.42	0.00	0.42	-	49.82	No detailed FEMA Floodplain data available for this area.
G4010	7.86	1.05	0.00	1.05	-	13.33	No detailed FEMA Floodplain data available for this area.
G4020	13.79	2.25	0.00	2.25	-	16.32	No detailed FEMA Floodplain data available for this area.
G4023	16.62	1.23	0.00	1.23	-	7.40	No detailed FEMA Floodplain data available for this area.
G4027	7.45	0.88	0.00	0.88	-	11.85	No detailed FEMA Floodplain data available for this area.
G4030	2.71	0.72	0.00	0.72	-	26.63	No detailed FEMA Floodplain data available for this area.
G4040	7.14	0.98	0.00	0.98	-	13.65	No detailed FEMA Floodplain data available for this area.
G4050	0.48	0.23	0.00	0.23	-	47.90	No detailed FEMA Floodplain data available for this area.
G5210	9.65	0.43	0.00	0.43	-	4.49	No detailed FEMA Floodplain data available for this area.
G5220	8.51	1.20	0.00	1.20	-	14.14	No detailed FEMA Floodplain data available for this area.
G5230	10.04	0.40	0.00	0.40	-	4.02	No detailed FEMA Floodplain data available for this area.
G5240	3.53	0.16	0.00	0.16	-	4.51	No detailed FEMA Floodplain data available for this area.
G5510	3.13	0.19	0.00	0.19	-	6.22	No detailed FEMA Floodplain data available for this area.
G5520	5.19	0.58	0.00	0.58	-	11.09	No detailed FEMA Floodplain data available for this area.
G5535	1.31	0.34	0.00	0.34	-	25.94	No detailed FEMA Floodplain data available for this area.
G5540	10.25	2.13	0.00	2.13	-	20.81	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
G5545	10.60	0.40	0.00	0.40	-	3.76	No detailed FEMA Floodplain data available for this area.
G5550	20.49	1.27	0.00	1.27	-	6.22	No detailed FEMA Floodplain data available for this area.
G5560	11.98	0.71	0.00	0.71	-	5.95	No detailed FEMA Floodplain data available for this area.
G5580	22.97	2.08	0.00	2.08	-	9.05	No detailed FEMA Floodplain data available for this area.
G5810	2.15	1.29	0.00	1.29	-	60.30	No detailed FEMA Floodplain data available for this area.
G5815	13.12	0.40	0.00	0.40	-	3.02	No detailed FEMA Floodplain data available for this area.
G5820	2.87	1.92	0.00	1.92	-	67.12	No detailed FEMA Floodplain data available for this area.
G5830	2.84	1.36	0.00	1.36	-	47.82	No detailed FEMA Floodplain data available for this area.
G5835	12.42	1.64	0.00	1.64	-	13.24	No detailed FEMA Floodplain data available for this area.
G5840	0.86	0.64	0.00	0.64	-	74.65	No detailed FEMA Floodplain data available for this area.
G5850	5.99	0.62	0.00	0.62	-	10.27	No detailed FEMA Floodplain data available for this area.
G5860	12.73	0.50	0.00	0.50	-	3.90	No detailed FEMA Floodplain data available for this area.
G5863	18.14	0.21	0.00	0.21	-	1.15	No detailed FEMA Floodplain data available for this area.
G5867	0.50	0.12	0.00	0.12	-	24.39	No detailed FEMA Floodplain data available for this area.
G5870	4.43	2.53	0.00	2.53	-	56.98	No detailed FEMA Floodplain data available for this area.
G5880	66.63	3.51	0.00	3.51	-	5.27	No detailed FEMA Floodplain data available for this area.
G5890	64.70	3.45	0.00	3.45	-	5.34	No detailed FEMA Floodplain data available for this area.
G6010	17.62	0.79	0.00	0.79	-	4.47	No detailed FEMA Floodplain data available for this area.
G6020	15.95	1.17	0.00	1.17	-	7.34	No detailed FEMA Floodplain data available for this area.
G6030	12.99	1.12	0.00	1.12	-	8.61	No detailed FEMA Floodplain data available for this area.
G6050	1.15	0.25	0.00	0.25	-	21.36	No detailed FEMA Floodplain data available for this area.
G7010	8.47	0.97	0.00	0.97	-	11.47	No detailed FEMA Floodplain data available for this area.
G7012	13.26	2.58	0.00	2.58	-	19.46	No detailed FEMA Floodplain data available for this area.
G7015	23.70	3.35	0.00	3.35	-	14.12	No detailed FEMA Floodplain data available for this area.
G7020	5.75	1.58	0.00	1.58	-	27.40	No detailed FEMA Floodplain data available for this area.
G7030	0.59	0.17	0.00	0.17	-	28.16	No detailed FEMA Floodplain data available for this area.
G7040	1.02	0.37	0.00	0.37	-	36.53	No detailed FEMA Floodplain data available for this area.
G7050	2.81	0.51	0.00	0.51	-	18.34	No detailed FEMA Floodplain data available for this area.
G8005	10.39	1.99	0.00	1.99	-	19.15	No detailed FEMA Floodplain data available for this area.
G8010	19.13	1.89	0.00	1.89	-	9.89	No detailed FEMA Floodplain data available for this area.
G8040	18.95	4.52	0.00	4.52	-	23.84	No detailed FEMA Floodplain data available for this area.
G8042	12.25	0.63	0.00	0.63	-	5.18	No detailed FEMA Floodplain data available for this area.
G8044	1.52	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
G8045	1.10	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
G8048	20.57	4.85	0.00	4.85	-	23.58	No detailed FEMA Floodplain data available for this area.
G8050	4.98	1.21	0.00	1.21	-	24.36	No detailed FEMA Floodplain data available for this area.
H0002	2.72	1.79	0.00	1.79	-	65.93	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
H0004	5.45	1.43	0.00	1.43	-	26.24	No detailed FEMA Floodplain data available for this area.
H0006	1.19	0.93	0.00	0.93	-	77.98	No detailed FEMA Floodplain data available for this area.
H0008	2.05	0.59	0.00	0.59	-	28.70	No detailed FEMA Floodplain data available for this area.
H0010	10.02	7.43	6.52	0.91	14.00	9.11	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
H0020	13.33	6.32	5.81	0.51	8.79	3.83	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
H0030	4.41	2.84	4.28	1.44	33.54	32.53	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
H0040	18.61	7.51	8.37	0.87	10.35	4.66	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
H0050	13.80	2.12	2.40	0.28	11.63	2.02	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
H0060	8.39	4.66	6.67	2.01	30.10	23.93	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
H0070	30.38	9.38	11.97	2.59	21.61	8.52	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
H0072	1.76	1.76	1.76	0.00	0.00	0.00	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
H0074	0.77	0.77	0.77	0.00	0.00	0.00	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
H0076	2.19	2.19	2.19	0.00	0.00	0.00	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
H0080	15.70	11.43	15.70	4.27	27.18	27.18	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
H0090	16.92	13.92	16.92	3.01	17.76	17.76	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
H0100	26.14	18.50	22.94	4.44	19.35	16.98	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
H0110	33.15	27.95	25.10	2.86	11.39	8.62	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
H0120	2.60	2.28	2.45	0.17	7.02	6.61	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
H0130	15.24	14.82	14.71	0.11	0.74	0.71	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
H0140	23.00	22.74	23.00	0.26	1.14	1.14	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
H0150	11.87	11.87	11.87	0.00	0.00	0.00	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
H0160	12.24	12.21	10.63	1.59	14.93	12.96	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
H6010	14.30	2.51	0.00	2.51	-	17.56	No detailed FEMA Floodplain data available for this area.
H6020	2.33	0.52	0.00	0.52	-	22.26	No detailed FEMA Floodplain data available for this area.
H6035	3.40	0.66	0.00	0.66	-	19.35	No detailed FEMA Floodplain data available for this area.
H6050	20.08	5.07	0.00	5.07	-	25.27	No detailed FEMA Floodplain data available for this area.
H6060	1.79	0.46	0.00	0.46	-	25.43	No detailed FEMA Floodplain data available for this area.
H6065	27.83	6.64	0.00	6.64	-	23.86	No detailed FEMA Floodplain data available for this area.
H6080	1.23	0.39	0.00	0.39	-	31.73	No detailed FEMA Floodplain data available for this area.
H6100	6.92	0.94	0.00	0.94	-	13.59	No detailed FEMA Floodplain data available for this area.
H6105	3.31	2.98	0.20	2.78	1362.41	83.83	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
H6110	4.60	4.52	2.05	2.48	120.87	53.79	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
H8010	5.61	3.34	0.00	3.34	-	59.60	No detailed FEMA Floodplain data available for this area.
H8020	8.49	4.52	0.00	4.52	-	53.23	No detailed FEMA Floodplain data available for this area.
H8030	13.26	8.26	0.00	8.26	-	62.28	No detailed FEMA Floodplain data available for this area.
H8060	15.14	4.96	0.00	4.96	-	32.76	No detailed FEMA Floodplain data available for this area.
H8075	10.00	3.04	0.00	3.04	-	30.36	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
H8077	16.23	5.61	0.00	5.61	-	34.60	No detailed FEMA Floodplain data available for this area.
H8080	14.57	2.05	0.00	2.05	-	14.06	No detailed FEMA Floodplain data available for this area.
H8090	10.62	2.26	0.28	1.99	721.13	18.72	No detailed FEMA Floodplain data available for this area.
H9000	35.93	7.49	6.70	0.79	11.83	2.20	No detailed FEMA Floodplain data available for this area.
I0012	15.75	0.96	0.00	0.96	-	6.10	No detailed FEMA Floodplain data available for this area.
I0015	10.57	1.74	0.00	1.74	-	16.41	No detailed FEMA Floodplain data available for this area.
I0016	29.58	7.51	0.00	7.51	-	25.39	No detailed FEMA Floodplain data available for this area.
I0018	1.70	0.56	0.00	0.56	-	33.04	No detailed FEMA Floodplain data available for this area.
I0020	34.79	12.24	0.00	12.24	-	35.19	No detailed FEMA Floodplain data available for this area.
I0025	1.99	0.22	0.00	0.22	-	11.20	No detailed FEMA Floodplain data available for this area.
I0030	21.13	7.58	0.00	7.58	-	35.88	No detailed FEMA Floodplain data available for this area.
I0040	4.62	0.58	0.00	0.58	-	12.54	No detailed FEMA Floodplain data available for this area.
I0050	5.80	0.61	0.00	0.61	-	10.45	No detailed FEMA Floodplain data available for this area.
I0055	19.20	0.10	0.00	0.10	-	0.51	No detailed FEMA Floodplain data available for this area.
I0059	0.86	0.13	0.00	0.13	-	14.67	No detailed FEMA Floodplain data available for this area.
I0060	18.46	2.17	0.00	2.17	-	11.73	No detailed FEMA Floodplain data available for this area.
I0062	11.76	2.46	0.00	2.46	-	20.90	No detailed FEMA Floodplain data available for this area.
I0070	26.83	3.06	0.00	3.06	-	11.40	No detailed FEMA Floodplain data available for this area.
I0080	29.06	2.15	0.00	2.15	-	7.39	No detailed FEMA Floodplain data available for this area.
I0082	16.09	3.56	0.00	3.56	-	22.11	No detailed FEMA Floodplain data available for this area.
I0085	50.93	13.72	0.00	13.72	-	26.95	No detailed FEMA Floodplain data available for this area.
I0090	12.47	2.76	0.00	2.76	-	22.10	No detailed FEMA Floodplain data available for this area.
I0095	18.00	4.38	0.00	4.38	-	24.31	No detailed FEMA Floodplain data available for this area.
I0100	31.58	4.59	0.00	4.59	-	14.54	No detailed FEMA Floodplain data available for this area.
I0105	24.16	3.22	0.00	3.22	-	13.32	No detailed FEMA Floodplain data available for this area.
I0110	29.56	4.89	0.00	4.89	-	16.55	No detailed FEMA Floodplain data available for this area.
I0130	9.20	2.46	0.00	2.46	-	26.75	No detailed FEMA Floodplain data available for this area.
I0132	26.09	0.58	0.00	0.58	-	2.22	No detailed FEMA Floodplain data available for this area.
I0133	34.23	7.79	0.00	7.79	-	22.75	No detailed FEMA Floodplain data available for this area.
I0135	29.07	0.95	0.00	0.95	-	3.25	No detailed FEMA Floodplain data available for this area.
I0138	40.16	1.00	0.00	1.00	-	2.48	No detailed FEMA Floodplain data available for this area.
I0140	5.72	2.95	0.00	2.95	-	51.48	No detailed FEMA Floodplain data available for this area.
I0150	40.51	6.77	0.00	6.77	-	16.71	No detailed FEMA Floodplain data available for this area.
I0155	17.02	0.80	0.00	0.80	-	4.71	No detailed FEMA Floodplain data available for this area.
I0160	3.66	1.87	0.00	1.87	-	51.02	No detailed FEMA Floodplain data available for this area.
I0170	11.78	0.87	0.00	0.87	-	7.41	No detailed FEMA Floodplain data available for this area.
I0172	22.42	1.18	0.00	1.18	-	5.28	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
I0174	31.78	4.49	0.00	4.49	-	14.12	No detailed FEMA Floodplain data available for this area.
I0176	71.29	5.85	0.00	5.85	-	8.21	No detailed FEMA Floodplain data available for this area.
I0178	10.54	0.73	0.00	0.73	-	6.97	No detailed FEMA Floodplain data available for this area.
I0180	6.83	3.07	0.00	3.07	-	44.99	No detailed FEMA Floodplain data available for this area.
I0181	9.53	1.01	0.00	1.01	-	10.61	No detailed FEMA Floodplain data available for this area.
I0182	33.23	4.76	0.00	4.76	-	14.34	No detailed FEMA Floodplain data available for this area.
I0183	33.59	2.39	0.00	2.39	-	7.12	No detailed FEMA Floodplain data available for this area.
I0185	46.56	7.67	0.00	7.67	-	16.47	No detailed FEMA Floodplain data available for this area.
I0188	9.50	2.69	0.00	2.69	-	28.30	No detailed FEMA Floodplain data available for this area.
I0190	3.79	2.08	0.00	2.08	-	54.86	No detailed FEMA Floodplain data available for this area.
I0192	15.98	1.47	0.00	1.47	-	9.18	No detailed FEMA Floodplain data available for this area.
I0193	21.99	4.24	0.00	4.24	-	19.26	No detailed FEMA Floodplain data available for this area.
I0195	9.04	1.73	0.00	1.73	-	19.16	No detailed FEMA Floodplain data available for this area.
I1010	22.73	0.20	0.00	0.20	-	0.87	No detailed FEMA Floodplain data available for this area.
I1015	32.59	0.51	0.00	0.51	-	1.55	No detailed FEMA Floodplain data available for this area.
I1020	62.15	1.12	0.00	1.12	-	1.80	No detailed FEMA Floodplain data available for this area.
I1030	39.56	0.80	0.00	0.80	-	2.03	No detailed FEMA Floodplain data available for this area.
I2010	5.85	0.59	0.00	0.59	-	10.12	No detailed FEMA Floodplain data available for this area.
I2020	4.73	0.56	0.00	0.56	-	11.90	No detailed FEMA Floodplain data available for this area.
I2030	9.49	1.21	0.00	1.21	-	12.75	No detailed FEMA Floodplain data available for this area.
I2040	8.59	0.90	0.00	0.90	-	10.47	No detailed FEMA Floodplain data available for this area.
I2050	18.27	1.67	0.00	1.67	-	9.13	No detailed FEMA Floodplain data available for this area.
I9020	2.61	1.38	0.00	1.38	-	52.83	No detailed FEMA Floodplain data available for this area.
I9022	9.08	2.78	0.00	2.78	-	30.67	No detailed FEMA Floodplain data available for this area.
I9024	50.34	10.78	0.00	10.78	-	21.41	No detailed FEMA Floodplain data available for this area.
J0005	5.64	1.48	0.00	1.48	-	26.17	No detailed FEMA Floodplain data available for this area.
J0010	25.39	7.45	0.00	7.45	-	29.35	No detailed FEMA Floodplain data available for this area.
J0020	25.36	6.27	0.00	6.27	-	24.73	No detailed FEMA Floodplain data available for this area.
J0030	29.51	5.75	0.00	5.75	-	19.47	No detailed FEMA Floodplain data available for this area.
J0040	37.32	12.69	0.00	12.69	-	34.01	No detailed FEMA Floodplain data available for this area.
J0050	9.34	3.42	0.00	3.42	-	36.61	No detailed FEMA Floodplain data available for this area.
J0070	3.50	2.37	0.00	2.37	-	67.62	No detailed FEMA Floodplain data available for this area.
J0080	46.37	12.14	0.00	12.14	-	26.18	No detailed FEMA Floodplain data available for this area.
J0090	13.16	8.68	0.00	8.68	-	65.96	No detailed FEMA Floodplain data available for this area.
J0100	7.56	1.52	0.00	1.52	-	20.16	No detailed FEMA Floodplain data available for this area.
J0103	3.14	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
J0104	3.30	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
J0105	6.67	0.12	0.00	0.12	-	1.84	No detailed FEMA Floodplain data available for this area.
J0110	43.62	2.74	0.00	2.74	-	6.28	No detailed FEMA Floodplain data available for this area.
J0120	41.71	4.40	0.00	4.40	-	10.55	No detailed FEMA Floodplain data available for this area.
J0130	29.88	4.59	0.00	4.59	-	15.37	No detailed FEMA Floodplain data available for this area.
J0140	2.85	1.66	0.00	1.66	-	58.33	No detailed FEMA Floodplain data available for this area.
J0142	1.25	0.53	0.00	0.53	-	42.28	No detailed FEMA Floodplain data available for this area.
J0143	3.50	0.64	0.00	0.64	-	18.43	No detailed FEMA Floodplain data available for this area.
J0144	2.01	0.09	0.00	0.09	-	4.30	No detailed FEMA Floodplain data available for this area.
J0145	63.90	9.90	0.00	9.90	-	15.50	No detailed FEMA Floodplain data available for this area.
J0148	0.86	0.25	0.00	0.25	-	29.76	No detailed FEMA Floodplain data available for this area.
J0150	13.02	2.19	0.00	2.19	-	16.82	No detailed FEMA Floodplain data available for this area.
J0160	42.00	12.44	0.00	12.44	-	29.62	No detailed FEMA Floodplain data available for this area.
J0162	17.11	3.73	0.00	3.73	-	21.82	No detailed FEMA Floodplain data available for this area.
J0165	11.78	2.59	0.00	2.59	-	21.97	No detailed FEMA Floodplain data available for this area.
J0168	0.99	0.33	0.00	0.33	-	32.87	No detailed FEMA Floodplain data available for this area.
J0170	3.89	2.14	0.00	2.14	-	55.06	No detailed FEMA Floodplain data available for this area.
J0172	9.78	1.33	0.00	1.33	-	13.61	No detailed FEMA Floodplain data available for this area.
J0174	22.00	4.07	0.00	4.07	-	18.51	No detailed FEMA Floodplain data available for this area.
J0176	11.39	3.23	0.00	3.23	-	28.35	No detailed FEMA Floodplain data available for this area.
J0178	19.35	4.66	0.00	4.66	-	24.10	No detailed FEMA Floodplain data available for this area.
J0180	12.04	4.52	0.00	4.52	-	37.54	No detailed FEMA Floodplain data available for this area.
J0182	9.42	1.25	0.00	1.25	-	13.26	No detailed FEMA Floodplain data available for this area.
J0184	4.31	1.13	0.00	1.13	-	26.28	No detailed FEMA Floodplain data available for this area.
J0186	18.58	3.23	0.00	3.23	-	17.40	No detailed FEMA Floodplain data available for this area.
J0188	0.84	0.31	0.00	0.31	-	36.46	No detailed FEMA Floodplain data available for this area.
J0190	2.63	1.28	0.00	1.28	-	48.63	No detailed FEMA Floodplain data available for this area.
J0192	8.95	1.30	0.00	1.30	-	14.50	No detailed FEMA Floodplain data available for this area.
J0195	27.28	3.64	0.00	3.64	-	13.35	No detailed FEMA Floodplain data available for this area.
J0198	6.03	1.59	0.00	1.59	-	26.41	No detailed FEMA Floodplain data available for this area.
J0200	19.40	4.83	0.00	4.83	-	24.89	No detailed FEMA Floodplain data available for this area.
J0210	14.72	2.52	0.00	2.52	-	17.10	No detailed FEMA Floodplain data available for this area.
J1010	3.45	0.69	0.00	0.69	-	20.09	No detailed FEMA Floodplain data available for this area.
J1020	5.37	1.01	0.00	1.01	-	18.81	No detailed FEMA Floodplain data available for this area.
J1110	2.53	0.80	0.00	0.80	-	31.75	No detailed FEMA Floodplain data available for this area.
J1120	19.23	2.55	0.00	2.55	-	13.28	No detailed FEMA Floodplain data available for this area.
J1130	20.25	2.97	0.00	2.97	-	14.67	No detailed FEMA Floodplain data available for this area.
J1210	9.38	0.42	0.00	0.42	-	4.52	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
J1220	3.64	0.45	0.00	0.45	-	12.33	No detailed FEMA Floodplain data available for this area.
J1310	7.11	1.45	0.00	1.45	-	20.44	No detailed FEMA Floodplain data available for this area.
J1320	31.07	2.14	0.00	2.14	-	6.87	No detailed FEMA Floodplain data available for this area.
J1330	4.58	1.05	0.00	1.05	-	22.94	No detailed FEMA Floodplain data available for this area.
J1410	14.27	0.64	0.00	0.64	-	4.45	No detailed FEMA Floodplain data available for this area.
J1420	4.11	0.51	0.00	0.51	-	12.40	No detailed FEMA Floodplain data available for this area.
J1501	7.85	5.61	0.00	5.61	-	71.43	No detailed FEMA Floodplain data available for this area.
J1502	30.44	0.74	0.00	0.74	-	2.43	No detailed FEMA Floodplain data available for this area.
J1503	14.94	1.10	0.00	1.10	-	7.35	No detailed FEMA Floodplain data available for this area.
J1504	15.09	0.73	0.00	0.73	-	4.83	No detailed FEMA Floodplain data available for this area.
J1505	10.01	4.17	0.00	4.17	-	41.61	No detailed FEMA Floodplain data available for this area.
J1506	7.86	4.13	0.00	4.13	-	52.58	No detailed FEMA Floodplain data available for this area.
J1510	0.69	0.43	0.00	0.43	-	62.06	No detailed FEMA Floodplain data available for this area.
J1520	7.93	1.05	0.00	1.05	-	13.20	No detailed FEMA Floodplain data available for this area.
J1530	14.89	3.68	0.00	3.68	-	24.72	No detailed FEMA Floodplain data available for this area.
J1540	16.56	5.10	0.00	5.10	-	30.79	No detailed FEMA Floodplain data available for this area.
J1550	8.10	1.76	0.00	1.76	-	21.74	No detailed FEMA Floodplain data available for this area.
J1560	21.88	7.43	0.00	7.43	-	33.95	No detailed FEMA Floodplain data available for this area.
J1570	13.15	1.55	0.00	1.55	-	11.81	No detailed FEMA Floodplain data available for this area.
J1580	11.67	2.57	0.00	2.57	-	22.01	No detailed FEMA Floodplain data available for this area.
J1590	6.36	1.72	0.00	1.72	-	26.97	No detailed FEMA Floodplain data available for this area.
J1600	26.57	1.64	0.00	1.64	-	6.18	No detailed FEMA Floodplain data available for this area.
J1610	5.95	1.08	0.00	1.08	-	18.12	No detailed FEMA Floodplain data available for this area.
J2010	2.23	0.05	0.00	0.05	-	2.29	No detailed FEMA Floodplain data available for this area.
J2020	18.12	1.34	0.00	1.34	-	7.40	No detailed FEMA Floodplain data available for this area.
J2030	15.80	1.77	0.00	1.77	-	11.18	No detailed FEMA Floodplain data available for this area.
J2110	34.21	2.48	0.00	2.48	-	7.26	No detailed FEMA Floodplain data available for this area.
J2120	14.21	0.92	0.00	0.92	-	6.50	No detailed FEMA Floodplain data available for this area.
J2210	9.68	0.78	0.00	0.78	-	8.03	No detailed FEMA Floodplain data available for this area.
J2220	16.18	1.49	0.00	1.49	-	9.19	No detailed FEMA Floodplain data available for this area.
J2230	16.41	0.82	0.00	0.82	-	4.97	No detailed FEMA Floodplain data available for this area.
J2310	14.81	1.98	0.00	1.98	-	13.37	No detailed FEMA Floodplain data available for this area.
J2320	25.67	2.69	0.00	2.69	-	10.47	No detailed FEMA Floodplain data available for this area.
J2330	26.74	4.72	0.00	4.72	-	17.65	No detailed FEMA Floodplain data available for this area.
J2410	16.73	0.22	0.00	0.22	-	1.32	No detailed FEMA Floodplain data available for this area.
J2420	10.99	1.17	0.00	1.17	-	10.69	No detailed FEMA Floodplain data available for this area.
J2430	18.71	0.39	0.00	0.39	-	2.11	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
J2440	11.37	0.28	0.00	0.28	-	2.50	No detailed FEMA Floodplain data available for this area.
J2450	16.64	1.57	0.00	1.57	-	9.46	No detailed FEMA Floodplain data available for this area.
J2460	15.38	0.39	0.00	0.39	-	2.52	No detailed FEMA Floodplain data available for this area.
J2470	17.27	0.40	0.00	0.40	-	2.30	No detailed FEMA Floodplain data available for this area.
J2480	0.60	0.31	0.00	0.31	-	51.19	No detailed FEMA Floodplain data available for this area.
J2510	5.34	1.23	0.00	1.23	-	23.02	No detailed FEMA Floodplain data available for this area.
J2520	30.93	3.14	0.00	3.14	-	10.14	No detailed FEMA Floodplain data available for this area.
J2530	4.26	1.75	0.00	1.75	-	40.97	No detailed FEMA Floodplain data available for this area.
J2540	1.21	0.59	0.00	0.59	-	48.59	No detailed FEMA Floodplain data available for this area.
J2550	29.26	14.88	0.00	14.88	-	50.85	No detailed FEMA Floodplain data available for this area.
J3010	16.03	2.38	0.00	2.38	-	14.87	No detailed FEMA Floodplain data available for this area.
J3020	30.88	3.29	0.00	3.29	-	10.65	No detailed FEMA Floodplain data available for this area.
J3030	13.88	1.73	0.00	1.73	-	12.49	No detailed FEMA Floodplain data available for this area.
J3210	8.87	1.85	0.00	1.85	-	20.90	No detailed FEMA Floodplain data available for this area.
J3520	8.25	0.53	0.00	0.53	-	6.47	No detailed FEMA Floodplain data available for this area.
J3530	10.89	1.00	0.00	1.00	-	9.18	No detailed FEMA Floodplain data available for this area.
J3540	15.82	1.51	0.00	1.51	-	9.56	No detailed FEMA Floodplain data available for this area.
J3550	4.66	1.83	0.00	1.83	-	39.15	No detailed FEMA Floodplain data available for this area.
J3810	17.91	2.32	0.00	2.32	-	12.96	No detailed FEMA Floodplain data available for this area.
J3820	5.26	0.61	0.00	0.61	-	11.60	No detailed FEMA Floodplain data available for this area.
J3830	3.79	0.70	0.00	0.70	-	18.49	No detailed FEMA Floodplain data available for this area.
J3835	10.10	1.01	0.00	1.01	-	9.97	No detailed FEMA Floodplain data available for this area.
J3838	4.24	0.96	0.00	0.96	-	22.71	No detailed FEMA Floodplain data available for this area.
J3840	1.39	0.63	0.00	0.63	-	45.43	No detailed FEMA Floodplain data available for this area.
J3850	4.79	2.40	0.00	2.40	-	50.12	No detailed FEMA Floodplain data available for this area.
J3870	5.12	1.18	0.00	1.18	-	23.04	No detailed FEMA Floodplain data available for this area.
J3880	23.45	3.12	0.00	3.12	-	13.30	No detailed FEMA Floodplain data available for this area.
J3890	41.33	6.20	0.00	6.20	-	15.01	No detailed FEMA Floodplain data available for this area.
J3900	4.87	1.31	0.00	1.31	-	26.83	No detailed FEMA Floodplain data available for this area.
J3910	12.72	1.93	0.00	1.93	-	15.16	No detailed FEMA Floodplain data available for this area.
J3920	1.33	0.37	0.00	0.37	-	28.28	No detailed FEMA Floodplain data available for this area.
J4010	53.11	12.11	0.00	12.11	-	22.79	No detailed FEMA Floodplain data available for this area.
J4020	13.01	3.05	0.00	3.05	-	23.42	No detailed FEMA Floodplain data available for this area.
J4030	22.79	2.72	0.00	2.72	-	11.92	No detailed FEMA Floodplain data available for this area.
J4040	18.13	1.30	0.00	1.30	-	7.18	No detailed FEMA Floodplain data available for this area.
J4050	9.89	0.52	0.00	0.52	-	5.22	No detailed FEMA Floodplain data available for this area.
J4060	1.78	0.43	0.00	0.43	-	24.34	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
J4503	3.16	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
J4505	4.07	0.00	0.00	0.00	0.00	0.00	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
J4510	21.23	4.83	0.00	4.83	-	22.73	No detailed FEMA Floodplain data available for this area.
J4520	15.91	2.62	0.00	2.62	-	16.45	No detailed FEMA Floodplain data available for this area.
J4530	29.33	4.12	0.00	4.12	-	14.06	No detailed FEMA Floodplain data available for this area.
J4540	15.79	2.26	0.00	2.26	-	14.34	No detailed FEMA Floodplain data available for this area.
J4550	3.79	1.14	0.00	1.14	-	29.99	No detailed FEMA Floodplain data available for this area.
J5005	5.74	0.04	0.00	0.04	-	0.67	No detailed FEMA Floodplain data available for this area.
J5015	7.68	0.08	0.00	0.08	-	1.09	No detailed FEMA Floodplain data available for this area.
J5020	15.12	0.50	0.00	0.50	-	3.30	No detailed FEMA Floodplain data available for this area.
J5022	8.85	0.22	0.00	0.22	-	2.47	No detailed FEMA Floodplain data available for this area.
J5025	9.13	0.20	0.00	0.20	-	2.19	No detailed FEMA Floodplain data available for this area.
J5030	11.76	0.89	0.00	0.89	-	7.56	No detailed FEMA Floodplain data available for this area.
J5040	0.80	0.23	0.00	0.23	-	28.29	No detailed FEMA Floodplain data available for this area.
J6010	18.84	0.62	0.00	0.62	-	3.26	No detailed FEMA Floodplain data available for this area.
J6020	2.78	0.19	0.00	0.19	-	6.89	No detailed FEMA Floodplain data available for this area.
J6030	4.45	0.68	0.00	0.68	-	15.28	No detailed FEMA Floodplain data available for this area.
J6040	16.96	1.43	0.00	1.43	-	8.46	No detailed FEMA Floodplain data available for this area.
J6050	0.93	0.37	0.00	0.37	-	39.73	No detailed FEMA Floodplain data available for this area.
J7010	51.26	1.09	0.00	1.09	-	2.13	No detailed FEMA Floodplain data available for this area.
J7013	55.33	3.71	0.00	3.71	-	6.70	No detailed FEMA Floodplain data available for this area.
J7017	4.40	0.83	0.00	0.83	-	18.95	No detailed FEMA Floodplain data available for this area.
J7020	21.94	2.52	0.00	2.52	-	11.49	No detailed FEMA Floodplain data available for this area.
J7022	21.19	3.69	0.00	3.69	-	17.40	No detailed FEMA Floodplain data available for this area.
J7025	3.28	0.63	0.00	0.63	-	19.14	No detailed FEMA Floodplain data available for this area.
J7028	1.24	0.29	0.00	0.29	-	23.37	No detailed FEMA Floodplain data available for this area.
J7030	69.53	6.78	0.00	6.78	-	9.75	No detailed FEMA Floodplain data available for this area.
J9000	7.84	0.86	0.00	0.86	-	11.00	No detailed FEMA Floodplain data available for this area.
J9100	7.61	1.02	0.00	1.02	-	13.41	No detailed FEMA Floodplain data available for this area.
J9200	13.30	2.21	0.00	2.21	-	16.64	No detailed FEMA Floodplain data available for this area.
K0005	7.32	0.36	0.00	0.36	-	4.89	No detailed FEMA Floodplain data available for this area.
K0010	0.95	0.41	0.00	0.41	-	42.90	No detailed FEMA Floodplain data available for this area.
K0030	3.68	1.44	0.00	1.44	-	39.23	No detailed FEMA Floodplain data available for this area.
K0035	16.84	0.74	0.00	0.74	-	4.40	No detailed FEMA Floodplain data available for this area.
K0040	6.15	2.34	0.00	2.34	-	38.00	No detailed FEMA Floodplain data available for this area.
K0050	6.28	2.57	0.00	2.57	-	40.88	No detailed FEMA Floodplain data available for this area.
K0070	3.62	1.25	0.00	1.25	-	34.46	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
K0077	14.68	0.48	0.00	0.48	-	3.26	No detailed FEMA Floodplain data available for this area.
K0080	2.56	0.94	0.00	0.94	-	36.79	No detailed FEMA Floodplain data available for this area.
K0088	9.92	0.88	0.00	0.88	-	8.91	No detailed FEMA Floodplain data available for this area.
K0090	4.00	2.08	0.00	2.08	-	51.95	No detailed FEMA Floodplain data available for this area.
K0095	36.18	15.08	0.00	15.08	-	41.68	No detailed FEMA Floodplain data available for this area.
K0100	4.14	1.37	0.00	1.37	-	33.22	No detailed FEMA Floodplain data available for this area.
K0110	1.20	0.69	0.00	0.69	-	57.80	No detailed FEMA Floodplain data available for this area.
K0118	10.69	2.81	0.00	2.81	-	26.30	No detailed FEMA Floodplain data available for this area.
K0119	2.10	1.28	0.00	1.28	-	60.81	No detailed FEMA Floodplain data available for this area.
K0120	0.87	0.58	0.00	0.58	-	65.93	No detailed FEMA Floodplain data available for this area.
K0123	12.56	0.76	0.00	0.76	-	6.07	No detailed FEMA Floodplain data available for this area.
K0135	2.23	1.12	0.00	1.12	-	49.98	No detailed FEMA Floodplain data available for this area.
K0140	1.65	0.31	0.00	0.31	-	18.71	No detailed FEMA Floodplain data available for this area.
K0141	1.76	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
K0142	7.19	0.35	0.00	0.35	-	4.83	No detailed FEMA Floodplain data available for this area.
K0143	2.57	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
K0144	14.73	6.17	0.00	6.17	-	41.87	No detailed FEMA Floodplain data available for this area.
K0145	2.39	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
K0146	5.62	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
K0148	1.88	0.19	0.00	0.19	-	9.94	No detailed FEMA Floodplain data available for this area.
K0150	2.48	0.86	0.00	0.86	-	34.69	No detailed FEMA Floodplain data available for this area.
K0158	5.24	0.28	0.00	0.28	-	5.37	No detailed FEMA Floodplain data available for this area.
K0160	5.83	2.20	0.00	2.20	-	37.64	No detailed FEMA Floodplain data available for this area.
K0170	4.20	1.66	0.00	1.66	-	39.58	No detailed FEMA Floodplain data available for this area.
K0174	11.43	0.38	0.00	0.38	-	3.35	No detailed FEMA Floodplain data available for this area.
K0175	10.99	0.46	0.00	0.46	-	4.17	No detailed FEMA Floodplain data available for this area.
K0180	2.34	1.34	0.00	1.34	-	57.17	No detailed FEMA Floodplain data available for this area.
K0185	12.39	0.24	0.00	0.24	-	1.97	No detailed FEMA Floodplain data available for this area.
K0190	2.16	0.75	0.00	0.75	-	34.85	No detailed FEMA Floodplain data available for this area.
K0200	8.24	4.12	0.00	4.12	-	49.98	No detailed FEMA Floodplain data available for this area.
K0210	11.53	0.59	0.00	0.59	-	5.14	No detailed FEMA Floodplain data available for this area.
K0226	8.48	0.36	0.00	0.36	-	4.20	No detailed FEMA Floodplain data available for this area.
K0230	3.34	1.42	0.00	1.42	-	42.35	No detailed FEMA Floodplain data available for this area.
K0233	9.92	0.29	0.00	0.29	-	2.97	No detailed FEMA Floodplain data available for this area.
K0237	1.16	0.32	0.00	0.32	-	27.79	No detailed FEMA Floodplain data available for this area.
K0242	19.09	0.04	0.00	0.04	-	0.22	No detailed FEMA Floodplain data available for this area.
K0245	1.35	0.22	0.00	0.22	-	16.40	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
K0246	17.53	0.52	0.00	0.52	-	2.99	No detailed FEMA Floodplain data available for this area.
K0248	1.08	0.17	0.00	0.17	-	15.58	No detailed FEMA Floodplain data available for this area.
K0250	22.10	3.50	0.00	3.50	-	15.85	No detailed FEMA Floodplain data available for this area.
K0274	4.99	0.16	0.00	0.16	-	3.26	No detailed FEMA Floodplain data available for this area.
K0280	40.95	5.54	0.00	5.54	-	13.52	No detailed FEMA Floodplain data available for this area.
K0294	6.87	0.16	0.00	0.16	-	2.36	No detailed FEMA Floodplain data available for this area.
K0300	37.60	3.91	0.00	3.91	-	10.40	No detailed FEMA Floodplain data available for this area.
K0302	24.30	3.52	0.00	3.52	-	14.47	No detailed FEMA Floodplain data available for this area.
K0305	79.83	10.08	0.00	10.08	-	12.62	No detailed FEMA Floodplain data available for this area.
K0308	1.62	0.64	0.00	0.64	-	39.42	No detailed FEMA Floodplain data available for this area.
K0309	15.33	0.47	0.00	0.47	-	3.04	No detailed FEMA Floodplain data available for this area.
K0310	20.23	3.46	0.00	3.46	-	17.11	No detailed FEMA Floodplain data available for this area.
K0314	11.59	0.22	0.00	0.22	-	1.89	No detailed FEMA Floodplain data available for this area.
K0318	10.03	0.19	0.00	0.19	-	1.87	No detailed FEMA Floodplain data available for this area.
K0320	29.21	2.85	0.00	2.85	-	9.75	No detailed FEMA Floodplain data available for this area.
K0323	30.82	1.50	0.00	1.50	-	4.86	No detailed FEMA Floodplain data available for this area.
K0327	2.20	0.34	0.00	0.34	-	15.41	No detailed FEMA Floodplain data available for this area.
K0328	6.51	0.16	0.00	0.16	-	2.48	No detailed FEMA Floodplain data available for this area.
K0330	11.08	1.96	0.00	1.96	-	17.66	No detailed FEMA Floodplain data available for this area.
K1010	2.22	0.77	0.00	0.77	-	34.85	No detailed FEMA Floodplain data available for this area.
K1020	7.21	1.08	0.00	1.08	-	15.00	No detailed FEMA Floodplain data available for this area.
K1030	20.06	1.33	0.00	1.33	-	6.65	No detailed FEMA Floodplain data available for this area.
K1040	5.71	0.62	0.00	0.62	-	10.92	No detailed FEMA Floodplain data available for this area.
K1050	0.67	0.19	0.00	0.19	-	28.06	No detailed FEMA Floodplain data available for this area.
K1510	19.48	0.92	0.00	0.92	-	4.70	No detailed FEMA Floodplain data available for this area.
K2010	19.86	1.61	0.00	1.61	-	8.10	No detailed FEMA Floodplain data available for this area.
K2020	64.42	1.55	0.00	1.55	-	2.41	No detailed FEMA Floodplain data available for this area.
K2040	10.28	1.94	0.00	1.94	-	18.85	No detailed FEMA Floodplain data available for this area.
K2510	7.68	0.34	0.00	0.34	-	4.47	No detailed FEMA Floodplain data available for this area.
K2520	5.06	0.10	0.00	0.10	-	2.05	No detailed FEMA Floodplain data available for this area.
K2530	6.83	0.23	0.00	0.23	-	3.40	No detailed FEMA Floodplain data available for this area.
K2540	8.17	0.89	0.00	0.89	-	10.90	No detailed FEMA Floodplain data available for this area.
K3010	57.98	8.75	0.00	8.75	-	15.10	No detailed FEMA Floodplain data available for this area.
K3020	14.66	1.09	0.00	1.09	-	7.44	No detailed FEMA Floodplain data available for this area.
K3030	16.58	1.50	0.00	1.50	-	9.06	No detailed FEMA Floodplain data available for this area.
K3040	1.38	0.49	0.00	0.49	-	35.70	No detailed FEMA Floodplain data available for this area.
K3050	12.60	5.36	0.00	5.36	-	42.51	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
K3070	6.65	0.47	0.00	0.47	-	7.07	No detailed FEMA Floodplain data available for this area.
K4010	4.59	0.59	0.00	0.59	-	12.77	No detailed FEMA Floodplain data available for this area.
K4020	25.70	2.16	0.00	2.16	-	8.42	No detailed FEMA Floodplain data available for this area.
K4030	18.15	1.86	0.00	1.86	-	10.26	No detailed FEMA Floodplain data available for this area.
K4060	22.42	1.59	0.00	1.59	-	7.10	No detailed FEMA Floodplain data available for this area.
K4070	3.66	0.92	0.00	0.92	-	25.22	No detailed FEMA Floodplain data available for this area.
K5010	1.62	0.41	0.00	0.41	-	25.09	No detailed FEMA Floodplain data available for this area.
K5030	5.03	0.86	0.00	0.86	-	17.09	No detailed FEMA Floodplain data available for this area.
K5040	7.27	0.91	0.00	0.91	-	12.56	No detailed FEMA Floodplain data available for this area.
K5050	12.73	0.89	0.00	0.89	-	6.97	No detailed FEMA Floodplain data available for this area.
K5060	3.93	0.24	0.00	0.24	-	6.06	No detailed FEMA Floodplain data available for this area.
K6010	14.55	1.55	0.00	1.55	-	10.67	No detailed FEMA Floodplain data available for this area.
K6030	5.67	1.62	0.00	1.62	-	28.52	No detailed FEMA Floodplain data available for this area.
K6040	11.09	1.43	0.00	1.43	-	12.87	No detailed FEMA Floodplain data available for this area.
K6050	4.27	0.65	0.00	0.65	-	15.16	No detailed FEMA Floodplain data available for this area.
K6060	7.94	1.21	0.00	1.21	-	15.24	No detailed FEMA Floodplain data available for this area.
K6070	2.37	0.75	0.00	0.75	-	31.66	No detailed FEMA Floodplain data available for this area.
K6080	3.29	0.75	0.00	0.75	-	22.82	No detailed FEMA Floodplain data available for this area.
K7020	3.16	0.17	0.00	0.17	-	5.31	No detailed FEMA Floodplain data available for this area.
K7040	3.10	0.19	0.00	0.19	-	6.05	No detailed FEMA Floodplain data available for this area.
K7050	3.83	0.19	0.00	0.19	-	4.84	No detailed FEMA Floodplain data available for this area.
K7060	2.29	0.18	0.00	0.18	-	7.79	No detailed FEMA Floodplain data available for this area.
K7070	2.97	0.14	0.00	0.14	-	4.64	No detailed FEMA Floodplain data available for this area.
K7210	7.68	1.25	0.00	1.25	-	16.26	No detailed FEMA Floodplain data available for this area.
K7220	9.21	0.90	0.00	0.90	-	9.75	No detailed FEMA Floodplain data available for this area.
K7230	3.67	0.29	0.00	0.29	-	7.81	No detailed FEMA Floodplain data available for this area.
K7240	8.46	0.72	0.00	0.72	-	8.53	No detailed FEMA Floodplain data available for this area.
K7250	1.75	0.67	0.00	0.67	-	38.07	No detailed FEMA Floodplain data available for this area.
K7410	4.03	0.28	0.00	0.28	-	6.91	No detailed FEMA Floodplain data available for this area.
K7420	11.08	1.57	0.00	1.57	-	14.19	No detailed FEMA Floodplain data available for this area.
K7430	7.87	1.38	0.00	1.38	-	17.58	No detailed FEMA Floodplain data available for this area.
K7440	5.59	1.02	0.00	1.02	-	18.19	No detailed FEMA Floodplain data available for this area.
K7450	20.83	2.97	0.00	2.97	-	14.26	No detailed FEMA Floodplain data available for this area.
K7460	61.58	6.93	0.00	6.93	-	11.26	No detailed FEMA Floodplain data available for this area.
K7470	3.67	0.48	0.00	0.48	-	13.06	No detailed FEMA Floodplain data available for this area.
K7480	6.07	0.31	0.00	0.31	-	5.10	No detailed FEMA Floodplain data available for this area.
K7490	0.63	0.15	0.00	0.15	-	23.35	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
K7610	2.64	0.70	0.00	0.70	-	26.61	No detailed FEMA Floodplain data available for this area.
K7630	6.30	0.93	0.00	0.93	-	14.74	No detailed FEMA Floodplain data available for this area.
K7640	8.32	0.71	0.00	0.71	-	8.57	No detailed FEMA Floodplain data available for this area.
K7650	7.57	0.61	0.00	0.61	-	8.05	No detailed FEMA Floodplain data available for this area.
K7660	3.94	0.15	0.00	0.15	-	3.88	No detailed FEMA Floodplain data available for this area.
K7805	13.72	2.32	0.00	2.32	-	16.92	No detailed FEMA Floodplain data available for this area.
K7810	3.55	0.63	0.00	0.63	-	17.68	No detailed FEMA Floodplain data available for this area.
K7812	4.83	0.75	0.00	0.75	-	15.48	No detailed FEMA Floodplain data available for this area.
K7814	8.98	1.01	0.00	1.01	-	11.28	No detailed FEMA Floodplain data available for this area.
K7816	5.24	0.93	0.00	0.93	-	17.80	No detailed FEMA Floodplain data available for this area.
K7818	6.50	1.60	0.00	1.60	-	24.64	No detailed FEMA Floodplain data available for this area.
K7820	5.09	1.46	0.00	1.46	-	28.73	No detailed FEMA Floodplain data available for this area.
K7830	2.77	0.96	0.00	0.96	-	34.67	No detailed FEMA Floodplain data available for this area.
K7845	16.81	2.01	0.00	2.01	-	11.98	No detailed FEMA Floodplain data available for this area.
K7850	2.95	1.73	0.00	1.73	-	58.56	No detailed FEMA Floodplain data available for this area.
K7855	7.59	2.67	0.00	2.67	-	35.22	No detailed FEMA Floodplain data available for this area.
K7858	13.49	2.69	0.00	2.69	-	19.95	No detailed FEMA Floodplain data available for this area.
K7859	3.32	1.76	0.00	1.76	-	53.15	No detailed FEMA Floodplain data available for this area.
K7860	3.67	2.15	0.00	2.15	-	58.63	No detailed FEMA Floodplain data available for this area.
K7864	1.66	0.08	0.00	0.08	-	4.76	No detailed FEMA Floodplain data available for this area.
K7865	4.26	0.36	0.00	0.36	-	8.48	No detailed FEMA Floodplain data available for this area.
K7872	9.14	2.59	0.00	2.59	-	28.29	No detailed FEMA Floodplain data available for this area.
K7873	7.09	1.68	0.00	1.68	-	23.74	No detailed FEMA Floodplain data available for this area.
K7874	6.74	0.15	0.00	0.15	-	2.26	No detailed FEMA Floodplain data available for this area.
K7875	4.55	0.74	0.00	0.74	-	16.29	No detailed FEMA Floodplain data available for this area.
K7880	0.76	0.22	0.00	0.22	-	28.60	No detailed FEMA Floodplain data available for this area.
K7881	5.25	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
K7882	5.29	0.79	0.00	0.79	-	14.88	No detailed FEMA Floodplain data available for this area.
K7884	2.21	0.95	0.00	0.95	-	42.98	No detailed FEMA Floodplain data available for this area.
K7885	1.76	0.34	0.00	0.34	-	19.53	No detailed FEMA Floodplain data available for this area.
K7886	6.08	0.14	0.00	0.14	-	2.36	No detailed FEMA Floodplain data available for this area.
K7890	1.83	0.48	0.00	0.48	-	26.43	No detailed FEMA Floodplain data available for this area.
K7893	6.42	0.21	0.00	0.21	-	3.28	No detailed FEMA Floodplain data available for this area.
K7900	7.25	0.56	0.00	0.56	-	7.72	No detailed FEMA Floodplain data available for this area.
K7910	4.48	0.58	0.00	0.58	-	13.02	No detailed FEMA Floodplain data available for this area.
K7913	9.71	1.25	0.00	1.25	-	12.85	No detailed FEMA Floodplain data available for this area.
K7917	4.60	0.75	0.00	0.75	-	16.42	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
K7920	26.96	1.75	0.00	1.75	-	6.48	No detailed FEMA Floodplain data available for this area.
K7930	22.69	1.93	0.00	1.93	-	8.51	No detailed FEMA Floodplain data available for this area.
K7932	7.80	1.29	0.00	1.29	-	16.53	No detailed FEMA Floodplain data available for this area.
K7934	13.67	1.29	0.00	1.29	-	9.46	No detailed FEMA Floodplain data available for this area.
K7936	15.43	0.95	0.00	0.95	-	6.18	No detailed FEMA Floodplain data available for this area.
K7938	6.07	0.78	0.00	0.78	-	12.79	No detailed FEMA Floodplain data available for this area.
K7940	12.68	1.08	0.00	1.08	-	8.50	No detailed FEMA Floodplain data available for this area.
K7945	16.13	0.36	0.00	0.36	-	2.25	No detailed FEMA Floodplain data available for this area.
K7947	1.28	0.38	0.00	0.38	-	29.39	No detailed FEMA Floodplain data available for this area.
K7950	13.23	1.71	0.00	1.71	-	12.92	No detailed FEMA Floodplain data available for this area.
K7960	16.04	3.05	0.00	3.05	-	19.04	No detailed FEMA Floodplain data available for this area.
K8010	5.07	0.54	0.00	0.54	-	10.73	No detailed FEMA Floodplain data available for this area.
K8020	6.93	0.80	0.00	0.80	-	11.58	No detailed FEMA Floodplain data available for this area.
K8030	14.30	0.22	0.00	0.22	-	1.56	No detailed FEMA Floodplain data available for this area.
K8040	3.19	0.63	0.00	0.63	-	19.58	No detailed FEMA Floodplain data available for this area.
K8050	11.04	0.38	0.00	0.38	-	3.48	No detailed FEMA Floodplain data available for this area.
K9010	35.52	2.68	0.00	2.68	-	7.56	No detailed FEMA Floodplain data available for this area.
K9020	23.29	2.56	0.00	2.56	-	11.00	No detailed FEMA Floodplain data available for this area.
K9030	24.98	2.61	0.00	2.61	-	10.46	No detailed FEMA Floodplain data available for this area.
K9040	13.31	1.44	0.00	1.44	-	10.81	No detailed FEMA Floodplain data available for this area.
K9050	18.38	0.49	0.00	0.49	-	2.64	No detailed FEMA Floodplain data available for this area.
K9052	16.11	0.82	0.00	0.82	-	5.12	No detailed FEMA Floodplain data available for this area.
K9055	8.93	0.21	0.00	0.21	-	2.37	No detailed FEMA Floodplain data available for this area.
K9058	40.83	1.14	0.00	1.14	-	2.79	No detailed FEMA Floodplain data available for this area.
K9060	23.40	1.83	0.00	1.83	-	7.83	No detailed FEMA Floodplain data available for this area.
K9070	1.65	0.42	0.00	0.42	-	25.65	No detailed FEMA Floodplain data available for this area.
K9510	11.57	1.23	0.00	1.23	-	10.65	No detailed FEMA Floodplain data available for this area.
K9520	9.21	1.56	0.00	1.56	-	16.94	No detailed FEMA Floodplain data available for this area.
K9610	8.85	0.70	0.00	0.70	-	7.96	No detailed FEMA Floodplain data available for this area.
K9630	25.30	2.23	0.00	2.23	-	8.82	No detailed FEMA Floodplain data available for this area.
K9710	17.48	2.62	0.00	2.62	-	15.01	No detailed FEMA Floodplain data available for this area.
K9720	1.97	0.47	0.00	0.47	-	24.04	No detailed FEMA Floodplain data available for this area.
K9730	3.35	0.65	0.00	0.65	-	19.45	No detailed FEMA Floodplain data available for this area.
L0010	70.08	11.04	0.00	11.04	-	15.75	No detailed FEMA Floodplain data available for this area.
L0020	15.38	2.07	0.00	2.07	-	13.43	No detailed FEMA Floodplain data available for this area.
L0030	32.48	0.66	0.00	0.66	-	2.04	No detailed FEMA Floodplain data available for this area.
L0035	57.64	1.27	0.00	1.27	-	2.20	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
L0040	61.71	2.02	0.00	2.02	-	3.27	No detailed FEMA Floodplain data available for this area.
L0042	14.55	0.23	0.00	0.23	-	1.55	No detailed FEMA Floodplain data available for this area.
L0045	2.28	0.45	0.00	0.45	-	19.76	No detailed FEMA Floodplain data available for this area.
L0047	8.40	2.32	0.00	2.32	-	27.66	No detailed FEMA Floodplain data available for this area.
L0048	18.88	0.04	0.00	0.04	-	0.24	No detailed FEMA Floodplain data available for this area.
L0050	18.52	2.29	0.00	2.29	-	12.37	No detailed FEMA Floodplain data available for this area.
L0057	9.88	0.65	0.00	0.65	-	6.56	No detailed FEMA Floodplain data available for this area.
L0060	19.52	3.97	0.00	3.97	-	20.33	No detailed FEMA Floodplain data available for this area.
L0063	34.04	0.14	0.00	0.14	-	0.40	No detailed FEMA Floodplain data available for this area.
L0067	0.70	0.15	0.00	0.15	-	21.06	No detailed FEMA Floodplain data available for this area.
L0070	61.85	4.01	0.00	4.01	-	6.48	No detailed FEMA Floodplain data available for this area.
L0073	16.53	1.54	0.00	1.54	-	9.33	No detailed FEMA Floodplain data available for this area.
L0077	6.96	0.90	0.00	0.90	-	12.99	No detailed FEMA Floodplain data available for this area.
L0080	20.86	2.54	0.00	2.54	-	12.18	No detailed FEMA Floodplain data available for this area.
L0083	11.29	0.61	0.00	0.61	-	5.42	No detailed FEMA Floodplain data available for this area.
L0087	12.68	1.58	0.00	1.58	-	12.43	No detailed FEMA Floodplain data available for this area.
L0090	35.25	2.09	0.00	2.09	-	5.94	No detailed FEMA Floodplain data available for this area.
L0100	58.71	2.71	0.00	2.71	-	4.61	No detailed FEMA Floodplain data available for this area.
L0110	55.56	3.90	0.00	3.90	-	7.03	No detailed FEMA Floodplain data available for this area.
L1010	27.22	0.23	0.00	0.23	-	0.86	No detailed FEMA Floodplain data available for this area.
L1013	16.65	3.82	0.00	3.82	-	22.92	No detailed FEMA Floodplain data available for this area.
L1017	10.83	2.08	0.00	2.08	-	19.24	No detailed FEMA Floodplain data available for this area.
L1020	3.21	0.51	0.00	0.51	-	15.97	No detailed FEMA Floodplain data available for this area.
L1021	13.53	2.49	0.00	2.49	-	18.43	No detailed FEMA Floodplain data available for this area.
L1023	29.20	1.06	0.00	1.06	-	3.64	No detailed FEMA Floodplain data available for this area.
L1027	18.48	2.46	0.00	2.46	-	13.33	No detailed FEMA Floodplain data available for this area.
L1030	6.02	0.86	0.00	0.86	-	14.22	No detailed FEMA Floodplain data available for this area.
L1035	17.04	5.16	0.00	5.16	-	30.30	No detailed FEMA Floodplain data available for this area.
L1040	23.61	0.52	0.00	0.52	-	2.19	No detailed FEMA Floodplain data available for this area.
N0009	18.17	4.25	0.00	4.25	-	23.39	No detailed FEMA Floodplain data available for this area.
N0010	22.86	15.24	0.00	15.24	-	66.66	No detailed FEMA Floodplain data available for this area.
N0020	6.55	2.86	0.00	2.86	-	43.59	No detailed FEMA Floodplain data available for this area.
N0030	2.94	1.56	0.00	1.56	-	52.97	No detailed FEMA Floodplain data available for this area.
N0035	11.29	0.58	0.00	0.58	-	5.18	No detailed FEMA Floodplain data available for this area.
N0040	5.13	1.92	0.00	1.92	-	37.39	No detailed FEMA Floodplain data available for this area.
N0042	19.82	0.74	0.00	0.74	-	3.74	No detailed FEMA Floodplain data available for this area.
N0045	16.13	2.50	0.00	2.50	-	15.51	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
N0047	1.55	0.49	0.00	0.49	-	31.24	No detailed FEMA Floodplain data available for this area.
N0048	1.38	0.22	0.00	0.22	-	15.56	No detailed FEMA Floodplain data available for this area.
N0049	7.11	0.37	0.00	0.37	-	5.25	No detailed FEMA Floodplain data available for this area.
N0050	3.76	1.75	0.00	1.75	-	46.42	No detailed FEMA Floodplain data available for this area.
N0055	7.39	1.47	0.00	1.47	-	19.92	No detailed FEMA Floodplain data available for this area.
N0060	1.23	0.74	0.00	0.74	-	59.93	No detailed FEMA Floodplain data available for this area.
N0070	6.57	1.63	0.00	1.63	-	24.87	No detailed FEMA Floodplain data available for this area.
N0075	11.29	0.50	0.00	0.50	-	4.47	No detailed FEMA Floodplain data available for this area.
N0080	6.86	2.70	0.00	2.70	-	39.39	No detailed FEMA Floodplain data available for this area.
N0085	25.49	2.01	0.00	2.01	-	7.87	No detailed FEMA Floodplain data available for this area.
N0090	7.85	2.58	0.00	2.58	-	32.86	No detailed FEMA Floodplain data available for this area.
N0092	3.20	0.36	0.00	0.36	-	11.33	No detailed FEMA Floodplain data available for this area.
N0093	13.22	0.57	0.00	0.57	-	4.29	No detailed FEMA Floodplain data available for this area.
N0098	28.22	2.09	0.00	2.09	-	7.41	No detailed FEMA Floodplain data available for this area.
N0100	10.21	3.46	0.00	3.46	-	33.83	No detailed FEMA Floodplain data available for this area.
N0105	13.21	0.97	0.00	0.97	-	7.38	No detailed FEMA Floodplain data available for this area.
N0110	27.15	9.33	0.00	9.33	-	34.35	No detailed FEMA Floodplain data available for this area.
N0115	0.96	0.06	0.00	0.06	-	6.47	No detailed FEMA Floodplain data available for this area.
N0120	3.74	0.22	0.00	0.22	-	5.75	No detailed FEMA Floodplain data available for this area.
N0121	2.43	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
N0122	1.98	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
N0123	1.92	0.27	0.00	0.27	-	13.93	No detailed FEMA Floodplain data available for this area.
N0124	3.19	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
N0125	2.47	0.33	0.00	0.33	-	13.30	No detailed FEMA Floodplain data available for this area.
N0127	1.34	0.25	0.00	0.25	-	18.69	No detailed FEMA Floodplain data available for this area.
N0130	3.23	1.48	0.00	1.48	-	45.77	No detailed FEMA Floodplain data available for this area.
N0144	8.50	0.09	0.00	0.09	-	1.01	No detailed FEMA Floodplain data available for this area.
N0147	14.42	0.35	0.00	0.35	-	2.43	No detailed FEMA Floodplain data available for this area.
N0150	3.64	1.53	0.00	1.53	-	42.06	No detailed FEMA Floodplain data available for this area.
N0160	4.89	0.34	0.00	0.34	-	6.88	No detailed FEMA Floodplain data available for this area.
N0165	9.80	0.37	0.00	0.37	-	3.74	No detailed FEMA Floodplain data available for this area.
N0170	5.28	1.08	0.00	1.08	-	20.45	No detailed FEMA Floodplain data available for this area.
N0171	18.32	0.44	0.00	0.44	-	2.38	No detailed FEMA Floodplain data available for this area.
N0172	14.23	1.61	0.00	1.61	-	11.32	No detailed FEMA Floodplain data available for this area.
N0174	10.75	1.22	0.00	1.22	-	11.34	No detailed FEMA Floodplain data available for this area.
N0176	8.33	0.58	0.00	0.58	-	7.02	No detailed FEMA Floodplain data available for this area.
N0177	10.52	0.25	0.00	0.25	-	2.38	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
N0178	4.00	0.45	0.00	0.45	-	11.21	No detailed FEMA Floodplain data available for this area.
N0180	4.40	2.10	0.00	2.10	-	47.85	No detailed FEMA Floodplain data available for this area.
N0182	8.71	1.69	0.00	1.69	-	19.45	No detailed FEMA Floodplain data available for this area.
N0184	5.03	1.18	0.00	1.18	-	23.54	No detailed FEMA Floodplain data available for this area.
N0185	7.34	0.11	0.00	0.11	-	1.50	No detailed FEMA Floodplain data available for this area.
N0186	22.15	3.10	0.00	3.10	-	14.00	No detailed FEMA Floodplain data available for this area.
N0188	0.47	0.08	0.00	0.08	-	17.99	No detailed FEMA Floodplain data available for this area.
N0190	2.75	1.18	0.00	1.18	-	42.96	No detailed FEMA Floodplain data available for this area.
N0194	9.55	0.22	0.00	0.22	-	2.27	No detailed FEMA Floodplain data available for this area.
N0200	3.87	1.57	0.00	1.57	-	40.53	No detailed FEMA Floodplain data available for this area.
N1010	7.11	0.18	0.00	0.18	-	2.50	No detailed FEMA Floodplain data available for this area.
N1020	7.23	0.45	0.00	0.45	-	6.17	No detailed FEMA Floodplain data available for this area.
N1030	8.28	0.46	0.00	0.46	-	5.50	No detailed FEMA Floodplain data available for this area.
N1040	5.09	0.46	0.00	0.46	-	9.09	No detailed FEMA Floodplain data available for this area.
N1050	1.83	0.10	0.00	0.10	-	5.67	No detailed FEMA Floodplain data available for this area.
N1510	0.64	0.17	0.00	0.17	-	26.68	No detailed FEMA Floodplain data available for this area.
N1520	1.56	0.52	0.00	0.52	-	33.26	No detailed FEMA Floodplain data available for this area.
N1540	1.94	0.21	0.00	0.21	-	10.73	No detailed FEMA Floodplain data available for this area.
N2010	9.98	1.04	0.00	1.04	-	10.40	No detailed FEMA Floodplain data available for this area.
N2020	2.51	0.44	0.00	0.44	-	17.42	No detailed FEMA Floodplain data available for this area.
N2030	9.33	0.65	0.00	0.65	-	6.95	No detailed FEMA Floodplain data available for this area.
N2040	5.47	0.71	0.00	0.71	-	12.92	No detailed FEMA Floodplain data available for this area.
N2510	8.31	0.79	0.00	0.79	-	9.56	No detailed FEMA Floodplain data available for this area.
N2520	11.54	0.76	0.00	0.76	-	6.56	No detailed FEMA Floodplain data available for this area.
N2530	2.83	1.10	0.00	1.10	-	38.72	No detailed FEMA Floodplain data available for this area.
N2540	1.38	0.70	0.00	0.70	-	50.42	No detailed FEMA Floodplain data available for this area.
N3020	21.47	2.33	0.00	2.33	-	10.84	No detailed FEMA Floodplain data available for this area.
N3030	18.70	1.78	0.00	1.78	-	9.54	No detailed FEMA Floodplain data available for this area.
N3040	20.89	1.48	0.00	1.48	-	7.09	No detailed FEMA Floodplain data available for this area.
N3050	5.33	1.27	0.00	1.27	-	23.89	No detailed FEMA Floodplain data available for this area.
N3510	2.83	1.72	0.00	1.72	-	60.77	No detailed FEMA Floodplain data available for this area.
N3520	25.90	1.67	0.00	1.67	-	6.44	No detailed FEMA Floodplain data available for this area.
N3530	17.67	2.13	0.00	2.13	-	12.03	No detailed FEMA Floodplain data available for this area.
N3540	1.09	0.48	0.00	0.48	-	44.52	No detailed FEMA Floodplain data available for this area.
N3550	3.38	0.17	0.00	0.17	-	5.01	No detailed FEMA Floodplain data available for this area.
N4010	1.42	0.24	0.00	0.24	-	16.72	No detailed FEMA Floodplain data available for this area.
N4020	11.90	2.09	0.00	2.09	-	17.60	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
N4024	0.85	0.42	0.00	0.42	-	48.99	No detailed FEMA Floodplain data available for this area.
N4026	1.49	0.65	0.00	0.65	-	43.73	No detailed FEMA Floodplain data available for this area.
N4028	0.81	0.36	0.00	0.36	-	44.67	No detailed FEMA Floodplain data available for this area.
N4030	8.12	0.89	0.00	0.89	-	11.00	No detailed FEMA Floodplain data available for this area.
N4040	3.63	0.15	0.00	0.15	-	4.24	No detailed FEMA Floodplain data available for this area.
N4045	0.16	0.06	0.00	0.06	-	37.49	No detailed FEMA Floodplain data available for this area.
N4050	5.17	1.04	0.00	1.04	-	20.13	No detailed FEMA Floodplain data available for this area.
N4060	21.87	9.11	0.00	9.11	-	41.64	No detailed FEMA Floodplain data available for this area.
N4320	23.09	1.06	0.00	1.06	-	4.58	No detailed FEMA Floodplain data available for this area.
N4710	26.12	4.23	0.00	4.23	-	16.18	No detailed FEMA Floodplain data available for this area.
N4720	3.39	1.53	0.00	1.53	-	45.19	No detailed FEMA Floodplain data available for this area.
N5010	13.73	0.14	0.00	0.14	-	1.04	No detailed FEMA Floodplain data available for this area.
N5013	2.28	0.04	0.00	0.04	-	1.88	No detailed FEMA Floodplain data available for this area.
N5015	13.99	0.28	0.00	0.28	-	2.00	No detailed FEMA Floodplain data available for this area.
N5016	1.67	0.15	0.00	0.15	-	8.70	No detailed FEMA Floodplain data available for this area.
N5017	2.13	0.31	0.00	0.31	-	14.74	No detailed FEMA Floodplain data available for this area.
N5020	1.36	0.14	0.00	0.14	-	10.50	No detailed FEMA Floodplain data available for this area.
N5520	28.16	2.28	0.00	2.28	-	8.09	No detailed FEMA Floodplain data available for this area.
N5530	8.66	1.21	0.00	1.21	-	13.99	No detailed FEMA Floodplain data available for this area.
N5540	0.59	0.22	0.00	0.22	-	37.21	No detailed FEMA Floodplain data available for this area.
N6010	2.31	0.35	0.00	0.35	-	14.95	No detailed FEMA Floodplain data available for this area.
N6020	2.38	0.45	0.00	0.45	-	19.06	No detailed FEMA Floodplain data available for this area.
N6030	4.28	0.56	0.00	0.56	-	13.15	No detailed FEMA Floodplain data available for this area.
N6040	3.60	0.39	0.00	0.39	-	10.82	No detailed FEMA Floodplain data available for this area.
N6050	2.59	0.45	0.00	0.45	-	17.21	No detailed FEMA Floodplain data available for this area.
N6060	7.85	1.71	0.00	1.71	-	21.84	No detailed FEMA Floodplain data available for this area.
N6080	5.65	0.63	0.00	0.63	-	11.17	No detailed FEMA Floodplain data available for this area.
N6100	4.00	0.00	0.00	0.00	-	0.02	No detailed FEMA Floodplain data available for this area.
N6510	16.58	1.07	0.00	1.07	-	6.43	No detailed FEMA Floodplain data available for this area.
N6520	15.05	1.11	0.00	1.11	-	7.37	No detailed FEMA Floodplain data available for this area.
N6530	1.65	0.13	0.00	0.13	-	7.69	No detailed FEMA Floodplain data available for this area.
N7020	8.87	0.97	0.00	0.97	-	10.88	No detailed FEMA Floodplain data available for this area.
N7030	15.98	1.37	0.00	1.37	-	8.54	No detailed FEMA Floodplain data available for this area.
N7040	1.44	0.59	0.00	0.59	-	41.23	No detailed FEMA Floodplain data available for this area.
N7045	0.49	0.23	0.00	0.23	-	46.36	No detailed FEMA Floodplain data available for this area.
N7050	20.42	3.17	0.00	3.17	-	15.54	No detailed FEMA Floodplain data available for this area.
N7060	3.69	0.31	0.00	0.31	-	8.42	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
O0010	5.74	2.77	0.00	2.77	-	48.35	No detailed FEMA Floodplain data available for this area.
O0012	15.39	0.97	0.00	0.97	-	6.30	No detailed FEMA Floodplain data available for this area.
O0015	18.55	1.39	0.00	1.39	-	7.50	No detailed FEMA Floodplain data available for this area.
O0017	7.31	1.00	0.00	1.00	-	13.75	No detailed FEMA Floodplain data available for this area.
O0020	5.76	3.94	0.00	3.94	-	68.47	No detailed FEMA Floodplain data available for this area.
O0030	4.32	2.32	0.00	2.32	-	53.66	No detailed FEMA Floodplain data available for this area.
O0035	10.69	1.79	0.00	1.79	-	16.72	No detailed FEMA Floodplain data available for this area.
O0040	8.42	2.45	0.00	2.45	-	29.14	No detailed FEMA Floodplain data available for this area.
O0050	8.36	2.54	0.00	2.54	-	30.42	No detailed FEMA Floodplain data available for this area.
O0055	2.26	1.17	0.00	1.17	-	51.85	No detailed FEMA Floodplain data available for this area.
O0060	38.04	8.39	0.00	8.39	-	22.05	No detailed FEMA Floodplain data available for this area.
O0070	35.57	6.73	0.00	6.73	-	18.93	No detailed FEMA Floodplain data available for this area.
O0078	6.60	4.29	0.00	4.29	-	64.96	No detailed FEMA Floodplain data available for this area.
O0080	42.18	11.78	0.00	11.78	-	27.94	No detailed FEMA Floodplain data available for this area.
O0083	45.51	5.36	0.00	5.36	-	11.78	No detailed FEMA Floodplain data available for this area.
O0087	12.27	1.81	0.00	1.81	-	14.76	No detailed FEMA Floodplain data available for this area.
O0090	57.46	10.23	0.00	10.23	-	17.81	No detailed FEMA Floodplain data available for this area.
O0095	72.68	8.34	0.00	8.34	-	11.47	No detailed FEMA Floodplain data available for this area.
O0097	5.23	1.76	0.00	1.76	-	33.67	No detailed FEMA Floodplain data available for this area.
O0100	13.38	3.43	0.00	3.43	-	25.60	No detailed FEMA Floodplain data available for this area.
O0110	0.90	0.56	0.00	0.56	-	62.06	No detailed FEMA Floodplain data available for this area.
O0115	0.88	0.46	0.00	0.46	-	52.02	No detailed FEMA Floodplain data available for this area.
O0116	3.18	1.15	0.00	1.15	-	36.21	No detailed FEMA Floodplain data available for this area.
O0120	21.94	1.19	0.00	1.19	-	5.41	No detailed FEMA Floodplain data available for this area.
O0130	26.59	3.43	0.00	3.43	-	12.90	No detailed FEMA Floodplain data available for this area.
O0133	64.51	0.79	0.00	0.79	-	1.23	No detailed FEMA Floodplain data available for this area.
O0137	1.88	0.49	0.00	0.49	-	25.88	No detailed FEMA Floodplain data available for this area.
O0150	82.71	7.52	0.00	7.52	-	9.10	No detailed FEMA Floodplain data available for this area.
O0160	69.03	7.77	0.00	7.77	-	11.26	No detailed FEMA Floodplain data available for this area.
O0170	25.37	2.74	0.00	2.74	-	10.78	No detailed FEMA Floodplain data available for this area.
O0172	0.97	0.41	0.00	0.41	-	42.19	No detailed FEMA Floodplain data available for this area.
O0174	6.14	0.72	0.00	0.72	-	11.75	No detailed FEMA Floodplain data available for this area.
O0176	21.51	0.95	0.00	0.95	-	4.43	No detailed FEMA Floodplain data available for this area.
O0178	1.76	0.42	0.00	0.42	-	23.67	No detailed FEMA Floodplain data available for this area.
O0180	1.79	0.96	0.00	0.96	-	53.83	No detailed FEMA Floodplain data available for this area.
O0190	2.40	1.35	0.00	1.35	-	56.33	No detailed FEMA Floodplain data available for this area.
O0200	31.24	2.85	0.00	2.85	-	9.13	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
O0210	3.94	0.70	0.00	0.70	-	17.76	No detailed FEMA Floodplain data available for this area.
O0213	27.43	0.96	0.00	0.96	-	3.50	No detailed FEMA Floodplain data available for this area.
O0217	55.93	5.20	0.00	5.20	-	9.31	No detailed FEMA Floodplain data available for this area.
O0220	4.76	2.18	0.00	2.18	-	45.78	No detailed FEMA Floodplain data available for this area.
O1010	3.51	0.06	0.00	0.06	-	1.64	No detailed FEMA Floodplain data available for this area.
O1020	5.81	0.38	0.00	0.38	-	6.61	No detailed FEMA Floodplain data available for this area.
O1030	12.57	2.48	0.00	2.48	-	19.71	No detailed FEMA Floodplain data available for this area.
O1040	17.59	1.02	0.00	1.02	-	5.78	No detailed FEMA Floodplain data available for this area.
O1050	10.82	0.75	0.00	0.75	-	6.95	No detailed FEMA Floodplain data available for this area.
O1070	4.26	0.42	0.00	0.42	-	9.86	No detailed FEMA Floodplain data available for this area.
O1510	10.57	1.76	0.00	1.76	-	16.65	No detailed FEMA Floodplain data available for this area.
O1520	9.15	3.33	0.00	3.33	-	36.44	No detailed FEMA Floodplain data available for this area.
O1530	15.47	2.59	0.00	2.59	-	16.77	No detailed FEMA Floodplain data available for this area.
O1540	7.36	0.90	0.00	0.90	-	12.23	No detailed FEMA Floodplain data available for this area.
O1550	6.26	0.51	0.00	0.51	-	8.08	No detailed FEMA Floodplain data available for this area.
O1560	12.86	1.22	0.00	1.22	-	9.52	No detailed FEMA Floodplain data available for this area.
O1570	1.49	0.75	0.00	0.75	-	50.19	No detailed FEMA Floodplain data available for this area.
O1580	9.07	0.73	0.00	0.73	-	8.03	No detailed FEMA Floodplain data available for this area.
O1600	3.58	0.45	0.00	0.45	-	12.57	No detailed FEMA Floodplain data available for this area.
O2010	2.85	0.66	0.00	0.66	-	23.14	No detailed FEMA Floodplain data available for this area.
O2020	8.21	0.98	0.00	0.98	-	11.97	No detailed FEMA Floodplain data available for this area.
O2030	11.38	1.68	0.00	1.68	-	14.73	No detailed FEMA Floodplain data available for this area.
O2050	4.82	1.01	0.00	1.01	-	21.01	No detailed FEMA Floodplain data available for this area.
O3010	24.93	2.32	0.00	2.32	-	9.30	No detailed FEMA Floodplain data available for this area.
O3020	30.37	3.38	0.00	3.38	-	11.15	No detailed FEMA Floodplain data available for this area.
O3030	18.26	2.83	0.00	2.83	-	15.50	No detailed FEMA Floodplain data available for this area.
O3040	32.63	8.48	0.00	8.48	-	25.98	No detailed FEMA Floodplain data available for this area.
O3050	14.26	1.79	0.00	1.79	-	12.52	No detailed FEMA Floodplain data available for this area.
O4010	19.85	2.74	0.00	2.74	-	13.81	No detailed FEMA Floodplain data available for this area.
O4020	11.35	3.16	0.00	3.16	-	27.85	No detailed FEMA Floodplain data available for this area.
O4030	2.52	0.57	0.00	0.57	-	22.46	No detailed FEMA Floodplain data available for this area.
O4040	1.64	0.15	0.00	0.15	-	9.09	No detailed FEMA Floodplain data available for this area.
O4050	1.61	0.16	0.00	0.16	-	9.92	No detailed FEMA Floodplain data available for this area.
O4060	0.91	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
O5010	2.95	0.36	0.00	0.36	-	12.34	No detailed FEMA Floodplain data available for this area.
O5020	9.49	1.16	0.00	1.16	-	12.28	No detailed FEMA Floodplain data available for this area.
O5030	3.74	0.52	0.00	0.52	-	13.80	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
O5040	3.63	0.10	0.00	0.10	-	2.71	No detailed FEMA Floodplain data available for this area.
O5050	1.02	0.07	0.00	0.07	-	7.33	No detailed FEMA Floodplain data available for this area.
P0003	1.24	0.27	0.00	0.27	-	22.13	No detailed FEMA Floodplain data available for this area.
P0010	3.63	1.64	0.00	1.64	-	45.00	No detailed FEMA Floodplain data available for this area.
P0013	5.55	1.06	0.00	1.06	-	19.17	No detailed FEMA Floodplain data available for this area.
P0014	3.72	1.75	0.00	1.75	-	46.90	No detailed FEMA Floodplain data available for this area.
P0016	1.44	0.50	0.00	0.50	-	34.98	No detailed FEMA Floodplain data available for this area.
P0018	11.32	1.66	0.00	1.66	-	14.68	No detailed FEMA Floodplain data available for this area.
P0020	3.47	0.82	0.00	0.82	-	23.55	No detailed FEMA Floodplain data available for this area.
P0030	3.95	1.84	0.00	1.84	-	46.64	No detailed FEMA Floodplain data available for this area.
P0040	4.57	2.69	0.00	2.69	-	58.89	No detailed FEMA Floodplain data available for this area.
P0045	13.11	0.70	0.00	0.70	-	5.34	No detailed FEMA Floodplain data available for this area.
P0050	4.09	1.34	0.00	1.34	-	32.75	No detailed FEMA Floodplain data available for this area.
P0060	2.62	1.28	0.00	1.28	-	48.78	No detailed FEMA Floodplain data available for this area.
P0070	6.75	5.63	0.32	5.31	1651.58	78.63	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
P0072	2.46	0.98	0.00	0.98	-	39.83	No detailed FEMA Floodplain data available for this area.
P0074	17.60	12.31	2.09	10.22	489.85	58.10	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
P0076	29.22	24.78	24.69	0.10	0.39	0.33	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
P0078	5.16	3.94	5.16	1.22	23.67	23.67	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
P0080	3.16	3.16	2.88	0.28	9.82	8.94	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
P0085	11.59	10.86	11.59	0.73	6.27	6.27	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
P0090	3.61	3.61	3.14	0.46	14.75	12.85	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
P0100	0.47	0.47	0.33	0.14	42.89	30.01	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
P1010	120.69	79.54	0.00	79.54	-	65.91	No detailed FEMA Floodplain data available for this area.
P1510	0.11	0.09	0.00	0.09	-	80.44	No detailed FEMA Floodplain data available for this area.
P2010	2.27	0.55	0.00	0.55	-	24.40	No detailed FEMA Floodplain data available for this area.
P2020	20.24	1.22	0.00	1.22	-	6.05	No detailed FEMA Floodplain data available for this area.
P2030	11.04	2.53	0.00	2.53	-	22.88	No detailed FEMA Floodplain data available for this area.
P2210	2.51	0.91	0.00	0.91	-	36.09	No detailed FEMA Floodplain data available for this area.
P2220	14.01	1.61	0.00	1.61	-	11.47	No detailed FEMA Floodplain data available for this area.
P2410	1.99	0.06	0.00	0.06	-	2.95	No detailed FEMA Floodplain data available for this area.
P2420	15.46	1.00	0.00	1.00	-	6.44	No detailed FEMA Floodplain data available for this area.
P2610	3.77	2.87	3.46	0.59	17.04	15.63	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
P2620	9.18	6.16	1.53	4.63	301.95	50.39	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
P2810	16.07	0.86	0.00	0.86	-	5.33	No detailed FEMA Floodplain data available for this area.
P2820	16.75	7.34	0.00	7.34	-	43.84	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
P2830	20.06	7.42	0.00	7.42	-	36.98	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
P2840	36.64	14.05	0.00	14.05	-	38.36	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
P2850	33.40	13.62	1.62	12.00	741.35	35.93	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
P2860	5.96	0.40	0.00	0.40	-	6.71	No detailed FEMA Floodplain data available for this area.
Q0175	0.13	0.06	0.00	0.06	-	47.43	No detailed FEMA Floodplain data available for this area.
Q3022	65.13	37.45	0.00	37.45	-	57.50	No detailed FEMA Floodplain data available for this area.
Q3024	5.25	1.65	0.00	1.65	-	31.43	No detailed FEMA Floodplain data available for this area.
Q3026	6.08	3.92	0.00	3.92	-	64.51	No detailed FEMA Floodplain data available for this area.
Q3040	0.62	0.62	0.00	0.62	-	99.88	No detailed FEMA Floodplain data available for this area.
Q3041	5.23	3.00	0.00	3.00	-	57.27	No detailed FEMA Floodplain data available for this area.
Q3043	1.83	1.83	0.00	1.83	-	100.00	No detailed FEMA Floodplain data available for this area.
Q3044	3.45	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
Q3048	7.26	2.25	0.00	2.25	-	30.92	No detailed FEMA Floodplain data available for this area.
R0170	0.37	0.27	0.00	0.27	-	72.68	No detailed FEMA Floodplain data available for this area.
R0270	30.93	4.28	0.00	4.28	-	13.83	No detailed FEMA Floodplain data available for this area.
R1043	31.35	10.14	0.00	10.14	-	32.33	No detailed FEMA Floodplain data available for this area.
R2560	0.00	0.00	0.00	0.00	-	87.85	No detailed FEMA Floodplain data available for this area.
R3008	13.23	11.40	10.88	0.51	4.72	3.88	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
R3010	2.39	2.39	1.01	1.38	136.03	57.62	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
R3020	1.96	1.94	0.63	1.32	209.66	67.05	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
R3025	2.68	2.48	0.19	2.28	1183.04	85.40	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
R3030	4.19	3.52	0.00	3.52	-	83.85	No detailed FEMA Floodplain data available for this area.
R3036	3.87	1.31	0.00	1.31	-	33.96	No detailed FEMA Floodplain data available for this area.
R3038	23.91	1.87	0.00	1.87	-	7.82	No detailed FEMA Floodplain data available for this area.
R3039	14.31	3.74	0.00	3.74	-	26.14	No detailed FEMA Floodplain data available for this area.
R3040	5.34	4.06	0.00	4.06	-	76.01	No detailed FEMA Floodplain data available for this area.
R3041	5.13	1.86	0.00	1.86	-	36.29	No detailed FEMA Floodplain data available for this area.
R3042	34.61	10.25	0.00	10.25	-	29.61	No detailed FEMA Floodplain data available for this area.
R3043	6.17	0.35	0.00	0.35	-	5.66	No detailed FEMA Floodplain data available for this area.
R3044	15.57	5.02	0.00	5.02	-	32.25	No detailed FEMA Floodplain data available for this area.
R3045	4.73	1.70	0.00	1.70	-	35.97	No detailed FEMA Floodplain data available for this area.
R3048	3.29	1.62	0.00	1.62	-	49.27	No detailed FEMA Floodplain data available for this area.
R3049	9.36	1.37	0.00	1.37	-	14.67	No detailed FEMA Floodplain data available for this area.
R3050	6.39	5.59	0.00	5.59	-	87.38	No detailed FEMA Floodplain data available for this area.
R3052	12.51	1.03	0.00	1.03	-	8.26	No detailed FEMA Floodplain data available for this area.
R3054	15.38	1.27	0.00	1.27	-	8.24	No detailed FEMA Floodplain data available for this area.
R3056	1.80	0.32	0.00	0.32	-	17.72	No detailed FEMA Floodplain data available for this area.
R3057	53.45	8.28	0.00	8.28	-	15.50	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
R3058	13.89	3.69	0.00	3.69	-	26.57	No detailed FEMA Floodplain data available for this area.
R3060	5.11	4.17	0.00	4.17	-	81.58	No detailed FEMA Floodplain data available for this area.
R3061	12.64	2.20	0.00	2.20	-	17.42	No detailed FEMA Floodplain data available for this area.
R3062	2.62	1.07	0.00	1.07	-	40.96	No detailed FEMA Floodplain data available for this area.
R3063	23.25	3.94	0.00	3.94	-	16.97	No detailed FEMA Floodplain data available for this area.
R3064	3.73	2.23	0.00	2.23	-	59.91	No detailed FEMA Floodplain data available for this area.
R3065	27.93	13.12	0.00	13.12	-	46.97	No detailed FEMA Floodplain data available for this area.
R3070	3.90	3.88	0.00	3.88	-	99.54	No detailed FEMA Floodplain data available for this area.
R3072	15.66	1.84	0.00	1.84	-	11.74	No detailed FEMA Floodplain data available for this area.
R3073	6.59	1.00	0.00	1.00	-	15.21	No detailed FEMA Floodplain data available for this area.
R3074	29.72	6.79	0.00	6.79	-	22.85	No detailed FEMA Floodplain data available for this area.
R3075	26.41	2.84	0.00	2.84	-	10.75	No detailed FEMA Floodplain data available for this area.
R3076	28.00	9.65	0.00	9.65	-	34.47	No detailed FEMA Floodplain data available for this area.
R3077	1.34	0.69	0.00	0.69	-	51.30	No detailed FEMA Floodplain data available for this area.
R3078	15.40	6.52	0.00	6.52	-	42.37	No detailed FEMA Floodplain data available for this area.
R3079	6.39	1.41	0.00	1.41	-	22.07	No detailed FEMA Floodplain data available for this area.
R3080	3.67	3.61	0.00	3.61	-	98.36	No detailed FEMA Floodplain data available for this area.
R3081	31.64	11.91	0.00	11.91	-	37.64	No detailed FEMA Floodplain data available for this area.
R3082	45.90	17.62	0.00	17.62	-	38.39	No detailed FEMA Floodplain data available for this area.
R3083	3.33	1.76	0.00	1.76	-	52.80	No detailed FEMA Floodplain data available for this area.
R3084	22.11	5.37	0.00	5.37	-	24.28	No detailed FEMA Floodplain data available for this area.
R3085	0.73	0.29	0.00	0.29	-	39.22	No detailed FEMA Floodplain data available for this area.
R3088	10.08	2.06	0.00	2.06	-	20.46	No detailed FEMA Floodplain data available for this area.
R3089	13.42	1.87	0.00	1.87	-	13.96	No detailed FEMA Floodplain data available for this area.
R3090	3.67	3.63	0.00	3.63	-	98.90	No detailed FEMA Floodplain data available for this area.
R3094	35.71	11.50	0.00	11.50	-	32.21	No detailed FEMA Floodplain data available for this area.
R3095	32.15	6.95	0.00	6.95	-	21.62	No detailed FEMA Floodplain data available for this area.
R3096	3.76	0.62	0.00	0.62	-	16.39	No detailed FEMA Floodplain data available for this area.
R3097	9.27	4.72	0.00	4.72	-	50.92	No detailed FEMA Floodplain data available for this area.
R3098	13.12	5.58	0.00	5.58	-	42.56	No detailed FEMA Floodplain data available for this area.
R3099	20.29	3.02	0.00	3.02	-	14.90	No detailed FEMA Floodplain data available for this area.
R3100	3.73	3.59	0.00	3.59	-	96.25	No detailed FEMA Floodplain data available for this area.
R3101	64.82	19.51	0.00	19.51	-	30.10	No detailed FEMA Floodplain data available for this area.
R3102	22.75	7.84	0.00	7.84	-	34.47	No detailed FEMA Floodplain data available for this area.
R3107	1.65	0.24	0.00	0.24	-	14.58	No detailed FEMA Floodplain data available for this area.
R3108	16.98	2.19	0.00	2.19	-	12.91	No detailed FEMA Floodplain data available for this area.
R3109	6.39	1.96	0.00	1.96	-	30.75	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
R3110	3.62	3.18	0.00	3.18	-	87.74	No detailed FEMA Floodplain data available for this area.
R3111	43.39	6.50	0.00	6.50	-	14.98	No detailed FEMA Floodplain data available for this area.
R3112	15.46	3.31	0.00	3.31	-	21.40	No detailed FEMA Floodplain data available for this area.
R3113	17.89	6.34	0.00	6.34	-	35.45	No detailed FEMA Floodplain data available for this area.
R3114	23.30	6.08	0.00	6.08	-	26.11	No detailed FEMA Floodplain data available for this area.
R3118	14.36	2.16	0.00	2.16	-	15.07	No detailed FEMA Floodplain data available for this area.
R3119	14.42	1.71	0.00	1.71	-	11.82	No detailed FEMA Floodplain data available for this area.
R3120	4.51	3.67	0.00	3.67	-	81.31	No detailed FEMA Floodplain data available for this area.
R3125	3.01	2.28	0.00	2.28	-	75.85	No detailed FEMA Floodplain data available for this area.
R3128	6.97	0.96	0.00	0.96	-	13.85	No detailed FEMA Floodplain data available for this area.
R3129	13.39	1.18	0.00	1.18	-	8.85	No detailed FEMA Floodplain data available for this area.
R3130	3.63	3.33	0.00	3.33	-	91.92	No detailed FEMA Floodplain data available for this area.
R3138	30.07	2.21	0.00	2.21	-	7.34	No detailed FEMA Floodplain data available for this area.
R3140	4.33	4.12	0.00	4.12	-	95.07	No detailed FEMA Floodplain data available for this area.
R3148	15.42	1.37	0.00	1.37	-	8.88	No detailed FEMA Floodplain data available for this area.
R3150	3.30	3.22	0.00	3.22	-	97.53	No detailed FEMA Floodplain data available for this area.
R3160	0.78	0.72	0.00	0.72	-	93.04	No detailed FEMA Floodplain data available for this area.
R3161	12.77	1.92	0.00	1.92	-	15.06	No detailed FEMA Floodplain data available for this area.
R3162	8.14	2.83	0.00	2.83	-	34.79	No detailed FEMA Floodplain data available for this area.
R3163	3.49	1.76	0.00	1.76	-	50.37	No detailed FEMA Floodplain data available for this area.
R3164	17.14	1.61	0.00	1.61	-	9.38	No detailed FEMA Floodplain data available for this area.
R3165	10.96	4.63	0.00	4.63	-	42.27	No detailed FEMA Floodplain data available for this area.
R3167	14.45	3.74	0.00	3.74	-	25.86	No detailed FEMA Floodplain data available for this area.
R3168	17.22	6.55	0.00	6.55	-	38.07	No detailed FEMA Floodplain data available for this area.
R3190	8.62	0.86	0.00	0.86	-	10.03	No detailed FEMA Floodplain data available for this area.
R3193	21.60	9.73	0.00	9.73	-	45.07	No detailed FEMA Floodplain data available for this area.
R3197	18.98	10.18	0.00	10.18	-	53.62	No detailed FEMA Floodplain data available for this area.
R3199	0.46	0.22	0.00	0.22	-	47.72	No detailed FEMA Floodplain data available for this area.
R3200	23.17	7.72	0.00	7.72	-	33.32	No detailed FEMA Floodplain data available for this area.
R3203	13.20	7.46	0.00	7.46	-	56.54	No detailed FEMA Floodplain data available for this area.
R3207	2.84	1.62	0.00	1.62	-	56.79	No detailed FEMA Floodplain data available for this area.
R3210	18.09	7.00	0.00	7.00	-	38.68	No detailed FEMA Floodplain data available for this area.
R3215	5.85	0.14	0.00	0.14	-	2.35	No detailed FEMA Floodplain data available for this area.
R3220	25.65	1.55	0.00	1.55	-	6.03	No detailed FEMA Floodplain data available for this area.
R3223	3.63	0.71	0.00	0.71	-	19.58	No detailed FEMA Floodplain data available for this area.
R3227	22.20	0.60	0.00	0.60	-	2.71	No detailed FEMA Floodplain data available for this area.
R3229	2.09	0.48	0.00	0.48	-	23.14	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
R3230	27.28	2.22	0.00	2.22	-	8.13	No detailed FEMA Floodplain data available for this area.
R3243	3.81	0.04	0.00	0.04	-	1.04	No detailed FEMA Floodplain data available for this area.
R3244	7.32	0.42	0.00	0.42	-	5.79	No detailed FEMA Floodplain data available for this area.
R3246	0.71	0.16	0.00	0.16	-	22.77	No detailed FEMA Floodplain data available for this area.
R3249	0.42	0.13	0.00	0.13	-	30.15	No detailed FEMA Floodplain data available for this area.
R3250	33.76	2.60	0.00	2.60	-	7.70	No detailed FEMA Floodplain data available for this area.
R3270	29.39	2.88	0.00	2.88	-	9.79	No detailed FEMA Floodplain data available for this area.
R3282	7.19	0.50	0.00	0.50	-	6.97	No detailed FEMA Floodplain data available for this area.
R3283	6.20	0.75	0.00	0.75	-	12.06	No detailed FEMA Floodplain data available for this area.
R3286	4.82	0.41	0.00	0.41	-	8.44	No detailed FEMA Floodplain data available for this area.
R3287	7.59	1.62	0.00	1.62	-	21.35	No detailed FEMA Floodplain data available for this area.
R3288	1.62	0.68	0.00	0.68	-	42.08	No detailed FEMA Floodplain data available for this area.
R3289	0.55	0.25	0.00	0.25	-	44.77	No detailed FEMA Floodplain data available for this area.
R3290	30.34	3.19	0.00	3.19	-	10.52	No detailed FEMA Floodplain data available for this area.
R3300	11.35	1.39	0.00	1.39	-	12.28	No detailed FEMA Floodplain data available for this area.
R3310	30.01	2.84	0.00	2.84	-	9.45	No detailed FEMA Floodplain data available for this area.
R3320	3.66	1.96	0.00	1.96	-	53.52	No detailed FEMA Floodplain data available for this area.
R3330	24.86	4.88	0.00	4.88	-	19.63	No detailed FEMA Floodplain data available for this area.
R3340	10.96	2.32	0.00	2.32	-	21.14	No detailed FEMA Floodplain data available for this area.
R3350	15.75	2.20	0.00	2.20	-	13.96	No detailed FEMA Floodplain data available for this area.
R3360	14.71	1.41	0.00	1.41	-	9.62	No detailed FEMA Floodplain data available for this area.
R3370	14.88	1.25	0.00	1.25	-	8.38	No detailed FEMA Floodplain data available for this area.
R3372	24.25	4.67	0.00	4.67	-	19.27	No detailed FEMA Floodplain data available for this area.
R3374	3.27	0.80	0.00	0.80	-	24.36	No detailed FEMA Floodplain data available for this area.
R3376	20.00	1.71	0.00	1.71	-	8.55	No detailed FEMA Floodplain data available for this area.
R3377	2.60	0.20	0.00	0.20	-	7.60	No detailed FEMA Floodplain data available for this area.
R3378	1.93	0.08	0.00	0.08	-	4.26	No detailed FEMA Floodplain data available for this area.
R3380	2.85	0.86	0.00	0.86	-	30.31	No detailed FEMA Floodplain data available for this area.
R3400	12.95	1.37	0.00	1.37	-	10.62	No detailed FEMA Floodplain data available for this area.
R3402	17.80	1.08	0.00	1.08	-	6.09	No detailed FEMA Floodplain data available for this area.
R3404	30.18	0.61	0.00	0.61	-	2.01	No detailed FEMA Floodplain data available for this area.
R3406	3.94	0.12	0.00	0.12	-	2.99	No detailed FEMA Floodplain data available for this area.
R3410	5.61	2.57	0.00	2.57	-	45.79	No detailed FEMA Floodplain data available for this area.
R3420	26.11	1.20	0.00	1.20	-	4.61	No detailed FEMA Floodplain data available for this area.
R3450	12.50	0.60	0.00	0.60	-	4.83	No detailed FEMA Floodplain data available for this area.
R3510	10.56	0.43	0.00	0.43	-	4.12	No detailed FEMA Floodplain data available for this area.
R3520	24.08	0.90	0.00	0.90	-	3.73	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
R3522	6.54	0.42	0.00	0.42	-	6.44	No detailed FEMA Floodplain data available for this area.
R3524	19.80	1.90	0.00	1.90	-	9.60	No detailed FEMA Floodplain data available for this area.
R3526	20.46	2.54	0.00	2.54	-	12.41	No detailed FEMA Floodplain data available for this area.
R3530	22.20	2.34	0.00	2.34	-	10.55	No detailed FEMA Floodplain data available for this area.
R3540	47.89	8.21	0.00	8.21	-	17.15	No detailed FEMA Floodplain data available for this area.
R3550	22.15	2.01	0.00	2.01	-	9.09	No detailed FEMA Floodplain data available for this area.
R3560	40.06	4.21	0.00	4.21	-	10.51	No detailed FEMA Floodplain data available for this area.
R3570	2.50	1.59	0.00	1.59	-	63.44	No detailed FEMA Floodplain data available for this area.
R3610	11.78	0.63	0.00	0.63	-	5.35	No detailed FEMA Floodplain data available for this area.
R3620	35.52	2.69	0.00	2.69	-	7.56	No detailed FEMA Floodplain data available for this area.
R3630	6.55	0.91	0.00	0.91	-	13.92	No detailed FEMA Floodplain data available for this area.
R3640	3.09	0.73	0.00	0.73	-	23.76	No detailed FEMA Floodplain data available for this area.
R3650	23.82	1.54	0.00	1.54	-	6.45	No detailed FEMA Floodplain data available for this area.
R3660	8.28	0.46	0.00	0.46	-	5.61	No detailed FEMA Floodplain data available for this area.
R3670	2.91	0.55	0.00	0.55	-	19.01	No detailed FEMA Floodplain data available for this area.
R3675	14.87	2.87	0.00	2.87	-	19.31	No detailed FEMA Floodplain data available for this area.
R3680	23.31	1.26	0.00	1.26	-	5.41	No detailed FEMA Floodplain data available for this area.
R3690	22.68	2.52	0.00	2.52	-	11.12	No detailed FEMA Floodplain data available for this area.
R3693	24.59	3.18	0.00	3.18	-	12.93	No detailed FEMA Floodplain data available for this area.
R3698	2.20	0.09	0.00	0.09	-	4.26	No detailed FEMA Floodplain data available for this area.
S0005	12.04	0.31	0.00	0.31	-	2.59	No detailed FEMA Floodplain data available for this area.
S0025	35.53	24.57	0.00	24.57	-	69.15	No detailed FEMA Floodplain data available for this area.
S0030	56.17	30.16	0.00	30.16	-	53.69	No detailed FEMA Floodplain data available for this area.
S0035	8.67	3.08	0.00	3.08	-	35.56	No detailed FEMA Floodplain data available for this area.
S0036	4.28	1.97	0.00	1.97	-	46.00	No detailed FEMA Floodplain data available for this area.
S0038	39.19	21.20	0.00	21.20	-	54.10	No detailed FEMA Floodplain data available for this area.
S0039	5.57	3.56	0.00	3.56	-	63.84	No detailed FEMA Floodplain data available for this area.
S0040	82.18	35.32	0.00	35.32	-	42.98	No detailed FEMA Floodplain data available for this area.
S0046	12.05	6.68	0.00	6.68	-	55.45	No detailed FEMA Floodplain data available for this area.
S0047	10.24	7.51	0.00	7.51	-	73.32	No detailed FEMA Floodplain data available for this area.
S0048	9.05	4.30	0.00	4.30	-	47.50	No detailed FEMA Floodplain data available for this area.
S0049	12.08	6.75	0.00	6.75	-	55.84	No detailed FEMA Floodplain data available for this area.
S0050	107.07	78.40	0.00	78.40	-	73.22	No detailed FEMA Floodplain data available for this area.
S0059	21.89	21.31	0.00	21.31	-	97.36	No detailed FEMA Floodplain data available for this area.
S0060	20.24	17.23	0.00	17.23	-	85.12	No detailed FEMA Floodplain data available for this area.
S0065	5.25	5.04	0.00	5.04	-	96.06	No detailed FEMA Floodplain data available for this area.
S0070	6.74	6.69	0.00	6.69	-	99.23	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
S0086	16.47	4.29	0.00	4.29	-	26.02	No detailed FEMA Floodplain data available for this area.
S0087	10.90	8.97	0.00	8.97	-	82.36	No detailed FEMA Floodplain data available for this area.
S0088	14.67	3.26	0.00	3.26	-	22.22	No detailed FEMA Floodplain data available for this area.
S0089	71.24	25.68	0.00	25.68	-	36.04	No detailed FEMA Floodplain data available for this area.
S0090	6.71	6.25	0.00	6.25	-	93.05	No detailed FEMA Floodplain data available for this area.
S0100	17.00	16.30	0.00	16.30	-	95.86	No detailed FEMA Floodplain data available for this area.
S0110	23.15	19.63	0.00	19.63	-	84.79	No detailed FEMA Floodplain data available for this area.
S0119	22.90	3.47	0.00	3.47	-	15.15	No detailed FEMA Floodplain data available for this area.
S0120	50.09	14.76	0.00	14.76	-	29.47	No detailed FEMA Floodplain data available for this area.
S0129	10.39	2.24	0.00	2.24	-	21.54	No detailed FEMA Floodplain data available for this area.
S0130	56.20	37.78	0.00	37.78	-	67.22	No detailed FEMA Floodplain data available for this area.
S0134	5.90	4.73	0.00	4.73	-	80.14	No detailed FEMA Floodplain data available for this area.
S0135	38.76	7.60	0.00	7.60	-	19.61	No detailed FEMA Floodplain data available for this area.
S0136	3.41	2.61	0.00	2.61	-	76.46	No detailed FEMA Floodplain data available for this area.
S0137	55.31	30.14	0.00	30.14	-	54.49	No detailed FEMA Floodplain data available for this area.
S0138	22.95	12.43	0.00	12.43	-	54.16	No detailed FEMA Floodplain data available for this area.
S0139	127.23	112.39	0.00	112.39	-	88.34	No detailed FEMA Floodplain data available for this area.
S0140	23.08	21.84	0.00	21.84	-	94.63	No detailed FEMA Floodplain data available for this area.
S0143	10.78	8.82	0.00	8.82	-	81.83	No detailed FEMA Floodplain data available for this area.
S0144	86.37	56.80	0.00	56.80	-	65.77	No detailed FEMA Floodplain data available for this area.
S0145	8.82	6.76	0.00	6.76	-	76.67	No detailed FEMA Floodplain data available for this area.
S0146	58.15	40.31	0.00	40.31	-	69.31	No detailed FEMA Floodplain data available for this area.
S0147	28.05	18.37	0.00	18.37	-	65.47	No detailed FEMA Floodplain data available for this area.
S0148	19.64	17.33	0.00	17.33	-	88.22	No detailed FEMA Floodplain data available for this area.
S0149	25.77	23.91	0.00	23.91	-	92.78	No detailed FEMA Floodplain data available for this area.
S0150	20.66	18.97	0.00	18.97	-	91.79	No detailed FEMA Floodplain data available for this area.
S0159	11.52	6.34	0.00	6.34	-	55.02	No detailed FEMA Floodplain data available for this area.
S0160	61.59	13.96	0.00	13.96	-	22.66	No detailed FEMA Floodplain data available for this area.
S0170	37.82	31.48	0.00	31.48	-	83.24	No detailed FEMA Floodplain data available for this area.
S0178	12.74	8.54	0.00	8.54	-	67.05	No detailed FEMA Floodplain data available for this area.
S0179	9.22	4.77	0.00	4.77	-	51.70	No detailed FEMA Floodplain data available for this area.
S0180	12.19	8.10	0.00	8.10	-	66.46	No detailed FEMA Floodplain data available for this area.
S0190	28.48	18.97	0.00	18.97	-	66.62	No detailed FEMA Floodplain data available for this area.
S0200	39.00	21.99	0.00	21.99	-	56.40	No detailed FEMA Floodplain data available for this area.
S0201	2.72	2.20	0.00	2.20	-	80.82	No detailed FEMA Floodplain data available for this area.
S0203	11.20	7.57	0.00	7.57	-	67.61	No detailed FEMA Floodplain data available for this area.
S0205	10.25	6.60	0.00	6.60	-	64.42	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
S0207	15.07	5.43	0.00	5.43	-	36.02	No detailed FEMA Floodplain data available for this area.
S0209	27.30	6.35	0.00	6.35	-	23.27	No detailed FEMA Floodplain data available for this area.
S0210	57.46	25.01	0.00	25.01	-	43.53	No detailed FEMA Floodplain data available for this area.
S0215	4.88	2.48	0.00	2.48	-	50.77	No detailed FEMA Floodplain data available for this area.
S0220	26.16	13.33	0.00	13.33	-	50.96	No detailed FEMA Floodplain data available for this area.
S0230	9.67	6.72	0.00	6.72	-	69.56	No detailed FEMA Floodplain data available for this area.
S0239	103.56	67.90	0.00	67.90	-	65.57	No detailed FEMA Floodplain data available for this area.
S0240	15.08	9.25	0.00	9.25	-	61.31	No detailed FEMA Floodplain data available for this area.
S0250	39.88	30.15	0.00	30.15	-	75.60	No detailed FEMA Floodplain data available for this area.
S0259	13.15	9.41	0.00	9.41	-	71.55	No detailed FEMA Floodplain data available for this area.
S0260	29.66	19.57	0.00	19.57	-	66.00	No detailed FEMA Floodplain data available for this area.
S0265	2.37	1.74	0.00	1.74	-	73.59	No detailed FEMA Floodplain data available for this area.
S0270	1.65	1.31	0.00	1.31	-	79.78	No detailed FEMA Floodplain data available for this area.
S0280	28.37	16.02	0.00	16.02	-	56.47	No detailed FEMA Floodplain data available for this area.
S0290	35.97	7.62	0.00	7.62	-	21.19	No detailed FEMA Floodplain data available for this area.
S0295	10.71	9.60	0.00	9.60	-	89.70	No detailed FEMA Floodplain data available for this area.
S0300	17.06	3.84	0.00	3.84	-	22.50	No detailed FEMA Floodplain data available for this area.
S0310	18.09	9.84	0.00	9.84	-	54.38	No detailed FEMA Floodplain data available for this area.
S0315	8.67	7.64	0.00	7.64	-	88.12	No detailed FEMA Floodplain data available for this area.
S0316	21.86	11.97	0.00	11.97	-	54.76	No detailed FEMA Floodplain data available for this area.
S0317	39.45	15.28	0.00	15.28	-	38.75	No detailed FEMA Floodplain data available for this area.
S0318	13.13	2.18	0.00	2.18	-	16.64	No detailed FEMA Floodplain data available for this area.
S0319	15.78	3.66	0.00	3.66	-	23.18	No detailed FEMA Floodplain data available for this area.
S0320	44.06	22.64	0.00	22.64	-	51.39	No detailed FEMA Floodplain data available for this area.
S0330	27.81	21.13	0.00	21.13	-	75.99	No detailed FEMA Floodplain data available for this area.
S0340	10.03	9.64	0.00	9.64	-	96.14	No detailed FEMA Floodplain data available for this area.
S0350	8.88	8.09	0.00	8.09	-	91.11	No detailed FEMA Floodplain data available for this area.
S0367	3.92	1.19	0.00	1.19	-	30.20	No detailed FEMA Floodplain data available for this area.
S0410	12.42	10.09	0.00	10.09	-	81.29	No detailed FEMA Floodplain data available for this area.
S0411	23.27	10.03	0.00	10.03	-	43.10	No detailed FEMA Floodplain data available for this area.
S0416	19.51	7.73	0.00	7.73	-	39.65	No detailed FEMA Floodplain data available for this area.
S0417	26.76	11.08	0.00	11.08	-	41.40	No detailed FEMA Floodplain data available for this area.
S0418	0.97	0.72	0.00	0.72	-	73.77	No detailed FEMA Floodplain data available for this area.
S0419	4.78	3.68	0.00	3.68	-	77.07	No detailed FEMA Floodplain data available for this area.
S0420	76.89	27.99	0.00	27.99	-	36.40	No detailed FEMA Floodplain data available for this area.
S0430	27.32	18.90	0.00	18.90	-	69.20	No detailed FEMA Floodplain data available for this area.
S0436	9.88	8.55	0.00	8.55	-	86.55	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
S0437	41.33	7.49	0.00	7.49	-	18.13	No detailed FEMA Floodplain data available for this area.
S0438	40.76	12.49	0.00	12.49	-	30.64	No detailed FEMA Floodplain data available for this area.
S0439	12.14	9.08	0.00	9.08	-	74.82	No detailed FEMA Floodplain data available for this area.
S0440	56.07	28.89	0.00	28.89	-	51.52	No detailed FEMA Floodplain data available for this area.
S0450	12.34	9.34	0.00	9.34	-	75.72	No detailed FEMA Floodplain data available for this area.
S0455	6.71	1.08	0.00	1.08	-	16.12	No detailed FEMA Floodplain data available for this area.
S0459	9.42	2.43	0.00	2.43	-	25.76	No detailed FEMA Floodplain data available for this area.
S0460	3.96	1.88	0.00	1.88	-	47.50	No detailed FEMA Floodplain data available for this area.
S0530	0.00	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
S0533	4.98	2.94	0.00	2.94	-	58.90	No detailed FEMA Floodplain data available for this area.
S0534	7.96	3.42	0.00	3.42	-	42.92	No detailed FEMA Floodplain data available for this area.
S0535	7.44	2.40	0.00	2.40	-	32.27	No detailed FEMA Floodplain data available for this area.
S0540	59.76	42.52	0.00	42.52	-	71.15	No detailed FEMA Floodplain data available for this area.
S0550	5.49	2.72	0.00	2.72	-	49.53	No detailed FEMA Floodplain data available for this area.
S0585	2.59	1.77	0.00	1.77	-	68.34	No detailed FEMA Floodplain data available for this area.
S0595	15.88	4.99	0.00	4.99	-	31.43	No detailed FEMA Floodplain data available for this area.
S0630	3.30	1.09	0.00	1.09	-	32.96	No detailed FEMA Floodplain data available for this area.
S0635	4.47	2.37	0.00	2.37	-	52.98	No detailed FEMA Floodplain data available for this area.
S0639	33.87	16.02	0.00	16.02	-	47.30	No detailed FEMA Floodplain data available for this area.
S0640	38.50	22.37	0.00	22.37	-	58.09	No detailed FEMA Floodplain data available for this area.
S0710	3.66	1.97	0.00	1.97	-	53.75	No detailed FEMA Floodplain data available for this area.
S0720	12.47	1.67	0.00	1.67	-	13.39	No detailed FEMA Floodplain data available for this area.
S0730	5.49	3.95	0.00	3.95	-	71.91	No detailed FEMA Floodplain data available for this area.
S0738	2.68	2.27	0.00	2.27	-	84.94	No detailed FEMA Floodplain data available for this area.
S0739	12.44	6.36	0.00	6.36	-	51.13	No detailed FEMA Floodplain data available for this area.
S0740	41.11	6.84	0.00	6.84	-	16.63	No detailed FEMA Floodplain data available for this area.
S0750	21.24	6.48	0.00	6.48	-	30.50	No detailed FEMA Floodplain data available for this area.
S0760	21.94	17.93	0.00	17.93	-	81.74	No detailed FEMA Floodplain data available for this area.
S0810	40.16	16.01	0.00	16.01	-	39.86	No detailed FEMA Floodplain data available for this area.
S0820	3.59	2.48	0.00	2.48	-	69.14	No detailed FEMA Floodplain data available for this area.
S0828	3.20	1.63	0.00	1.63	-	51.12	No detailed FEMA Floodplain data available for this area.
S0829	18.99	7.25	0.00	7.25	-	38.20	No detailed FEMA Floodplain data available for this area.
S0830	6.08	2.63	0.00	2.63	-	43.24	No detailed FEMA Floodplain data available for this area.
S0840	23.46	9.20	0.00	9.20	-	39.21	No detailed FEMA Floodplain data available for this area.
S0846	4.99	3.61	0.00	3.61	-	72.46	No detailed FEMA Floodplain data available for this area.
S0847	15.14	6.39	0.00	6.39	-	42.25	No detailed FEMA Floodplain data available for this area.
S0848	43.93	8.15	0.00	8.15	-	18.55	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
S0849	8.14	5.01	0.00	5.01	-	61.57	No detailed FEMA Floodplain data available for this area.
S0850	31.81	7.05	0.00	7.05	-	22.17	No detailed FEMA Floodplain data available for this area.
S0857	14.46	3.93	0.00	3.93	-	27.17	No detailed FEMA Floodplain data available for this area.
S0858	4.65	1.98	0.00	1.98	-	42.52	No detailed FEMA Floodplain data available for this area.
S0859	14.48	4.45	0.00	4.45	-	30.76	No detailed FEMA Floodplain data available for this area.
S0860	45.32	34.77	0.00	34.77	-	76.71	No detailed FEMA Floodplain data available for this area.
S0867	4.00	2.05	0.00	2.05	-	51.40	No detailed FEMA Floodplain data available for this area.
S0868	20.84	7.06	0.00	7.06	-	33.86	No detailed FEMA Floodplain data available for this area.
S0869	15.09	2.59	0.00	2.59	-	17.14	No detailed FEMA Floodplain data available for this area.
S0870	10.28	5.85	0.00	5.85	-	56.85	No detailed FEMA Floodplain data available for this area.
S1010	2.50	0.74	0.00	0.74	-	29.35	No detailed FEMA Floodplain data available for this area.
S1020	9.59	1.12	0.00	1.12	-	11.70	No detailed FEMA Floodplain data available for this area.
S1033	10.62	0.25	0.00	0.25	-	2.31	No detailed FEMA Floodplain data available for this area.
S1037	2.00	0.45	0.00	0.45	-	22.63	No detailed FEMA Floodplain data available for this area.
S1038	1.16	0.42	0.00	0.42	-	36.00	No detailed FEMA Floodplain data available for this area.
S1040	5.00	0.52	0.00	0.52	-	10.32	No detailed FEMA Floodplain data available for this area.
S1050	14.19	0.69	0.00	0.69	-	4.90	No detailed FEMA Floodplain data available for this area.
S1070	13.62	0.75	0.00	0.75	-	5.49	No detailed FEMA Floodplain data available for this area.
S1080	4.37	0.29	0.00	0.29	-	6.61	No detailed FEMA Floodplain data available for this area.
S1110	8.67	0.84	0.00	0.84	-	9.67	No detailed FEMA Floodplain data available for this area.
S1120	11.54	0.82	0.00	0.82	-	7.10	No detailed FEMA Floodplain data available for this area.
S1130	20.79	0.75	0.00	0.75	-	3.60	No detailed FEMA Floodplain data available for this area.
S1140	0.60	0.12	0.00	0.12	-	19.98	No detailed FEMA Floodplain data available for this area.
S1210	4.80	0.63	0.00	0.63	-	13.17	No detailed FEMA Floodplain data available for this area.
S1220	11.03	1.00	0.00	1.00	-	9.09	No detailed FEMA Floodplain data available for this area.
S1230	12.94	1.02	0.00	1.02	-	7.86	No detailed FEMA Floodplain data available for this area.
S1240	4.54	0.86	0.00	0.86	-	19.04	No detailed FEMA Floodplain data available for this area.
S1250	19.02	1.19	0.00	1.19	-	6.25	No detailed FEMA Floodplain data available for this area.
S1260	6.12	0.68	0.00	0.68	-	11.08	No detailed FEMA Floodplain data available for this area.
S1280	7.14	0.22	0.00	0.22	-	3.02	No detailed FEMA Floodplain data available for this area.
S1310	9.02	3.33	0.00	3.33	-	36.91	No detailed FEMA Floodplain data available for this area.
S1320	98.91	33.85	0.00	33.85	-	34.22	No detailed FEMA Floodplain data available for this area.
S1330	1.78	1.23	0.00	1.23	-	69.09	No detailed FEMA Floodplain data available for this area.
S1340	6.92	5.64	0.00	5.64	-	81.53	No detailed FEMA Floodplain data available for this area.
S1510	13.52	0.90	0.00	0.90	-	6.68	No detailed FEMA Floodplain data available for this area.
S1530	8.58	1.24	0.00	1.24	-	14.44	No detailed FEMA Floodplain data available for this area.
S1540	13.66	1.14	0.00	1.14	-	8.32	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
S1560	20.15	1.29	0.00	1.29	-	6.42	No detailed FEMA Floodplain data available for this area.
S1570	2.29	0.89	0.00	0.89	-	39.02	No detailed FEMA Floodplain data available for this area.
S1575	5.79	0.13	0.00	0.13	-	2.31	No detailed FEMA Floodplain data available for this area.
S1580	1.28	0.67	0.00	0.67	-	51.90	No detailed FEMA Floodplain data available for this area.
S1610	8.10	0.79	0.00	0.79	-	9.79	No detailed FEMA Floodplain data available for this area.
S1620	7.24	0.07	0.00	0.07	-	0.97	No detailed FEMA Floodplain data available for this area.
S1630	3.68	0.58	0.00	0.58	-	15.73	No detailed FEMA Floodplain data available for this area.
S1640	1.62	0.26	0.00	0.26	-	16.07	No detailed FEMA Floodplain data available for this area.
S1710	20.08	1.00	0.00	1.00	-	4.98	No detailed FEMA Floodplain data available for this area.
S1720	5.97	0.62	0.00	0.62	-	10.37	No detailed FEMA Floodplain data available for this area.
S1730	12.89	1.80	0.00	1.80	-	14.00	No detailed FEMA Floodplain data available for this area.
S1740	37.37	0.22	0.00	0.22	-	0.58	No detailed FEMA Floodplain data available for this area.
S1750	3.62	0.52	0.00	0.52	-	14.28	No detailed FEMA Floodplain data available for this area.
S1760	1.55	0.36	0.00	0.36	-	23.17	No detailed FEMA Floodplain data available for this area.
S1810	39.39	2.73	0.00	2.73	-	6.93	No detailed FEMA Floodplain data available for this area.
S1820	12.76	2.10	0.00	2.10	-	16.43	No detailed FEMA Floodplain data available for this area.
S1830	12.48	2.07	0.00	2.07	-	16.62	No detailed FEMA Floodplain data available for this area.
S1910	26.50	7.86	0.00	7.86	-	29.65	No detailed FEMA Floodplain data available for this area.
S1920	17.00	3.34	0.00	3.34	-	19.68	No detailed FEMA Floodplain data available for this area.
S1930	11.68	0.97	0.00	0.97	-	8.32	No detailed FEMA Floodplain data available for this area.
S2010	18.79	0.37	0.00	0.37	-	1.95	No detailed FEMA Floodplain data available for this area.
S2020	19.84	1.07	0.00	1.07	-	5.41	No detailed FEMA Floodplain data available for this area.
S2029	11.04	1.78	0.00	1.78	-	16.09	No detailed FEMA Floodplain data available for this area.
S2040	12.46	1.34	0.00	1.34	-	10.75	No detailed FEMA Floodplain data available for this area.
S2045	46.04	3.53	0.00	3.53	-	7.68	No detailed FEMA Floodplain data available for this area.
S2050	63.00	4.90	0.00	4.90	-	7.78	No detailed FEMA Floodplain data available for this area.
S2070	44.85	2.70	0.00	2.70	-	6.01	No detailed FEMA Floodplain data available for this area.
S2510	5.83	0.15	0.00	0.15	-	2.53	No detailed FEMA Floodplain data available for this area.
S2705	16.07	0.30	3.98	3.68	92.52	22.91	No detailed FEMA Floodplain data available for this area.
S2710	16.77	0.26	1.10	0.84	76.24	5.01	No detailed FEMA Floodplain data available for this area.
S2717	4.69	0.09	0.00	0.09	-	1.95	No detailed FEMA Floodplain data available for this area.
S2718	10.73	0.52	0.00	0.52	-	4.86	No detailed FEMA Floodplain data available for this area.
S2719	1.25	0.23	0.00	0.23	-	18.19	No detailed FEMA Floodplain data available for this area.
S2720	36.68	0.75	1.59	0.84	52.71	2.28	No detailed FEMA Floodplain data available for this area.
S2810	1.48	0.18	0.00	0.18	-	12.24	No detailed FEMA Floodplain data available for this area.
S2820	20.12	0.65	0.00	0.65	-	3.24	No detailed FEMA Floodplain data available for this area.
S2830	2.90	0.76	0.00	0.76	-	26.04	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
S2840	8.29	0.83	0.00	0.83	-	9.99	No detailed FEMA Floodplain data available for this area.
S2850	1.22	0.37	0.00	0.37	-	30.34	No detailed FEMA Floodplain data available for this area.
S2910	2.71	0.16	0.00	0.16	-	5.85	No detailed FEMA Floodplain data available for this area.
S2920	2.25	0.24	0.00	0.24	-	10.90	No detailed FEMA Floodplain data available for this area.
S2930	1.50	0.60	0.00	0.60	-	39.88	No detailed FEMA Floodplain data available for this area.
S2940	5.13	0.71	0.00	0.71	-	13.76	No detailed FEMA Floodplain data available for this area.
S2950	1.03	0.07	0.00	0.07	-	6.53	No detailed FEMA Floodplain data available for this area.
S3010	12.71	0.45	0.00	0.45	-	3.51	No detailed FEMA Floodplain data available for this area.
S3020	23.32	1.66	0.00	1.66	-	7.13	No detailed FEMA Floodplain data available for this area.
S3030	2.39	0.87	0.00	0.87	-	36.25	No detailed FEMA Floodplain data available for this area.
S3040	5.62	0.72	0.00	0.72	-	12.84	No detailed FEMA Floodplain data available for this area.
S3050	3.01	0.32	0.00	0.32	-	10.60	No detailed FEMA Floodplain data available for this area.
S3510	24.26	0.93	0.00	0.93	-	3.82	No detailed FEMA Floodplain data available for this area.
S3520	8.94	0.99	0.00	0.99	-	11.11	No detailed FEMA Floodplain data available for this area.
S3525	1.26	0.44	0.00	0.44	-	34.76	No detailed FEMA Floodplain data available for this area.
S3530	22.98	2.18	0.00	2.18	-	9.51	No detailed FEMA Floodplain data available for this area.
S3540	5.73	0.46	0.00	0.46	-	8.00	No detailed FEMA Floodplain data available for this area.
S4010	6.10	0.90	0.00	0.90	-	14.79	No detailed FEMA Floodplain data available for this area.
S4020	17.65	1.66	0.00	1.66	-	9.38	No detailed FEMA Floodplain data available for this area.
S4030	9.56	1.01	0.00	1.01	-	10.52	No detailed FEMA Floodplain data available for this area.
S4050	7.41	0.29	0.00	0.29	-	3.96	No detailed FEMA Floodplain data available for this area.
S4510	13.98	0.53	0.00	0.53	-	3.81	No detailed FEMA Floodplain data available for this area.
S4520	7.70	0.71	0.00	0.71	-	9.23	No detailed FEMA Floodplain data available for this area.
S4530	2.02	0.16	0.00	0.16	-	7.90	No detailed FEMA Floodplain data available for this area.
S4540	0.40	0.14	0.00	0.14	-	34.44	No detailed FEMA Floodplain data available for this area.
S5010	21.29	13.99	0.00	13.99	-	65.72	No detailed FEMA Floodplain data available for this area.
S5020	3.49	2.08	0.00	2.08	-	59.53	No detailed FEMA Floodplain data available for this area.
S5030	4.63	2.65	0.00	2.65	-	57.30	No detailed FEMA Floodplain data available for this area.
S5040	6.13	3.65	0.00	3.65	-	59.62	No detailed FEMA Floodplain data available for this area.
S5050	6.39	4.59	0.00	4.59	-	71.79	No detailed FEMA Floodplain data available for this area.
S5059	6.81	0.25	0.00	0.25	-	3.71	No detailed FEMA Floodplain data available for this area.
S5060	6.23	3.83	0.00	3.83	-	61.43	No detailed FEMA Floodplain data available for this area.
S5070	4.05	2.88	0.00	2.88	-	71.01	No detailed FEMA Floodplain data available for this area.
S5080	5.48	3.76	0.00	3.76	-	68.63	No detailed FEMA Floodplain data available for this area.
S5090	7.33	5.42	0.00	5.42	-	73.97	No detailed FEMA Floodplain data available for this area.
S5100	7.84	5.33	0.00	5.33	-	68.00	No detailed FEMA Floodplain data available for this area.
S5109	4.63	2.61	0.00	2.61	-	56.44	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
S5110	2.85	2.43	0.00	2.43	-	85.19	No detailed FEMA Floodplain data available for this area.
S5114	45.50	10.29	0.00	10.29	-	22.61	No detailed FEMA Floodplain data available for this area.
S5116	12.35	1.98	0.00	1.98	-	16.06	No detailed FEMA Floodplain data available for this area.
S5117	2.28	1.17	0.00	1.17	-	51.31	No detailed FEMA Floodplain data available for this area.
S5118	3.44	1.37	0.00	1.37	-	39.86	No detailed FEMA Floodplain data available for this area.
S5119	15.97	7.89	0.00	7.89	-	49.42	No detailed FEMA Floodplain data available for this area.
S5120	3.53	2.71	0.00	2.71	-	76.95	No detailed FEMA Floodplain data available for this area.
S5130	2.89	0.92	0.00	0.92	-	31.90	No detailed FEMA Floodplain data available for this area.
S5142	5.97	2.49	0.00	2.49	-	41.73	No detailed FEMA Floodplain data available for this area.
S5144	5.04	1.18	0.00	1.18	-	23.40	No detailed FEMA Floodplain data available for this area.
S5146	2.20	0.74	0.00	0.74	-	33.69	No detailed FEMA Floodplain data available for this area.
S5150	3.93	2.98	0.00	2.98	-	75.83	No detailed FEMA Floodplain data available for this area.
S5158	2.25	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
S5160	4.61	1.37	0.00	1.37	-	29.71	No detailed FEMA Floodplain data available for this area.
S5162	3.19	0.00	0.00	0.00	-	0.00	No detailed FEMA Floodplain data available for this area.
S5163	8.94	0.90	0.00	0.90	-	10.07	No detailed FEMA Floodplain data available for this area.
S5165	3.14	0.45	0.00	0.45	-	14.40	No detailed FEMA Floodplain data available for this area.
S5170	3.51	1.47	0.00	1.47	-	42.00	No detailed FEMA Floodplain data available for this area.
S5173	11.80	10.08	0.00	10.08	-	85.45	No detailed FEMA Floodplain data available for this area.
S5174	4.11	0.54	0.00	0.54	-	13.21	No detailed FEMA Floodplain data available for this area.
S5175	4.58	0.65	0.00	0.65	-	14.19	No detailed FEMA Floodplain data available for this area.
S5180	6.59	3.57	0.00	3.57	-	54.10	No detailed FEMA Floodplain data available for this area.
S5189	40.91	13.34	0.00	13.34	-	32.61	No detailed FEMA Floodplain data available for this area.
S5198	13.90	1.12	0.00	1.12	-	8.07	No detailed FEMA Floodplain data available for this area.
S5200	4.63	2.51	0.00	2.51	-	54.20	No detailed FEMA Floodplain data available for this area.
S5210	3.72	2.40	0.00	2.40	-	64.66	No detailed FEMA Floodplain data available for this area.
S5220	2.18	1.45	0.00	1.45	-	66.43	No detailed FEMA Floodplain data available for this area.
S5229	52.20	4.52	0.00	4.52	-	8.67	No detailed FEMA Floodplain data available for this area.
S5230	1.48	0.98	0.00	0.98	-	65.99	No detailed FEMA Floodplain data available for this area.
S5238	5.91	0.40	0.00	0.40	-	6.72	No detailed FEMA Floodplain data available for this area.
S5240	2.26	1.38	0.00	1.38	-	60.95	No detailed FEMA Floodplain data available for this area.
S5245	5.57	0.26	0.00	0.26	-	4.72	No detailed FEMA Floodplain data available for this area.
S5250	3.55	2.35	0.00	2.35	-	66.16	No detailed FEMA Floodplain data available for this area.
S5255	10.24	0.26	0.00	0.26	-	2.54	No detailed FEMA Floodplain data available for this area.
S5258	6.34	2.17	0.00	2.17	-	34.30	No detailed FEMA Floodplain data available for this area.
S5260	2.99	1.98	0.00	1.98	-	66.31	No detailed FEMA Floodplain data available for this area.
S5270	4.22	2.70	0.00	2.70	-	63.93	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
S5275	14.09	0.27	0.00	0.27	-	1.90	No detailed FEMA Floodplain data available for this area.
S5278	8.63	6.84	0.00	6.84	-	79.32	No detailed FEMA Floodplain data available for this area.
S5280	2.54	1.53	0.00	1.53	-	60.44	No detailed FEMA Floodplain data available for this area.
S5290	2.55	1.53	0.00	1.53	-	59.78	No detailed FEMA Floodplain data available for this area.
S5295	10.51	0.22	0.00	0.22	-	2.11	No detailed FEMA Floodplain data available for this area.
S5300	2.96	1.81	0.00	1.81	-	60.95	No detailed FEMA Floodplain data available for this area.
S5310	2.46	1.56	0.00	1.56	-	63.16	No detailed FEMA Floodplain data available for this area.
S5313	5.97	2.14	0.00	2.14	-	35.86	No detailed FEMA Floodplain data available for this area.
S5318	12.00	0.56	0.00	0.56	-	4.66	No detailed FEMA Floodplain data available for this area.
S5320	2.02	1.26	0.00	1.26	-	62.62	No detailed FEMA Floodplain data available for this area.
S5325	10.31	0.52	0.00	0.52	-	5.01	No detailed FEMA Floodplain data available for this area.
S5330	3.46	2.16	0.00	2.16	-	62.25	No detailed FEMA Floodplain data available for this area.
S5340	2.68	1.74	0.00	1.74	-	65.08	No detailed FEMA Floodplain data available for this area.
S5348	11.92	9.32	0.00	9.32	-	78.21	No detailed FEMA Floodplain data available for this area.
S5349	10.70	7.23	0.00	7.23	-	67.57	No detailed FEMA Floodplain data available for this area.
S5350	1.91	1.28	0.00	1.28	-	67.31	No detailed FEMA Floodplain data available for this area.
S5360	5.06	2.69	0.00	2.69	-	53.16	No detailed FEMA Floodplain data available for this area.
S5368	2.43	0.63	0.00	0.63	-	26.04	No detailed FEMA Floodplain data available for this area.
S5369	7.93	1.77	0.00	1.77	-	22.39	No detailed FEMA Floodplain data available for this area.
S5370	2.36	1.28	0.00	1.28	-	54.27	No detailed FEMA Floodplain data available for this area.
S5378	17.17	4.69	0.00	4.69	-	27.30	No detailed FEMA Floodplain data available for this area.
S5379	1.17	0.64	0.00	0.64	-	54.54	No detailed FEMA Floodplain data available for this area.
S5380	4.09	2.34	0.00	2.34	-	57.25	No detailed FEMA Floodplain data available for this area.
S5388	9.65	0.57	0.00	0.57	-	5.92	No detailed FEMA Floodplain data available for this area.
S5389	7.25	1.07	0.00	1.07	-	14.77	No detailed FEMA Floodplain data available for this area.
S5390	3.23	1.88	0.00	1.88	-	58.20	No detailed FEMA Floodplain data available for this area.
S5400	11.24	3.36	0.00	3.36	-	29.85	No detailed FEMA Floodplain data available for this area.
S5405	33.82	4.99	0.00	4.99	-	14.76	No detailed FEMA Floodplain data available for this area.
S5410	29.87	9.83	0.00	9.83	-	32.91	No detailed FEMA Floodplain data available for this area.
S5420	29.88	2.49	0.00	2.49	-	8.33	No detailed FEMA Floodplain data available for this area.
S5430	0.65	0.21	0.00	0.21	-	32.41	No detailed FEMA Floodplain data available for this area.
S5440	22.61	2.31	0.00	2.31	-	10.22	No detailed FEMA Floodplain data available for this area.
S5450	16.90	7.27	0.00	7.27	-	43.01	No detailed FEMA Floodplain data available for this area.
S5460	31.56	4.70	0.00	4.70	-	14.89	No detailed FEMA Floodplain data available for this area.
S5470	10.01	2.22	0.00	2.22	-	22.18	No detailed FEMA Floodplain data available for this area.
S5480	10.36	5.52	0.00	5.52	-	53.28	No detailed FEMA Floodplain data available for this area.
S5490	29.14	3.77	0.00	3.77	-	12.94	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
S5500	16.68	0.73	0.00	0.73	-	4.36	No detailed FEMA Floodplain data available for this area.
S5520	13.37	1.58	0.00	1.58	-	11.80	No detailed FEMA Floodplain data available for this area.
S5530	47.98	4.10	0.00	4.10	-	8.54	No detailed FEMA Floodplain data available for this area.
S5540	4.89	2.56	0.00	2.56	-	52.32	No detailed FEMA Floodplain data available for this area.
S5545	6.09	1.69	0.00	1.69	-	27.76	No detailed FEMA Floodplain data available for this area.
S5549	16.44	1.37	0.00	1.37	-	8.32	No detailed FEMA Floodplain data available for this area.
S5550	39.66	15.59	0.00	15.59	-	39.30	No detailed FEMA Floodplain data available for this area.
S5560	26.12	2.44	0.00	2.44	-	9.32	No detailed FEMA Floodplain data available for this area.
S5566	1.97	0.30	0.00	0.30	-	15.16	No detailed FEMA Floodplain data available for this area.
S5567	1.88	0.50	0.00	0.50	-	26.52	No detailed FEMA Floodplain data available for this area.
S5570	12.93	0.94	0.00	0.94	-	7.25	No detailed FEMA Floodplain data available for this area.
S5577	9.59	1.04	0.00	1.04	-	10.89	No detailed FEMA Floodplain data available for this area.
S5578	2.32	0.96	0.00	0.96	-	41.59	No detailed FEMA Floodplain data available for this area.
S5579	3.87	0.21	0.00	0.21	-	5.31	No detailed FEMA Floodplain data available for this area.
S5580	3.69	1.54	0.00	1.54	-	41.75	No detailed FEMA Floodplain data available for this area.
S5590	42.37	3.75	0.00	3.75	-	8.86	No detailed FEMA Floodplain data available for this area.
S5600	18.53	11.08	4.46	6.63	148.58	35.75	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
S5610	2.56	2.52	2.56	0.04	1.55	1.55	1) Terrain differences resulting from using more recent and accurate Terrain data, 2) differences in methodology employed, 3) recent development that has occurred subsequent to FEMA's study, and 4) differences due to the more rigorous approach used in selecting storage locations to model and due to the resulting greater study detail.
S9000	12.98	1.42	0.00	1.42	-	10.94	No detailed FEMA Floodplain data available for this area.
S9050	12.82	2.39	0.00	2.39	-	18.64	No detailed FEMA Floodplain data available for this area.
S9055	49.89	11.98	0.00	11.98	-	24.01	No detailed FEMA Floodplain data available for this area.
S9060	2.47	2.25	0.00	2.25	-	91.20	No detailed FEMA Floodplain data available for this area.
S9065	0.28	0.22	0.00	0.22	-	80.17	No detailed FEMA Floodplain data available for this area.
S9070	10.90	1.40	0.00	1.40	-	12.89	No detailed FEMA Floodplain data available for this area.
S9075	31.70	5.89	0.00	5.89	-	18.59	No detailed FEMA Floodplain data available for this area.
S9080	0.42	0.35	0.00	0.35	-	82.76	No detailed FEMA Floodplain data available for this area.
S9085	34.18	6.66	0.00	6.66	-	19.50	No detailed FEMA Floodplain data available for this area.
S9090	31.20	29.60	0.00	29.60	-	94.89	No detailed FEMA Floodplain data available for this area.
S9095	3.39	1.18	0.00	1.18	-	34.79	No detailed FEMA Floodplain data available for this area.
S9100	2.04	0.29	0.00	0.29	-	14.11	No detailed FEMA Floodplain data available for this area.
S9110	1.23	0.01	0.00	0.01	-	0.57	No detailed FEMA Floodplain data available for this area.
S9200	0.69	0.11	0.00	0.11	-	16.29	No detailed FEMA Floodplain data available for this area.
S9610	4.16	1.15	0.00	1.15	-	27.71	No detailed FEMA Floodplain data available for this area.
S9620	0.65	0.33	0.00	0.33	-	51.39	No detailed FEMA Floodplain data available for this area.
T0010	2.61	1.45	0.00	1.45	-	55.51	No detailed FEMA Floodplain data available for this area.
T0013	14.32	3.61	0.00	3.61	-	25.23	No detailed FEMA Floodplain data available for this area.
T0014	7.12	0.22	0.00	0.22	-	3.13	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
T0015	7.80	0.15	0.00	0.15	-	1.98	No detailed FEMA Floodplain data available for this area.
T0016	6.25	0.81	0.00	0.81	-	13.04	No detailed FEMA Floodplain data available for this area.
T0017	1.44	0.13	0.00	0.13	-	8.91	No detailed FEMA Floodplain data available for this area.
T0018	6.36	0.26	0.00	0.26	-	4.10	No detailed FEMA Floodplain data available for this area.
T0019	5.70	3.53	0.00	3.53	-	61.98	No detailed FEMA Floodplain data available for this area.
T0030	2.91	1.75	0.00	1.75	-	60.08	No detailed FEMA Floodplain data available for this area.
T0035	15.25	0.57	0.00	0.57	-	3.71	No detailed FEMA Floodplain data available for this area.
T0040	2.89	1.92	0.00	1.92	-	66.34	No detailed FEMA Floodplain data available for this area.
T0043	22.93	9.77	0.00	9.77	-	42.60	No detailed FEMA Floodplain data available for this area.
T0045	9.44	5.45	0.00	5.45	-	57.74	No detailed FEMA Floodplain data available for this area.
T0050	10.87	2.79	0.00	2.79	-	25.67	No detailed FEMA Floodplain data available for this area.
T0060	30.04	0.45	0.00	0.45	-	1.49	No detailed FEMA Floodplain data available for this area.
T0065	24.62	3.57	0.00	3.57	-	14.49	No detailed FEMA Floodplain data available for this area.
T0068	5.67	2.37	0.00	2.37	-	41.81	No detailed FEMA Floodplain data available for this area.
T0069	12.18	2.59	0.00	2.59	-	21.31	No detailed FEMA Floodplain data available for this area.
T0070	15.76	2.50	0.00	2.50	-	15.88	No detailed FEMA Floodplain data available for this area.
T0073	20.08	8.44	0.00	8.44	-	42.06	No detailed FEMA Floodplain data available for this area.
T0077	34.68	16.79	0.00	16.79	-	48.43	No detailed FEMA Floodplain data available for this area.
T0080	14.80	3.26	0.00	3.26	-	22.05	No detailed FEMA Floodplain data available for this area.
T0090	29.53	4.39	0.00	4.39	-	14.87	No detailed FEMA Floodplain data available for this area.
T0092	2.59	1.00	0.00	1.00	-	38.45	No detailed FEMA Floodplain data available for this area.
T0093	26.67	11.95	0.00	11.95	-	44.80	No detailed FEMA Floodplain data available for this area.
T0097	6.76	1.04	0.00	1.04	-	15.42	No detailed FEMA Floodplain data available for this area.
T0100	40.76	7.00	0.00	7.00	-	17.17	No detailed FEMA Floodplain data available for this area.
T0110	34.23	8.56	0.00	8.56	-	25.00	No detailed FEMA Floodplain data available for this area.
T0112	6.98	0.53	0.00	0.53	-	7.58	No detailed FEMA Floodplain data available for this area.
T0115	7.67	2.08	0.00	2.08	-	27.09	No detailed FEMA Floodplain data available for this area.
T0118	1.67	0.74	0.00	0.74	-	44.15	No detailed FEMA Floodplain data available for this area.
T0120	16.19	10.10	0.00	10.10	-	62.39	No detailed FEMA Floodplain data available for this area.
T1010	10.00	0.86	0.00	0.86	-	8.63	No detailed FEMA Floodplain data available for this area.
T1020	15.12	1.08	0.00	1.08	-	7.14	No detailed FEMA Floodplain data available for this area.
T1030	13.20	1.62	0.00	1.62	-	12.25	No detailed FEMA Floodplain data available for this area.
T1040	5.20	0.64	0.00	0.64	-	12.33	No detailed FEMA Floodplain data available for this area.
T1050	3.30	0.16	0.00	0.16	-	4.73	No detailed FEMA Floodplain data available for this area.
T2010	10.33	0.62	0.00	0.62	-	6.01	No detailed FEMA Floodplain data available for this area.
T2020	15.84	1.38	0.00	1.38	-	8.70	No detailed FEMA Floodplain data available for this area.
T2030	45.34	3.38	0.00	3.38	-	7.46	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
T2040	29.51	1.83	0.00	1.83	-	6.22	No detailed FEMA Floodplain data available for this area.
T2050	19.33	1.85	0.00	1.85	-	9.56	No detailed FEMA Floodplain data available for this area.
T2510	3.06	0.32	0.00	0.32	-	10.43	No detailed FEMA Floodplain data available for this area.
T2520	10.93	0.76	0.00	0.76	-	6.94	No detailed FEMA Floodplain data available for this area.
T2530	6.59	0.83	0.00	0.83	-	12.63	No detailed FEMA Floodplain data available for this area.
T2540	3.20	0.22	0.00	0.22	-	6.91	No detailed FEMA Floodplain data available for this area.
T2550	19.20	0.72	0.00	0.72	-	3.74	No detailed FEMA Floodplain data available for this area.
T2560	22.84	8.08	0.00	8.08	-	35.40	No detailed FEMA Floodplain data available for this area.
T2570	7.63	0.48	0.00	0.48	-	6.27	No detailed FEMA Floodplain data available for this area.
T2580	1.10	0.24	0.00	0.24	-	21.99	No detailed FEMA Floodplain data available for this area.
T3006	24.19	2.59	0.00	2.59	-	10.71	No detailed FEMA Floodplain data available for this area.
T3008	7.07	2.98	0.00	2.98	-	42.10	No detailed FEMA Floodplain data available for this area.
T3010	7.66	2.72	0.00	2.72	-	35.52	No detailed FEMA Floodplain data available for this area.
T3014	21.22	12.55	0.00	12.55	-	59.16	No detailed FEMA Floodplain data available for this area.
T3015	2.11	1.34	0.00	1.34	-	63.70	No detailed FEMA Floodplain data available for this area.
T3020	11.34	0.24	0.00	0.24	-	2.08	No detailed FEMA Floodplain data available for this area.
T3030	2.09	0.38	0.00	0.38	-	18.41	No detailed FEMA Floodplain data available for this area.
T3040	5.05	0.39	0.00	0.39	-	7.67	No detailed FEMA Floodplain data available for this area.
T4010	34.93	2.34	0.00	2.34	-	6.71	No detailed FEMA Floodplain data available for this area.
T4020	11.75	4.74	0.00	4.74	-	40.34	No detailed FEMA Floodplain data available for this area.
T4021	15.28	6.65	0.00	6.65	-	43.52	No detailed FEMA Floodplain data available for this area.
T4022	18.15	3.94	0.00	3.94	-	21.69	No detailed FEMA Floodplain data available for this area.
T4030	1.75	0.35	0.00	0.35	-	20.06	No detailed FEMA Floodplain data available for this area.
T4040	36.49	15.35	0.00	15.35	-	42.07	No detailed FEMA Floodplain data available for this area.
T4060	0.28	0.07	0.00	0.07	-	24.22	No detailed FEMA Floodplain data available for this area.
U0486	7.64	4.33	0.00	4.33	-	56.63	No detailed FEMA Floodplain data available for this area.
U0487	3.85	1.04	0.00	1.04	-	27.02	No detailed FEMA Floodplain data available for this area.
U0490	44.64	36.98	0.00	36.98	-	82.84	No detailed FEMA Floodplain data available for this area.
U0493	15.13	6.77	0.00	6.77	-	44.74	No detailed FEMA Floodplain data available for this area.
U0494	13.08	5.56	0.00	5.56	-	42.48	No detailed FEMA Floodplain data available for this area.
U0495	38.38	19.22	0.00	19.22	-	50.07	No detailed FEMA Floodplain data available for this area.
U0500	67.24	55.94	0.00	55.94	-	83.19	No detailed FEMA Floodplain data available for this area.
U0507	22.13	22.13	0.00	22.13	-	100.00	No detailed FEMA Floodplain data available for this area.
U0510	23.54	23.54	0.00	23.54	-	99.99	No detailed FEMA Floodplain data available for this area.
U0512	27.88	27.88	0.00	27.88	-	100.00	No detailed FEMA Floodplain data available for this area.
U0515	5.09	4.28	0.00	4.28	-	84.11	No detailed FEMA Floodplain data available for this area.
U0520	33.32	26.52	0.00	26.52	-	79.58	No detailed FEMA Floodplain data available for this area.

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U0525	8.61	6.46	0.00	6.46	-	75.03	No detailed FEMA Floodplain data available for this area.
U0530	7.77	7.77	0.00	7.77	-	100.00	No detailed FEMA Floodplain data available for this area.
U0537	83.59	51.74	0.00	51.74	-	61.89	No detailed FEMA Floodplain data available for this area.
U0538	6.65	1.87	0.00	1.87	-	28.19	No detailed FEMA Floodplain data available for this area.
U0540	143.52	107.27	0.00	107.27	-	74.74	No detailed FEMA Floodplain data available for this area.
U0543	30.23	9.61	0.00	9.61	-	31.79	No detailed FEMA Floodplain data available for this area.
U0545	16.87	14.62	0.00	14.62	-	86.70	No detailed FEMA Floodplain data available for this area.
U0550	47.19	28.32	0.00	28.32	-	60.02	No detailed FEMA Floodplain data available for this area.
U0551	16.78	7.03	0.00	7.03	-	41.91	No detailed FEMA Floodplain data available for this area.
U0552	23.80	10.56	0.00	10.56	-	44.37	No detailed FEMA Floodplain data available for this area.
U0553	4.39	2.38	0.00	2.38	-	54.21	No detailed FEMA Floodplain data available for this area.
U0554	33.16	8.32	0.00	8.32	-	25.09	No detailed FEMA Floodplain data available for this area.
U0555	5.09	2.70	0.00	2.70	-	53.05	No detailed FEMA Floodplain data available for this area.
U0556	29.71	19.33	0.00	19.33	-	65.07	No detailed FEMA Floodplain data available for this area.
U0557	5.19	2.15	0.00	2.15	-	41.44	No detailed FEMA Floodplain data available for this area.
U0558	10.29	7.56	0.00	7.56	-	73.47	No detailed FEMA Floodplain data available for this area.
U0560	91.00	57.86	0.00	57.86	-	63.58	No detailed FEMA Floodplain data available for this area.
U0570	64.68	60.47	0.00	60.47	-	93.49	No detailed FEMA Floodplain data available for this area.
U0575	55.25	36.09	0.00	36.09	-	65.32	No detailed FEMA Floodplain data available for this area.
U0580	57.30	55.72	0.00	55.72	-	97.24	No detailed FEMA Floodplain data available for this area.
U0590	12.71	12.62	0.00	12.62	-	99.27	No detailed FEMA Floodplain data available for this area.
U0610	4.28	3.01	0.00	3.01	-	70.24	No detailed FEMA Floodplain data available for this area.
U0640	0.38	0.12	0.00	0.12	-	31.37	No detailed FEMA Floodplain data available for this area.
U0645	16.74	7.38	0.00	7.38	-	44.09	No detailed FEMA Floodplain data available for this area.
U0646	13.69	7.84	0.00	7.84	-	57.31	No detailed FEMA Floodplain data available for this area.
U0647	4.68	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
U0648	8.29	0.55	0.00	0.55	-	6.69	No detailed FEMA Floodplain data available for this area.
U0650	30.59	16.33	0.00	16.33	-	53.37	No detailed FEMA Floodplain data available for this area.
U0655	20.81	10.80	0.00	10.80	-	51.90	No detailed FEMA Floodplain data available for this area.
U2610	13.63	4.92	0.00	4.92	-	36.08	No detailed FEMA Floodplain data available for this area.
U2625	4.20	2.42	0.00	2.42	-	57.68	No detailed FEMA Floodplain data available for this area.
U2630	27.79	17.92	0.00	17.92	-	64.48	No detailed FEMA Floodplain data available for this area.
U2710	1.38	0.78	0.00	0.78	-	56.23	No detailed FEMA Floodplain data available for this area.
U2720	8.76	4.86	0.00	4.86	-	55.53	No detailed FEMA Floodplain data available for this area.
U2730	40.73	26.63	0.00	26.63	-	65.39	No detailed FEMA Floodplain data available for this area.
U2735	96.16	12.03	0.00	12.03	-	12.51	No detailed FEMA Floodplain data available for this area.
U2737	6.25	2.90	0.00	2.90	-	46.36	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
U2740	34.05	22.61	0.00	22.61	-	66.42	No detailed FEMA Floodplain data available for this area.
U2745	5.90	4.73	0.00	4.73	-	80.28	No detailed FEMA Floodplain data available for this area.
U2750	17.59	15.61	0.00	15.61	-	88.78	No detailed FEMA Floodplain data available for this area.
U2753	2.36	1.04	0.00	1.04	-	44.11	No detailed FEMA Floodplain data available for this area.
U2755	13.24	10.23	0.00	10.23	-	77.25	No detailed FEMA Floodplain data available for this area.
U2756	0.06	0.06	0.00	0.06	-	99.90	No detailed FEMA Floodplain data available for this area.
U2757	7.25	7.25	0.00	7.25	-	100.00	No detailed FEMA Floodplain data available for this area.
U2760	17.46	15.30	0.00	15.30	-	87.65	No detailed FEMA Floodplain data available for this area.
U2770	3.23	3.23	0.00	3.23	-	99.98	No detailed FEMA Floodplain data available for this area.
U3126	5.20	1.71	0.00	1.71	-	32.89	No detailed FEMA Floodplain data available for this area.
U3130	5.53	4.03	0.00	4.03	-	72.83	No detailed FEMA Floodplain data available for this area.
U3135	10.29	3.49	0.00	3.49	-	33.90	No detailed FEMA Floodplain data available for this area.
U3140	15.32	8.04	0.00	8.04	-	52.50	No detailed FEMA Floodplain data available for this area.
U3150	48.23	29.66	0.00	29.66	-	61.50	No detailed FEMA Floodplain data available for this area.
U3160	55.75	45.25	0.00	45.25	-	81.17	No detailed FEMA Floodplain data available for this area.
U3163	41.40	28.61	0.00	28.61	-	69.11	No detailed FEMA Floodplain data available for this area.
U3165	22.31	6.56	0.00	6.56	-	29.42	No detailed FEMA Floodplain data available for this area.
U3170	37.70	30.95	0.00	30.95	-	82.10	No detailed FEMA Floodplain data available for this area.
U3255	7.05	3.78	0.00	3.78	-	53.59	No detailed FEMA Floodplain data available for this area.
U3260	12.29	5.17	0.00	5.17	-	42.06	No detailed FEMA Floodplain data available for this area.
U3270	50.07	31.45	0.00	31.45	-	62.81	No detailed FEMA Floodplain data available for this area.
U3490	1.07	0.31	0.00	0.31	-	28.64	No detailed FEMA Floodplain data available for this area.
U3510	7.38	6.55	0.00	6.55	-	88.71	No detailed FEMA Floodplain data available for this area.
U3810	2.44	1.01	0.00	1.01	-	41.61	No detailed FEMA Floodplain data available for this area.
U3815	9.61	5.23	0.00	5.23	-	54.39	No detailed FEMA Floodplain data available for this area.
U3820	33.68	22.79	0.00	22.79	-	67.68	No detailed FEMA Floodplain data available for this area.
U3825	16.02	7.03	0.00	7.03	-	43.91	No detailed FEMA Floodplain data available for this area.
U3830	31.56	19.99	0.00	19.99	-	63.32	No detailed FEMA Floodplain data available for this area.
U3840	48.62	39.20	0.00	39.20	-	80.63	No detailed FEMA Floodplain data available for this area.
U3843	15.53	6.33	0.00	6.33	-	40.75	No detailed FEMA Floodplain data available for this area.
U3845	3.55	2.44	0.00	2.44	-	68.66	No detailed FEMA Floodplain data available for this area.
U3848	25.82	13.69	0.00	13.69	-	53.03	No detailed FEMA Floodplain data available for this area.
U3850	63.07	27.50	0.00	27.50	-	43.59	No detailed FEMA Floodplain data available for this area.
U3910	7.13	2.69	0.00	2.69	-	37.74	No detailed FEMA Floodplain data available for this area.
U3915	4.81	3.49	0.00	3.49	-	72.48	No detailed FEMA Floodplain data available for this area.
U3920	19.07	9.49	0.00	9.49	-	49.78	No detailed FEMA Floodplain data available for this area.
U3930	11.72	8.57	0.00	8.57	-	73.14	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
U3940	14.75	11.33	0.00	11.33	-	76.80	No detailed FEMA Floodplain data available for this area.
U4010	46.83	29.04	0.00	29.04	-	62.01	No detailed FEMA Floodplain data available for this area.
U4020	7.69	3.22	0.00	3.22	-	41.91	No detailed FEMA Floodplain data available for this area.
U4030	6.41	2.45	0.00	2.45	-	38.28	No detailed FEMA Floodplain data available for this area.
U4040	4.68	3.17	0.00	3.17	-	67.66	No detailed FEMA Floodplain data available for this area.
U4050	26.59	14.91	0.00	14.91	-	56.07	No detailed FEMA Floodplain data available for this area.
U4052	24.46	12.74	0.00	12.74	-	52.06	No detailed FEMA Floodplain data available for this area.
U4053	40.67	26.98	0.00	26.98	-	66.35	No detailed FEMA Floodplain data available for this area.
U4054	64.89	54.87	0.00	54.87	-	84.55	No detailed FEMA Floodplain data available for this area.
U4055	7.89	6.52	0.00	6.52	-	82.64	No detailed FEMA Floodplain data available for this area.
U4060	62.66	48.04	0.00	48.04	-	76.67	No detailed FEMA Floodplain data available for this area.
U4070	25.94	14.91	0.00	14.91	-	57.46	No detailed FEMA Floodplain data available for this area.
U4080	35.07	15.99	0.00	15.99	-	45.60	No detailed FEMA Floodplain data available for this area.
U4082	15.98	10.53	0.00	10.53	-	65.89	No detailed FEMA Floodplain data available for this area.
U4084	20.13	12.45	0.00	12.45	-	61.86	No detailed FEMA Floodplain data available for this area.
U4087	14.86	1.28	0.00	1.28	-	8.60	No detailed FEMA Floodplain data available for this area.
U4090	38.35	20.09	0.00	20.09	-	52.39	No detailed FEMA Floodplain data available for this area.
U4100	46.61	23.28	0.00	23.28	-	49.95	No detailed FEMA Floodplain data available for this area.
U4105	33.31	26.77	0.00	26.77	-	80.36	No detailed FEMA Floodplain data available for this area.
U4110	18.18	13.60	0.00	13.60	-	74.79	No detailed FEMA Floodplain data available for this area.
U4112	22.57	11.40	0.00	11.40	-	50.52	No detailed FEMA Floodplain data available for this area.
U4113	4.29	2.88	0.00	2.88	-	67.10	No detailed FEMA Floodplain data available for this area.
U4115	14.87	4.77	0.00	4.77	-	32.05	No detailed FEMA Floodplain data available for this area.
U4117	3.69	2.63	0.00	2.63	-	71.20	No detailed FEMA Floodplain data available for this area.
U4124	7.00	3.45	0.00	3.45	-	49.30	No detailed FEMA Floodplain data available for this area.
U4125	65.77	44.58	0.00	44.58	-	67.78	No detailed FEMA Floodplain data available for this area.
U4126	11.67	8.81	0.00	8.81	-	75.52	No detailed FEMA Floodplain data available for this area.
U4128	61.97	48.56	0.00	48.56	-	78.37	No detailed FEMA Floodplain data available for this area.
U4130	75.73	39.20	0.00	39.20	-	51.77	No detailed FEMA Floodplain data available for this area.
U4140	38.11	18.24	0.00	18.24	-	47.87	No detailed FEMA Floodplain data available for this area.
U4150	19.57	8.41	0.00	8.41	-	42.94	No detailed FEMA Floodplain data available for this area.
U4155	9.96	4.81	0.00	4.81	-	48.32	No detailed FEMA Floodplain data available for this area.
U4160	42.36	34.17	0.00	34.17	-	80.67	No detailed FEMA Floodplain data available for this area.
U4165	8.44	7.46	0.00	7.46	-	88.31	No detailed FEMA Floodplain data available for this area.
U4210	8.05	7.33	0.00	7.33	-	91.01	No detailed FEMA Floodplain data available for this area.
U4220	14.95	13.13	0.00	13.13	-	87.83	No detailed FEMA Floodplain data available for this area.
U4225	26.63	13.54	0.00	13.54	-	50.84	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
U4230	12.70	11.34	0.00	11.34	-	89.25	No detailed FEMA Floodplain data available for this area.
U4240	40.43	14.44	0.00	14.44	-	35.72	No detailed FEMA Floodplain data available for this area.
U4250	23.96	23.10	0.00	23.10	-	96.39	No detailed FEMA Floodplain data available for this area.
U4260	37.70	37.44	0.00	37.44	-	99.31	No detailed FEMA Floodplain data available for this area.
U4410	24.01	12.53	0.00	12.53	-	52.21	No detailed FEMA Floodplain data available for this area.
U4420	26.92	19.17	0.00	19.17	-	71.22	No detailed FEMA Floodplain data available for this area.
U4430	18.17	8.14	0.00	8.14	-	44.80	No detailed FEMA Floodplain data available for this area.
U4440	55.08	41.68	0.00	41.68	-	75.66	No detailed FEMA Floodplain data available for this area.
U4445	20.49	6.71	0.00	6.71	-	32.76	No detailed FEMA Floodplain data available for this area.
U4450	72.56	48.49	0.00	48.49	-	66.83	No detailed FEMA Floodplain data available for this area.
U4610	28.72	16.94	0.00	16.94	-	58.97	No detailed FEMA Floodplain data available for this area.
U4615	19.78	10.07	0.00	10.07	-	50.92	No detailed FEMA Floodplain data available for this area.
U4620	48.85	21.69	0.00	21.69	-	44.41	No detailed FEMA Floodplain data available for this area.
U4623	8.76	3.34	0.00	3.34	-	38.14	No detailed FEMA Floodplain data available for this area.
U4627	9.23	7.27	0.00	7.27	-	78.78	No detailed FEMA Floodplain data available for this area.
U4630	49.66	15.61	0.00	15.61	-	31.43	No detailed FEMA Floodplain data available for this area.
U4640	68.59	48.55	0.00	48.55	-	70.79	No detailed FEMA Floodplain data available for this area.
U4642	3.27	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
U4644	34.31	16.54	0.00	16.54	-	48.20	No detailed FEMA Floodplain data available for this area.
U4646	22.63	16.38	0.00	16.38	-	72.38	No detailed FEMA Floodplain data available for this area.
U4660	32.08	20.27	0.00	20.27	-	63.18	No detailed FEMA Floodplain data available for this area.
U4675	64.99	39.59	0.00	39.59	-	60.92	No detailed FEMA Floodplain data available for this area.
U4677	39.29	22.49	0.00	22.49	-	57.25	No detailed FEMA Floodplain data available for this area.
U4680	23.10	20.38	0.00	20.38	-	88.25	No detailed FEMA Floodplain data available for this area.
U4710	38.48	22.69	0.00	22.69	-	58.97	No detailed FEMA Floodplain data available for this area.
U4720	22.92	10.99	0.00	10.99	-	47.95	No detailed FEMA Floodplain data available for this area.
U4725	2.96	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
U4730	12.04	4.56	0.00	4.56	-	37.86	No detailed FEMA Floodplain data available for this area.
U4740	6.88	3.44	0.00	3.44	-	49.94	No detailed FEMA Floodplain data available for this area.
U4750	15.33	11.21	0.00	11.21	-	73.13	No detailed FEMA Floodplain data available for this area.
U4760	12.92	7.18	0.00	7.18	-	55.58	No detailed FEMA Floodplain data available for this area.
U4770	13.05	12.48	0.00	12.48	-	95.65	No detailed FEMA Floodplain data available for this area.
U4810	5.21	4.04	0.00	4.04	-	77.56	No detailed FEMA Floodplain data available for this area.
U4820	26.39	21.65	0.00	21.65	-	82.03	No detailed FEMA Floodplain data available for this area.
U4830	12.80	10.27	0.00	10.27	-	80.23	No detailed FEMA Floodplain data available for this area.
U4840	11.31	8.21	0.00	8.21	-	72.54	No detailed FEMA Floodplain data available for this area.
U4844	18.29	15.62	0.00	15.62	-	85.37	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
U4850	12.82	10.74	0.00	10.74	-	83.79	No detailed FEMA Floodplain data available for this area.
U4857	3.62	2.48	0.00	2.48	-	68.59	No detailed FEMA Floodplain data available for this area.
U4860	19.06	17.90	0.00	17.90	-	93.88	No detailed FEMA Floodplain data available for this area.
U4870	18.48	17.47	0.00	17.47	-	94.50	No detailed FEMA Floodplain data available for this area.
U4910	2.22	0.78	0.00	0.78	-	34.94	No detailed FEMA Floodplain data available for this area.
U4920	14.77	6.81	0.00	6.81	-	46.11	No detailed FEMA Floodplain data available for this area.
U5010	2.40	0.36	0.00	0.36	-	14.93	No detailed FEMA Floodplain data available for this area.
U5020	0.29	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
U5030	0.26	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
U5040	11.89	2.14	0.00	2.14	-	17.96	No detailed FEMA Floodplain data available for this area.
U5050	6.37	5.74	0.00	5.74	-	90.08	No detailed FEMA Floodplain data available for this area.
U5060	0.40	0.13	0.00	0.13	-	32.18	No detailed FEMA Floodplain data available for this area.
U5080	0.33	0.15	0.00	0.15	-	44.47	No detailed FEMA Floodplain data available for this area.
U5090	20.32	6.87	0.00	6.87	-	33.80	No detailed FEMA Floodplain data available for this area.
U5095	11.86	11.07	0.00	11.07	-	93.38	No detailed FEMA Floodplain data available for this area.
U5185	25.48	24.44	0.00	24.44	-	95.92	No detailed FEMA Floodplain data available for this area.
U5202	18.02	18.02	0.00	18.02	-	100.00	No detailed FEMA Floodplain data available for this area.
U5203	7.45	7.45	0.00	7.45	-	100.00	No detailed FEMA Floodplain data available for this area.
U5205	12.24	12.23	0.00	12.23	-	99.99	No detailed FEMA Floodplain data available for this area.
U5207	22.00	22.00	0.00	22.00	-	100.00	No detailed FEMA Floodplain data available for this area.
U5210	12.79	12.79	0.00	12.79	-	100.00	No detailed FEMA Floodplain data available for this area.
U5220	15.72	15.72	0.00	15.72	-	100.00	No detailed FEMA Floodplain data available for this area.
U5410	17.07	17.07	0.00	17.07	-	100.00	No detailed FEMA Floodplain data available for this area.
U5420	68.04	68.04	0.00	68.04	-	100.00	No detailed FEMA Floodplain data available for this area.
U5421	18.72	16.87	0.00	16.87	-	90.13	No detailed FEMA Floodplain data available for this area.
U5422	6.01	3.18	0.00	3.18	-	52.93	No detailed FEMA Floodplain data available for this area.
U5423	16.96	11.35	0.00	11.35	-	66.94	No detailed FEMA Floodplain data available for this area.
U5424	9.34	7.43	0.00	7.43	-	79.57	No detailed FEMA Floodplain data available for this area.
U5425	40.50	24.57	0.00	24.57	-	60.65	No detailed FEMA Floodplain data available for this area.
U5426	24.05	24.05	0.00	24.05	-	100.00	No detailed FEMA Floodplain data available for this area.
U5427	9.11	9.11	0.00	9.11	-	100.00	No detailed FEMA Floodplain data available for this area.
U5428	15.29	15.01	0.00	15.01	-	98.12	No detailed FEMA Floodplain data available for this area.
U5429	9.78	9.66	0.00	9.66	-	98.77	No detailed FEMA Floodplain data available for this area.
U5430	40.60	15.91	0.00	15.91	-	39.20	No detailed FEMA Floodplain data available for this area.
U5440	18.93	7.01	0.00	7.01	-	37.01	No detailed FEMA Floodplain data available for this area.
U5450	84.25	38.83	0.00	38.83	-	46.09	No detailed FEMA Floodplain data available for this area.
U5455	8.05	3.10	0.00	3.10	-	38.52	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
U5457	37.64	23.83	0.00	23.83	-	63.30	No detailed FEMA Floodplain data available for this area.
U5460	21.98	6.55	0.00	6.55	-	29.79	No detailed FEMA Floodplain data available for this area.
U5470	7.48	3.84	0.00	3.84	-	51.30	No detailed FEMA Floodplain data available for this area.
U5480	64.68	51.05	0.00	51.05	-	78.93	No detailed FEMA Floodplain data available for this area.
U5482	56.92	36.82	0.00	36.82	-	64.69	No detailed FEMA Floodplain data available for this area.
U5484	28.43	20.90	0.00	20.90	-	73.51	No detailed FEMA Floodplain data available for this area.
U5486	6.16	2.50	0.00	2.50	-	40.52	No detailed FEMA Floodplain data available for this area.
U5487	27.35	17.46	0.00	17.46	-	63.84	No detailed FEMA Floodplain data available for this area.
U5488	7.26	2.72	0.00	2.72	-	37.42	No detailed FEMA Floodplain data available for this area.
U5490	3.01	3.01	0.00	3.01	-	100.00	No detailed FEMA Floodplain data available for this area.
U5495	10.98	2.35	0.00	2.35	-	21.39	No detailed FEMA Floodplain data available for this area.
U5500	28.41	24.00	0.00	24.00	-	84.48	No detailed FEMA Floodplain data available for this area.
U5520	30.63	19.89	0.00	19.89	-	64.95	No detailed FEMA Floodplain data available for this area.
U5525	20.03	7.96	0.00	7.96	-	39.74	No detailed FEMA Floodplain data available for this area.
U5530	24.78	10.68	0.00	10.68	-	43.11	No detailed FEMA Floodplain data available for this area.
U5540	29.32	14.80	0.00	14.80	-	50.46	No detailed FEMA Floodplain data available for this area.
U5545	17.20	6.09	0.00	6.09	-	35.39	No detailed FEMA Floodplain data available for this area.
U5550	10.65	5.86	0.00	5.86	-	55.01	No detailed FEMA Floodplain data available for this area.
U5555	31.32	16.22	0.00	16.22	-	51.81	No detailed FEMA Floodplain data available for this area.
U5570	17.88	8.71	0.00	8.71	-	48.68	No detailed FEMA Floodplain data available for this area.
U5580	8.24	6.92	0.00	6.92	-	84.08	No detailed FEMA Floodplain data available for this area.
U5590	58.26	27.62	0.00	27.62	-	47.40	No detailed FEMA Floodplain data available for this area.
U5595	32.94	30.91	0.00	30.91	-	93.83	No detailed FEMA Floodplain data available for this area.
U5610	4.58	0.56	0.00	0.56	-	12.17	No detailed FEMA Floodplain data available for this area.
U5620	0.27	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
U5630	0.31	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
U5640	9.92	2.30	0.00	2.30	-	23.22	No detailed FEMA Floodplain data available for this area.
U5710	0.20	0.09	0.00	0.09	-	42.46	No detailed FEMA Floodplain data available for this area.
U5720	0.33	0.21	0.00	0.21	-	62.31	No detailed FEMA Floodplain data available for this area.
U5730	12.80	4.96	0.00	4.96	-	38.79	No detailed FEMA Floodplain data available for this area.
U5810	6.42	3.17	0.00	3.17	-	49.41	No detailed FEMA Floodplain data available for this area.
U5820	11.64	7.42	0.00	7.42	-	63.75	No detailed FEMA Floodplain data available for this area.
U5825	6.71	4.46	0.00	4.46	-	66.51	No detailed FEMA Floodplain data available for this area.
U5830	54.97	32.27	0.00	32.27	-	58.71	No detailed FEMA Floodplain data available for this area.
U5835	18.66	6.18	0.00	6.18	-	33.12	No detailed FEMA Floodplain data available for this area.
U5840	97.68	28.46	0.00	28.46	-	29.14	No detailed FEMA Floodplain data available for this area.
U5845	34.31	19.15	0.00	19.15	-	55.81	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
U5850	137.41	65.36	0.00	65.36	-	47.57	No detailed FEMA Floodplain data available for this area.
U5870	3.84	3.20	0.00	3.20	-	83.26	No detailed FEMA Floodplain data available for this area.
U5910	16.74	5.16	0.00	5.16	-	30.84	No detailed FEMA Floodplain data available for this area.
U5915	5.75	3.29	0.00	3.29	-	57.21	No detailed FEMA Floodplain data available for this area.
U5920	68.42	38.59	0.00	38.59	-	56.40	No detailed FEMA Floodplain data available for this area.
U5930	22.77	19.09	0.00	19.09	-	83.81	No detailed FEMA Floodplain data available for this area.
U5940	32.91	17.56	0.00	17.56	-	53.37	No detailed FEMA Floodplain data available for this area.
U6010	13.57	7.65	0.00	7.65	-	56.38	No detailed FEMA Floodplain data available for this area.
U6020	14.51	9.91	0.00	9.91	-	68.29	No detailed FEMA Floodplain data available for this area.
U6021	24.16	3.38	0.00	3.38	-	14.00	No detailed FEMA Floodplain data available for this area.
U6022	10.28	0.67	0.00	0.67	-	6.53	No detailed FEMA Floodplain data available for this area.
U6023	83.38	74.21	0.00	74.21	-	89.00	No detailed FEMA Floodplain data available for this area.
U6024	5.49	3.57	0.00	3.57	-	65.05	No detailed FEMA Floodplain data available for this area.
U6026	13.86	9.35	0.00	9.35	-	67.43	No detailed FEMA Floodplain data available for this area.
U6030	122.00	80.39	0.00	80.39	-	65.90	No detailed FEMA Floodplain data available for this area.
U6040	4.97	1.09	0.00	1.09	-	21.93	No detailed FEMA Floodplain data available for this area.
U6070	57.31	20.68	0.00	20.68	-	36.08	No detailed FEMA Floodplain data available for this area.
U6080	41.68	5.42	0.00	5.42	-	13.00	No detailed FEMA Floodplain data available for this area.
U6090	17.10	9.71	0.00	9.71	-	56.77	No detailed FEMA Floodplain data available for this area.
U6095	15.89	2.91	0.00	2.91	-	18.32	No detailed FEMA Floodplain data available for this area.
U6100	27.00	18.09	0.00	18.09	-	66.99	No detailed FEMA Floodplain data available for this area.
U6103	26.26	8.47	0.00	8.47	-	32.27	No detailed FEMA Floodplain data available for this area.
U6107	12.86	11.29	0.00	11.29	-	87.82	No detailed FEMA Floodplain data available for this area.
U6110	64.50	18.64	0.00	18.64	-	28.89	No detailed FEMA Floodplain data available for this area.
U6310	4.97	2.02	0.00	2.02	-	40.70	No detailed FEMA Floodplain data available for this area.
U6320	5.10	1.76	0.00	1.76	-	34.44	No detailed FEMA Floodplain data available for this area.
U6330	15.31	8.36	0.00	8.36	-	54.60	No detailed FEMA Floodplain data available for this area.
U6335	26.73	6.80	0.00	6.80	-	25.43	No detailed FEMA Floodplain data available for this area.
U6340	33.68	29.13	0.00	29.13	-	86.47	No detailed FEMA Floodplain data available for this area.
U6350	11.25	6.42	0.00	6.42	-	57.08	No detailed FEMA Floodplain data available for this area.
U6360	41.53	18.30	0.00	18.30	-	44.06	No detailed FEMA Floodplain data available for this area.
U6361	9.33	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
U6362	7.98	1.40	0.00	1.40	-	17.60	No detailed FEMA Floodplain data available for this area.
U6370	10.74	8.53	0.00	8.53	-	79.46	No detailed FEMA Floodplain data available for this area.
U6380	6.91	5.77	0.00	5.77	-	83.54	No detailed FEMA Floodplain data available for this area.
U6383	5.44	4.68	0.00	4.68	-	86.11	No detailed FEMA Floodplain data available for this area.
U6385	1.24	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
U6387	7.00	1.13	0.00	1.13	-	16.20	No detailed FEMA Floodplain data available for this area.
U6390	16.31	8.73	0.00	8.73	-	53.51	No detailed FEMA Floodplain data available for this area.
U6410	24.80	16.47	0.00	16.47	-	66.44	No detailed FEMA Floodplain data available for this area.
U6416	6.92	1.53	0.00	1.53	-	22.17	No detailed FEMA Floodplain data available for this area.
U6420	4.30	0.75	0.00	0.75	-	17.38	No detailed FEMA Floodplain data available for this area.
U6607	29.54	14.72	0.00	14.72	-	49.83	No detailed FEMA Floodplain data available for this area.
U6612	5.77	3.20	0.00	3.20	-	55.51	No detailed FEMA Floodplain data available for this area.
U6620	15.10	10.79	0.00	10.79	-	71.42	No detailed FEMA Floodplain data available for this area.
U6630	24.86	22.18	0.00	22.18	-	89.25	No detailed FEMA Floodplain data available for this area.
U6640	12.26	8.84	0.00	8.84	-	72.09	No detailed FEMA Floodplain data available for this area.
U6650	9.80	7.01	0.00	7.01	-	71.51	No detailed FEMA Floodplain data available for this area.
U6655	0.88	0.65	0.00	0.65	-	73.62	No detailed FEMA Floodplain data available for this area.
U6660	4.85	1.98	0.00	1.98	-	40.81	No detailed FEMA Floodplain data available for this area.
U6666	9.07	1.70	0.00	1.70	-	18.78	No detailed FEMA Floodplain data available for this area.
U6670	4.94	2.91	0.00	2.91	-	58.96	No detailed FEMA Floodplain data available for this area.
U6680	2.76	1.95	0.00	1.95	-	70.72	No detailed FEMA Floodplain data available for this area.
U6690	1.35	0.72	0.00	0.72	-	53.06	No detailed FEMA Floodplain data available for this area.
U6700	1.28	0.47	0.00	0.47	-	36.83	No detailed FEMA Floodplain data available for this area.
U6810	3.20	1.62	0.00	1.62	-	50.59	No detailed FEMA Floodplain data available for this area.
U6820	0.92	0.21	0.00	0.21	-	23.02	No detailed FEMA Floodplain data available for this area.
U6825	0.47	0.24	0.00	0.24	-	51.22	No detailed FEMA Floodplain data available for this area.
U6830	0.49	0.11	0.00	0.11	-	23.36	No detailed FEMA Floodplain data available for this area.
U6834	0.47	0.09	0.00	0.09	-	19.61	No detailed FEMA Floodplain data available for this area.
U6840	7.12	2.73	0.00	2.73	-	38.40	No detailed FEMA Floodplain data available for this area.
U6850	0.16	0.09	0.00	0.09	-	54.56	No detailed FEMA Floodplain data available for this area.
U6860	0.63	0.24	0.00	0.24	-	38.91	No detailed FEMA Floodplain data available for this area.
U6870	0.08	0.02	0.00	0.02	-	27.64	No detailed FEMA Floodplain data available for this area.
U6880	5.54	4.55	0.00	4.55	-	82.21	No detailed FEMA Floodplain data available for this area.
U6890	0.66	0.09	0.00	0.09	-	14.00	No detailed FEMA Floodplain data available for this area.
U6900	7.90	1.68	0.00	1.68	-	21.26	No detailed FEMA Floodplain data available for this area.
U6910	0.61	0.21	0.00	0.21	-	34.10	No detailed FEMA Floodplain data available for this area.
U6915	0.58	0.19	0.00	0.19	-	32.57	No detailed FEMA Floodplain data available for this area.
U6920	0.49	0.05	0.00	0.05	-	10.39	No detailed FEMA Floodplain data available for this area.
U6930	5.03	3.61	0.00	3.61	-	71.77	No detailed FEMA Floodplain data available for this area.
U6940	0.34	0.15	0.00	0.15	-	43.45	No detailed FEMA Floodplain data available for this area.
U6945	0.66	0.17	0.00	0.17	-	26.29	No detailed FEMA Floodplain data available for this area.
U6950	0.45	0.21	0.00	0.21	-	47.06	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
U6960	0.60	0.34	0.00	0.34	-	57.76	No detailed FEMA Floodplain data available for this area.
U6970	23.77	11.77	0.00	11.77	-	49.50	No detailed FEMA Floodplain data available for this area.
U6975	16.87	8.03	0.00	8.03	-	47.59	No detailed FEMA Floodplain data available for this area.
U7010	4.19	0.47	0.00	0.47	-	11.30	No detailed FEMA Floodplain data available for this area.
U7110	6.50	1.69	0.00	1.69	-	26.06	No detailed FEMA Floodplain data available for this area.
U7210	0.77	0.20	0.00	0.20	-	26.36	No detailed FEMA Floodplain data available for this area.
U7220	0.37	0.01	0.00	0.01	-	2.91	No detailed FEMA Floodplain data available for this area.
U7230	5.30	1.87	0.00	1.87	-	35.27	No detailed FEMA Floodplain data available for this area.
U7310	23.97	14.01	0.00	14.01	-	58.44	No detailed FEMA Floodplain data available for this area.
U7320	65.63	50.35	0.00	50.35	-	76.72	No detailed FEMA Floodplain data available for this area.
U7330	6.71	5.84	0.00	5.84	-	86.98	No detailed FEMA Floodplain data available for this area.
U7355	4.38	2.13	0.00	2.13	-	48.70	No detailed FEMA Floodplain data available for this area.
U7360	29.44	20.09	0.00	20.09	-	68.23	No detailed FEMA Floodplain data available for this area.
U7363	30.83	13.20	0.00	13.20	-	42.83	No detailed FEMA Floodplain data available for this area.
U7365	4.54	4.40	0.00	4.40	-	97.06	No detailed FEMA Floodplain data available for this area.
U7367	1.94	1.41	0.00	1.41	-	72.71	No detailed FEMA Floodplain data available for this area.
U7370	22.28	17.49	0.00	17.49	-	78.48	No detailed FEMA Floodplain data available for this area.
U7375	5.58	4.36	0.00	4.36	-	78.18	No detailed FEMA Floodplain data available for this area.
U7380	7.48	6.35	0.00	6.35	-	84.85	No detailed FEMA Floodplain data available for this area.
U7390	6.49	6.03	0.00	6.03	-	92.88	No detailed FEMA Floodplain data available for this area.
U7400	2.98	2.66	0.00	2.66	-	89.35	No detailed FEMA Floodplain data available for this area.
U7510	12.28	2.62	0.00	2.62	-	21.30	No detailed FEMA Floodplain data available for this area.
U7520	0.50	0.01	0.00	0.01	-	1.99	No detailed FEMA Floodplain data available for this area.
U7530	0.94	0.60	0.00	0.60	-	63.51	No detailed FEMA Floodplain data available for this area.
U7540	0.64	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
U7550	2.57	0.74	0.00	0.74	-	28.64	No detailed FEMA Floodplain data available for this area.
U7560	0.99	0.18	0.00	0.18	-	18.44	No detailed FEMA Floodplain data available for this area.
U7570	1.43	0.48	0.00	0.48	-	33.81	No detailed FEMA Floodplain data available for this area.
U8210	11.48	9.44	0.00	9.44	-	82.24	No detailed FEMA Floodplain data available for this area.
U8220	14.72	11.66	0.00	11.66	-	79.23	No detailed FEMA Floodplain data available for this area.
U8230	5.60	4.87	0.00	4.87	-	86.90	No detailed FEMA Floodplain data available for this area.
U8240	4.92	3.91	0.00	3.91	-	79.39	No detailed FEMA Floodplain data available for this area.
U8250	6.05	4.25	0.00	4.25	-	70.23	No detailed FEMA Floodplain data available for this area.
U8260	2.21	1.05	0.00	1.05	-	47.27	No detailed FEMA Floodplain data available for this area.
U9000	21.36	12.90	0.00	12.90	-	60.41	No detailed FEMA Floodplain data available for this area.
U9002	13.03	8.89	0.00	8.89	-	68.27	No detailed FEMA Floodplain data available for this area.
U9003	0.74	0.61	0.00	0.61	-	82.44	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
U9004	5.04	2.41	0.00	2.41	-	47.77	No detailed FEMA Floodplain data available for this area.
U9005	4.58	1.02	0.00	1.02	-	22.28	No detailed FEMA Floodplain data available for this area.
U9006	21.24	8.85	0.00	8.85	-	41.67	No detailed FEMA Floodplain data available for this area.
U9007	3.55	1.41	0.00	1.41	-	39.66	No detailed FEMA Floodplain data available for this area.
U9008	4.13	1.94	0.00	1.94	-	47.07	No detailed FEMA Floodplain data available for this area.
U9009	12.26	8.92	0.00	8.92	-	72.78	No detailed FEMA Floodplain data available for this area.
U9011	19.77	5.49	0.00	5.49	-	27.77	No detailed FEMA Floodplain data available for this area.
U9012	7.43	3.94	0.00	3.94	-	52.98	No detailed FEMA Floodplain data available for this area.
U9013	5.03	1.28	0.00	1.28	-	25.46	No detailed FEMA Floodplain data available for this area.
U9014	4.84	1.26	0.00	1.26	-	26.13	No detailed FEMA Floodplain data available for this area.
U9015	3.00	0.91	0.00	0.91	-	30.23	No detailed FEMA Floodplain data available for this area.
U9016	2.16	0.15	0.00	0.15	-	6.86	No detailed FEMA Floodplain data available for this area.
U9017	1.66	0.12	0.00	0.12	-	7.19	No detailed FEMA Floodplain data available for this area.
U9018	3.13	2.31	0.00	2.31	-	73.82	No detailed FEMA Floodplain data available for this area.
U9019	0.58	0.37	0.00	0.37	-	63.97	No detailed FEMA Floodplain data available for this area.
U9021	1.09	0.80	0.00	0.80	-	73.60	No detailed FEMA Floodplain data available for this area.
U9022	5.22	1.02	0.00	1.02	-	19.61	No detailed FEMA Floodplain data available for this area.
U9023	2.74	0.69	0.00	0.69	-	25.29	No detailed FEMA Floodplain data available for this area.
U9024	2.38	0.53	0.00	0.53	-	22.30	No detailed FEMA Floodplain data available for this area.
U9025	5.21	4.22	0.00	4.22	-	81.03	No detailed FEMA Floodplain data available for this area.
U9026	4.50	2.11	0.00	2.11	-	46.91	No detailed FEMA Floodplain data available for this area.
U9027	2.01	0.45	0.00	0.45	-	22.10	No detailed FEMA Floodplain data available for this area.
U9028	3.95	3.46	0.00	3.46	-	87.59	No detailed FEMA Floodplain data available for this area.
U9029	23.56	21.11	0.00	21.11	-	89.60	No detailed FEMA Floodplain data available for this area.
U9030	4.27	1.17	0.00	1.17	-	27.35	No detailed FEMA Floodplain data available for this area.
U9031	6.60	2.94	0.00	2.94	-	44.48	No detailed FEMA Floodplain data available for this area.
U9032	2.03	1.30	0.00	1.30	-	64.09	No detailed FEMA Floodplain data available for this area.
U9033	6.19	3.23	0.00	3.23	-	52.20	No detailed FEMA Floodplain data available for this area.
U9034	5.08	0.96	0.00	0.96	-	18.99	No detailed FEMA Floodplain data available for this area.
U9035	0.28	0.11	0.00	0.11	-	40.67	No detailed FEMA Floodplain data available for this area.
U9036	1.90	1.60	0.00	1.60	-	84.01	No detailed FEMA Floodplain data available for this area.
U9037	0.91	0.03	0.00	0.03	-	2.84	No detailed FEMA Floodplain data available for this area.
U9038	1.53	0.34	0.00	0.34	-	21.97	No detailed FEMA Floodplain data available for this area.
U9039	2.13	0.03	0.00	0.03	-	1.26	No detailed FEMA Floodplain data available for this area.
U9040	0.80	0.58	0.00	0.58	-	72.80	No detailed FEMA Floodplain data available for this area.
U9041	1.80	0.78	0.00	0.78	-	43.08	No detailed FEMA Floodplain data available for this area.
U9042	5.69	4.76	0.00	4.76	-	83.69	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
U9043	7.79	5.15	0.00	5.15	-	66.14	No detailed FEMA Floodplain data available for this area.
U9044	2.85	0.14	0.00	0.14	-	4.91	No detailed FEMA Floodplain data available for this area.
U9045	7.23	0.21	0.00	0.21	-	2.87	No detailed FEMA Floodplain data available for this area.
U9046	2.12	0.27	0.00	0.27	-	12.89	No detailed FEMA Floodplain data available for this area.
U9051	1.09	0.68	0.00	0.68	-	62.63	No detailed FEMA Floodplain data available for this area.
U9052	4.39	0.19	0.00	0.19	-	4.22	No detailed FEMA Floodplain data available for this area.
U9053	3.69	0.29	0.00	0.29	-	7.87	No detailed FEMA Floodplain data available for this area.
U9054	1.01	0.08	0.00	0.08	-	8.06	No detailed FEMA Floodplain data available for this area.
U9055	6.18	2.23	0.00	2.23	-	36.17	No detailed FEMA Floodplain data available for this area.
U9056	3.31	0.13	0.00	0.13	-	3.99	No detailed FEMA Floodplain data available for this area.
U9057	2.23	0.13	0.00	0.13	-	5.61	No detailed FEMA Floodplain data available for this area.
U9058	0.62	0.22	0.00	0.22	-	35.70	No detailed FEMA Floodplain data available for this area.
U9059	2.68	1.76	0.00	1.76	-	65.71	No detailed FEMA Floodplain data available for this area.
U9061	1.56	1.18	0.00	1.18	-	75.16	No detailed FEMA Floodplain data available for this area.
U9062	20.96	3.86	0.00	3.86	-	18.41	No detailed FEMA Floodplain data available for this area.
U9065	0.46	0.22	0.00	0.22	-	48.45	No detailed FEMA Floodplain data available for this area.
U9066	1.09	0.92	0.00	0.92	-	83.74	No detailed FEMA Floodplain data available for this area.
U9067	19.13	15.00	0.00	15.00	-	78.38	No detailed FEMA Floodplain data available for this area.
U9068	8.94	1.64	0.00	1.64	-	18.30	No detailed FEMA Floodplain data available for this area.
U9069	0.26	0.13	0.00	0.13	-	51.72	No detailed FEMA Floodplain data available for this area.
U9070	2.75	0.66	0.00	0.66	-	24.00	No detailed FEMA Floodplain data available for this area.
U9071	3.02	2.67	0.00	2.67	-	88.55	No detailed FEMA Floodplain data available for this area.
U9072	1.74	1.50	0.00	1.50	-	86.04	No detailed FEMA Floodplain data available for this area.
U9073	0.46	0.29	0.00	0.29	-	62.97	No detailed FEMA Floodplain data available for this area.
U9074	0.92	0.40	0.00	0.40	-	43.44	No detailed FEMA Floodplain data available for this area.
U9080	1.96	1.24	0.00	1.24	-	63.15	No detailed FEMA Floodplain data available for this area.
U9081	8.04	5.30	0.00	5.30	-	65.87	No detailed FEMA Floodplain data available for this area.
U9082	2.70	0.55	0.00	0.55	-	20.24	No detailed FEMA Floodplain data available for this area.
U9083	2.15	0.50	0.00	0.50	-	23.25	No detailed FEMA Floodplain data available for this area.
U9084	5.28	1.07	0.00	1.07	-	20.28	No detailed FEMA Floodplain data available for this area.
U9085	46.70	27.81	0.00	27.81	-	59.54	No detailed FEMA Floodplain data available for this area.
U9086	0.79	0.42	0.00	0.42	-	53.02	No detailed FEMA Floodplain data available for this area.
U9087	0.03	0.01	0.00	0.01	-	40.51	No detailed FEMA Floodplain data available for this area.
U9088	0.10	0.06	0.00	0.06	-	54.48	No detailed FEMA Floodplain data available for this area.
U9089	3.96	0.54	0.00	0.54	-	13.71	No detailed FEMA Floodplain data available for this area.
U9090	9.76	8.66	0.00	8.66	-	88.68	No detailed FEMA Floodplain data available for this area.
U9091	0.03	0.01	0.00	0.01	-	46.13	No detailed FEMA Floodplain data available for this area.

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U9092	2.31	0.23	0.00	0.23	-	10.08	No detailed FEMA Floodplain data available for this area.
U9093	0.11	0.06	0.00	0.06	-	51.62	No detailed FEMA Floodplain data available for this area.
U9094	1.79	0.12	0.00	0.12	-	6.55	No detailed FEMA Floodplain data available for this area.
U9095	0.09	0.01	0.00	0.01	-	16.59	No detailed FEMA Floodplain data available for this area.
U9096	1.28	0.04	0.00	0.04	-	3.18	No detailed FEMA Floodplain data available for this area.
U9097	1.35	0.05	0.00	0.05	-	3.65	No detailed FEMA Floodplain data available for this area.
U9098	1.24	0.12	0.00	0.12	-	9.64	No detailed FEMA Floodplain data available for this area.
U9100	13.79	7.80	0.00	7.80	-	56.56	No detailed FEMA Floodplain data available for this area.
U9101	0.74	0.00	0.00	0.00	-	0.05	No detailed FEMA Floodplain data available for this area.
U9110	16.54	3.16	0.00	3.16	-	19.07	No detailed FEMA Floodplain data available for this area.
U9115	10.51	2.65	0.00	2.65	-	25.18	No detailed FEMA Floodplain data available for this area.
U9120	1.19	0.24	0.00	0.24	-	20.50	No detailed FEMA Floodplain data available for this area.
U9125	6.06	1.33	0.00	1.33	-	22.01	No detailed FEMA Floodplain data available for this area.
U9130	0.88	0.05	0.00	0.05	-	5.99	No detailed FEMA Floodplain data available for this area.
U9135	3.74	0.05	0.00	0.05	-	1.42	No detailed FEMA Floodplain data available for this area.
U9140	2.13	0.15	0.00	0.15	-	6.81	No detailed FEMA Floodplain data available for this area.
U9145	1.75	0.44	0.00	0.44	-	25.41	No detailed FEMA Floodplain data available for this area.
U9155	1.36	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
U9160	2.96	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
U9201	14.97	3.86	0.00	3.86	-	25.81	No detailed FEMA Floodplain data available for this area.
U9301	1.03	0.10	0.00	0.10	-	9.81	No detailed FEMA Floodplain data available for this area.
U9400	14.36	12.04	0.00	12.04	-	83.86	No detailed FEMA Floodplain data available for this area.
U9450	16.08	4.25	0.00	4.25	-	26.42	No detailed FEMA Floodplain data available for this area.
U9500	6.28	5.61	0.00	5.61	-	89.25	No detailed FEMA Floodplain data available for this area.
U9600	3.23	2.63	0.00	2.63	-	81.40	No detailed FEMA Floodplain data available for this area.
U9700	1.40	1.16	0.00	1.16	-	82.51	No detailed FEMA Floodplain data available for this area.
U9800	1.90	1.60	0.00	1.60	-	84.24	No detailed FEMA Floodplain data available for this area.
U9810	0.29	0.09	0.00	0.09	-	32.81	No detailed FEMA Floodplain data available for this area.
U9820	3.62	0.81	0.00	0.81	-	22.45	No detailed FEMA Floodplain data available for this area.
U9830	0.66	0.28	0.00	0.28	-	41.89	No detailed FEMA Floodplain data available for this area.
U9900	0.57	0.40	0.00	0.40	-	70.72	No detailed FEMA Floodplain data available for this area.
U9910	0.07	0.04	0.00	0.04	-	55.26	No detailed FEMA Floodplain data available for this area.
V0001	2.05	0.60	0.00	0.60	-	29.40	No detailed FEMA Floodplain data available for this area.
V0002	9.38	5.88	0.00	5.88	-	62.63	No detailed FEMA Floodplain data available for this area.
V0003	2.41	0.54	0.00	0.54	-	22.20	No detailed FEMA Floodplain data available for this area.
V0004	1.83	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
V0005	8.09	4.21	0.00	4.21	-	51.96	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
V0006	6.06	1.09	0.00	1.09	-	17.95	No detailed FEMA Floodplain data available for this area.
V0007	9.38	1.64	0.00	1.64	-	17.53	No detailed FEMA Floodplain data available for this area.
V0008	0.74	0.45	0.00	0.45	-	60.78	No detailed FEMA Floodplain data available for this area.
V0009	2.86	1.87	0.00	1.87	-	65.53	No detailed FEMA Floodplain data available for this area.
V0011	3.05	1.38	0.00	1.38	-	45.08	No detailed FEMA Floodplain data available for this area.
V0012	19.98	4.50	0.00	4.50	-	22.53	No detailed FEMA Floodplain data available for this area.
V0014	18.71	1.75	0.00	1.75	-	9.35	No detailed FEMA Floodplain data available for this area.
V0015	8.16	0.13	0.00	0.13	-	1.57	No detailed FEMA Floodplain data available for this area.
V0020	1.57	1.04	0.00	1.04	-	66.14	No detailed FEMA Floodplain data available for this area.
V0029	5.52	0.01	0.00	0.01	-	0.20	No detailed FEMA Floodplain data available for this area.
V0030	5.44	0.52	0.00	0.52	-	9.61	No detailed FEMA Floodplain data available for this area.
V0040	15.24	1.55	0.00	1.55	-	10.15	No detailed FEMA Floodplain data available for this area.
V0045	62.46	3.44	0.00	3.44	-	5.50	No detailed FEMA Floodplain data available for this area.
V0050	55.80	2.07	0.00	2.07	-	3.70	No detailed FEMA Floodplain data available for this area.
V0051	17.18	1.91	0.00	1.91	-	11.09	No detailed FEMA Floodplain data available for this area.
V0055	0.65	0.20	0.00	0.20	-	31.36	No detailed FEMA Floodplain data available for this area.
V0060	7.20	3.47	0.00	3.47	-	48.10	No detailed FEMA Floodplain data available for this area.
V0062	3.28	0.13	0.00	0.13	-	3.86	No detailed FEMA Floodplain data available for this area.
V0064	4.22	1.30	0.00	1.30	-	30.82	No detailed FEMA Floodplain data available for this area.
V0065	22.68	4.04	0.00	4.04	-	17.79	No detailed FEMA Floodplain data available for this area.
V0066	4.63	1.38	0.00	1.38	-	29.92	No detailed FEMA Floodplain data available for this area.
V0068	8.44	1.30	0.00	1.30	-	15.36	No detailed FEMA Floodplain data available for this area.
V0070	5.89	2.60	0.00	2.60	-	44.12	No detailed FEMA Floodplain data available for this area.
V0073	27.30	2.92	0.00	2.92	-	10.69	No detailed FEMA Floodplain data available for this area.
V0077	1.68	0.62	0.00	0.62	-	36.85	No detailed FEMA Floodplain data available for this area.
V0080	2.91	2.00	0.00	2.00	-	68.76	No detailed FEMA Floodplain data available for this area.
V0090	24.84	4.60	0.00	4.60	-	18.50	No detailed FEMA Floodplain data available for this area.
V0100	17.84	1.87	0.00	1.87	-	10.50	No detailed FEMA Floodplain data available for this area.
V0110	10.54	2.13	0.00	2.13	-	20.26	No detailed FEMA Floodplain data available for this area.
V0120	2.71	0.58	0.00	0.58	-	21.46	No detailed FEMA Floodplain data available for this area.
V0130	11.25	0.53	0.00	0.53	-	4.74	No detailed FEMA Floodplain data available for this area.
V0135	8.86	0.32	0.00	0.32	-	3.55	No detailed FEMA Floodplain data available for this area.
V0140	4.50	2.25	0.00	2.25	-	49.91	No detailed FEMA Floodplain data available for this area.
V0160	24.55	1.03	0.00	1.03	-	4.20	No detailed FEMA Floodplain data available for this area.
V0170	12.22	1.00	0.00	1.00	-	8.18	No detailed FEMA Floodplain data available for this area.
V0180	33.63	2.17	0.00	2.17	-	6.45	No detailed FEMA Floodplain data available for this area.
V0187	13.10	2.49	0.00	2.49	-	19.03	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
V0190	19.68	1.68	0.00	1.68	-	8.53	No detailed FEMA Floodplain data available for this area.
V0200	15.17	1.39	0.00	1.39	-	9.17	No detailed FEMA Floodplain data available for this area.
V0205	8.31	0.41	0.00	0.41	-	4.96	No detailed FEMA Floodplain data available for this area.
V0210	29.21	1.74	0.00	1.74	-	5.97	No detailed FEMA Floodplain data available for this area.
V0220	13.02	1.52	0.00	1.52	-	11.66	No detailed FEMA Floodplain data available for this area.
V0230	14.49	1.02	0.00	1.02	-	7.02	No detailed FEMA Floodplain data available for this area.
V0240	23.87	1.40	0.00	1.40	-	5.86	No detailed FEMA Floodplain data available for this area.
V0250	10.52	0.88	0.00	0.88	-	8.33	No detailed FEMA Floodplain data available for this area.
V1010	5.36	1.55	0.00	1.55	-	28.83	No detailed FEMA Floodplain data available for this area.
V1015	36.76	25.85	0.00	25.85	-	70.31	No detailed FEMA Floodplain data available for this area.
V1033	17.66	17.21	0.00	17.21	-	97.46	No detailed FEMA Floodplain data available for this area.
V1037	29.57	26.39	0.00	26.39	-	89.24	No detailed FEMA Floodplain data available for this area.
V1040	30.44	27.40	0.00	27.40	-	90.01	No detailed FEMA Floodplain data available for this area.
V1043	89.73	66.46	0.00	66.46	-	74.06	No detailed FEMA Floodplain data available for this area.
V1047	83.48	55.17	0.00	55.17	-	66.09	No detailed FEMA Floodplain data available for this area.
V1050	37.35	29.27	0.00	29.27	-	78.36	No detailed FEMA Floodplain data available for this area.
V1080	20.04	2.73	0.00	2.73	-	13.64	No detailed FEMA Floodplain data available for this area.
V1090	0.42	0.19	0.00	0.19	-	45.98	No detailed FEMA Floodplain data available for this area.
V2011	12.18	0.80	0.00	0.80	-	6.58	No detailed FEMA Floodplain data available for this area.
V2015	6.78	0.57	0.00	0.57	-	8.47	No detailed FEMA Floodplain data available for this area.
V2210	20.60	1.51	0.00	1.51	-	7.35	No detailed FEMA Floodplain data available for this area.
V2220	3.49	0.59	0.00	0.59	-	16.85	No detailed FEMA Floodplain data available for this area.
V2520	7.38	0.59	0.00	0.59	-	8.01	No detailed FEMA Floodplain data available for this area.
V2530	14.26	2.19	0.00	2.19	-	15.38	No detailed FEMA Floodplain data available for this area.
V2540	17.43	2.13	0.00	2.13	-	12.24	No detailed FEMA Floodplain data available for this area.
V2550	11.96	2.46	0.00	2.46	-	20.60	No detailed FEMA Floodplain data available for this area.
V2560	14.30	3.43	0.00	3.43	-	23.96	No detailed FEMA Floodplain data available for this area.
V2570	35.87	8.07	0.00	8.07	-	22.49	No detailed FEMA Floodplain data available for this area.
V2590	21.54	4.38	0.00	4.38	-	20.33	No detailed FEMA Floodplain data available for this area.
V2600	10.55	1.90	0.00	1.90	-	18.03	No detailed FEMA Floodplain data available for this area.
V2610	7.41	1.98	0.00	1.98	-	26.68	No detailed FEMA Floodplain data available for this area.
V2810	9.57	3.19	0.00	3.19	-	33.35	No detailed FEMA Floodplain data available for this area.
V2830	5.68	1.03	0.00	1.03	-	18.11	No detailed FEMA Floodplain data available for this area.
V2840	2.56	0.95	0.00	0.95	-	37.15	No detailed FEMA Floodplain data available for this area.
V2850	9.66	0.88	0.00	0.88	-	9.06	No detailed FEMA Floodplain data available for this area.
V2853	1.64	0.55	0.00	0.55	-	33.58	No detailed FEMA Floodplain data available for this area.
V2857	3.69	1.17	0.00	1.17	-	31.74	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
V2860	4.92	1.30	0.00	1.30	-	26.38	No detailed FEMA Floodplain data available for this area.
V2880	9.24	1.19	0.00	1.19	-	12.89	No detailed FEMA Floodplain data available for this area.
V2890	1.41	0.65	0.00	0.65	-	45.72	No detailed FEMA Floodplain data available for this area.
V3010	13.45	0.71	0.00	0.71	-	5.27	No detailed FEMA Floodplain data available for this area.
V3020	23.39	0.57	0.00	0.57	-	2.44	No detailed FEMA Floodplain data available for this area.
V3042	5.35	4.38	0.00	4.38	-	81.85	No detailed FEMA Floodplain data available for this area.
V3060	7.80	0.48	0.00	0.48	-	6.21	No detailed FEMA Floodplain data available for this area.
V3510	5.68	0.00	0.00	0.00	-	0.01	No detailed FEMA Floodplain data available for this area.
V3520	5.32	1.98	0.00	1.98	-	37.15	No detailed FEMA Floodplain data available for this area.
V3530	5.02	1.45	0.00	1.45	-	28.80	No detailed FEMA Floodplain data available for this area.
V3540	6.69	1.44	0.00	1.44	-	21.54	No detailed FEMA Floodplain data available for this area.
V3550	9.49	2.65	0.00	2.65	-	27.91	No detailed FEMA Floodplain data available for this area.
V4020	5.81	2.63	0.00	2.63	-	45.21	No detailed FEMA Floodplain data available for this area.
V4025	7.64	1.23	0.00	1.23	-	16.14	No detailed FEMA Floodplain data available for this area.
V4030	3.41	1.02	0.00	1.02	-	29.82	No detailed FEMA Floodplain data available for this area.
V4035	37.34	1.20	0.00	1.20	-	3.22	No detailed FEMA Floodplain data available for this area.
V4040	4.41	3.36	0.00	3.36	-	76.02	No detailed FEMA Floodplain data available for this area.
V4050	0.68	0.16	0.00	0.16	-	23.14	No detailed FEMA Floodplain data available for this area.
V4060	0.78	0.14	0.00	0.14	-	17.93	No detailed FEMA Floodplain data available for this area.
V4070	1.08	0.20	0.00	0.20	-	18.73	No detailed FEMA Floodplain data available for this area.
V4080	1.38	0.23	0.00	0.23	-	16.61	No detailed FEMA Floodplain data available for this area.
V4090	1.18	0.19	0.00	0.19	-	15.94	No detailed FEMA Floodplain data available for this area.
V4100	1.02	0.22	0.00	0.22	-	21.31	No detailed FEMA Floodplain data available for this area.
V4110	0.96	0.20	0.00	0.20	-	21.14	No detailed FEMA Floodplain data available for this area.
V4120	0.98	0.27	0.00	0.27	-	28.10	No detailed FEMA Floodplain data available for this area.
V4130	0.95	0.38	0.00	0.38	-	40.19	No detailed FEMA Floodplain data available for this area.
V4140	1.24	0.56	0.00	0.56	-	44.96	No detailed FEMA Floodplain data available for this area.
V4150	1.59	0.68	0.00	0.68	-	42.74	No detailed FEMA Floodplain data available for this area.
V4160	1.24	0.54	0.00	0.54	-	43.43	No detailed FEMA Floodplain data available for this area.
V4170	1.20	0.29	0.00	0.29	-	24.21	No detailed FEMA Floodplain data available for this area.
V4180	1.07	0.33	0.00	0.33	-	30.71	No detailed FEMA Floodplain data available for this area.
V4190	1.35	0.30	0.00	0.30	-	22.44	No detailed FEMA Floodplain data available for this area.
X0004	12.43	2.32	0.00	2.32	-	18.67	No detailed FEMA Floodplain data available for this area.
X0006	0.36	0.17	0.00	0.17	-	46.64	No detailed FEMA Floodplain data available for this area.
X0008	0.52	0.23	0.00	0.23	-	44.06	No detailed FEMA Floodplain data available for this area.
X0010	31.83	5.53	0.00	5.53	-	17.39	No detailed FEMA Floodplain data available for this area.
X0035	31.54	17.51	0.00	17.51	-	55.53	No detailed FEMA Floodplain data available for this area.

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X0040	4.74	0.88	0.00	0.88	-	18.64	No detailed FEMA Floodplain data available for this area.
X0050	13.75	1.93	0.00	1.93	-	14.04	No detailed FEMA Floodplain data available for this area.
X0055	5.53	1.51	0.00	1.51	-	27.34	No detailed FEMA Floodplain data available for this area.
X0060	2.28	1.08	0.00	1.08	-	47.57	No detailed FEMA Floodplain data available for this area.
X0070	3.86	0.94	0.00	0.94	-	24.43	No detailed FEMA Floodplain data available for this area.
X0510	32.10	4.20	0.00	4.20	-	13.08	No detailed FEMA Floodplain data available for this area.
X0519	10.37	1.87	0.00	1.87	-	18.04	No detailed FEMA Floodplain data available for this area.
X0520	8.56	1.81	0.00	1.81	-	21.08	No detailed FEMA Floodplain data available for this area.
X1005	1.94	0.19	0.00	0.19	-	9.80	No detailed FEMA Floodplain data available for this area.
X1010	3.16	0.61	0.00	0.61	-	19.33	No detailed FEMA Floodplain data available for this area.
X1020	5.99	0.53	0.00	0.53	-	8.86	No detailed FEMA Floodplain data available for this area.
X1030	3.82	0.59	0.00	0.59	-	15.52	No detailed FEMA Floodplain data available for this area.
X1040	5.38	0.34	0.00	0.34	-	6.25	No detailed FEMA Floodplain data available for this area.
X1045	3.67	0.87	0.00	0.87	-	23.68	No detailed FEMA Floodplain data available for this area.
X1050	5.77	1.10	0.00	1.10	-	19.00	No detailed FEMA Floodplain data available for this area.
X1505	30.65	15.58	0.00	15.58	-	50.84	No detailed FEMA Floodplain data available for this area.
X1510	7.50	1.36	0.00	1.36	-	18.18	No detailed FEMA Floodplain data available for this area.
X1524	13.03	3.22	0.00	3.22	-	24.67	No detailed FEMA Floodplain data available for this area.
X1525	5.49	2.38	0.00	2.38	-	43.45	No detailed FEMA Floodplain data available for this area.
X1530	3.04	0.91	0.00	0.91	-	30.05	No detailed FEMA Floodplain data available for this area.
X1540	14.73	0.84	0.00	0.84	-	5.69	No detailed FEMA Floodplain data available for this area.
X1541	4.23	2.08	0.00	2.08	-	49.29	No detailed FEMA Floodplain data available for this area.
X1542	21.92	1.97	0.00	1.97	-	8.97	No detailed FEMA Floodplain data available for this area.
X1543	4.87	0.63	0.00	0.63	-	13.00	No detailed FEMA Floodplain data available for this area.
X1544	12.29	2.47	0.00	2.47	-	20.09	No detailed FEMA Floodplain data available for this area.
X1545	22.13	4.02	0.00	4.02	-	18.19	No detailed FEMA Floodplain data available for this area.
X1547	8.38	2.62	0.00	2.62	-	31.22	No detailed FEMA Floodplain data available for this area.
X1548	2.67	0.98	0.00	0.98	-	36.63	No detailed FEMA Floodplain data available for this area.
X1549	7.27	1.12	0.00	1.12	-	15.38	No detailed FEMA Floodplain data available for this area.
X1550	2.06	0.60	0.00	0.60	-	29.26	No detailed FEMA Floodplain data available for this area.
X3005	2.58	0.02	0.00	0.02	-	0.64	No detailed FEMA Floodplain data available for this area.
X3010	5.51	0.03	0.00	0.03	-	0.63	No detailed FEMA Floodplain data available for this area.
X3020	3.52	0.12	0.00	0.12	-	3.49	No detailed FEMA Floodplain data available for this area.
X3030	7.14	1.23	0.00	1.23	-	17.19	No detailed FEMA Floodplain data available for this area.
X3031	7.94	1.48	0.00	1.48	-	18.65	No detailed FEMA Floodplain data available for this area.
X3032	6.32	0.17	0.00	0.17	-	2.61	No detailed FEMA Floodplain data available for this area.
X3033	1.86	0.45	0.00	0.45	-	24.47	No detailed FEMA Floodplain data available for this area.

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Y0010	29.14	7.21	0.00	7.21	-	24.74	No detailed FEMA Floodplain data available for this area.
Y0020	11.74	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
Y0040	0.31	0.11	0.00	0.11	-	35.40	No detailed FEMA Floodplain data available for this area.
Y0050	0.26	0.11	0.00	0.11	-	41.63	No detailed FEMA Floodplain data available for this area.
Y0063	2.51	0.14	0.00	0.14	-	5.50	No detailed FEMA Floodplain data available for this area.
Y0067	0.24	0.09	0.00	0.09	-	36.85	No detailed FEMA Floodplain data available for this area.
Y0070	1.26	0.36	0.00	0.36	-	28.56	No detailed FEMA Floodplain data available for this area.
Y0073	10.25	0.57	0.00	0.57	-	5.56	No detailed FEMA Floodplain data available for this area.
Y0077	16.88	0.30	0.00	0.30	-	1.79	No detailed FEMA Floodplain data available for this area.
Y0080	10.77	0.98	0.00	0.98	-	9.14	No detailed FEMA Floodplain data available for this area.
Y0083	18.67	0.32	0.00	0.32	-	1.69	No detailed FEMA Floodplain data available for this area.
Y0087	2.13	0.35	0.00	0.35	-	16.27	No detailed FEMA Floodplain data available for this area.
Y0090	14.32	1.87	0.00	1.87	-	13.05	No detailed FEMA Floodplain data available for this area.
Y0093	20.87	1.63	0.00	1.63	-	7.79	No detailed FEMA Floodplain data available for this area.
Y0097	0.69	0.19	0.00	0.19	-	28.01	No detailed FEMA Floodplain data available for this area.
Y0100	3.11	1.20	0.00	1.20	-	38.61	No detailed FEMA Floodplain data available for this area.
Y0103	28.08	0.84	0.00	0.84	-	3.01	No detailed FEMA Floodplain data available for this area.
Y0107	0.92	0.17	0.00	0.17	-	18.62	No detailed FEMA Floodplain data available for this area.
Y0120	13.92	2.14	0.00	2.14	-	15.35	No detailed FEMA Floodplain data available for this area.
Y0130	7.88	0.83	0.00	0.83	-	10.55	No detailed FEMA Floodplain data available for this area.
Y0140	26.71	5.04	0.00	5.04	-	18.85	No detailed FEMA Floodplain data available for this area.
Y0150	21.00	3.13	0.00	3.13	-	14.90	No detailed FEMA Floodplain data available for this area.
Y0160	2.43	1.07	0.00	1.07	-	44.08	No detailed FEMA Floodplain data available for this area.
Y0162	35.06	2.86	0.00	2.86	-	8.16	No detailed FEMA Floodplain data available for this area.
Y0165	10.84	1.63	0.00	1.63	-	15.00	No detailed FEMA Floodplain data available for this area.
Y0168	4.12	0.73	0.00	0.73	-	17.83	No detailed FEMA Floodplain data available for this area.
Y0170	9.20	2.83	0.00	2.83	-	30.79	No detailed FEMA Floodplain data available for this area.
Y0180	7.50	1.13	0.00	1.13	-	15.10	No detailed FEMA Floodplain data available for this area.
Y0190	3.51	0.71	0.00	0.71	-	20.28	No detailed FEMA Floodplain data available for this area.
Y0200	12.61	1.74	0.00	1.74	-	13.81	No detailed FEMA Floodplain data available for this area.
Y0203	15.66	0.71	0.00	0.71	-	4.51	No detailed FEMA Floodplain data available for this area.
Y0207	17.28	0.93	0.00	0.93	-	5.40	No detailed FEMA Floodplain data available for this area.
Y0208	0.46	0.14	0.00	0.14	-	30.27	No detailed FEMA Floodplain data available for this area.
Y0210	17.64	2.18	0.00	2.18	-	12.35	No detailed FEMA Floodplain data available for this area.
Y0220	20.79	3.81	0.00	3.81	-	18.30	No detailed FEMA Floodplain data available for this area.
Y0230	8.33	0.95	0.00	0.95	-	11.44	No detailed FEMA Floodplain data available for this area.
Y0240	15.41	3.97	0.00	3.97	-	25.78	No detailed FEMA Floodplain data available for this area.

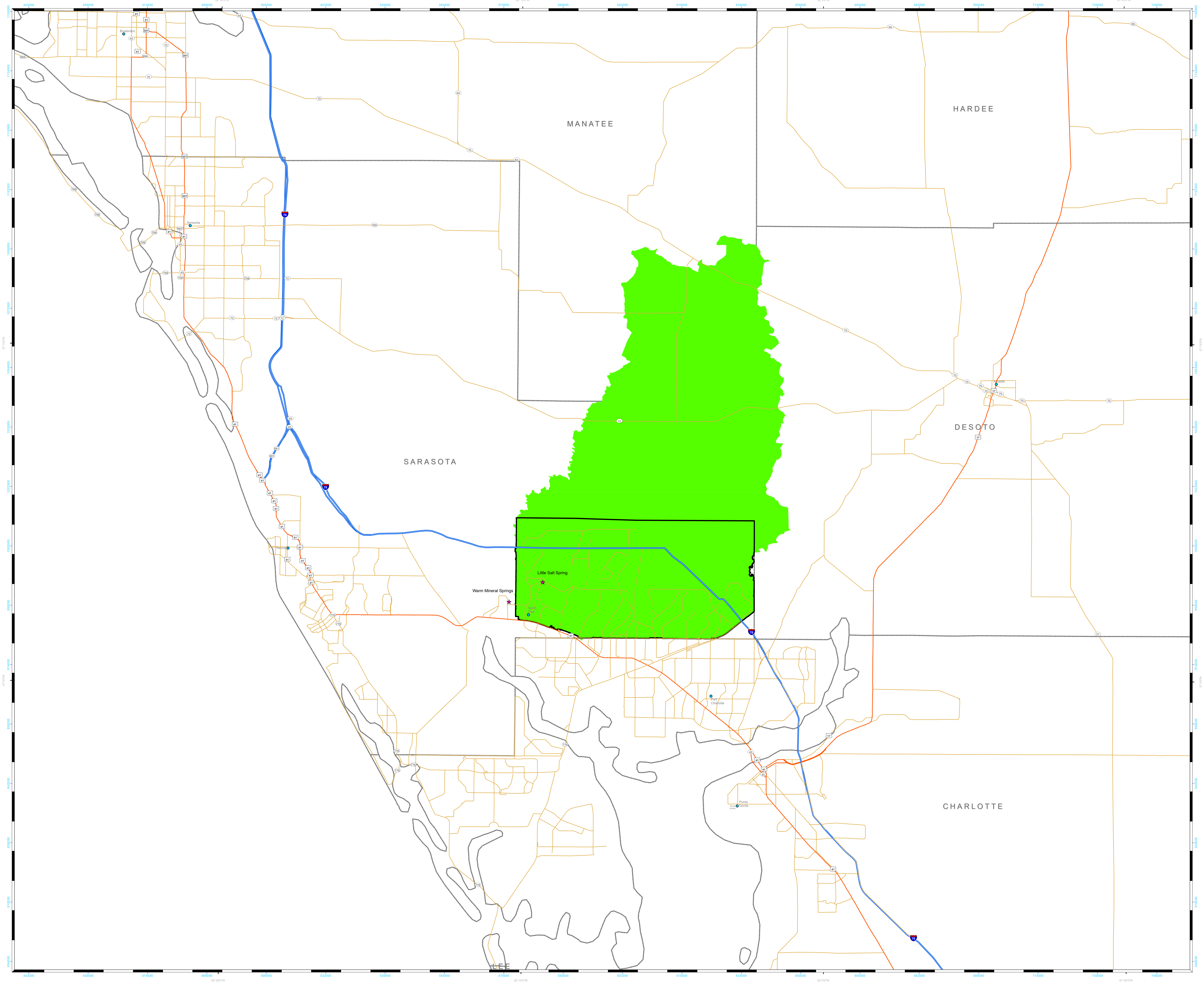
Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
Y0250	14.81	3.48	0.00	3.48	-	23.50	No detailed FEMA Floodplain data available for this area.
Y0260	6.37	2.54	0.00	2.54	-	39.91	No detailed FEMA Floodplain data available for this area.
Y1003	14.51	2.44	0.00	2.44	-	16.84	No detailed FEMA Floodplain data available for this area.
Y1005	12.19	1.73	0.00	1.73	-	14.22	No detailed FEMA Floodplain data available for this area.
Y1007	1.63	0.21	0.00	0.21	-	12.81	No detailed FEMA Floodplain data available for this area.
Y1010	14.10	4.81	0.00	4.81	-	34.09	No detailed FEMA Floodplain data available for this area.
Y1020	14.03	3.29	0.00	3.29	-	23.46	No detailed FEMA Floodplain data available for this area.
Y1310	23.92	0.55	0.00	0.55	-	2.31	No detailed FEMA Floodplain data available for this area.
Y1320	12.23	0.84	0.00	0.84	-	6.83	No detailed FEMA Floodplain data available for this area.
Y1330	10.31	0.68	0.00	0.68	-	6.60	No detailed FEMA Floodplain data available for this area.
Y1332	17.07	3.92	0.00	3.92	-	22.94	No detailed FEMA Floodplain data available for this area.
Y1335	1.95	0.26	0.00	0.26	-	13.58	No detailed FEMA Floodplain data available for this area.
Y1338	1.64	0.16	0.00	0.16	-	9.87	No detailed FEMA Floodplain data available for this area.
Y1340	17.95	2.75	0.00	2.75	-	15.32	No detailed FEMA Floodplain data available for this area.
Y1348	14.19	3.25	0.00	3.25	-	22.92	No detailed FEMA Floodplain data available for this area.
Y1350	2.22	1.37	0.00	1.37	-	61.74	No detailed FEMA Floodplain data available for this area.
Y1510	18.11	3.75	0.00	3.75	-	20.69	No detailed FEMA Floodplain data available for this area.
Y1520	9.62	2.35	0.00	2.35	-	24.38	No detailed FEMA Floodplain data available for this area.
Y1530	11.20	1.71	0.00	1.71	-	15.23	No detailed FEMA Floodplain data available for this area.
Y1535	16.02	4.08	0.00	4.08	-	25.46	No detailed FEMA Floodplain data available for this area.
Y1537	0.89	0.16	0.00	0.16	-	18.39	No detailed FEMA Floodplain data available for this area.
Y1540	41.04	5.67	0.00	5.67	-	13.82	No detailed FEMA Floodplain data available for this area.
Y1550	13.50	4.17	0.00	4.17	-	30.92	No detailed FEMA Floodplain data available for this area.
Y1555	3.30	0.00	0.00	0.00	0.00	0.00	No detailed FEMA Floodplain data available for this area.
Y1560	36.60	12.17	0.00	12.17	-	33.24	No detailed FEMA Floodplain data available for this area.
Y2010	15.11	1.17	0.00	1.17	-	7.74	No detailed FEMA Floodplain data available for this area.
Y2015	7.20	3.31	0.00	3.31	-	46.00	No detailed FEMA Floodplain data available for this area.
Y2020	26.80	4.26	0.00	4.26	-	15.88	No detailed FEMA Floodplain data available for this area.
Y2510	8.46	1.02	0.00	1.02	-	12.05	No detailed FEMA Floodplain data available for this area.
Y2512	6.23	2.21	0.00	2.21	-	35.53	No detailed FEMA Floodplain data available for this area.
Y2513	21.11	4.08	0.00	4.08	-	19.31	No detailed FEMA Floodplain data available for this area.
Y2517	8.36	2.32	0.00	2.32	-	27.76	No detailed FEMA Floodplain data available for this area.
Y2520	21.53	1.70	0.00	1.70	-	7.89	No detailed FEMA Floodplain data available for this area.
Y2540	10.42	1.87	0.00	1.87	-	17.98	No detailed FEMA Floodplain data available for this area.
Y2550	15.60	3.19	0.00	3.19	-	20.43	No detailed FEMA Floodplain data available for this area.
Y3010	29.89	2.99	0.00	2.99	-	9.99	No detailed FEMA Floodplain data available for this area.
Y3310	6.05	1.69	0.00	1.69	-	27.92	No detailed FEMA Floodplain data available for this area.

Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
Y3710	10.91	1.71	0.00	1.71	-	15.63	No detailed FEMA Floodplain data available for this area.
Y3720	42.45	3.95	0.00	3.95	-	9.30	No detailed FEMA Floodplain data available for this area.
Y3730	16.60	1.05	0.00	1.05	-	6.33	No detailed FEMA Floodplain data available for this area.
Y3740	3.21	0.12	0.00	0.12	-	3.75	No detailed FEMA Floodplain data available for this area.
Y4010	11.42	1.74	0.00	1.74	-	15.20	No detailed FEMA Floodplain data available for this area.
Y4020	47.38	5.37	0.00	5.37	-	11.34	No detailed FEMA Floodplain data available for this area.
Y4030	11.59	2.03	0.00	2.03	-	17.54	No detailed FEMA Floodplain data available for this area.
Y4040	5.39	1.57	0.00	1.57	-	29.23	No detailed FEMA Floodplain data available for this area.
Y4050	2.45	0.98	0.00	0.98	-	40.08	No detailed FEMA Floodplain data available for this area.
Y4060	1.10	0.14	0.00	0.14	-	13.14	No detailed FEMA Floodplain data available for this area.
Z0010	12.20	0.99	0.00	0.99	-	8.12	No detailed FEMA Floodplain data available for this area.
Z0020	22.74	2.85	0.00	2.85	-	12.53	No detailed FEMA Floodplain data available for this area.
Z0025	37.01	6.00	0.00	6.00	-	16.21	No detailed FEMA Floodplain data available for this area.
Z0030	3.49	1.66	0.00	1.66	-	47.44	No detailed FEMA Floodplain data available for this area.
Z0033	38.67	0.35	0.00	0.35	-	0.91	No detailed FEMA Floodplain data available for this area.
Z0037	1.70	0.45	0.00	0.45	-	26.30	No detailed FEMA Floodplain data available for this area.
Z0040	45.08	3.35	0.00	3.35	-	7.42	No detailed FEMA Floodplain data available for this area.
Z0043	23.28	0.28	0.00	0.28	-	1.18	No detailed FEMA Floodplain data available for this area.
Z0047	1.43	0.33	0.00	0.33	-	23.13	No detailed FEMA Floodplain data available for this area.
Z0050	35.68	2.02	0.00	2.02	-	5.65	No detailed FEMA Floodplain data available for this area.
Z0060	14.72	3.00	0.00	3.00	-	20.37	No detailed FEMA Floodplain data available for this area.
Z0070	27.02	2.64	0.00	2.64	-	9.78	No detailed FEMA Floodplain data available for this area.
Z1010	5.35	0.25	0.00	0.25	-	4.66	No detailed FEMA Floodplain data available for this area.
Z1020	4.83	0.21	0.00	0.21	-	4.28	No detailed FEMA Floodplain data available for this area.
Z1040	7.68	0.27	0.00	0.27	-	3.57	No detailed FEMA Floodplain data available for this area.
Z1510	9.63	0.71	0.00	0.71	-	7.34	No detailed FEMA Floodplain data available for this area.
Z1520	30.77	1.98	0.00	1.98	-	6.44	No detailed FEMA Floodplain data available for this area.
Z1540	12.43	0.97	0.00	0.97	-	7.76	No detailed FEMA Floodplain data available for this area.
Z1550	4.11	0.83	0.00	0.83	-	20.25	No detailed FEMA Floodplain data available for this area.
Z1560	45.45	0.87	0.00	0.87	-	1.91	No detailed FEMA Floodplain data available for this area.
Z1570	0.41	0.12	0.00	0.12	-	28.64	No detailed FEMA Floodplain data available for this area.
Z2010	3.04	0.07	0.00	0.07	-	2.41	No detailed FEMA Floodplain data available for this area.
Z2020	7.50	0.43	0.00	0.43	-	5.70	No detailed FEMA Floodplain data available for this area.
Z2310	11.47	0.95	0.00	0.95	-	8.24	No detailed FEMA Floodplain data available for this area.
Z2320	1.94	0.36	0.00	0.36	-	18.76	No detailed FEMA Floodplain data available for this area.
Z2710	54.12	2.34	0.00	2.34	-	4.32	No detailed FEMA Floodplain data available for this area.
Z2720	26.75	1.19	0.00	1.19	-	4.43	No detailed FEMA Floodplain data available for this area.

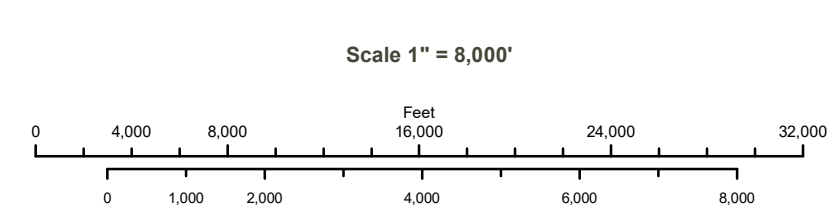
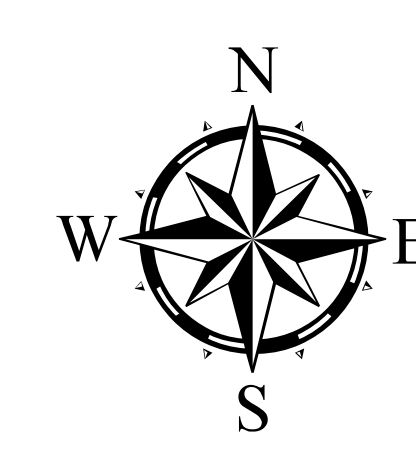
Basin Name	Basin Area (Acres)	Ardaman 100 Year Floodplain (Acres)	FEMA Q3 Area (Acres)	FP Difference (Acres)	% Change FEMA Area Basis	% Change Basin Area Basis	Justification Category
Z2740	28.03	1.49	0.00	1.49	-	5.31	No detailed FEMA Floodplain data available for this area.
Z2750	16.55	0.58	0.00	0.58	-	3.53	No detailed FEMA Floodplain data available for this area.
Z2760	1.32	0.27	0.00	0.27	-	20.37	No detailed FEMA Floodplain data available for this area.
Z3010	7.38	1.05	0.00	1.05	-	14.23	No detailed FEMA Floodplain data available for this area.
Z3020	29.78	2.82	0.00	2.82	-	9.48	No detailed FEMA Floodplain data available for this area.
Z3030	37.22	5.63	0.00	5.63	-	15.13	No detailed FEMA Floodplain data available for this area.
Z3040	22.55	1.20	0.00	1.20	-	5.31	No detailed FEMA Floodplain data available for this area.
Z3050	4.69	0.82	0.00	0.82	-	17.52	No detailed FEMA Floodplain data available for this area.
Z3060	4.03	0.12	0.00	0.12	-	2.96	No detailed FEMA Floodplain data available for this area.

Appendix C

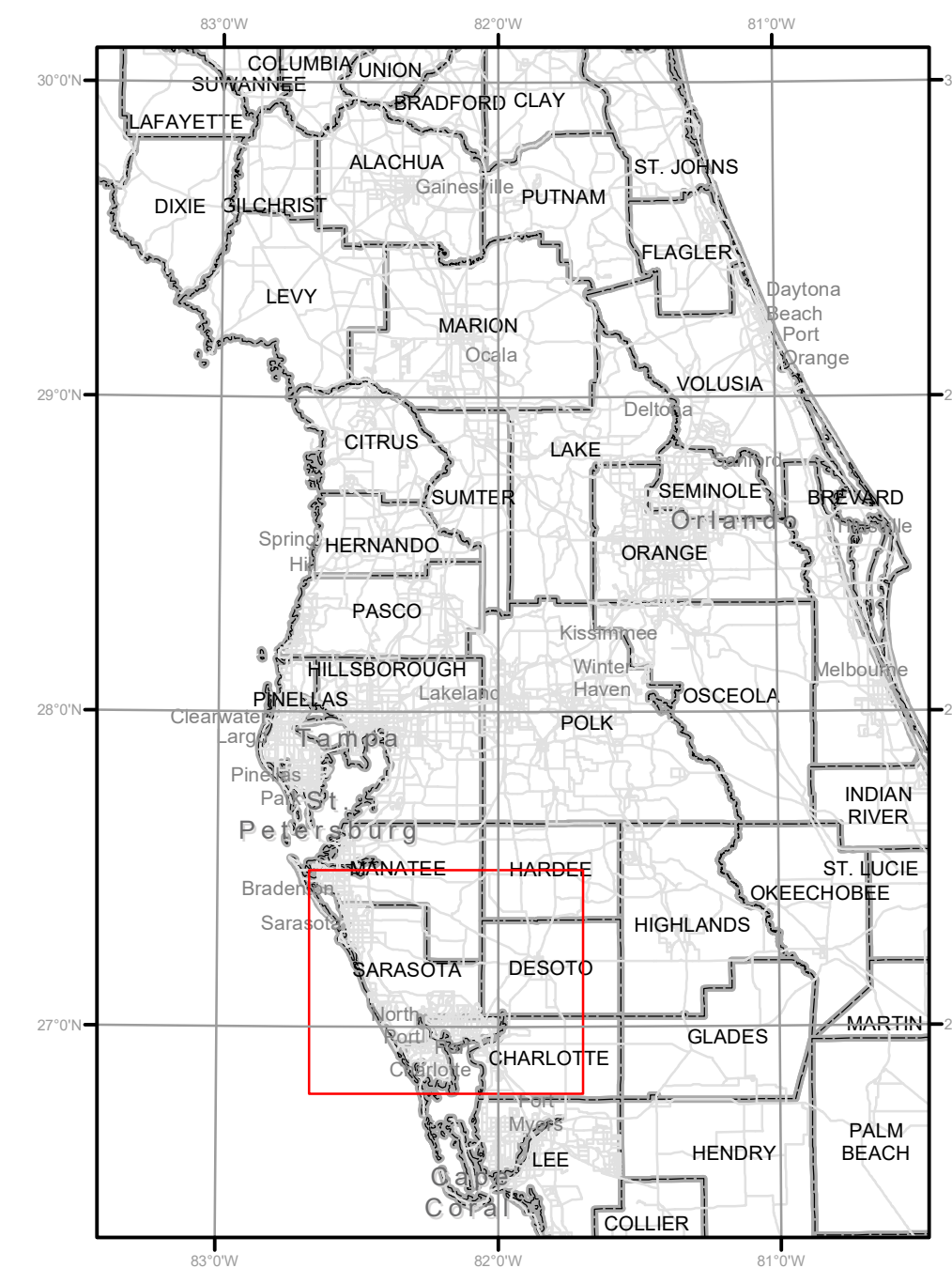
Maps



MAP 1 LOCATION MAP



- ★ Springs
- Interstate
- Highway
- Major Road
- ▭ City of North Port in Big Slough Watershed
- Watershed
- ▭ County Limits

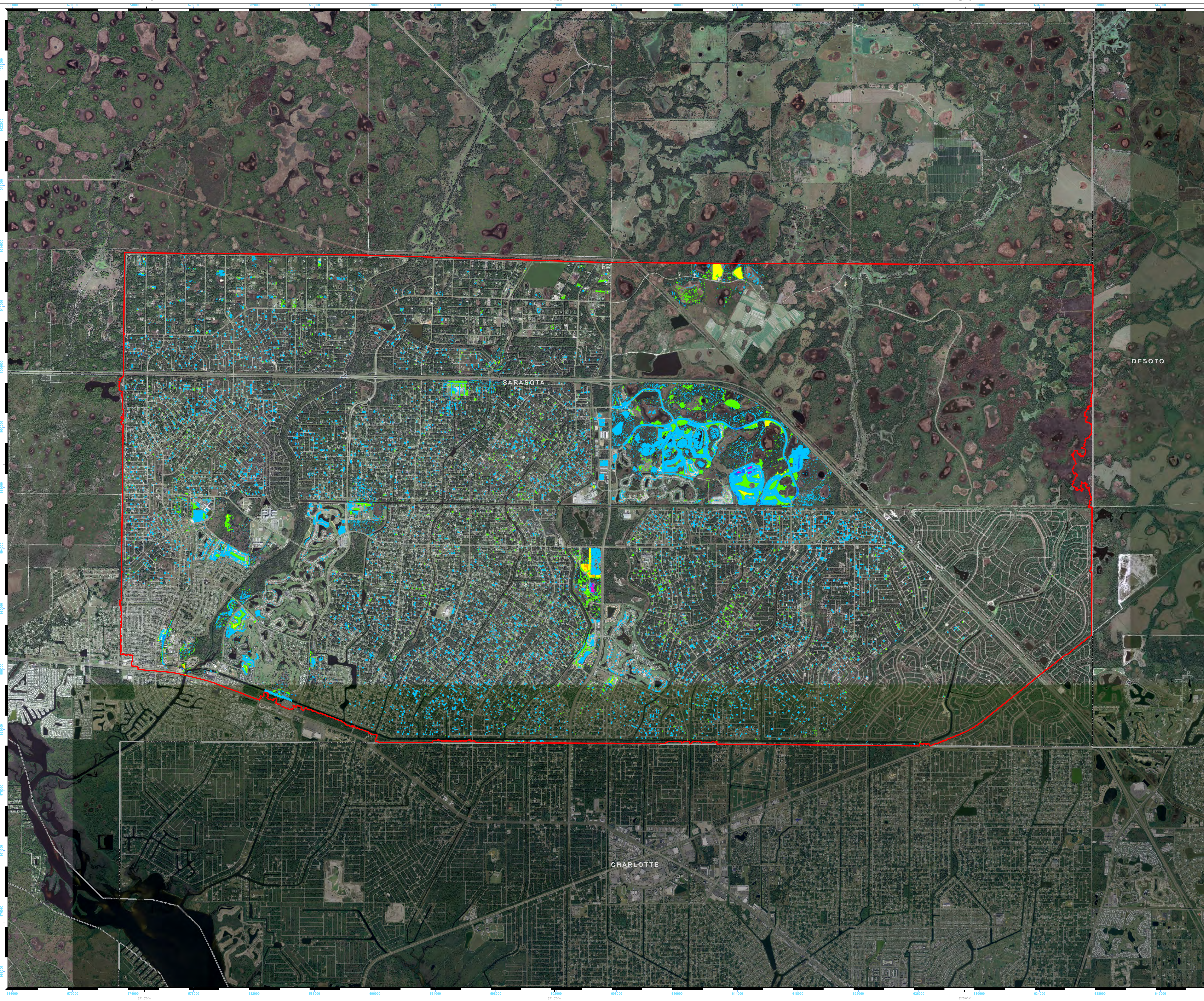


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Prepared: 12-9-2010	Horizontal Datum: NAD83
Prepared by: TJC	Modified by:
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BIG SLOUGH/CITY OF NORTH PORT WATERSHED MANAGEMENT PROGRAM LOCATION MAP

**Ardaman & Associates, Inc.**
Geotechnical, Environmental and
Materials Consultants
Phone: 407-855-3800 Fax: 407-859-8121
8008 South Orange Avenue
Orlando, Florida 32809

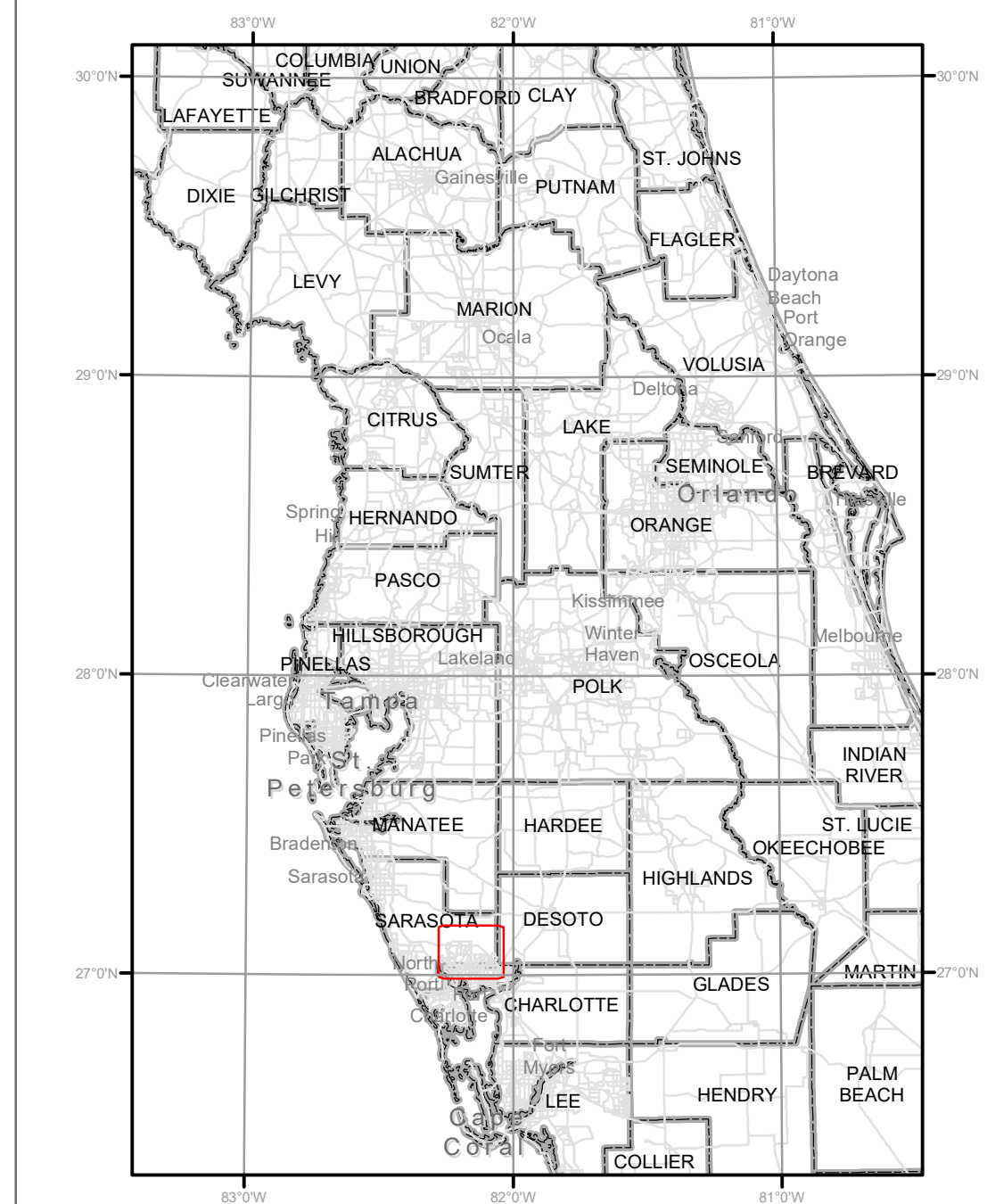
Attachment D Page 269



MAP 2
2007 MINUS
2004 TERRAIN

Scale 1" = 2,000'

- City of North Port in Big Slough Watershed
- County Limits
- Elevation Change (feet)
 - 25 to -10
 - 10 to -5
 - 5 to -1
 - 1 to 1
 - 1 to 5
 - 5 to 10
 - 10 to 60



Project: 07-204
Prepared: 8-6-2010
Prepared by: TJC
File: 107-224\GIS\MapLayouts\Floodplain Comparison Maps_August2010\DEM Change 20x48.mxd

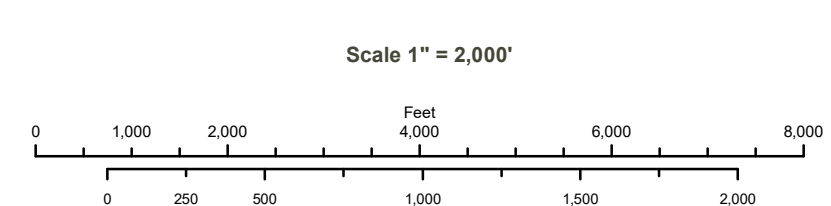
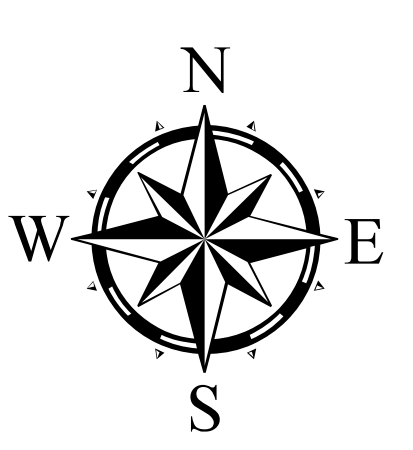
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Horizontal Datum: NAD83
Vertical Datum:
Modified by:

BIG SLOUGH/CITY OF NORTH PORT WATERSHED MANAGEMENT PROGRAM

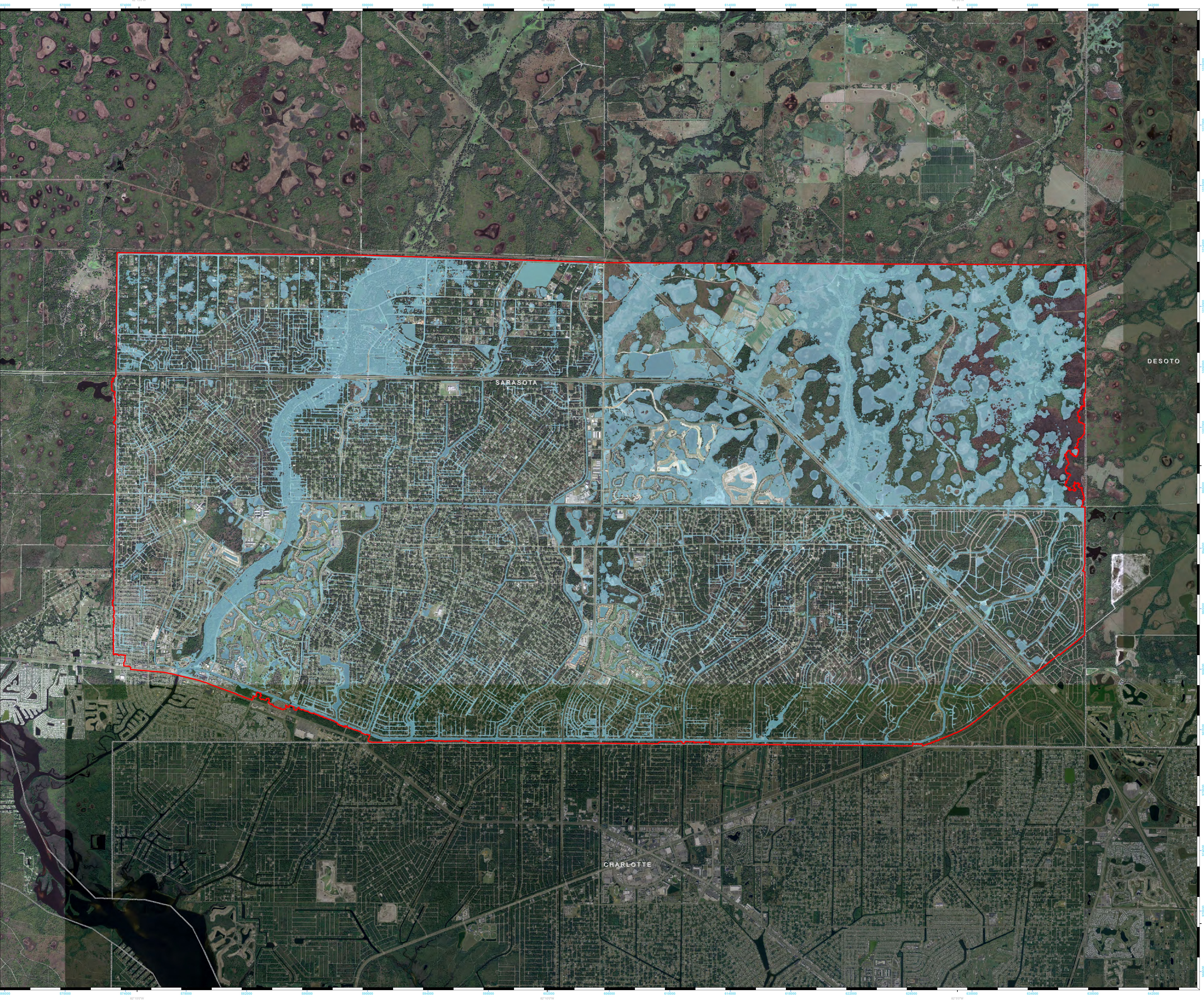
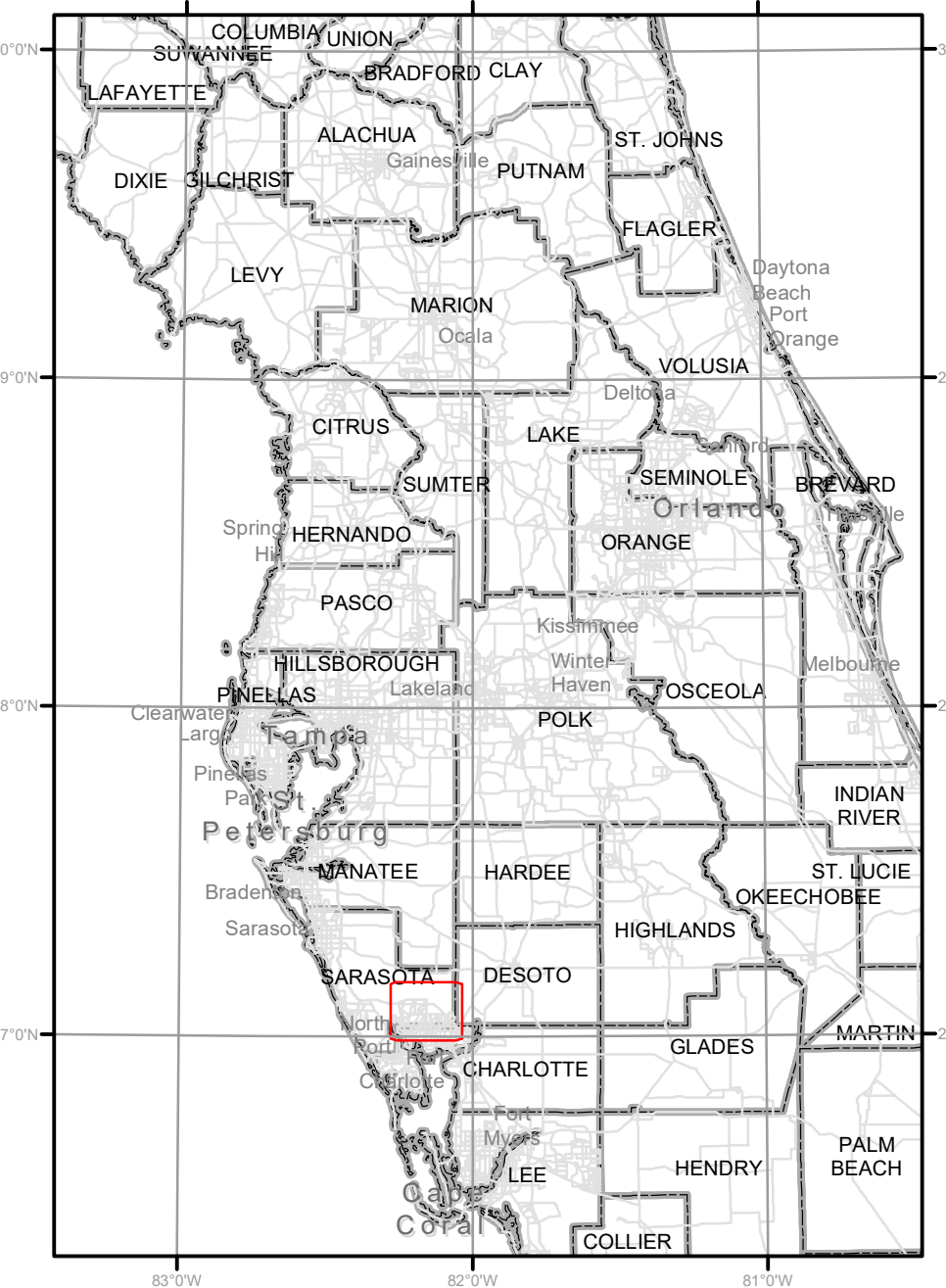
TERRAIN MODEL COMPARISON

Ardaman & Associates, Inc.
Geotechnical, Environmental and
Materials Consultants
Phone: 407-855-3860 Fax: 407-859-8121
8008 South Orange Avenue
Orlando, Florida 32809

MAP 3
100 YEAR FLOODPLAIN



- City of North Port in Big Slough Watershed
- Floodplain
- County Limits



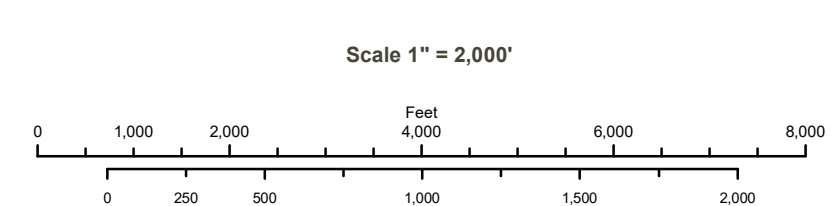
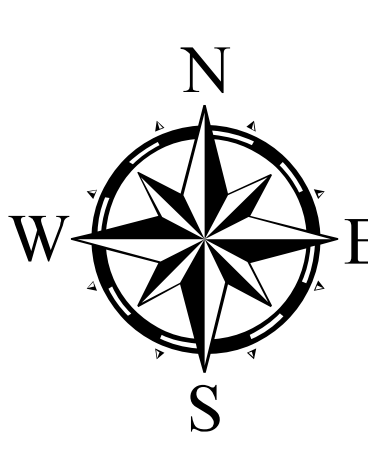
Project: 03-066
Prepared: 12-9-2010
Modified by: TJC
File: \\work\Marketing\GIS\GIS_Arc\Layouts\Dec 2010_Audit\Report\Ardaman Floodplain 30x45.mxd

Projection: StatePlane Florida West
Horizontal Datum: NAD83
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Modified:

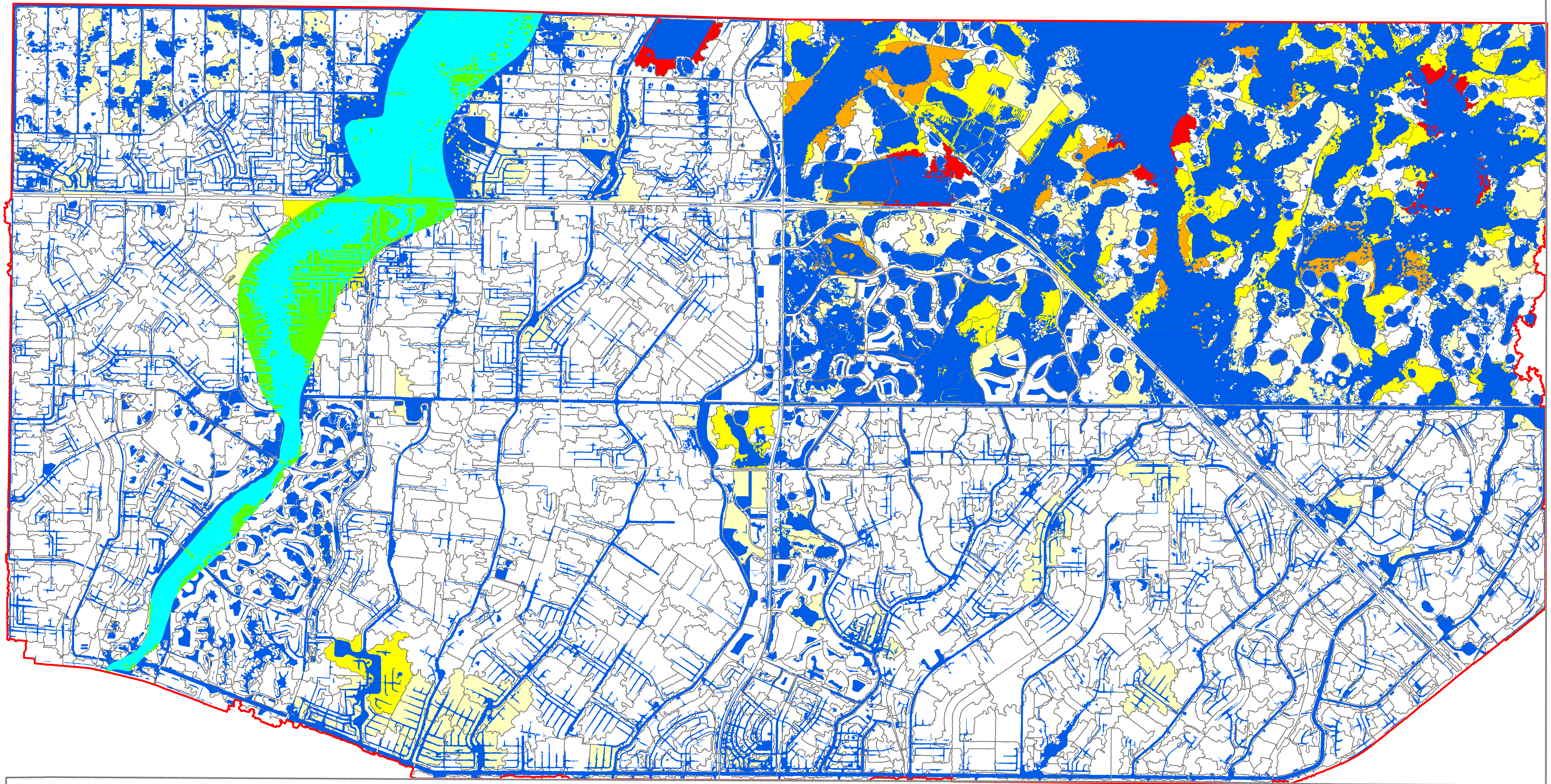
BIG SLOUGH/CITY OF NORTH PORT WATERSHED MANAGEMENT PROGRAM
100 YEAR FLOODPLAIN

Ardaman & Associates, Inc.
Geotechnical, Environmental and
Materials Consultants
Phone: 407-855-3860 Fax: 407-859-8121
8008 South Orange Avenue
Orlando, Florida 32809

MAP 4
ACREAGE CHANGE

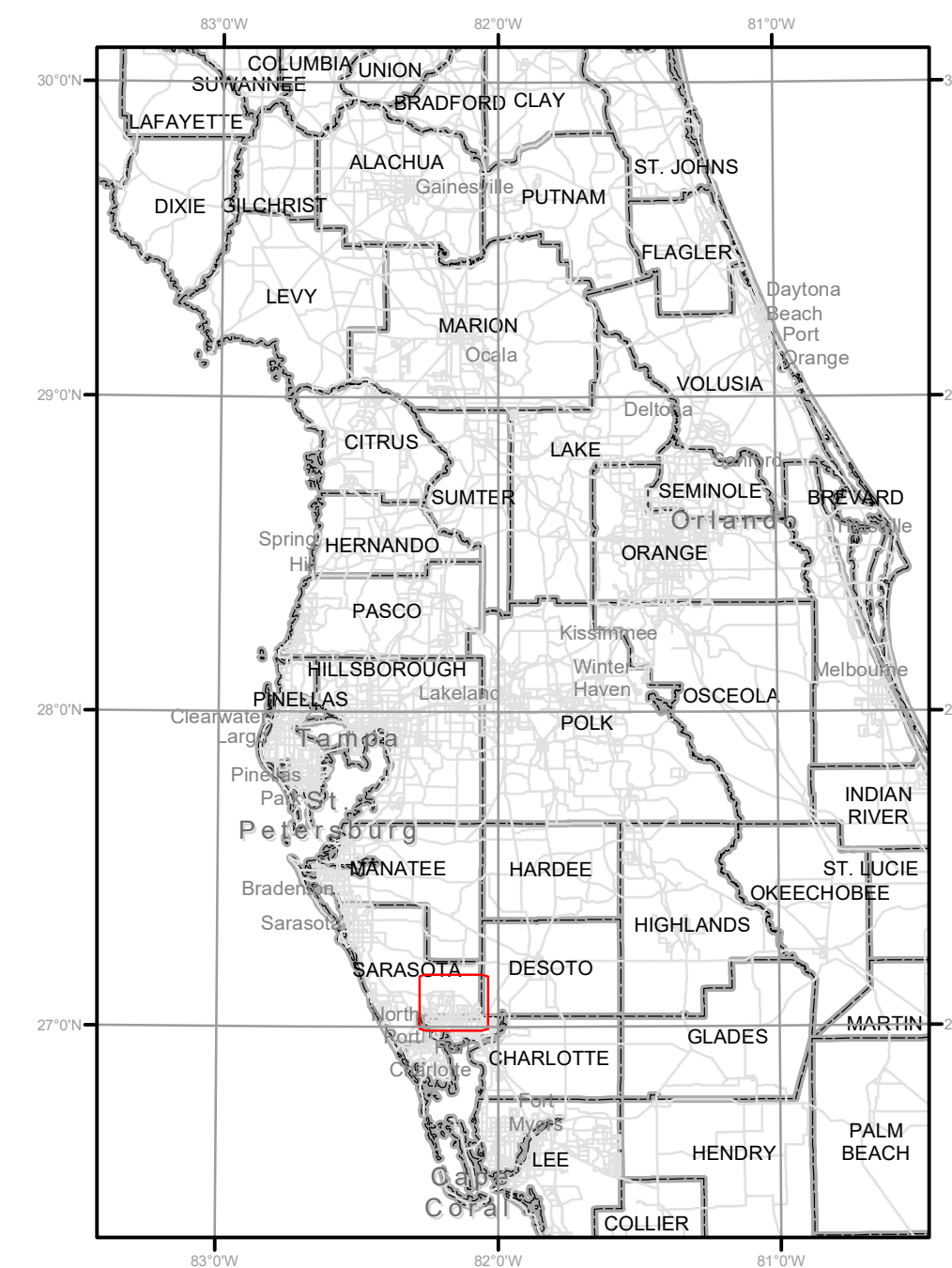


- County Limits
- City of North Port in Big Slough Watershed
- FEMA vs. Ardaman Flooded Area
- No Change
- Decrease
- Increase
- Acreege Change (Absolute Value)
- 0 - 10
- 10 - 25
- 25 - 50
- 50 - 75
- 75 - 115



DESOTO

CHARLOTTE



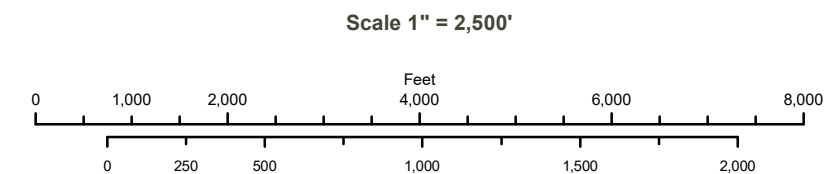
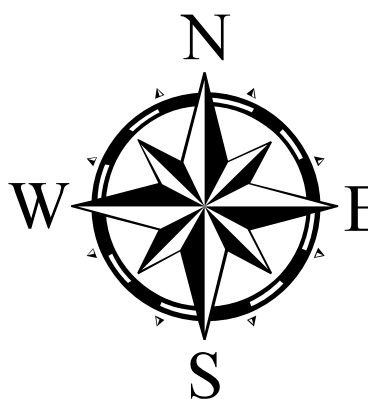
BIG SLOUGH/CITY OF NORTH PORT WATERSHED MANAGEMENT PROGRAM
FEMA VS. ARDAMAN FLOODPLAIN COMPARISON

Project: 075.065
Prepared by: TJC
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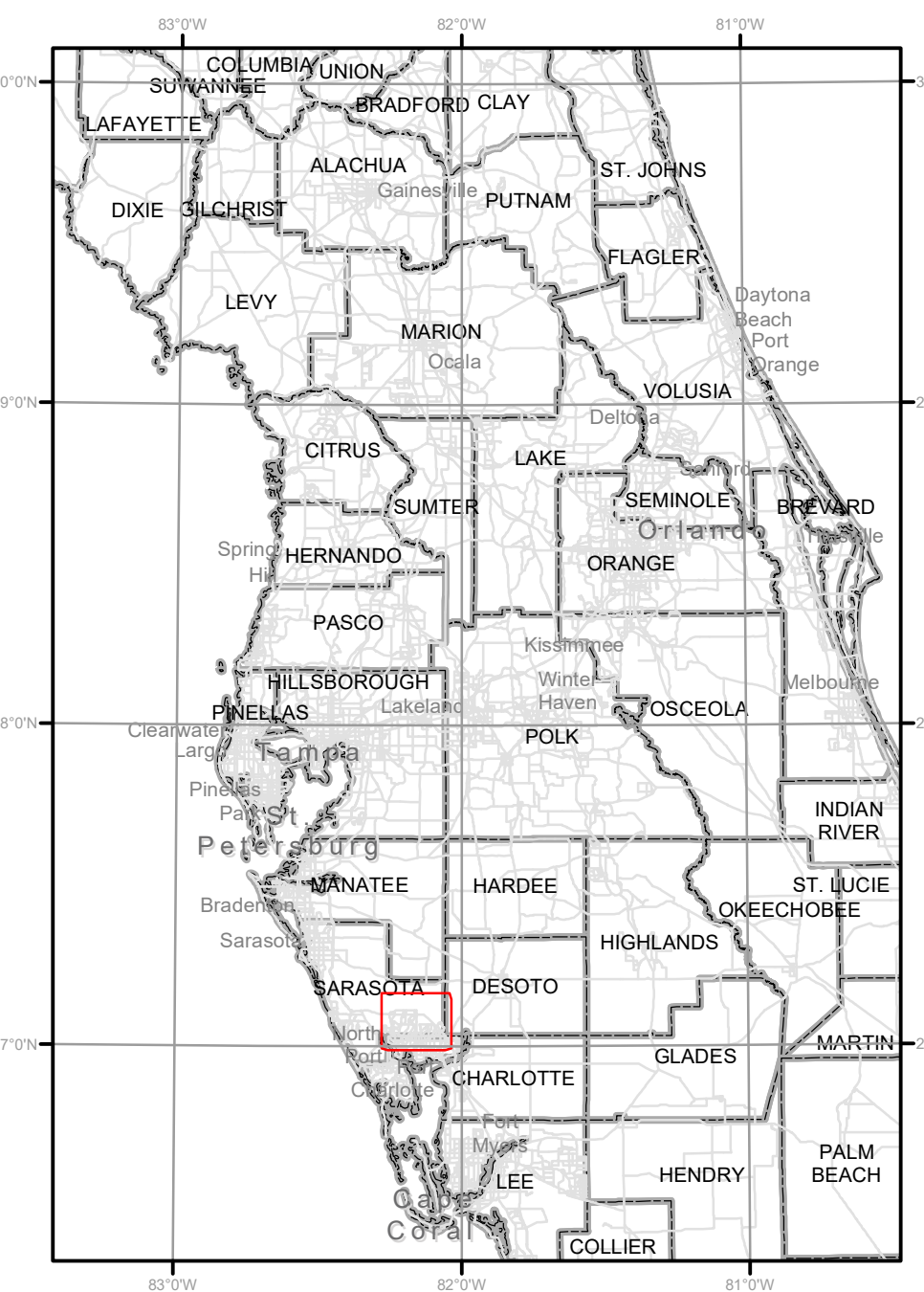
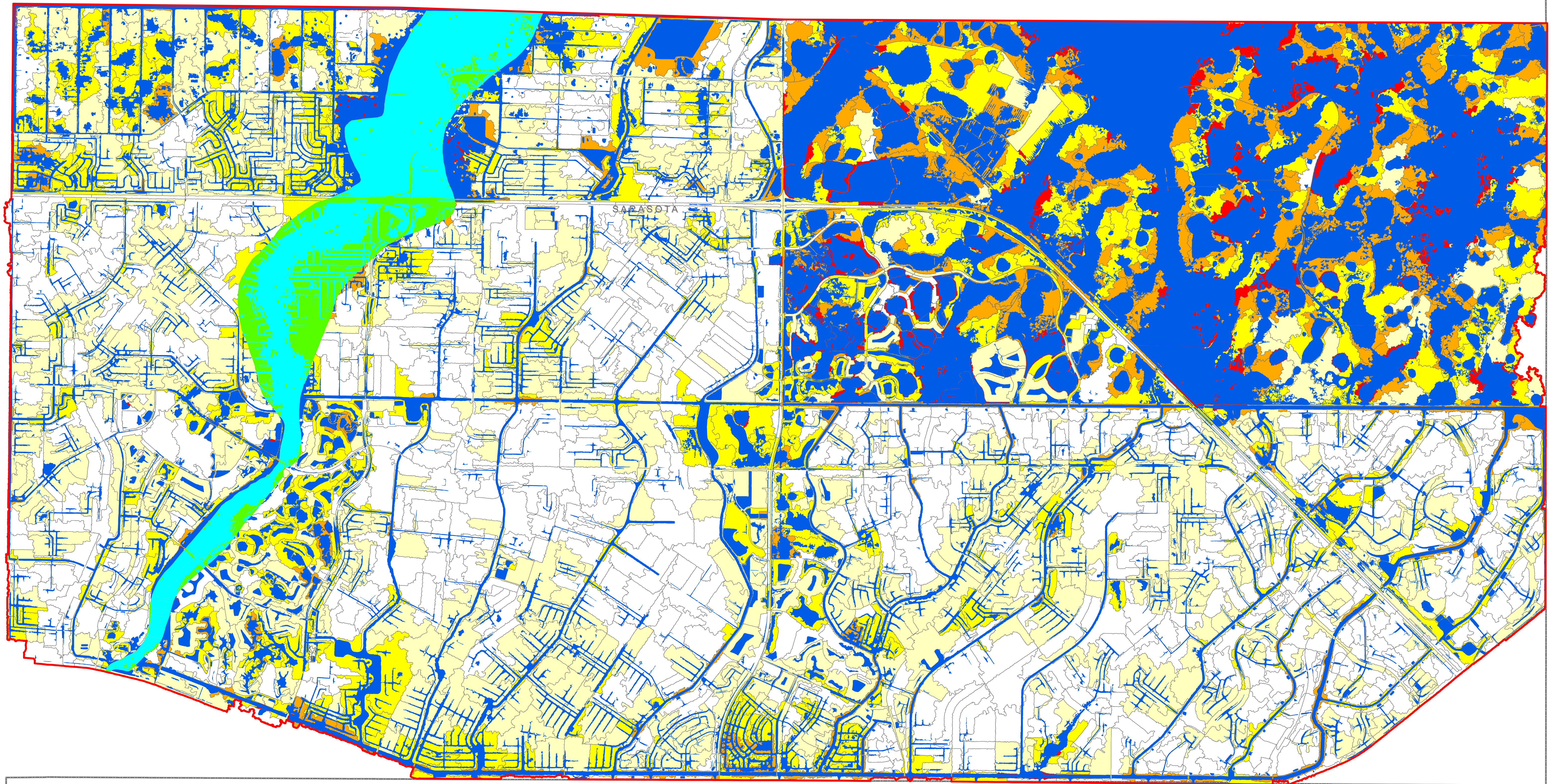
Projection: StatePlane Florida West
Horizontal Datum: NAD83
Vertical Datum: MLLD

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Geotechnical, Environmental and
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Orlando, Florida 32809

MAP 6
PERCENT CHANGE
BY BASIN AREA



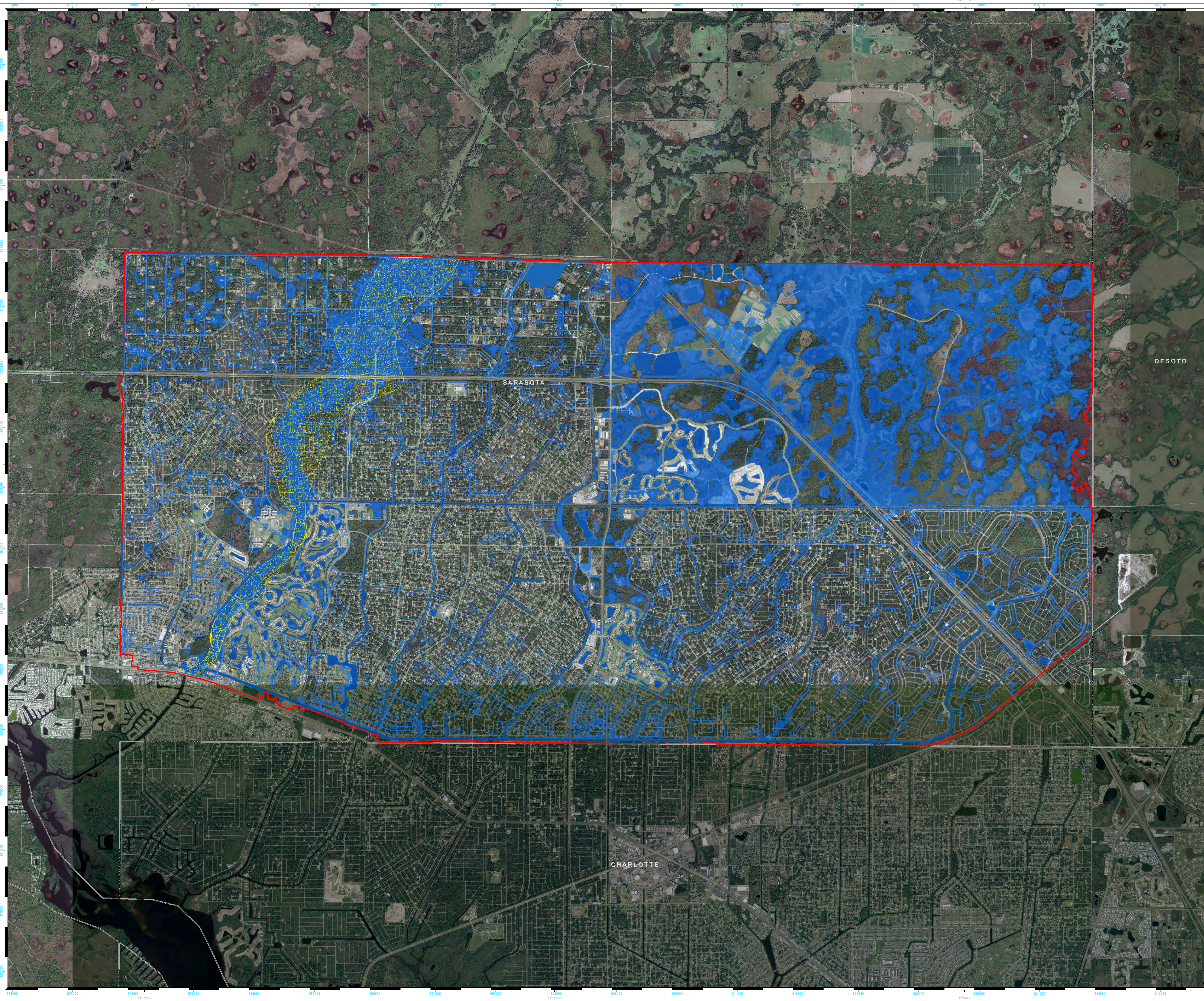
- City of North Port in Big Slough Watershed
- County Limits
- FEMA vs. Ardaman Flooded Area
 - No Change
 - Decrease
 - Increase
- Percent Change (Absolute Value)
 - 0 - 10
 - 10 - 25
 - 25 - 50
 - 50 - 75
 - 75 - 100



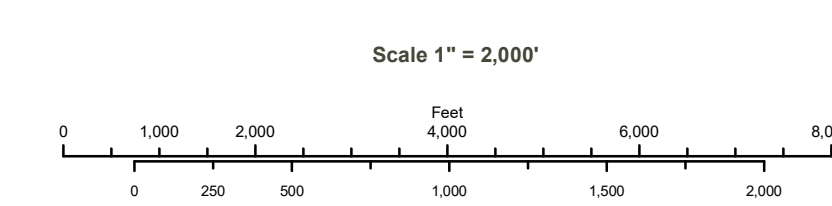
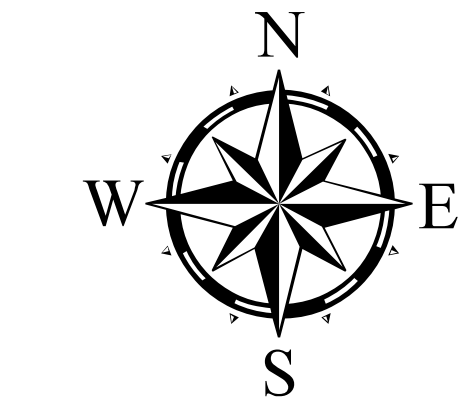
Project: 03-066	Proportion: Stateplane Florida West
Prepared: 12-9-2010	Horizontal Datum: NAD83
Prepared by: TJC	Modified by:
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BIG SLOUGH/CITY OF NORTH PORT WATERSHED MANAGEMENT PROGRAM
FEMA VS. ARDAMAN FLOODPLAIN COMPARISON

Ardaman & Associates, Inc.
Geotechnical, Environmental and
Materials Consultants
Phone: 407-855-3860 Fax: 407-859-8121
8008 South Orange Avenue
Orlando, Florida 32809



MAP 7 FLOOD RISK COMPARISON

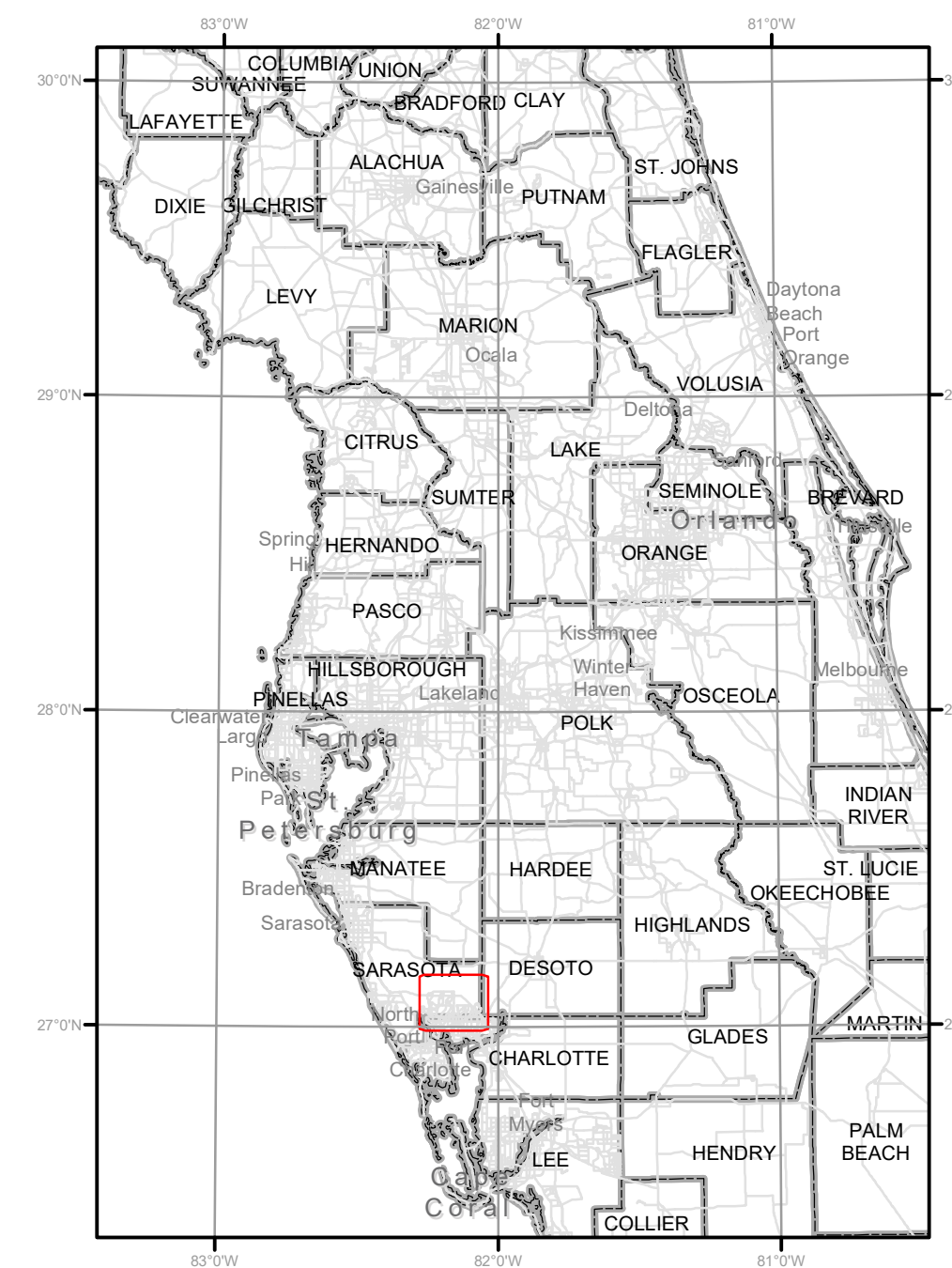


City of North Port in Big Slough Watershed

FEMA Floodplain

Ardaman 2010 Floodplain

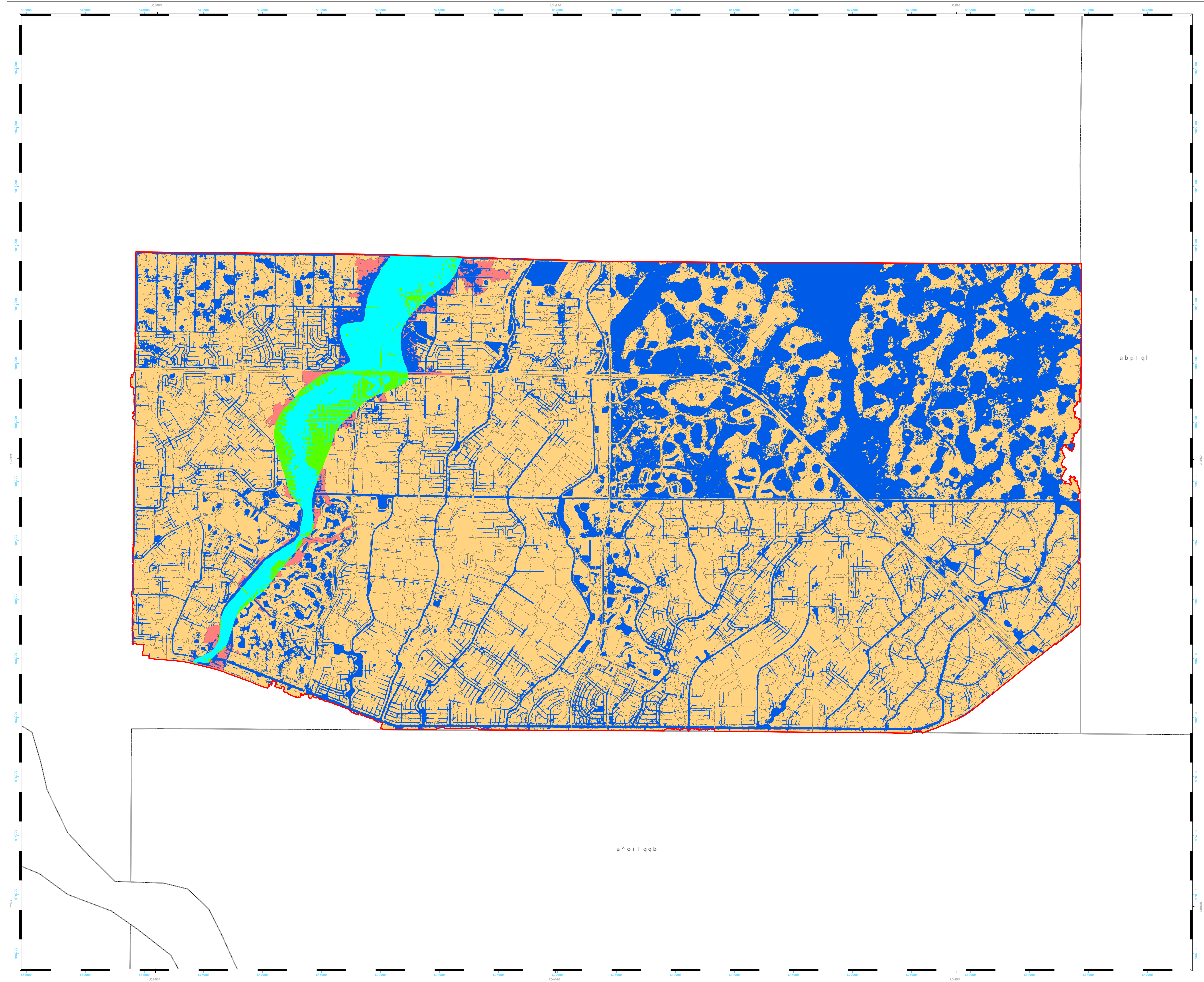
	Acres	Parcels
FEMA	1,825	2,370
Ardaman 2010	13,544	2,630



Project: 03-066
Prepared: 12-9-2010
Modified: TJC
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Projection: StatePlane Florida West
Horizontal Datum: NAD83
Vertical Datum: MLLD
Modified: TJC

BIG SLOUGH/CITY OF NORTH PORT WATERSHED MANAGEMENT PROGRAM FLOOD RISK COMPARISON



North arrow pointing up, labeled N, S, E, W.

Scale 1" = 2,000'

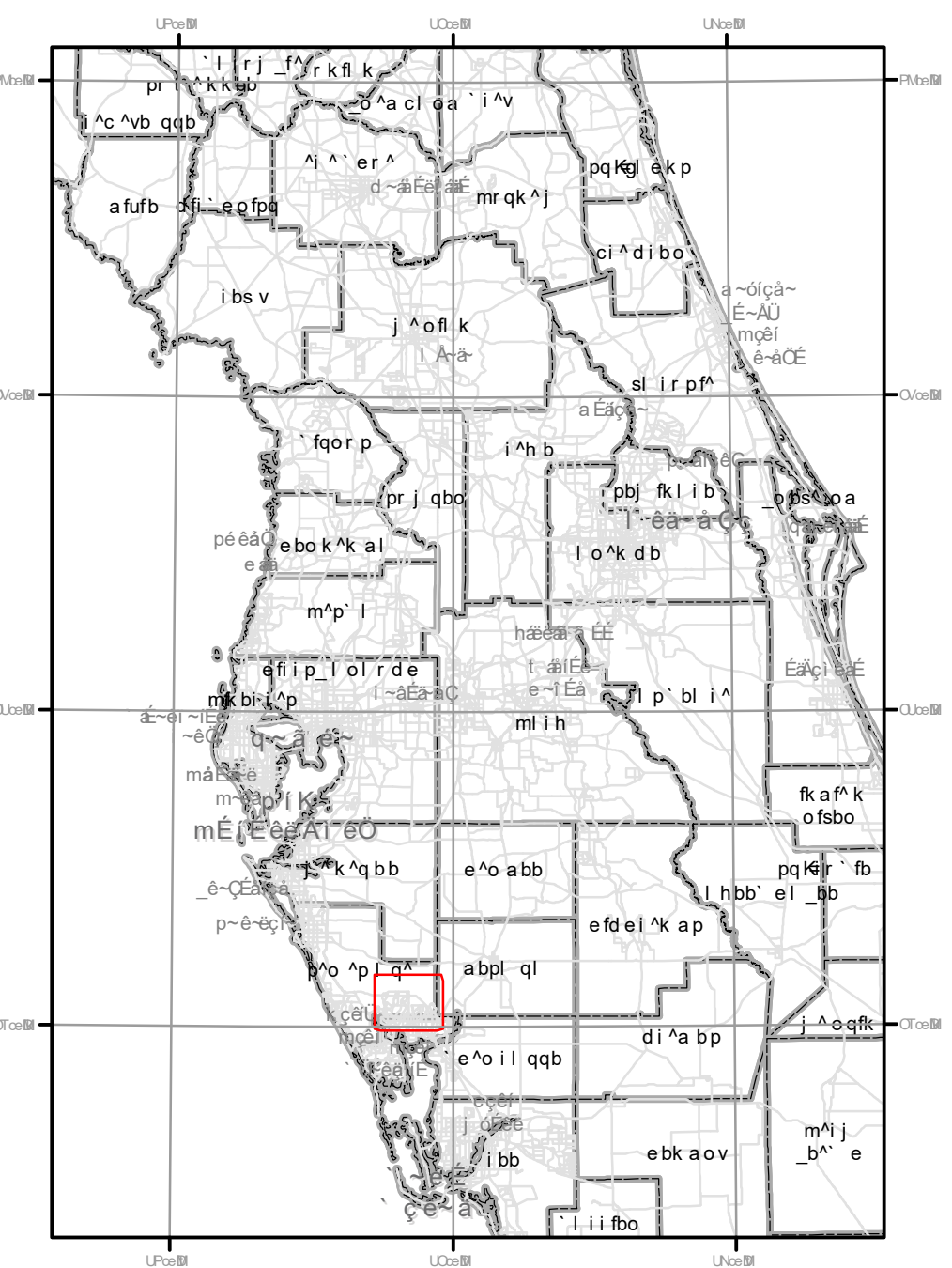
Graphic scale bar showing distances in feet (0 to 1000) and miles (0 to 1).

Legend

- Blue line: Major Road
- Yellow area: FEMA vs. Ardaman Flooded Area
- Blue area: FEMA Flooded Area
- Green area: FEMA Flooded Area
- Red area: FEMA Flooded Area

Reason for Floodplain Change

Map showing the reason for floodplain change, with areas colored red, yellow, and blue.



PROJECT NAME	PROJECT LOCATION	PROJECT NUMBER
BIG SLOUGH/CITY OF NORTH PORT WATERSHED MANAGEMENT PROGRAM	86000 87000 88000 89000 90000 91000 92000 93000 94000 95000 96000 97000 98000 99000 100000 101000 102000 103000 104000 105000 106000 107000 108000 109000 110000 111000 112000 113000 114000 115000 116000 117000 118000 119000 120000 121000 122000 123000 124000 125000 126000 127000 128000 129000 130000 131000 132000 133000 134000 135000 136000 137000 138000 139000 140000 141000 142000 143000 144000 145000 146000 147000 148000 149000 150000 151000 152000 153000 154000 155000 156000 157000 158000 159000 160000 161000 162000 163000 164000 165000 166000 167000 168000 169000 170000 171000 172000 173000 174000 175000 176000 177000 178000 179000 180000 181000 182000 183000 184000 185000 186000 187000 188000 189000 190000 191000 192000 193000 194000 195000 196000 197000 198000 199000 200000	100000 101000 102000 103000 104000 105000 106000 107000 108000 109000 110000 111000 112000 113000 114000 115000 116000 117000 118000 119000 120000 121000 122000 123000 124000 125000 126000 127000 128000 129000 130000 131000 132000 133000 134000 135000 136000 137000 138000 139000 140000 141000 142000 143000 144000 145000 146000 147000 148000 149000 150000 151000 152000 153000 154000 155000 156000 157000 158000 159000 160000 161000 162000 163000 164000 165000 166000 167000 168000 169000 170000 171000 172000 173000 174000 175000 176000 177000 178000 179000 180000 181000 182000 183000 184000 185000 186000 187000 188000 189000 190000 191000 192000 193000 194000 195000 196000 197000 198000 199000 200000

BIG SLOUGH/CITY OF NORTH PORT WATERSHED MANAGEMENT PROGRAM

Map showing the reason for floodplain change, with areas colored red, yellow, and blue.

Ardaman & Associates, Inc.
Geotechnical, Environmental and
Materials Consultants
100000 101000 102000 103000 104000 105000 106000 107000 108000 109000 110000 111000 112000 113000 114000 115000 116000 117000 118000 119000 120000 121000 122000 123000 124000 125000 126000 127000 128000 129000 130000 131000 132000 133000 134000 135000 136000 137000 138000 139000 140000 141000 142000 143000 144000 145000 146000 147000 148000 149000 150000 151000 152000 153000 154000 155000 156000 157000 158000 159000 160000 161000 162000 163000 164000 165000 166000 167000 168000 169000 170000 171000 172000 173000 174000 175000 176000 177000 178000 179000 180000 181000 182000 183000 184000 185000 186000 187000 188000 189000 190000 191000 192000 193000 194000 195000 196000 197000 198000 199000 200000

Appendix C

**Watershed Management Program Consulting Services in the Big Slough Watershed (K883),
Best Management Practices (BMP) Analysis Final Report**

Ardaman & Associates, Inc., September 2014

**Watershed Management Program Consulting Services
in the Big Slough Watershed (K883)**

**Best Management Practices (BMP) Analysis
Final Report**

**Prepared for
Southwest Florida Water Management District
&
City of North Port**

**Prepared by
Ardaman & Associates, Inc.**

September 2014

TABLE OF CONTENTS

LIST OF TABLES	iii
LIST OF FIGURES	iv
LIST OF APPENDICES	vi
1.0 INTRODUCTION.....	1
1.1 Authorization.....	1
1.2 Project Location and General Description	1
1.3 Purpose and Objectives.....	1
1.4 Previous Reports	2
2.0 CHARACTERIZATION OF FLOOD PRONE AREAS	3
2.1 Hydrologic Inventory	3
2.1.1 Subbasin Delineation Process	3
2.1.2 Tributary Subbasins and Characterization.	4
2.1.3 Tributary Land Use Characterization.....	5
2.1.4 Tributary Soil Characterization.	6
2.1.5 Tributary Hydrologic Parameterization	8
2.2 Hydraulic Feature Inventory.....	9
2.2.1 Hydraulic Feature Inventory	9
2.2.2 Summary of Water Body Features by Tributary and Type	10
2.2.3 Summary of Conveyance Features by Tributary and Type	11
2.2.4 Tributary Hydraulic Connectivity.....	12
2.3 Magnitude of Present Flooding.....	12
2.3.1 Identification of Flooded Areas	13
2.3.2 Estimated Number of Structures Flooded (10-, 25-, and 100-year)	13
2.3.3 Emergency and Evacuation Route Inundation (10-, 25-, and 100-year) ...	13
3.0 ALTERNATIVE BMP FORMULATION.....	14
3.1 BMP Development Process.....	14
3.2 Alternative BMP Concepts.....	14
3.3 Alternative BMP Evaluation	14
3.3.1 Regional BMPs:.....	15

3.3.1.1	BMP #1: Remove Structures throughout City of North Port Waterways	16
3.3.1.2	BMP #2: Constrain Flow Entering City Of North Port at Big Slough Canal	18
3.3.1.3	BMP #3: Diversion Alternative.....	20
3.3.1.4	BMP #4: R-580 Improvements	22
3.3.1.5	BMP #5: Increase Capacity on Southern Boundary	24
3.3.1.6	BMP #6: Upstream Detention Alternative.....	26
3.3.2	BMP Evaluation of Four Crossings.....	28
3.3.2.1	R-36 Canal at I-75 Evaluation	28
3.3.2.2	Myakkahatchee Creek at I-75 Evaluation.....	29
3.3.2.3	R-36 Canal at Tropicaire Boulevard Evaluation	30
3.3.2.4	Myakkahatchee Creek at Tropicaire Boulevard Evaluation.....	30
3.3.3	WCS-162 Evaluation	34
3.3.3.1	R-36 Canal Drawdown Evaluation	34
3.3.3.2	Storm Events Simulation Results	34
3.3.4	Price Boulevard LOS Improvements	37
3.3.4.1	West Price Boulevard BMP 1	38
3.3.4.2	West Price Boulevard BMP 2	38
3.3.4.3	West Price Boulevard BMP 3	39
3.3.4.4	Other Evaluated BMPs.....	39
3.3.4.5	Summary and Recommendations	40
4.0	CONCEPTUAL PERMIT APPLICATION	41
5.0	Conclusions.....	41

LIST OF TABLES

Table 2-1: Subbasin Size Summary per Tributary	5
Table 2-2: Generalized Land Use Summary per Tributary	6
Table 2-3: Hydrologic Soil Group Summary per Tributary	8
Table 2-4: Water Body Size Summary per Tributary	10
Table 2-5: Conveyance Features per Tributary	11
Table 2-6: Open Channel Lengths per Tributary.....	12
Table 2-7: Estimated Lengths of Road Inundation.....	14
Table 3-1: BMP#1 Results Summary.....	17
Table 3-2: BMP#2 Results Summary.....	19
Table 3-3: BMP#3 Results Summary.....	21
Table 3-4: BMP#4 Results Summary.....	23
Table 3-5: BMP#5 Results Summary.....	25
Table 3-6: BMP#6 Results Summary.....	27
Table 3-7: Location and Description of Existing and BMP Conditions	28
Table 3-8: R-36 Canal at I-75 Crossing Evaluation Results Summary	29
Table 3-9: Myakkahatchee Creek at I-75 Crossing Evaluation Results Summary.....	31
Table 3-10: R-36 Canal at Tropicair Boulevard Crossing Evaluation Results Summary	32
Table 3-11: Myakkahatchee Creek at Tropicair Boulevard Crossing Evaluation Results Summary.....	33
Table 3-12: Mean Annual Event Simulated Maximum Stages in R-36 Canal Upstream of WCS-162.....	36
Table 3-13: Summary of West Price Boulevard BMPs	40
Table 5-1: Summary of Parcels to Survey	41

LIST OF FIGURES

- Figure 2-1: 10 Year Level of Service
- Figure 2-2: 25 Year Level of Service
- Figure 2-3: 100 Year Level of Service
- Figure 3-1: BMP Alternative 1 - 1 Day 100 Year Evaluation
- Figure 3-2: BMP Alternative 2 - 1 Day 100 Year Evaluation
- Figure 3-3: BMP Alternative 3 - 1 Day 100 Year Evaluation
- Figure 3-4: BMP Alternative 4 - 1 Day 100 Year Evaluation
- Figure 3-5: BMP Alternative 5 - 1 Day 100 Year Evaluation
- Figure 3-6: BMP Alternative 6 - 1 Day 100 Year Evaluation
- Figure 3-7: Model Results with Mean Annual Floodplain Comparison and Difference in Max Stages (R-36 Canal at I-75 BMP Evaluation)
- Figure 3-8: Model Results with 1 Day 100 Year Floodplain Comparison and Difference in Max Stages (R-36 Canal at I-75 BMP Evaluation)
- Figure 3-9: Model Results with Mean Annual Floodplain Comparison and Difference in Max Stages (Myakkahatchee Creek at I-75 BMP Evaluation)
- Figure 3-10: Model Results with 1 Day 100 Year Floodplain Comparison and Difference in Max Stages (Myakkahatchee Creek at I-75 BMP Evaluation)
- Figure 3-11: Model Results with Mean Annual Floodplain Comparison and Difference in Max Stages (R-36 Canal at Tropicaire Boulevard BMP Evaluation)
- Figure 3-12: Model Results with 1 Day 100 Year Floodplain Comparison and Difference in Max Stages (R-36 Canal at Tropicaire Boulevard BMP Evaluation)
- Figure 3-13: Model Results with Mean Annual Floodplain Comparison and Difference in Max Stages (Myakkahatchee Creek at Tropicaire Boulevard BMP Evaluation)
- Figure 3-14: Model Results with 1 Day 100 Year Floodplain Comparison and Difference in Max Stages (Myakkahatchee Creek at Tropicaire Boulevard BMP Evaluation)
- Figure 3-15: Location of WCS-162
- Figure 3-16: Stage at R-36 Canal Upstream of WCS-162
- Figure 3-17: Existing Condition LOS and 100 Year Floodplain
- Figure 3-18: Updated Existing Condition 100 Year Floodplain
- Figure 3-19: BMP_1 25 Year Floodplain Comparison
- Figure 3-20: BMP_1 100 Year Floodplain Comparison
- Figure 3-21: BMP_2 100 Year Floodplain Comparison
- Figure 3-22: BMP_3 100 Year Floodplain Comparison
- Figure 5-1: Flooded Parcels to Survey

LIST OF APPENDICES

Appendix A: 2014 Survey Data of WCS-162

Appendix B: WCS-162 Pictures

Appendix C: 2014 Survey Data of West Price Boulevard

Appendix D: Canal Cross-sections and Profiles

Appendix E: Preliminary Cost Estimates

1.0 INTRODUCTION

As described in the Southwest Florida Water Management District's Watershed Management Program Guidelines and Specifications, Best Management Practice (BMP) Alternatives Analysis involves modification of the existing model condition to evaluate best management practices, to address the enhancement and protection of natural systems, recharge, and water quality while achieving flood protection.

BMP alternatives analysis involves the use and modification of the existing model condition to evaluate BMPs, to address habitual flooding conditions while ensuring no adverse impact.

Best management practices (BMP) is a phrase which means the best available techniques to reduce harmful environmental impacts. Usually, BMPs for urban watershed management are storage devices that temporarily store and/or treat urban runoff to reduce flooding and/or remove pollutants. For this task, the following alternative methods were evaluated with the unique purpose of reducing flooding: flow diversion, conveyance improvements, detention, exclusion of all existing drop structures and water control structures (WCS), and modification of gated structure and raising road elevations.

1.1 Authorization

Ardaman and Associates was contracted by the Southwest Florida Water Management District to conduct specific tasks of a Watershed Management Program for the North Port/Big Slough Watershed. The project was initiated in July 2003 and a series of work orders were issued. Work order number 4, issued in August 2005, included BMP alternative analysis for the North Port/Big Slough watershed.

1.2 Project Location and General Description

The Big Slough Watershed is located in southeastern Sarasota County, and the slough is tributary to the Myakka River. Portions of the incorporated City of North Port (those areas east of the Myakka) are located within the southern portion of the watershed. The 195.5 square mile watershed encompasses numerous depressional features, including wetlands and water bodies, the most prominent of which is the Big Slough Canal (also called Myakkahatchee Creek in its lower reaches). The Big Slough Canal passes from north to south through the City of North Port, and receives inflows from an internal system of waterways which provide surface drainage throughout the City, before discharging beneath U.S. Highway 41 toward its confluence with the Myakka River. The Big Slough Watershed and portions of the City of North Port are traversed from east to west by Interstate Highway 75.

1.3 Purpose and Objectives

The objective of this study is to evaluate BMP alternatives that would solve flooding conditions within the City of North Port. Existing condition model results and Floodplain

Level of Service (LOS) were used to identify present watershed flooding condition. Various BMP concepts and alternatives were evaluated for their effectiveness in solving flooding problems, permitability, and economic viability.

1.4 Previous Reports

Over the course of the project, numerous interim reports have been submitted along with supporting data to SWFWMD and City of North Port. Those prior reports contain additional details and supporting documentation regarding these tasks completion, and include the following:

WO#1 – Watershed Evaluation

- Task 1.1.2.1 – Existing Watershed Feature Data Evaluation and Assembly
- Task 1.1.2.2 – Sub-basin delineations and landuse inventory

WO#2 – Watershed Evaluation

- Task 1.1.2 – Watershed Evaluation
 - 1.1.2.2 Hydrologic Feature Inventory
 - 1.1.2.3 Hydraulic Feature Inventory
 - 1.1.2.4 Field Reconnaissance
 - 1.1.2.5 ID of Surveys to be Completed by a PLS
 - 1.1.2.6 Preliminary Junction/Reach Coverage Development
 - 1.1.2.7 SW Assessment Inventory and Approach Development
 - 1.1.2.9 Watershed Evaluation Deliverables

WO#3 – Watershed Evaluation

- Task 2.3.1 – Surveys by a Professional Land Surveyor

WO#4 – Watershed Management Plan

- Task 1.1.3.2 – Watershed Parameterization
- Task 1.1.3.3 – Watershed Model Development & Verification
- Task 1.1.3.4 – Floodplain Analysis and Delineation Report
- Task 1.1.3.5a – Level of Service Determination – original analysis
- Task 1.1.3.5b – Level of Service Determination – with model maintenance
- Task 1.1.3.7a – BMP Alternative Formulation Report – original analysis
- Task 1.1.3.7a – BMP Evaluation of Four Crossings
- Task 1.1.3.7b – BMP Evaluation Price Boulevard
- Task 1.1.3.7b – BMP Evaluation WCS-162
- Task 1.1.3.7b – Final BMP Report

WO#7 – Maintenance of Watershed Parameters and Models

- Task 2.2.1 – 2004-2007 LiDAR Comparison
- Task 2.3.1.1 – Collect and Evaluate Environmental Resource Permit (ERP) Information
- Task 2.3.4 – Limited Field Reconnaissance

Task 2.3.6 and 2.3.7 – Generic Hydrologic Features and Generic Hydraulic Features

Task 2.3.6, 2.3.7, and 2.4.1 – Generic Hydrologic Features, Generic Hydraulic Features, and Refined Generic and Semi-generic Geodatabase and Parameterization

Task 2.4.1, 2.4.2, 2.4.3 – Refined Generic and Semi-generic Geodatabase and Parameterization, Watershed Computer Simulation Model Development and Verification, and Floodplain Analysis and Delineation

Task 2.4.3 – Floodplain Analysis and Delineation

Task N/A – Justification Report and Peer Review Presentation

WO#8 – Maintenance of Watershed Parameters and Models

Task 2.2.2 – 2007 LiDAR Review

WO#12 – Maintenance of Watershed Parameters and Models

Task 2.4.11 - Floodway Analysis Report

2.0 CHARACTERIZATION OF FLOOD PRONE AREAS

The Big Slough watershed is located in the Gulf coastal lowlands of southwestern Florida, characterized by flat topography and sandy, shelly and silty sand soils with little organic matter. Its headwaters are rural, consisting primarily of agricultural and undeveloped lands. A vast majority of urban and built up lands occur in the southern portion of the watershed, within in the City of North Port. Commercial development is generally limited to main thoroughfares within the city, especially along the US 41 corridor. Myakkahatchee Creek/Big Slough Canal begins in the southeastern part of Manatee County (near Edgeville) and flows approximately 21 miles through the City of North Port and ultimately empties to the estuarine portion of the Myakka River.

2.1 Hydrologic Inventory

2.1.1 Subbasin Delineation Process

Subbasin delineations were performed to support watershed parameterization and modeling. The subbasins were delineated using Arc Hydro Tools with LiDAR-based terrain data, where available. The surface model was prepared for “automated” subbasin delineation by combining the large terrain models with highly detailed secondary flow path information. The secondary flow paths were digitized based on scanned and orthorectified as-built information, terrain model features, and field observations of drainage patterns.

A set of protocols was developed for assigning subbasin break points, to allow for batch processing of the watershed using the delineation tools. As a result of pre-processing the surface model in the manner described here, the Arc Hydro tools were better able to recognize surface drainage characteristics and provide accurate subbasin delineations for use in model parameterization. In those areas where LiDAR was not available, other

topographic and drainage delineation information was employed to support automated and manual delineations.

2.1.2 Tributary Subbasins and Characterization.

Tributary areas were defined primarily by grouping surface storage features according to their connectivity (via culverts) or primary overflow paths (across topographic saddles). Open channel conveyance systems were also used to identify unique tributary areas. Each tributary area could then be summarized using GIS to describe unique characteristics, as discussed below.

Subbasin sizes range throughout the study area from 0.33 to 1,673.79 acres. Table 2-1 summarizes subbasin size by tributary area.

Table 2-1: Subbasin Size Summary per Tributary

Tributary ID	Count	Minimum	Maximum	Average
A	60	0.33	36.00	9.17
B	1282	0.06	1244.70	30.97
C	339	0.12	61.14	9.91
D	67	1.23	75.40	26.24
E	210	0.19	151.42	10.30
F	54	0.32	83.20	20.68
G	130	0.32	66.63	11.58
H	42	0.77	35.93	11.87
I	58	0.86	71.29	21.11
J	153	0.60	69.53	14.49
K	188	0.63	79.83	10.53
L	33	0.70	70.08	24.53
M	84	1.38	1040.82	133.85
N	119	0.16	28.22	8.22
O	76	0.88	82.72	15.89
P	38	0.11	120.69	13.19
Q	288	1.04	167.71	25.23
R	263	0.42	234.44	21.53
S	361	0.28	1139.68	21.10
T	65	0.28	45.34	13.73
U	799	0.03	410.92	24.79
V	116	0.42	89.73	14.68
W	29	15.55	1673.79	320.55
X	42	0.36	32.10	9.11
Y	84	0.24	47.38	12.87
Z	36	0.41	54.12	17.78

2.1.3 Tributary Land Use Characterization

While the headwaters of the Big Slough Watershed remain predominantly undeveloped or agricultural, changes in land uses throughout the City of North Port reflect significant population growth, with continued commercial and industrial growth along the US 41 corridor and the Price Boulevard intersections with Sumter Boulevard and Toledo Blade Boulevard.

Land use types were acquired as a GIS coverage from the SWFWMD and updated using 2004 aerial photography. Table 2-2 summarizes generalized land use encountered and respective percent areas of coverage, by tributary.

Table 2-2: Generalized Land Use Summary per Tributary

Tributary ID	Residential	Com/Industrial	Upland/Open	Water/Wetland
A	10.55	0.00	86.54	2.91
B	9.06	1.41	66.33	23.19
C	51.87	6.30	34.51	7.32
D	97.99	0.06	0.18	1.77
E	64.02	2.86	24.11	9.02
F	89.64	2.37	5.43	2.56
G	85.46	0.19	10.80	3.56
H	24.47	0.51	33.01	42.01
I	73.04	3.46	16.82	6.68
J	76.21	3.39	16.98	3.42
K	34.18	3.62	58.39	3.81
L	65.17	0.48	25.84	8.51
M	2.02	0.22	75.29	22.47
N	0.32	4.18	88.79	6.71
O	85.80	0.15	11.00	3.04
P	67.31	2.43	11.53	18.73
Q	0.00	0.75	71.86	27.39
R	32.98	0.78	40.77	25.48
S	16.20	2.33	56.24	25.22
T	57.69	5.05	27.44	9.82
U	1.18	1.95	62.64	34.23
V	35.95	7.19	36.04	20.82
W	1.49	0.27	79.92	18.32
X	76.68	2.32	8.57	12.42
Y	85.27	4.58	9.13	1.03
Z	98.90	0.00	0.00	1.10

2.1.4 Tributary Soil Characterization.

Low permeability, hydric soils associated with depressional areas and flood plains are predominant within the study area.

Soil types were identified using soil survey data for Sarasota, Charlotte, Manatee and DeSoto Counties acquired as a GIS coverage from SWFWMD. Individual soil types were categorized according to their runoff potential. In order to perform that categorization, the hydrologic soil group of each soil was defined according to the relevant soil survey reports. A brief discussion of each hydrologic soil group's characteristics is provided below.

HYDROLOGIC SOIL GROUP A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively well drained sands or gravelly sands. These soils have a high rate of water transmission.

HYDROLOGIC SOIL GROUP B. Soils having a moderate infiltration when thoroughly wet. These consist mainly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

HYDROLOGIC SOIL GROUP C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

HYDROLOGIC SOIL GROUP D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have high shrink-swell potential, soils that have a permanent high water table, soils that have a clay pan or clay layer at or near the surface, and soils that are shallow over nearly impervious material.

Some soil types are classified as belonging to dual hydrologic soil groups, such as A/D, B/D, or C/D. These ratings mean that, under natural conditions, the soil is classified as belonging to hydrologic soil group D, but by artificial methods the water table could be lowered sufficiently so that the soil would fit into a lower runoff potential category.

Table 2-3 presents a summary of hydrologic soil groups encountered (with dual classified groups assigned to the un-drained condition "D") and respective percent areas of coverage.

Table 2-3: Hydrologic Soil Group Summary per Tributary

Tributary	Hydrologic Soil Coverage Area %								
	A	A/D	B	B/D	C	C/D	D	UND	W
A	0.00	0.00	0.00	70.01	0.36	0.88	28.75	0.00	0.00
B	0.00	0.00	0.09	70.30	1.07	0.04	28.16	0.23	0.10
C	0.00	0.06	0.00	61.51	7.64	0.87	25.03	0.00	4.89
D	0.00	0.00	0.00	71.73	0.09	0.21	27.98	0.00	0.00
E	0.00	0.00	0.00	77.85	0.71	0.91	18.81	0.00	1.73
F	0.00	0.00	0.00	63.79	0.00	1.48	34.73	0.00	0.00
G	0.00	0.00	0.00	50.55	0.04	0.00	49.41	0.00	0.00
H	0.00	0.00	0.00	90.15	5.12	0.00	4.73	0.00	0.00
I	0.00	0.00	0.00	66.44	0.06	0.77	32.73	0.00	0.00
J	0.00	0.00	0.00	65.84	0.00	0.85	33.09	0.00	0.22
K	0.00	0.00	0.00	70.16	0.08	1.21	28.08	0.00	0.47
L	0.00	0.00	0.00	50.53	0.00	1.90	47.57	0.00	0.00
M	0.38	0.00	0.36	77.05	4.82	0.00	17.38	0.01	0.00
N	0.00	0.00	0.00	68.48	0.00	0.45	29.89	0.00	1.18
O	0.00	0.00	0.00	67.36	0.00	0.00	32.50	0.14	0.00
P	0.00	0.00	0.00	75.24	0.00	0.12	24.64	0.01	0.00
Q	0.00	0.00	0.00	64.78	0.00	0.13	35.09	0.00	0.00
R	0.00	0.00	0.00	65.45	0.00	0.90	33.62	0.02	0.00
S	0.00	0.00	0.00	63.35	0.00	0.07	36.57	0.00	0.00
T	0.00	0.00	0.00	70.31	0.00	0.52	29.17	0.00	0.00
U	0.00	0.00	0.00	64.62	0.00	0.01	34.98	0.00	0.39
V	0.00	0.00	0.00	48.77	0.00	0.00	51.23	0.00	0.00
W	0.61	0.00	0.25	75.03	11.94	0.00	12.17	0.00	0.00
X	0.00	0.00	0.00	56.73	0.00	0.00	42.64	0.00	0.64
Y	0.00	0.00	0.00	70.24	0.00	0.15	29.61	0.00	0.00
Z	0.00	0.00	0.00	73.02	0.00	3.30	23.69	0.00	0.00

2.1.5 Tributary Hydrologic Parameterization

Subbasin parameterization was performed in order to assign values for hydrologic model development, including: Time of Concentration (Tc), Runoff Curve Number (CN), Percentages of imperviousness, and Peak Rate Factor (K').

Time of Concentration (Tc) is generally defined as the amount of time it takes for a drop of water to travel from the most hydrologically distant point in a basin to the point where that basin discharges to a receiving water body (represented in the model as a node). It is used as a parameter in the computation of a runoff hydrograph, when using the SCS Unit Hydrograph method for hydrograph generation.

The Tc computation was made according to techniques recommended in TR-55 by the National Resource Conservation Service. According to that methodology, runoff generally moves along the surface of a basin as sheet flow, shallow concentrated flow, open channel flow, or some combination of these until it is intercepted by a storage or conveyance system. Travel times for each flow segment are computed and summed, yielding a time of concentration for the basin. Further adjustments can be made to account for movement through ponds, storm sewers and the like in order to account for additional travel time, when not accounted for in the modeled conveyance system.

Travel segment data for this study was developed using aerial photography, one foot SWFWMD 1"=200' scale aerial imagery, 2-foot SWFWMD digital photogrammetric contours and the digital terrain model to define travel paths, lengths, slopes and land cover for sheet and shallow concentrated flow segments. For open channel segments, cross sectional geometry and roughness values were estimated, and lengths and slopes taken from the terrain model. For conveyance systems (such as pipes, channels, embedded ponds and wetlands) a velocity method was employed to adjust times of concentration.

Runoff Curve Numbers were developed for each subbasin, based on land use and hydrologic soil group designations. Using GIS, basin, land use and soils polygon coverages were intersected with one another, resulting in the creation of a single composite polygon coverage. Each polygon in the composite coverage contains a land use code, a hydrologic soil group, and a basin assignment. Combinations of land use and soils were then used, along with a lookup table of curve number values, to define area-weighted runoff curve numbers within each basin. Percentages of imperviousness were developed in a like manner, based on land use within each subbasin area. Runoff curve numbers that were employed in this analysis were representative of average antecedent moisture conditions (AMC-II) and were adapted from tables provided in the NRCS publication, TR-55.

The peak rate factor (K') is a numeric value used to describe the shape of a unit hydrograph for a basin. The peak rate factor varies from one basin to another. Throughout the state, typical values applied by hydrologists range from 256 to 484, with even lower values applied in flat, swampy areas. A peak rate factor of 256 was used for all subbasins within the Big Slough watershed. That value is most appropriate in basins that exhibit little topographic relief, which includes the vast majority of all subbasins delineated in the study area.

2.2 Hydraulic Feature Inventory

2.2.1 Hydraulic Feature Inventory

An inventory of hydraulic features within the watershed area was initially performed using digital aerial photography, as-built and ERP data, in order to identify conveyance structures, open channels, SMSAs, lakes and wetlands greater than one acre in area throughout the watershed. Each feature was assigned a unique HYD-ID, as an identifier for subsequent field reconnaissance and survey. The hydraulic feature inventory served as an initial database of features to be incorporated into a model database for simulation.

2.2.2 Summary of Water Body Features by Tributary and Type

Wetlands and water bodies of varying size are located throughout the watershed area. Named water bodies include: Big Slough Canal or Myakkahatchee Creek, Cocoplum Water Way, Snover Water Way and a series of named internal water ways providing surface drainage for the City of North Port. Area lakes range in size from 1.0 to 125 acres. In addition, numerous retention and detention ponds are present, providing stormwater attenuation and water quality treatment throughout the area. Table 2-4 presents a summary of water bodies and their sizes in each tributary.

Table 2-4: Water Body Size Summary per Tributary

Tributary	Count	Minimum Area (acres)	Maximum Area (acres)	Average Area (acres)
A	0	0.00	0.00	0.00
B	386	0.20	110.46	4.90
C	9	0.60	2.77	1.72
D	0	0.00	0.00	0.00
E	37	0.19	25.93	3.06
F	1	3.99	3.99	3.99
G	9	1.26	17.93	3.93
H	10	0.77	12.99	3.98
I	11	0.07	12.23	2.79
J	5	0.40	2.39	1.20
K	3	2.21	11.54	5.96
L	3	2.86	5.06	3.88
M	18	1.01	6.89	3.13
N	6	1.22	13.75	4.75
O	3	1.05	3.04	1.73
P	1	75.40	75.40	75.40
Q	121	1.03	36.57	4.72
R	77	1.22	60.85	9.02
S	112	0.35	35.30	5.72
T	20	1.08	19.34	5.93
U	363	0.13	125.04	5.61
V	12	1.12	30.60	12.98
W	0	0.00	0.00	0.00
X	5	1.18	15.20	7.16
Y	0	0.00	0.00	0.00
Z	0	0.00	0.00	0.00

2.2.3 Summary of Conveyance Features by Tributary and Type

Surface drainage throughout the watershed consists largely of natural sloughs, creeks and numerous manmade ditches and canals. Manmade storage features (SMSA) and natural depressional features (lakes and wetlands) are interconnected by drainage culverts or joined across natural topographic saddles. Table 2-5 summarizes number of conveyance features and Table 2-6 presents lengths of open channels in each tributary.

Table 2-5: Conveyance Features per Tributary

Tributary	Bridge	Channel	Culvert	Riser Pipes	Weir
A	1	23	10	50	175
B	16	382	210	39	3631
C	16	156	108	129	1028
D	0	43	9	3	194
E	0	67	67	50	616
F	0	27	13	1	175
G	1	63	42	28	384
H	2	17	9	13	138
I	0	27	10	17	195
J	0	87	51	1	427
K	4	75	51	77	531
L	0	19	6	0	103
M	0	9	18	0	202
N	2	49	27	69	316
O	0	39	19	13	218
P	0	24	15	0	95
Q	1	65	18	0	867
R	0	114	72	0	752
S	6	104	44	49	1050
T	0	27	19	10	197
U	3	47	116	62	2316
V	1	51	50	5	345
W	1	15	18	0	48
X	0	28	11	0	94
Y	0	49	23	0	239
Z	0	19	11	0	97

Table 2-6: Open Channel Lengths per Tributary

Tributary ID	Count	Minimum (feet)	Maximum (feet)	Average (feet)
A	23	267	1600	780
B	382	124	4819	1173
C	155	193	3674	1011
D	44	252	1896	1067
E	67	221	2110	855
F	27	185	1977	1053
G	64	243	1985	801
H	16	361	2261	908
I	28	293	2347	1179
J	87	255	2844	956
K	75	265	1935	897
L	19	491	2443	1167
M	10	723	5785	2052
N	49	231	2501	882
O	39	260	2186	973
P	24	88	2890	1070
Q	65	367	2677	1300
R	110	384	2878	1449
S	103	257	2309	932
T	26	260	2021	996
U	47	500	4442	1623
V	51	255	2202	786
W	15	1137	4578	2372
X	32	257	2421	1254
Y	49	224	2426	896
Z	19	443	2191	1044

2.2.4 Tributary Hydraulic Connectivity

Connectivity within tributary areas was determined through review of aerial photographs, as-built and construction drawings, topographic data and field investigation. That connectivity is defined and stored in the project database as a node-reach topological relationship.

2.3 Magnitude of Present Flooding

The magnitude of present flooding in the watershed was identified by using the results of floodplain and flood protection level of service (LOS) analyses.

2.3.1 Identification of Flooded Areas

The City of North Port experiences three distinct types of flooding problems. The most severe and the least common problem is a small number of habitable structures near Big Slough that experience flooding in the 100 year event. Also significant and very isolated is major road flooding in 25-year and 100-year events. Finally extensive local road flooding is common even during a smaller storm event. While inconvenient, this local road flooding poses little risk of damage to the citizens' property.

As shown in Figure 2-1, 2-2, and 2-3 (10, 25, and 100-year LOS figures), the majority of flooding within the City is related to street flooding. An arterial street/emergency route (West Price Boulevard), which provides access to the City's emergency facilities, will flood in 10-year or higher storm events.

Most of the habitable structures that flood in a 100-year storm event are located in the neighborhood located adjacent to Big Slough/Myakkahatchee Creek between Cocoplum Waterway and Tropicair Boulevard. Locations of the houses that would flood (model predicted) in a 100-year storm event are shown in Figure 2-3 (100-year LOS figure).

2.3.2 Estimated Number of Structures Flooded (10-, 25-, and 100-year)

Based on the model results, it is estimated that ~5 structures will flood in a 10-year storm event; ~ 7 structures will flood in a 25-year storm event; and ~75 structures will flood in a 100-year storm event within the City of North Port.

Habitable structures were identified by visually inspecting 2008 aerial imagery in the City of North Port, and placing a point in GIS on the topographical high of the 2004/2007 hybrid LiDAR DTM. The elevation of the 2004/2007 hybrid LiDAR DTM at the point was compared with 10-year, 25-year and 100-year modeled maximum stages. Where maximum stages were higher than the habitable structure, it was reported as a flooded structure. Since the surveyed house pad elevations (finished floor elevations) data was not available, the method applied in estimating the number of flooded structures is very approximate.

2.3.3 Emergency and Evacuation Route Inundation (10-, 25-, and 100-year)

Estimated lengths of emergency and evacuation route inundation are presented in Table 2-7. As stated earlier, the majority of flooding within the City is associated with street/road flooding.

Evacuation routes were received from the City of North Port, and emergency routes were identified by Ardaman as the shortest route from an emergency facility to an evacuation route. Street centerlines were acquired from Sarasota County. The positions of all lines were verified in GIS as on the centerline of the road, and moved to the centerline if necessary. Any portion of the centerline of the road that overlapped with the 10-year, 25-year or 100-year floodplain was reported as inundated.

Table 2-7: Estimated Lengths of Road Inundation

Storm Event	Length of Emergency Route Inundation (feet)	Length of Evacuation Route Inundation (feet)
10-year	6,403	1,464
25-year	7,758	3,077
100-year	19,625	7,218

3.0 ALTERNATIVE BMP FORMULATION

According to Southwest Florida Water Management District's Watershed Management Program Guidelines and Specifications (SWFWMD G&S), the generation of best management practices (BMP) alternatives must take into account many watershed management issues in order to formulate an alternative that is permittable, economically viable, and is supported by the public. This study is mainly focused in addressing storm event flooding conditions within the City of North Port.

3.1 BMP Development Process

As described in the SWFWMD G&S, alternatives analysis involves the use and modification of the existing model condition to evaluate BMPs, to address habitual flooding conditions while ensuring no adverse impact.

Best management practice is a phrase which means the best available techniques to reduce harmful environmental impacts. Usually, BMPs for urban watershed management are storage devices that temporarily store and/or treat urban runoff to reduce flooding and/or remove pollutants. For this task, the following alternative methods were evaluated with the unique purpose of reducing flooding: Flow diversion, conveyance improvements, detention and exclusion of all existing drop structures and water control structures (WCS), modification of gated structure and raising road elevations.

3.2 Alternative BMP Concepts

Various BMP alternative concepts evaluated in this study include conveyance improvements, stormwater management storage areas, flood proofing, and flow diversions.

3.3 Alternative BMP Evaluation

BMP alternative evaluations were performed using the existing watershed model and updating it to reflect various BMP scenarios. The following sections provide a brief description of each evaluated BMP alternative and a summary of the evaluation outcome.

3.3.1 Regional BMPs:

BMP alternatives that could potentially improve flooding condition in a large area are considered as regional BMPs. These alternatives could significantly alter the hydrodynamics of the drainage system. Although the alternatives presented in this report might not be permittable or economically viable, they provide a better understanding of the hydraulic response when applying the BMPs to further understand improvement limitations.

Six different regional BMPs were evaluated. Results from each BMP evaluation were compared to a benchmark scenario to evaluate the impact of the BMP. The benchmark scenario used was the 24-hour-100 year existing condition model previously submitted. The storm event used for the evaluations was the 24-hour, 100 year event with a Type II, Florida modified rainfall distribution.

For these analyses, the following GIS procedures were used when comparing the existing condition (Benchmark) and the proposed scenario (BMP):

Three potential analyses were considered when comparing each BMP scenario to the Benchmark Scenario.

- For the first analysis, the geoprocessing tool “Symmetric Difference” was applied with the BMP floodplain and benchmark floodplain as inputs, resulting in flooded area reduction and flooded area increase polygons for each scenario. Flooded area reduction represents area that flooded in the benchmark scenario, but not in the BMP scenario, and flooded area increase represents area that did not flood in the benchmark scenario, but did flood in the BMP scenario. Results were then summarized by sub-watershed in acres.
- The second analysis compared the length of street flooding in the BMP scenarios to length of street flooding in the benchmark scenario. The BMP scenario floodplain shapefile was intersected with the streets shapefile, and the total length of flooding was summarized by sub-watershed. Benchmark flooded street data was obtained from previous analysis per LOS (Level of Service) requirements.
- The final analysis compared the number of flooded parcels in the benchmark scenario to the number of flooded parcels in the BMP scenarios. To determine which parcels were flooded we used the parcels polygon shapefile downloaded from Sarasota County. Elevations were extracted from the LiDAR-based terrain data utilizing the centroid of the parcel as a calculation point, and one foot was added to the calculated elevation to represent buildings on fill material. Parcels in waterways or ponds were eliminated and not considered in these analyses. These elevations were then compared to the maximum stages from the CHAN model output for the BMP and benchmark simulation. Any parcels with elevations less than the maximum stage were considered flooded. The comparisons of the BMP scenario to the benchmark scenario were then broken down by sub-watershed for better understanding of local response to the BMP.

3.3.1.1 BMP #1: Remove Structures throughout City of North Port Waterways

Objective:

The objective of this BMP is to understand current primary drainage system capacity assuming no losses due to water control structures or drop structures within several waterways. Also, additional connectivity was provided among a few R canals southwest of the I-75 corridor to evaluate the response when transferring some of the existing load throughout less compromised areas.

Description:

Water control structures (WCS) and drop structures (DS) depicted in Figure 3-1 were removed and replaced with an equivalent channel section that mimics the immediate upstream canal's section. Also, and as stated before, additional connections were provided between a few existing secondary manmade R canals. Specifically, canal R-36 was hydraulically connected to the R-43 canal via a weir with equivalent channel geometry. Similarly, the R-43 canal was also connected with the R-24 and R-32 (See Figure 3-1).

Results:

Overall results indicate general improvements immediately north of Price Blvd and along Bass Point waterway while increasing flooding between S Toledo Blvd and S Sumter Blvd. Also, improvements are observed southwest of I-75 where supplemental canal connectivity was provided. An initial evaluation suggests that this BMP may not be feasible due to potential loss of potable water supply, fish and wildlife habitat, and wetlands. Please refer to Figure 3-1 and Table 3-1 for a summary of BMP#1 analysis results.

Table 3-1: BMP#1 Results Summary

Sub-Watershed	Bench Mark Total Flooded Area (Acres)	BMP1 Total Flooded Area (Acres)	BMP1 Total Flooded Area Change (%)	Bench Mark Flooded Street Length (Feet)	BMP1 Flooded Street Length (Feet)	BMP1 Flooded Street Length Change (%)	Bench Mark Flooded Parcels (Units)	BMP1 Flooded Parcels (Units)	BMP1 Flooded Parcels Change (%)
A	58	59	0.8	7,959	8,124	2.1	2	2	0.0
B	15,839	15,881	0.3	304,750	306,791	0.7	665	655	-1.5
C	724	745	2.8	118,951	124,883	5.0	38	40	5.3
D	150	172	14.5	38,510	47,969	24.6	15	17	13.3
E	407	446	9.5	47,961	65,534	36.6	2	2	0.0
F	98	124	25.7	22,234	34,741	56.3	1	1	0.0
G	250	208	-16.7	53,687	36,920	-31.2	17	9	-47.1
H	199	186	-6.4	1,082	548	-49.3	2	2	0.0
I	165	165	0.2	21,519	25,051	16.4	2	1	-50.0
J	335	298	-11.2	84,088	57,952	-31.1	15	15	0.0
K	240	237	-1.3	45,022	44,366	-1.5	5	5	0.0
L	69	67	-1.5	11,354	11,267	-0.8	0	0	0.0
M	2,426	2,475	2.0	0	0	0.0	0	0	0.0
N	150	146	-2.7	14,407	14,101	-2.1	1	1	0.0
O	189	177	-6.2	56,008	49,468	-11.7	9	8	-11.1
P	191	192	0.5	11,134	11,173	0.4	6	6	0.0
Q	3,733	3,735	0.1	0	0	0.0	0	0	0.0
R	2,294	2,320	1.1	86,929	99,236	14.2	43	60	39.5
S	2,489	2,454	-1.4	23,286	20,576	-11.6	74	74	0.0
T	206	190	-8.1	14,915	9,256	-37.9	5	2	-60.0
U	9,907	9,888	-0.2	8,973	8,934	-0.4	19	19	0.0
V	553	545	-1.5	20,054	18,184	-9.3	6	6	0.0
W	1,207	1,207	0.0	0	0	0.0	0	0	0.0
X	92	92	0.4	7,471	7,445	-0.3	2	2	0.0
Y	189	179	-5.1	70,162	63,890	-8.9	11	11	0.0
Z	51	48	-5.9	14,978	14,783	-1.3	0	0	0.0
Total	42,211	42,236	0.1	1,085,434	1,081,192	-0.4	940	938	-0.2

3.3.1.2 BMP #2: Constrain Flow Entering City Of North Port at Big Slough Canal

Objective:

The objective of this BMP is to constrain the volume of water coming from offsite areas through the Big Slough canal prior to entering the City in the Estates area.

The BMP would involve real estate acquisition, maintenance activities, dam construction and removal of existing hydraulic structures (culverts).

Description:

On the northwest City boundary, at the intersection of Big Slough canal with R-36 and R-580 waterways, all existing earthen weirs were raised to limit runoff from offsite areas, leaving the Big Slough canal as the only conveyance system into the western portion of the City (see Figure 3-2). All earthen weirs farther north, at the intersection of Big Slough canal and Power Line Road were raised as well.

Results:

This BMP results in approximately 0.5 feet flood stage reduction within the vicinity of the Big Slough canal from the City's northern border to just south of I-75. Likewise, results indicate that flood stages increase approximately 1.0 foot in the offsite areas north of R-36 and R-580 waterways. Table 3-2 summarizes BMP#2 analysis results.

Table 3-2: BMP#2 Results Summary

Sub-Watershed	Bench Mark Total Flooded Area (Acres)	BMP2 Total Flooded Area (Acres)	BMP2 Total Flooded Area Change (%)	Bench Mark Flooded Street Length (Feet)	BMP2 Flooded Street Length (Feet)	BMP2 Flooded Street Length Change (%)	Bench Mark Flooded Parcels (Units)	BMP2 Flooded Parcels (Units)	BMP2 Flooded Parcels Change (%)
A	58	58	0.0	7,959	7,958	0.0	2	2	0.0
B	15,839	16,092	1.6	304,750	260,559	-14.5	665	458	-31.1
C	724	725	0.0	118,951	118,959	0.0	38	38	0.0
D	150	150	0.0	38,510	38,460	-0.1	15	15	0.0
E	407	407	0.0	47,961	47,969	0.0	2	2	0.0
F	98	98	0.0	22,234	22,241	0.0	1	1	0.0
G	250	250	0.0	53,687	53,666	0.0	17	17	0.0
H	199	199	-0.1	1,082	1,078	-0.4	2	2	0.0
I	165	165	0.0	21,519	21,514	0.0	2	2	0.0
J	335	314	-6.4	84,088	72,205	-14.1	15	12	-20.0
K	240	240	0.0	45,022	45,020	0.0	5	5	0.0
L	69	69	0.0	11,354	11,354	0.0	0	0	0.0
M	2,426	2,421	-0.2	0	0	0.0	0	0	0.0
N	150	150	0.0	14,407	14,407	0.0	1	1	0.0
O	189	189	0.0	56,008	55,994	0.0	9	9	0.0
P	191	179	-6.1	11,134	10,124	-9.1	6	4	-33.3
Q	3,733	3,742	0.2	0	0	0.0	0	0	0.0
R	2,294	2,302	0.3	86,929	86,186	-0.9	43	45	4.7
S	2,489	2,486	-0.2	23,286	20,530	-11.8	74	73	-1.4
T	206	206	0.0	14,915	14,904	-0.1	5	5	0.0
U	9,907	9,907	0.0	8,973	8,973	0.0	19	19	0.0
V	553	552	-0.2	20,054	20,043	-0.1	6	6	0.0
W	1,207	1,207	0.0	0	0	0.0	0	0	0.0
X	92	87	-5.1	7,471	5,780	-22.6	2	2	0.0
Y	189	188	-0.5	70,162	69,877	-0.4	11	11	0.0
Z	51	51	-0.1	14,978	14,952	-0.2	0	0	0.0
Total	42,211	42,434	0.5	1,085,434	1,022,753	-5.8	940	729	-22.4

3.3.1.3 BMP #3: Diversion Alternative

Objective:

The purpose of this BMP is to divert flows from offsite areas via the existing R-36 canal, by increasing its capacity and improving its hydraulic connectivity with Deer Prairie Slough canal.

This BMP would involve construction of new structures, maintenance activities, real estate acquisition, and detailed hydrologic and hydraulic evaluation of the western boundary (Deer Prairie Slough watershed).

Description:

On the northwest boundary, along R-36 canal, two earthen overflow weirs were provided to enhance the R-36 waterway connectivity with Deer Prairie Slough canal (See Figure 3). Weir location and parameters were selected based on terrain and hydraulic constraints. The weirs were located on the northwest corner to address flooding in the Estates area and along Big Slough canal. Weir lengths and elevation used are as follows: Weir 1, L: 300 feet at EL:22.0 feet, NAVD88 and Weir 2, L:450 feet at EL:21.0 feet, NAVD88. The R-36 canal capacity was also doubled by replacing the existing cross-section with a 60 feet bottom width trapezoidal channel with 4:1 side slopes. The current model assumes no tailwater influence from Deer Prairie Slough.

Results:

As anticipated, simulation results indicate flood reduction throughout the Estates area, along the Big Slough Canal between the R-36 canal and I-75 corridor as well as in the localized area along Big Slough south of I-75 (See Figure 3-3). Overall results indicate a flood stage reduction between 0.1 foot and 1.0 foot throughout the aforementioned areas.

As mentioned before, these results were obtained assuming no increase in stages in the Deer Prairie Slough Canal since a fixed tailwater condition was used for modeling purposes. Further consideration of impacts of additional flow into the Deer Prairie Slough watershed should be taken into account during final evaluation of BMP's. Table 3-3 summarizes BMP#3 analysis results.

Table 3-3: BMP#3 Results Summary

Sub-Watershed	Bench Mark Total Flooded Area (Acres)	BMP3 Total Flooded Area (Acres)	BMP3 Total Flooded Area Change (%)	Bench Mark Flooded Street Length (Feet)	BMP3 Flooded Street Length (Feet)	BMP3 Flooded Street Length Change (%)	Bench Mark Flooded Parcels (Units)	BMP3 Flooded Parcels (Units)	BMP3 Flooded Parcels Change (%)
A	58	58	0.0	7,959	7,958	0.0	2	2	0.0
B	15,839	15,720	-0.8	304,750	282,118	-7.4	665	568	-14.6
C	724	724	-0.1	118,951	118,890	-0.1	38	38	0.0
D	150	150	-0.2	38,510	38,348	-0.4	15	15	0.0
E	407	407	-0.1	47,961	47,880	-0.2	2	2	0.0
F	98	98	-0.3	22,234	22,141	-0.4	1	1	0.0
G	250	250	0.0	53,687	53,663	0.0	17	17	0.0
H	199	198	-0.3	1,082	1,065	-1.5	2	2	0.0
I	165	165	0.0	21,519	21,463	-0.3	2	2	0.0
J	335	316	-5.7	84,088	73,854	-12.2	15	13	-13.3
K	240	240	0.0	45,022	45,022	0.0	5	5	0.0
L	69	69	0.0	11,354	11,354	0.0	0	0	0.0
M	2,426	2,426	0.0	0	0	0.0	0	0	0.0
N	150	150	0.0	14,407	14,407	0.0	1	1	0.0
O	189	189	0.0	56,008	55,998	0.0	9	9	0.0
P	191	184	-3.4	11,134	10,572	-5.0	6	4	-33.3
Q	3,733	3,731	-0.1	0	0	0.0	0	0	0.0
R	2,294	2,199	-4.1	86,929	64,689	-25.6	43	27	-37.2
S	2,489	2,486	-0.1	23,286	20,653	-11.3	74	73	-1.4
T	206	206	0.0	14,915	14,892	-0.2	5	5	0.0
U	9,907	9,907	0.0	8,973	8,973	0.0	19	19	0.0
V	553	552	-0.2	20,054	19,978	-0.4	6	6	0.0
W	1,207	1,207	0.0	0	0	0.0	0	0	0.0
X	92	86	-5.6	7,471	6,029	-19.3	2	2	0.0
Y	189	184	-2.4	70,162	68,020	-3.1	11	9	-18.2
Z	51	51	-0.2	14,978	14,924	-0.4	0	0	0.0
Total	42,211	41,953	-0.6	1,085,434	1,022,891	-5.8	940	820	-12.8

3.3.1.4 BMP #4: R-580 Improvements

Objective:

The objective of this alternative is to induce additional flows through Creighton waterway by improving current conveyance capacity in the R-580 waterway.

Description:

Waterway R-580's bottom profile was reset assuming a flat ditch at its lower elevation of 15.0 feet, NAVD along the entire stretch. The current bottom configuration of the R-580 waterway transitions between 17.71 feet, NAVD88 bottom elevation on the most western end to 23.0 feet, NAVD88 bottom elevation at the most eastern end and sags between these ends at elevation 15.0 feet, NAVD88 (see Figure 3-4).

Results:

This alternative results in small improvements within the vicinity of Big Slough. However, and as intended, additional flows were induced towards Creighton waterway. Inducing additional flow through Creighton waterway will result in additional flooding near I-75 for this particular rainfall event as shown on Figure 3-4. A summary of BMP#4 analysis results is presented in Table 3-4.

Table 3-4: BMP#4 Results Summary

Sub-Watershed	Bench Mark Total Flooded Area (Acres)	BMP4 Total Flooded Area (Acres)	BMP4 Total Flooded Area Change (%)	Bench Mark Flooded Street Length (Feet)	BMP4 Flooded Street Length (Feet)	BMP4 Flooded Street Length Change (%)	Bench Mark Flooded Parcels (Units)	BMP4 Flooded Parcels (Units)	BMP4 Flooded Parcels Change (%)
A	58	58	-0.1	7,959	7,953	-0.1	2	2	0.0
B	15,839	15,806	-0.2	304,750	298,627	-2.0	665	638	-4.1
C	724	725	0.1	118,951	119,411	0.4	38	38	0.0
D	150	151	0.2	38,510	38,526	0.0	15	15	0.0
E	407	408	0.1	47,961	48,223	0.6	2	2	0.0
F	98	99	0.4	22,234	22,517	1.3	1	1	0.0
G	250	250	0.1	53,687	53,782	0.2	17	17	0.0
H	199	199	-0.1	1,082	1,077	-0.4	2	2	0.0
I	165	165	0.1	21,519	21,636	0.6	2	2	0.0
J	335	329	-1.9	84,088	80,578	-4.2	15	15	0.0
K	240	240	0.0	45,022	45,026	0.0	5	5	0.0
L	69	69	0.0	11,354	11,354	0.0	0	0	0.0
M	2,426	2,426	0.0	0	0	0.0	0	0	0.0
N	150	150	0.0	14,407	14,412	0.0	1	1	0.0
O	189	189	0.1	56,008	56,041	0.1	9	9	0.0
P	191	189	-0.7	11,134	11,005	-1.2	6	5	-16.7
Q	3,733	3,720	-0.4	0	0	0.0	0	0	0.0
R	2,294	2,288	-0.3	86,929	85,260	-1.9	43	43	0.0
S	2,489	2,489	0.0	23,286	22,823	-2.0	74	74	0.0
T	206	206	0.0	14,915	14,957	0.3	5	5	0.0
U	9,907	9,910	0.0	8,973	8,973	0.0	19	19	0.0
V	553	577	4.3	20,054	23,139	15.4	6	10	66.7
W	1,207	1,207	0.0	0	0	0.0	0	0	0.0
X	92	90	-1.3	7,471	7,215	-3.4	2	2	0.0
Y	189	188	-0.4	70,162	69,897	-0.4	11	11	0.0
Z	51	51	-0.1	14,978	14,939	-0.3	0	0	0.0
Total	42,211	42,179	-0.1	1,085,434	1,077,371	-0.7	940	916	-2.6

3.3.1.5 BMP #5: Increase Capacity on Southern Boundary

Objective:

The objective of this alternative is to evaluate the system response when doubling the southern boundary discharge capacity into Charlotte Harbor area.

The BMP would involve conveyance improvements, construction of new structures and/or reconditioning of existing structures, maintenance activities, real estate acquisition, and detailed evaluation of the southern boundary through hydrology and hydraulic modeling.

Description:

All structures discharging from Cocoplum waterway into the Charlotte Harbor area under Hillsborough Blvd and their upstream weirs were doubled in capacity. A total of 13 structures under Hillsborough Blvd were double in the model and a total of 6 lateral weirs along Cocoplum waterway were doubled in size (see Figure 3-5).

Results:

This alternative was evaluated for information purposes only, as it is understood that inducing additional flows into Charlotte Harbor would not be desirable. Results indicate that improvements relative to house flooding were not significant; however roads experienced a considerable flood reduction between S Sumter Blvd and Atwater Dr. (see Figure 3-5). A summary of BMP#5 analysis results is presented in Table 3-5.

Table 3-5: BMP#5 Results Summary

Sub-Watershed	Bench Mark Total Flooded Area (Acres)	BMP5 Total Flooded Area (Acres)	BMP5 Total Flooded Area Change (%)	Bench Mark Flooded Street Length (Feet)	BMP5 Flooded Street Length (Feet)	BMP5 Flooded Street Length Change (%)	Bench Mark Flooded Parcels (Units)	BMP5 Flooded Parcels (Units)	BMP5 Flooded Parcels Change (%)
A	58	58	0.1	7,959	8,001	0.5	2	1	-50.0
B	15,839	15,836	0.0	304,750	304,487	-0.1	665	665	0.0
C	724	612	-15.6	118,951	75,331	-36.7	38	25	-34.2
D	150	121	-19.8	38,510	20,694	-46.3	15	7	0.0
E	407	395	-3.1	47,961	42,761	-10.8	2	2	0.0
F	98	76	-22.7	22,234	8,236	-63.0	1	1	-11.8
G	250	245	-2.1	53,687	51,993	-3.2	17	15	0.0
H	199	196	-1.4	1,082	1,000	-7.6	2	2	-50.0
I	165	143	-13.1	21,519	8,237	-61.7	2	1	0.0
J	335	335	0.0	84,088	84,042	-0.1	15	15	0.0
K	240	238	-0.8	45,022	44,688	-0.7	5	5	0.0
L	69	67	-2.1	11,354	11,317	-0.3	0	0	0.0
M	2,426	2,426	0.0	0	0	0.0	0	0	0.0
N	150	149	-0.6	14,407	14,407	0.0	1	1	0.0
O	189	180	-4.6	56,008	51,322	-8.4	9	9	0.0
P	191	191	0.0	11,134	11,133	0.0	6	6	0.0
Q	3,733	3,733	0.0	0	0	0.0	0	0	0.0
R	2,294	2,293	-0.1	86,929	86,339	-0.7	43	43	0.0
S	2,489	2,489	0.0	23,286	23,282	0.0	74	74	0.0
T	206	206	-0.3	14,915	14,756	-1.1	5	5	0.0
U	9,907	9,907	0.0	8,973	8,973	0.0	19	19	0.0
V	553	553	0.0	20,054	20,047	0.0	6	6	0.0
W	1,207	1,207	0.0	0	0	0.0	0	0	0.0
X	92	92	0.0	7,471	7,471	0.0	2	2	0.0
Y	189	189	0.0	70,162	70,161	0.0	11	11	0.0
Z	51	51	0.0	14,978	14,976	0.0	0	0	0.0
Total	42,211	41,988	-0.5	1,085,434	983,655	-9.4	940	915	-2.7

3.3.1.6 BMP #6: Upstream Detention Alternative

Objective:

The objective of this analysis is to examine the effects when attenuating peak flow rates in agricultural areas along the Big Slough canal with a series of new detention facilities.

This BMP would involve construction of stormwater management storage areas, maintenance activities and real estate acquisition.

Description:

In offsite areas, seven detention facilities were added to the model. Each detention area has a 100 acre footprint and is more than 10 feet deep. These areas were located on upland sites along Big Slough canal where feasible (see Figure 3-6). The bottom elevations of these detention areas were set at the adjacent canal initial elevation. Each of these ponds was linked to the Big Slough canal by a 500 foot weir. The crest elevations were set at the bottom of the pond. The total anticipated detained volume is 600 acre-ft per detention site, a total of 4,200 acre-ft.

Results:

Results indicate that the supplemental detention area alternative produces little reduction in peak water surface elevations. Elevations along Big Slough were reduced by only 0.1 to 0.6 feet, making this option less attractive. The extent of flooding for this BMP is essentially the same as the existing scenario with few flood reduction areas along the Big Slough canal (see Figure 3-6). Initial evaluation suggests that the costs associated with purchasing the proposed detention areas from private landowners will likely be high. In addition the complexity of building reservoirs will make it a less attractive solution; e.g. runup wave analysis will increase the height of the perimeter berm. Total costs include an initial cost of location, proper land acquisition and construction, in addition to recurring maintenance and operation costs. A summary of BMP#6 analysis results is presented in Table 3-6.

Table 3-6: BMP#6 Results Summary

Sub-Watershed	Bench Mark Total Flooded Area (Acres)	BMP6 Total Flooded Area (Acres)	BMP6 Total Flooded Area Change (%)	Bench Mark Flooded Street Length (Feet)	BMP6 Flooded Street Length (Feet)	BMP6 Flooded Street Length Change (%)	Bench Mark Flooded Parcels (Units)	BMP6 Flooded Parcels (Units)	BMP6 Flooded Parcels Change (%)
A	58	58	0.0	7,959	7,959	0.0	2	2	0.0
B	15,839	15,645	-1.2	304,750	280,497	-8.0	665	563	-15.3
C	724	724	-0.1	118,951	118,818	-0.1	38	38	0.0
D	150	150	-0.5	38,510	38,067	-1.2	15	15	0.0
E	407	407	-0.1	47,961	47,827	-0.3	2	2	0.0
F	98	98	-0.6	22,234	22,019	-1.0	1	1	0.0
G	250	250	0.0	53,687	53,659	-0.1	17	17	0.0
H	199	197	-0.8	1,082	1,021	-5.6	2	2	0.0
I	165	165	-0.1	21,519	21,418	-0.5	2	2	0.0
J	335	311	-7.2	84,088	72,123	-14.2	15	13	-13.3
K	240	240	0.0	45,022	45,022	0.0	5	5	0.0
L	69	69	0.0	11,354	11,354	0.0	0	0	0.0
M	2,426	2,426	0.0	0	0	0.0	0	0	0.0
N	150	150	0.0	14,407	14,407	0.0	1	1	0.0
O	189	189	-0.1	56,008	55,961	-0.1	9	9	0.0
P	191	183	-3.8	11,134	10,588	-4.9	6	4	-33.3
Q	3,733	3,723	-0.3	0	0	0.0	0	0	0.0
R	2,294	2,268	-1.2	86,929	80,023	-7.9	43	42	-2.3
S	2,489	2,485	-0.2	23,286	20,307	-12.8	74	73	-1.4
T	206	206	0.0	14,915	14,866	-0.3	5	5	0.0
U	9,907	9,907	0.0	8,973	8,973	0.0	19	19	0.0
V	553	550	-0.5	20,054	19,833	-1.1	6	6	0.0
W	1,207	1,207	0.0	0	0	0.0	0	0	0.0
X	92	88	-4.4	7,471	6,413	-14.2	2	2	0.0
Y	189	187	-0.7	70,162	69,679	-0.7	11	11	0.0
Z	51	51	-0.4	14,978	14,887	-0.6	0	0	0.0
Total	42,211	41,934	-0.7	1,085,434	1,035,721	-4.6	940	832	-11.5

3.3.2 BMP Evaluation of Four Crossings

Under this evaluation, as requested by the City of North Port, hydraulic performance and the effects of potential conveyance improvements at four sites, including: R-36 Canal at I-75, Myakkahatchee Creek at I-75, R-36 Canal at Tropicaire Boulevard, and Myakkahatchee Creek at Tropicaire Boulevard were analyzed.

A systematic evaluation was conducted to first understand the existing hydraulic behavior of each of the four crossings under various synthetic storm events. Head differences across each structure, flow conditions at peak discharge, and hydraulic connectivity (including flow patterns in adjacent areas) were assessed to understand unique conditions at each crossing.

In order to evaluate effectiveness of potential BMP improvements at these locations (including any resulting flood reduction and/or downstream flood increase), conveyance capacity at each site was increased by doubling the number of existing structures. This was achieved by adding a duplicate set of model reach elements at each location. A description of existing crossings and the applied BMP for evaluation are provided in Table 3-7.

Table 3-7: Location and Description of Existing and BMP Conditions

Crossing Location	Existing Crossing	BMP Condition
R-36 Canal at I-75	Two (2) 7.5' x 6' box culverts	Two (2) identical 7.5' x 6' box culverts were added in parallel to existing structure
Myakkahatchee Creek at I-75	Two (2) parallel bridges with 8 piers and a total span of 540 feet	Two (2) identical parallel bridges were added in parallel to existing structure
R-36 Canal at Tropicaire Blvd	Two (2) 5' diameter RCP culverts	Two (2) identical 5' diameter RCP culverts were added in parallel to existing structure
Myakkahatchee Creek at Tropicaire Blvd	One (1) bridge with 4 piers and a total span of 150 feet	One (1) identical bridge was added in parallel to existing structure

3.3.2.1 *R-36 Canal at I-75 Evaluation*

Existing condition model results indicate that more than two feet of head difference occurs across this structure during the 100-year storm event (see Table 3-8 and Figures 3-7 & 3-8). Under the proposed BMP condition, model results indicate that a peak stage reduction of up to 0.6 feet occurs upstream of the crossing, while a stage increase of approximately 0.6 feet occurs in the downstream areas. It is notable that reduced discharges are observed from the R-36 Canal westward into the adjacent Deer Prairie Slough watershed for the proposed BMP condition. This overflow connection with the adjacent watershed to the west is located north of I-75. The reduced overflow results in an increased total volume remaining within the North Port area, by virtue of the improved conveyance capacity of the proposed BMP. In summary, increasing the crossing capacity of the R-36 Canal at I-75 may reduce water levels upstream of the crossing, but

also raises flood elevations in the downstream areas. Mitigation of flooding in downstream areas was beyond the scope of this evaluation.

Table 3-8: R-36 Canal at I-75 Crossing Evaluation Results Summary

Table 3-8 (a): Existing Condition Upstream and Downstream Node Maximum Stages and Flows

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)*	NR3210	17.47	19.57	20.38	20.99	21.69	22.30
D/S Node Max Stage (ft)*	NR3220	16.82	18.33	18.86	19.20	19.56	19.92
Difference in Stage (ft)	n/a	0.65	1.24	1.52	1.78	2.14	2.38
Flow (cfs)	n/a	424	586	654	710	779	846

Table 3-8 (b): With BMP Upstream and Downstream Node Maximum Stages and Flows

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)*	NR3210	17.05	18.97	19.74	20.34	21.08	22.08
D/S Node Max Stage (ft)*	NR3220	16.88	18.61	19.25	19.69	20.19	20.74
Difference in Stage (ft)	n/a	0.17	0.36	0.49	0.65	0.90	1.34
Flow (cfs)	n/a	433	631	735	845	997	1223

Table 3-8 (c): Difference in Flows and Stages between BMP and Existing Condition

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)	NR3210	-0.42	-0.60	-0.64	-0.65	-0.61	-0.22
D/S Node Max Stage (ft)	NR3220	0.06	0.28	0.39	0.49	0.63	0.82
Flow (cfs)	n/a	9	45	82	135	218	377

*Vertical datum of stage reported in the table is with reference to NAVD88 Datum.

3.3.2.2 Myakkahatchee Creek at I-75 Evaluation

Existing condition model results indicate that approximately one foot of head difference occurs across this structure during extreme storm events (see Table 3-9 and Figures 3-9 & 3-10). This head difference is relatively small considering the magnitude of flow that arrives from the upstream contributing watershed (up to 8000 cubic feet per second). The applied BMP at this location assumes that the conveyance capacity of the bridge

crossing was doubled. In other words, an identical, parallel 540-foot bridge span was added to investigate the benefit of increasing bridge capacity. Under this hypothetical scenario, model results indicate that a localized stage reduction of 0.7 feet is observed immediately at the upstream end of the crossing. However, peak stage reductions decrease further upstream of the crossing along the creek. No significant change in peak elevations is observed 1,200 feet upstream of the crossing. Also, no significant change to flooding conditions is observed in areas downstream of the crossing. In summary, increasing the crossing capacity of the bridge over Myakkahatchee Creek at I-75 may reduce water levels immediately upstream of the crossing, but does not generally improve flooding conditions north of I-75. The area impacted by this improvement is very localized and would not justify the cost of the improvement.

3.3.2.3 R-36 Canal at Tropicair Boulevard Evaluation

Existing condition model results indicate that up to three feet of head difference occurs across this structure during various storm events (see Table 3-10 and Figures 3-11 & 3-12). Under the proposed BMP conditions, model results indicate a peak stage reduction of approximately 0.8 feet upstream of the crossing, while a stage increase of up to 1.1 feet occurs downstream of Tropicair. During all events, discharges from the R-36 canal into Deer Prairie Slough watershed are observed north of Tropicair Boulevard. The proposed BMP results in a reduction of those discharges to Deer Prairie Slough and a resulting increased total volume remaining within the North Port area. In summary, while increasing the crossing capacity of the R-36 Canal at Tropicair Boulevard may reduce water levels upstream of the crossing, it also raises flood elevations in downstream areas. Mitigation of flooding in downstream areas was beyond the scope of this evaluation.

3.3.2.4 Myakkahatchee Creek at Tropicair Boulevard Evaluation

Existing condition model results indicate that the maximum calculated head difference for the various storm events is 0.2 feet; therefore the bridge is not causing a flow restriction (see Table 3-11 and Figures 3-13 & 3-14). Regardless, a BMP was applied for evaluation and assumes that the conveyance capacity was increased (doubled) by adding an identical bridge element in parallel to the existing structure. Under this scenario, model results indicate that a maximum localized stage reduction of approximately 0.1 feet was calculated, yet no significant change is observed further upstream nor downstream of the crossing. In summary, increasing the crossing capacity of the bridge over Myakkahatchee Creek at Tropicair Boulevard does not substantially improve flooding conditions north of I-75.

Model results (maximum stages and maximum flows) for various storm events (Mean Annual, 5-year, 10-year, 25-year, 50-year, and 100-year) are provided in tabular form within the accompanying geodatabase.

Table 3-9: Myakkahatchee Creek at I-75 Crossing Evaluation Results Summary

Table 3-9 (a): Existing Condition Upstream and Downstream Node Maximum Stages and Flows

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)*	NB0750	20.40	21.89	22.19	22.46	22.82	23.93
D/S Node Max Stage (ft)*	NB0780	19.81	20.86	21.13	21.37	21.79	22.83
Difference in Stage (ft)	n/a	0.59	1.03	1.07	1.09	1.02	1.10
Flow (cfs)	n/a	1306	3045	3640	4236	5290	7816

Table 3-9 (b): With BMP Upstream and Downstream Node Maximum Stages and Flows

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)*	NB0750	19.97	21.16	21.45	21.71	22.14	23.35
D/S Node Max Stage (ft)*	NB0780	19.82	20.87	21.14	21.39	21.83	23.02
Difference in Stage (ft)	n/a	0.16	0.29	0.31	0.32	0.30	0.33
Flow (cfs)	n/a	1311	3601	3673	4291	5175	8509

Table 3-9 (c): Difference in Flows and Stages between BMP and Existing Condition

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)	NB0750	-0.43	-0.72	-0.75	-0.75	-0.68	-0.58
D/S Node Max Stage (ft)	NB0780	0.00	0.01	0.01	0.02	0.04	0.20
Flow (cfs)	n/a	5	556	33	55	-115	692

*Vertical datum of stage reported in the table is with reference to NAVD88 Datum.

Table 3-10: R-36 Canal at Tropicaire Boulevard Crossing Evaluation Results Summary

Table 3-10 (a): Existing Condition Upstream and Downstream Node Maximum Stages and Flows

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)*	NR0170	21.57	21.99	22.08	22.15	22.22	22.33
D/S Node Max Stage (ft)*	NR3190	18.15	19.74	20.48	21.07	21.73	22.31
Difference in Stage (ft)	n/a	3.42	2.25	1.61	1.08	0.49	0.01
Flow (cfs)	n/a	414	420	420	420	421	420

Table 3-10 (b): With BMP Upstream and Downstream Node Maximum Stages and Flows

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)*	NR0170	20.77	21.77	21.94	22.06	22.18	22.32
D/S Node Max Stage (ft)*	NR3190	19.29	20.68	21.11	21.49	21.90	22.32
Difference in Stage (ft)	n/a	1.48	1.10	0.83	0.57	0.28	0.00
Flow (cfs)	n/a	550	575	576	578	578	577

Table 3-10 (c): Difference in Flows and Stages between BMP and Existing Condition

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)	NR0170	-0.80	-0.21	-0.14	-0.09	-0.04	0.00
D/S Node Max Stage (ft)	NR3190	1.14	0.94	0.63	0.42	0.17	0.01
Flow (cfs)	n/a	136	156	156	157	158	157

*Vertical datum of stage reported in the table is with reference to NAVD88 Datum.

Table 3-11: Myakkahatchee Creek at Tropicaire Boulevard Crossing Evaluation Results Summary

Table 3-11(a): Existing Condition Upstream and Downstream Node Maximum Stages and Flows

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)*	NB0700	22.79	24.28	24.51	24.71	24.99	26.13
D/S Node Max Stage (ft)*	NB0710	22.70	24.08	24.31	24.52	24.83	26.07
Difference in Stage (ft)	n/a	0.09	0.19	0.20	0.20	0.16	0.06
Flow (cfs)	n/a	1332	2582	2785	2890	2973	2756

Table 3-11(b): With BMP Upstream and Downstream Node Maximum Stages and Flows

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)*	NB0700	22.73	24.17	24.41	24.63	24.94	26.11
D/S Node Max Stage (ft)*	NB0710	22.71	24.12	24.35	24.57	24.88	26.09
Difference in Stage (ft)	n/a	0.02	0.05	0.06	0.06	0.05	0.02
Flow (cfs)	n/a	1353	2712	3001	3167	3278	3031

Table 3-11(c): Difference in Flows and Stages between BMP and Existing Condition

Location	Node Name	Mean Annual	1 Day 10YR	1 Day 25YR	1 Day 50YR	1 Day 100YR	5 Day 100YR
U/S Node Max Stage (ft)	NB0700	-0.06	-0.10	-0.10	-0.09	-0.06	-0.02
D/S Node Max Stage (ft)	NB0710	0.01	0.04	0.04	0.05	0.05	0.02
Flow (cfs)	n/a	21	131	217	277	305	275

*Vertical datum of stage reported in the table is with reference to NAVD88 Datum.

3.3.3 WCS-162 Evaluation

WCS-162 is located on the R-36 Canal, north of Interstate 75, and immediately upstream of Tropicair Boulevard (refer to Figure 3-15). This is the only gated weir structure on the R-36 Canal, with one 2.25 feet high by 2 feet wide pull up slide gate. The City generally operates this structure by fully opening the gate in anticipation of a storm event to lower the water level in the R-36 canal to minimize potential upstream flooding; otherwise, the gate remains closed. The City staff would like to determine if adding gates would help draw down the canal more quickly and increase conveyance capacity.

3.3.3.1 *R-36 Canal Drawdown Evaluation*

To reduce impacts downstream of WCS-162 while improving peak conditions upstream of the structure, an evaluation was performed to determine the benefits of adding additional gates. The evaluation included calculating the drawdown time for the R-36 canal and the additional conveyance capacity provided by the additional gates.

To evaluate BMPs at WCS-162, Ardaman requested to survey the structure to better understand the geometry of the structure and canal with the purpose of assessing availability of adequate space for additional gates. The survey data provided by Van Buskirk/Fish & Associates, Inc. is included in Appendix A, and the structure pictures are provided in Appendix B. The existing condition model was revised using the latest (2014) survey information for this BMP Evaluation. The update model simulated results rendered no change in model results compared to the May 2012 Governing Board approved model.

The benefits of reducing time required to lower R-36 canal elevation by adding gates at WCS-162 upstream of the structure were assessed by performing a drawdown analysis. For the drawdown evaluation, the R-36 canal upstream of WCS-162 was assumed to be at the control elevation of the weir (elevation 18.3 feet NAVD88). The water level at the canal was simulated by fully opening the existing gate with no additional flows coming into the canal. The existing condition drawdown simulation results indicates that it would take approximately 18 hours to lower the canal to elevation 15 feet (refer to Figure 3-16).

The canal drawdown simulation was repeated for one and two additional gates scenarios. The canal stage hydrographs upstream of the structure with additional gates are also plotted in Figure 3-16. As shown in Figure 3-16, the time required to drawdown R-36 canal will decrease to 11 hours by adding an identical gate. When 2 additional matching gates are provided, the time require to drawdown R-36 canal would decrease to 9 hours. Therefore, the total time required to drawdown R-36 canal (to elevation 15 feet) upstream of WCS-162 will be reduced by 7 and 9 hours by adding one and two additional gates respectively.

3.3.3.2 *Storm Events Simulation Results*

The mean annual, 5-year, and 10-year storm events were simulated using the updated existing condition model with 2014 survey information. The City's water control structure operation criteria were employed in these simulations. The gates are closed at the

beginning of the simulation, and they will be fully open when Big Slough Canal stage at Tropicair rises to Elevation 15.88 feet NAVD88.

Benefits of flood control at the upstream of WCS-162 during a storm event were evaluated by simulating the mean annual storm event starting at the drawdown stage levels (Elevation 15 feet NAVD88). For this evaluation, initial stages in R-36 Canal upstream of WCS-162 were set to the drawdown levels, i.e. simulated canal stages after 18 hours of drawdown simulation. The lower initials at the canal will account for the additional canal storage capacity available upstream of WCS-162. During the lower initial condition simulation, the WCS-162 gate was assumed to be opened throughout the simulation. Model results with lowered initials were compared to the results with the normal initial stage, which is at the invert elevation (at elevation 18.29 feet NAVD88) of WCS-162 weir. Table 3-12 presents model results and comparison of max stages of R-36 canal upstream of WCS-162 weir with normal and lowered initial stage at the canal for the mean annual storm event. As indicated in the table, simulated results suggest that there will be no difference in peak stages in R-36 canal due to the lower initial canal stage. It should be noted that model results suggest the 50-foot wide weir at WCS-162 overtops by 2.6 feet conveying 328 cfs of peak flow across the structure during the mean annual storm event. The R-36 Canal upstream of WCS-162 holds approximately 30 acre-feet of storage capacity behind the gate, whereas more than 3,000 acre-feet of runoff volume is conveyed by the canal during the mean annual storm event. The additional available storage seems to be insignificant compared to the runoff conveyed by the canal during the storm event.

In addition, benefits of having one additional gate with the lowered R-36 canal stages upstream of WCS-162 were also evaluated. For this scenario, both gates (one existing and one additional BMP gate) were assumed to be fully opened throughout the simulation. The model results for mean annual storm event for this scenario are also presented in Table 3-12. The simulated results suggest that there will be no difference in R-36 canal max stages upstream of WCS-162 with an additional gate at the structure. As no difference in peak stages were predicted for the mean annual storm event, no other higher return period storm events (5-year and 10-year) were analyzed with additional gates.

In conclusion, providing one or two additional gates at WCS-162 will help to reduce the time required to drawdown canal levels at the upstream of the structure; however the model results suggest that lower initial levels in R-36 canal upstream of the structure will provide no benefits in terms of reducing flooding at the upstream areas even for small storm events such as mean annual storm event. Also, the modeling results suggest that there would be no adverse impacts in the downstream of WCS-162 due to the additional gate.

**Table 3-12: Mean Annual Event Simulated Maximum Stages in R-36 Canal
Upstream of WCS-162**

Model Node ⁺	Existing Condition Max Stage (ft, NAVD88)	Scenario 1: Existing with Lowered Initials		Scenario 2: One Additional Gate BMP with Lowered Initials	
		Max Stage (ft, NAVD88)	Difference in Max Stage (ft)	Max Stage (ft, NAVD88)	Difference in Max Stage(ft)
NR0170*	21.55	21.55	0.00	21.56	0.01
Water Control Structure WCS-162					
NR3160**	21.86	21.86	0.00	21.85	0.00
NR3150	21.87	21.86	0.00	21.86	0.00
NR3140	22.09	22.09	0.00	22.09	0.00
NR3130	22.23	22.23	0.00	22.23	0.00
NR3125	22.42	22.41	-0.01	22.41	-0.01
NR3120	22.58	22.57	-0.01	22.57	-0.01
NR3110	22.76	22.76	-0.01	22.76	-0.01
NR3100	22.85	22.84	-0.01	22.84	-0.01
NR3090	22.94	22.94	0.00	22.94	0.00
NR3080	23.01	23.01	0.00	23.01	0.00
NR3070	23.09	23.09	0.00	23.08	0.00
NR3060	23.20	23.20	0.00	23.20	0.00
NR3050	23.40	23.40	0.00	23.40	0.00
NR3040	23.44	23.44	0.00	23.44	0.00
NR3030	23.51	23.51	0.00	23.51	0.00
NR3025	23.58	23.58	0.00	23.58	0.00
NR3020	23.59	23.59	0.00	23.59	0.00
NR3010	23.62	23.62	0.00	23.62	0.00
NB5695	23.65	23.65	0.00	23.65	0.00

⁺ Model nodes are presented from downstream to upstream location at R-36 canal

* Model Node Downstream of WCS-162

** Model Node Upstream of WCS-162

3.3.4 Price Boulevard LOS Improvements

Existing condition model results (May 2012 Governing Board approved model) predict that West Price Boulevard would intermittently flood between Locher Road and the Big Slough Canal during the 10, 25, and 100-year, 24-hour storm events. The currently designated City of North Port Level of Service (LOS) is shown in Figure 3-17. As shown on this figure, the West Price Boulevard stretch is identified as an arterial street that floods during the 100-year, 24-hour design storm event. This arterial street is critical to stormwater emergency response since it provides access to emergency facilities such as North Port Utilities Building, North Port High School and Heron Creek Middle School. Therefore, the City of North Port requested further evaluation of the stretch of West Price Boulevard between North Biscayne Boulevard and the Big Slough Canal to provide BMP recommendations to meet the City of North Port LOS criteria. City Unified Land Development Code Chapter 18 Level of Service criteria for arterial roads states that flooding must be less than 6 inches, as measured at the outside edge of pavement in a 100-year, 24-hour design storm event.

Ardaman staff reviewed the May 2012 Governing Board approved model setup within the area of interest (AOI) to verify whether the current model adequately represents the 2014 condition. With desktop and field reconnaissance of the area, it was observed that a section of the surface and sub-surface drainage systems near the North Port High School had been recently updated. Ardaman recommended surveying the AOI to better represent the existing condition. The survey data provided by Van Buskirk/Fish & Associates, Inc. is included in Appendix C.

Existing (2014) Condition Description:

Based on recent survey, stormwater runoff collected from the north and south swales of West Price Boulevard generally flows west from the North Port Utilities Building, whereas stormwater runoff from the remaining areas flows east from this location. Accumulated stormwater runoff going west from the North Port Utilities Building ultimately flows north via the Indian burial ground toward the R-32 canal.

Stormwater runoff going east toward Big Slough is routed through a series of surface water features (ditches, swales and inlets) which connects to a sub-surface system along the north side of West Price Boulevard.

Existing Condition Model Update and Results:

The May 2012 Governing Board approved model was updated using the 2014 survey provided by Van Buskirk/Fish & Associates, Inc. The revised 100-year storm event model results indicate that West Price Boulevard would not flood near the North Port High School as previously predicted. However, the stretch of West Price Boulevard north of Little Salt Spring would still flood by 0.4 feet at the crown during the 10-year storm event. Survey data indicates that road overtopping would occur at the lowest point (near the culvert crossing) at 17.3 feet NAVD88. The model predicted the 25-year and 100-year storm maximum stages at West Price Boulevard are 17.9 and 18.2 feet NAVD88 respectively. The revised existing condition floodplain delineations for the 100-year storm event and the revised LOS are presented in Figure 3-18.

BMP Alternative Analysis

The objective of this series of BMPs is to mitigate flooding along the stretch of West Price Boulevard near the Indian burial ground to meet the existing City of North Port LOS criteria.

Five different BMP alternatives were considered. Only the three alternatives that were determined to be effective in improving the LOS are described below:

3.3.4.1 West Price Boulevard BMP 1

Description

The first BMP alternative involves dredging the R-24 and R-32 canals. As shown in Figure 3-19, this alternative would require: dredging 2,300 feet of R-24 canal and 1,800 feet of R-32 canal to add approximately 2 to 3 feet of depth; and installing one extra parallel 36-inch pipe at the existing culvert crossing, between Indian burial ground and the R-32 canal. Figures showing comparison of existing and BMP cross-sections and bottom profiles of these canals are provided in Appendix D.

The City is not allowed to disturb the 50-foot wide drainage right-of-way through the Indian burial ground.

Results

Model results, comparison of floodplains, and the maximum stages at notable locations are presented in Figure 3-19. Model results with BMP_1 alternative suggest that West Price Boulevard would not overtop during the 25-year storm event. In addition, this alternative would reduce flooding on some local streets (Dundee Ave, Surf Ave, and San Salvador Road) located north of R-32 canal.

The model predicted that the 100-year maximum stage at West Price Boulevard with BMP_1 alternative will be reduced from 18.2 to 17.5 feet NAVD88. West Price Boulevard would still overtop by 0.2 feet over the crown of the road at the lowest section during the 100-year storm event. However, the road would be passable according to City of North Port LOS criteria. Figure 3-20 shows the comparison of the 100-year floodplain and maximum stages at notable locations with BMP 1 alternative. Model results also indicate that there will be no adverse impacts at downstream areas due to this improvement.

3.3.4.2 West Price Boulevard BMP 2

Description

The second BMP alternative consists of raising the road (West Price Boulevard) such that it would not flood during the 100-year design storm event. This alternative would involve raising approximately 1,900 feet of West Price Boulevard to an elevation of 18.5 feet NAVD88. Survey data suggests that the lowest segment of the road, which is located at the culvert crossing, needs to be raised by 1.2 feet to reach an elevation of 18.5 feet NAVD88. Figure 3-21 shows the comparison of the 100-year floodplain as well

as the extent of West Price Boulevard that needs to be raised to reduce flooding potential during the event.

Results

Model results suggest that the 100-year peak stages upstream and downstream of the culvert across West Price Boulevard would be 18.2 feet NAVD88 with this alternative. The model predicted the 100-year maximum stage at West Price Boulevard is below the recommended raised road crown elevation of 18.5 feet NAVD88. The peak stage model results suggest that there will be no adverse impacts or increase in stages upstream or downstream of the improvement for any modeled storm event.

Additional right-of-way requirement to raise the road and its availability should be thoroughly assessed prior to selecting this BMP alternative.

3.3.4.3 West Price Boulevard BMP 3

Description

The third BMP alternative evaluated incorporates both BMP_1 and BMP_2 improvements, i.e. dredging the R-32 and R-24 canals, adding a new pipe crossing, and raising the road such that it would not flood during the 100-year storm event.

Results

Model results suggest that the 100-year peak stage upstream of the culvert across West Price Boulevard would be 17.6 feet NAVD88 with this alternative. Figure 3-22 shows the comparison of the 100-year floodplain as well as the elements of BMP_3 improvements. This alternative would require raising approximately 950 feet of West Price Boulevard to elevation 18.0 feet NAVD88. Compared to BMP_2 improvements, this alternative would reduce the required road improvement length by half at a lower elevation (6 inches lower than BMP_2). Similar to BMP_1 and BMP_2, the peak stage model results suggest that there will be no adverse impacts or increase in stages upstream or downstream of the road improvement for any model storm event.

3.3.4.4 Other Evaluated BMPs

In addition to the three previously described BMP alternatives, a few other BMPs were evaluated. However, modeling results suggest that these BMPs would not mitigate the flooding conditions along the evaluated stretch of West Price Boulevard.

One of the other BMPs evaluated was to install a 24-inch pipe at the south side of West Price Boulevard near the culvert that would run approximately 1,400 feet to the east and connect to the existing sub-surface system inlet. This BMP did not show any improvements since the BMP pipe is too long and there was not sufficient hydraulic gradient available to convey the necessary flow rate through the pipe.

Another BMP evaluated was to provide a 20-foot wide cut/swale that would connect the flooded area south of West Price Boulevard to the south towards the Little Salt Spring basin. 25-year storm event model results suggest that this BMP alternative would lower

peak stages at West Price Boulevard only by 0.2 feet. However, the road would still flood during this event. Also, this BMP may raise environmental concerns considering that it would require diverting stormwater runoff from the road towards Little Salt Spring basin.

3.3.4.5 Summary and Recommendations

Various BMP alternatives were evaluated to mitigate flooding at West Price Boulevard with the purpose of meeting City of North Port LOS criteria. BMP_1 alternative (dredging R-24 and R-32 canals) would eradicate the road flooding in a 25-year design storm event, and it would minimize flooding in a 100-year storm event to make it passable during the event. BMP_2 alternative would eliminate road flooding in a 100-year design storm event by raising West Price Blvd. BMP_3 alternative would also eliminate West Price Boulevard road flooding in a 100-year storm event while minimizing road improvements. A summary of 100-year peak stages for each BMP alternatives and recommended road crown and edge of pavement elevations are provided in Table 3-13. It is estimated that it would cost \$0.8 million, \$0.9 million, and \$1.3 million for BMP_1, BMP_2, and BMP_3, respectively (see Appendix E for the detailed cost estimates). These cost estimates are approximate, and they are used for the comparison purpose only. Considering the project cost, BMP_2 alternative (raising the road) appears to be the most effective approach to eliminate road flooding conditions for the 100-year design storm event. In 2010, the city cleaned these canals with the purpose of removing mucks accumulated at the bottom. It is recommended current cross-sections and bottom profiles of these canals be surveyed to verify dredging requirements prior to selecting dredging alternatives. Also, canal dredging cost could be less, if City of North Port performs the dredging using in-house resources.

Table 3-13: Summary of West Price Boulevard BMPs

BMP Description	100-year Flood Elevation (ft, NAVD88)		EOP Elevation (ft, NAVD88)		Road Crown Elevation (ft, NAVD88)		Preliminary Cost Estimate for Construction in 2017
	Without BMP	With BMP	Existing	Proposed	Existing	Proposed	
No. 1- Dredge R-24 and 32, add 36" pipe	18.2	17.5	17	17	17.3	17.3	\$832,000
No. 2- Raise 1900 LF of Price Blvd 1.2' higher	18.2	18.2	17	18.2	17.3	18.5	\$859,000
No. 3- Dredge R-24 and 32, add 36" pipe, Raise 850 LF of Price Blvd 0.7' higher	18.2	17.6	17	17.7	17.3	18.0	\$1,308,000

The 25-year and 100-year storm events revised existing condition and BMP 1, 2, and 3 alternatives model results (maximum stages and maximum flows) are provided in tabular form within the accompanying geodatabase along with updated model network (basins, nodes, and reaches). CHAN model data and simulation run files for these alternatives are also included in an external hard drive.

4.0 CONCEPTUAL PERMIT APPLICATION

Conceptual permit application was not included in this project.

5.0 CONCLUSIONS

It is recommended that the City of North Port purchase the small number of habitable structures in which flooding is predicted in the 100 year event. Purchasing the affected properties may be more cost effective than implementing any BMPs. Figure 5-1 shows the 74 parcels (one parcel contains two habitable structures) identified in the LOS analysis, in addition to 25 parcels reported as flooded in 1992 and 27 properties reported as damaged in 2003 (also see Table 5-1 below). Several parcels were identified as flooded in more than one event, which is noted in the table.

It is recommended that finished floor elevations of the 101 parcels are acquired by survey, and finished floor elevations are compared with modeled 100 year event maximum stages, to determine which properties flood in the 100 year event. Highlighted rows indicate parcels that were identified as flooded in the LOS analysis, and have documented flooding in the 1992 and/or 2003 event.

Table 5-1: Summary of Parcels to Survey

PID	Address	City, State, Zip	In 100 Year Level of Service Analysis	Reported as Flooded in 1992	Reported as Flooded in 2003
1122-16-0325	1297 NACKMAN RD	NORTH PORT, FL 34288	Yes		
1008-25-5316	1400 LONGBOW AVE	NORTH PORT, FL 34288	Yes		
0976-26-4128	2386 VESTRIDGE ST	NORTH PORT, FL 34287	Yes		
0964-08-1404	2912 OKLAHOMA ST	NORTH PORT, FL 34286	Yes		
0995-18-2835	2989 SARLETT ST	NORTH PORT, FL 34287		Yes	
0995-18-2836	2999 SARLETT ST	NORTH PORT, FL 34287		Yes	
0967-06-0117	3166 SNOWBIRD ST	NORTH PORT, FL 34291	Yes	Yes	Yes
0993-26-4012	3236 MONTCLAIR CIR	NORTH PORT, FL 34287	Yes		
0993-26-3801	3262 MONTCLAIR CIR	NORTH PORT, FL 34287	Yes		
0993-26-3730	3589 MONTCLAIR CIR	NORTH PORT, FL 34287	Yes		
0993-26-3815	3626 MONTCLAIR CIR	NORTH PORT, FL 34287	Yes		
0993-26-3816	3652 MONTCLAIR CIR	NORTH PORT, FL 34287	Yes		

PID	Address	City, State, Zip	In 100 Year Level of Service Analysis	Reported as Flooded in 1992	Reported as Flooded in 2003
0954-14-2522	4268 BACKENSTO ST	NORTH PORT, FL 34291	Yes		Yes
1144-07-4316	4268 LEESBURG AVE	NORTH PORT, FL 34288	Yes		
1002-18-4613	4353 MCKIBBEN DR	NORTH PORT, FL 34287	Yes		
1002-27-6618	4399 MONGITE RD	NORTH PORT, FL 34287	Yes		
1002-18-4810	4440 MONGITE RD	NORTH PORT, FL 34287	Yes		
0955-15-4601	4441 COBBLER LN	NORTH PORT, FL 34286	Yes		
1002-27-6621	4441 MONGITE RD	NORTH PORT, FL 34287	Yes		
0996-19-1923	4531 NELE ST	NORTH PORT, FL 34287		Yes	
1002-18-4806	4534 MONGITE RD	NORTH PORT, FL 34287	Yes		
1002-27-6627	4567 MONGITE RD	NORTH PORT, FL 34287	Yes		
0996-19-1922	4573 NELE ST	NORTH PORT, FL 34287		Yes	
1002-27-6628	4583 MONGITE RD	NORTH PORT, FL 34287	Yes		
1002-27-6629	4599 MONGITE RD	NORTH PORT, FL 34287	Yes		
1002-27-6630	4609 MONGITE RD	NORTH PORT, FL 34287	Yes		
1002-27-6631	4625 MONGITE RD	NORTH PORT, FL 34287	Yes		
1002-18-5011	4628 MONGITE RD	NORTH PORT, FL 34287	Yes		
1002-18-5010	4640 MONGITE RD	NORTH PORT, FL 34287	Yes		
1002-27-6632	4641 MONGITE RD	NORTH PORT, FL 34287	Yes		
1002-18-5008	4668 MONGITE RD	NORTH PORT, FL 34287	Yes		
0996-19-4324	4943 GROBE ST	NORTH PORT, FL 34287	Yes		
0996-19-2317	4964 GROBE ST	NORTH PORT, FL 34287		Yes	
1001-27-6105	4974 ESCALANTE DR	NORTH PORT, FL 34287	Yes		
1001-27-6106	4982 ESCALANTE DR	NORTH PORT, FL 34287	Yes		
1001-27-6316	4983 ESCALANTE DR	NORTH PORT, FL 34287	Yes		
0996-19-4325	4987 GROBE ST	NORTH PORT, FL 34287	Yes		
1001-27-6107	4990 ESCALANTE DR	NORTH PORT, FL 34287	Yes		
0996-19-2318	4991 BULLARD ST	NORTH PORT, FL 34287		Yes	

PID	Address	City, State, Zip	In 100 Year Level of Service Analysis	Reported as Flooded in 1992	Reported as Flooded in 2003
0953-15-2713	5005 LACEY ST	NORTH PORT, FL 34286	Yes		Yes
0996-09-4126	5009 BULLARD ST	NORTH PORT, FL 34287	Yes		
0955-15-3218	5060 IBSON LN	NORTH PORT, FL 34286	Yes		
0942-15-3308	5089 HABLOW LN	NORTH PORT, FL 34286	Yes		
0942-15-3307	5101 HABLOW LN	NORTH PORT, FL 34286	Yes		
1001-27-6115	5102 ESCALANTE DR	NORTH PORT, FL 34287	Yes		
0942-15-3205	5133 INKS LN	NORTH PORT, FL 34286	Yes		
1001-27-6117	5142 ESCALANTE DR	NORTH PORT, FL 34287	Yes		
0942-15-3204	5149 INKS LN	NORTH PORT, FL 34286	Yes		
0942-15-3301	5173 HABLOW LN	NORTH PORT, FL 34286	Yes		
0953-15-2415	5208 GRIGGS AVE	NORTH PORT, FL 34291	Yes		
0953-15-2214	5224 HACKLEY RD	NORTH PORT, FL 34291	Yes		
0953-15-2615	5272 GADBOYS AVE	NORTH PORT, FL 34291	Yes		
0953-15-2614	5278 GADBOYS AVE	NORTH PORT, FL 34291	Yes		
0953-15-2324	5290 HAAS AVE	NORTH PORT, FL 34291	Yes		
1001-27-6122	5292 TREKELL ST	NORTH PORT, FL 34287	Yes		
1001-27-6123	5302 TREKELL ST	NORTH PORT, FL 34287	Yes		
0996-19-4339	5323 GROBE ST	NORTH PORT, FL 34287		Yes	
0944-15-2728	5363 LACEY ST	NORTH PORT, FL 34286	Yes		Yes
0955-15-4505	5382 NOHAVA RD	NORTH PORT, FL 34286	Yes		
0954-14-2930	5437 MANDRAKE TER	NORTH PORT, FL 34291	Yes		
0954-14-2515	5497 LADY SLIPPER AVE	NORTH PORT, FL 34291			Yes
0953-14-1109	5516 REISTERSTOWN RD	NORTH PORT, FL 34291			Yes
0944-07-1204	5519 GARRISON AVE	NORTH PORT, FL 34291			Yes
0953-14-1108	5547 TANEYTOWN ST	NORTH PORT, FL 34291			Yes
0953-14-1208	5551 REISTERSTOWN RD	NORTH PORT, FL 34291	Yes	Yes	Yes

PID	Address	City, State, Zip	In 100 Year Level of Service Analysis	Reported as Flooded in 1992	Reported as Flooded in 2003
0953-14-1113	5555 HENNESSY ST	NORTH PORT, FL 34291	Yes	Yes	Yes
0953-14-1207	5585 REISTERSTOWN RD	NORTH PORT, FL 34291			Yes
0953-14-1111	5588 REISTERSTOWN RD	NORTH PORT, FL 34291	Yes		Yes
0944-07-1202	5621 GARRISON AVE	NORTH PORT, FL 34291	Yes		
0953-14-1206	5621 REISTERSTOWN RD	NORTH PORT, FL 34291	Yes	Yes	Yes
0953-14-1112	5624 REISTERSTOWN RD	NORTH PORT, FL 34291	Yes	Yes	Yes
0942-08-0004	5625 N SUMTER BLVD	NORTH PORT, FL 34286	Yes		
1002-18-4802	5650 POSTMA ST	NORTH PORT, FL 34287	Yes		
0954-14-2520	5654 LADY SLIPPER AVE	NORTH PORT, FL 34291			Yes
0944-07-1309	5664 GARRISON AVE	NORTH PORT, FL 34291	Yes		Yes
0944-07-1304	5779 REISTERSTOWN RD	NORTH PORT, FL 34291	Yes	Yes	Yes
0967-05-8905	5788 SYLVANIA AVE	NORTH PORT, FL 34291			Yes
0967-05-8904	5814 SYLVANIA AVE	NORTH PORT, FL 34291			Yes
0942-04-1904	5815 SUMTER BLVD	NORTH PORT, FL 34286	Yes		Yes
0968-05-7474	5834 BURWIN AVE	NORTH PORT, FL 34291	Yes		
0968-05-7448	5839 BATTERSEA AVE	NORTH PORT, FL 34291	Yes		Yes
0968-05-7450	5861 BATTERSEA AVE	NORTH PORT, FL 34291	Yes		Yes
0968-05-8024	5933 BURWIN AVE	NORTH PORT, FL 34291	Yes		
0968-05-7454	5971 BATTERSEA AVE	NORTH PORT, FL 34291	Yes		Yes
0941-04-1613	6527 REISTERSTOWN RD	NORTH PORT, FL 34291			Yes
0943-01-1009	6531 TANEYTOWN ST	NORTH PORT, FL 34291		Yes	
0941-04-1611	6669 REISTERSTOWN RD	NORTH PORT, FL 34291	Yes	Yes	Yes
0941-04-1609	6869 REISTERSTOWN RD	NORTH PORT, FL 34291		Yes	Yes

PID	Address	City, State, Zip	In 100 Year Level of Service Analysis	Reported as Flooded in 1992	Reported as Flooded in 2003
0941-04-1615	6969 REISTERSTOWN RD	NORTH PORT, FL 34291			Yes
0952-12-1121	7254 MUNCEY RD	NORTH PORT, FL 34291	Yes		
0996-09-3204	8515 FAY AVE	NORTH PORT, FL 34287		Yes	
0996-19-4520	8634 HERBISON AVE	NORTH PORT, FL 34287		Yes	
0996-19-4508	8645 CRISTOBAL AVE	NORTH PORT, FL 34287		Yes	
0996-19-4519	8664 HERBISON AVE	NORTH PORT, FL 34287		Yes	
0996-19-4517	8720 HERBISON AVE	NORTH PORT, FL 34287	Yes		
0996-19-4515	8772 HERBISON AVE	NORTH PORT, FL 34287		Yes	
0996-19-4513	8795 CRISTOBAL AVE	NORTH PORT, FL 34287		Yes	
0995-19-2413	8796 PORTO BELLO AVE	NORTH PORT, FL 34287	Yes		
0996-19-4514	8798 HERBISON AVE	NORTH PORT, FL 34287	Yes	Yes	
0995-18-2838	8855 CHESEBRO AVE	NORTH PORT, FL 34287		Yes	
0995-18-2837	8875 CHESEBRO AVE	NORTH PORT, FL 34287		Yes	

We trust that this report satisfies your expectations and appreciate the opportunity to work with you on this important project. If you have any questions, or if we can be of further service to you, please do not hesitate to call.

Very truly yours,
ARDAMAN & ASSOCIATES, INC.

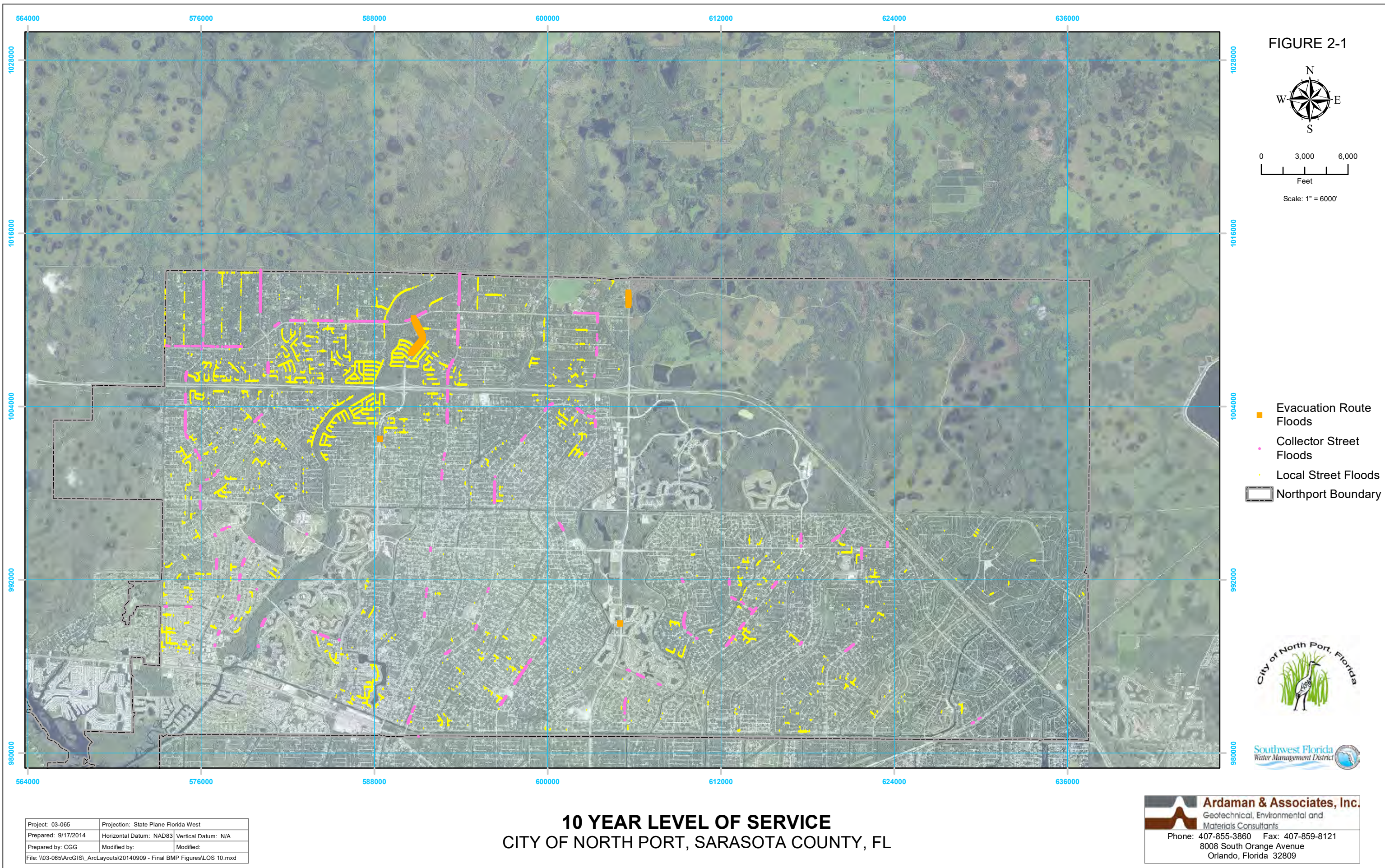

Nestor Aceituno, P.E.
Senior Project Engineer

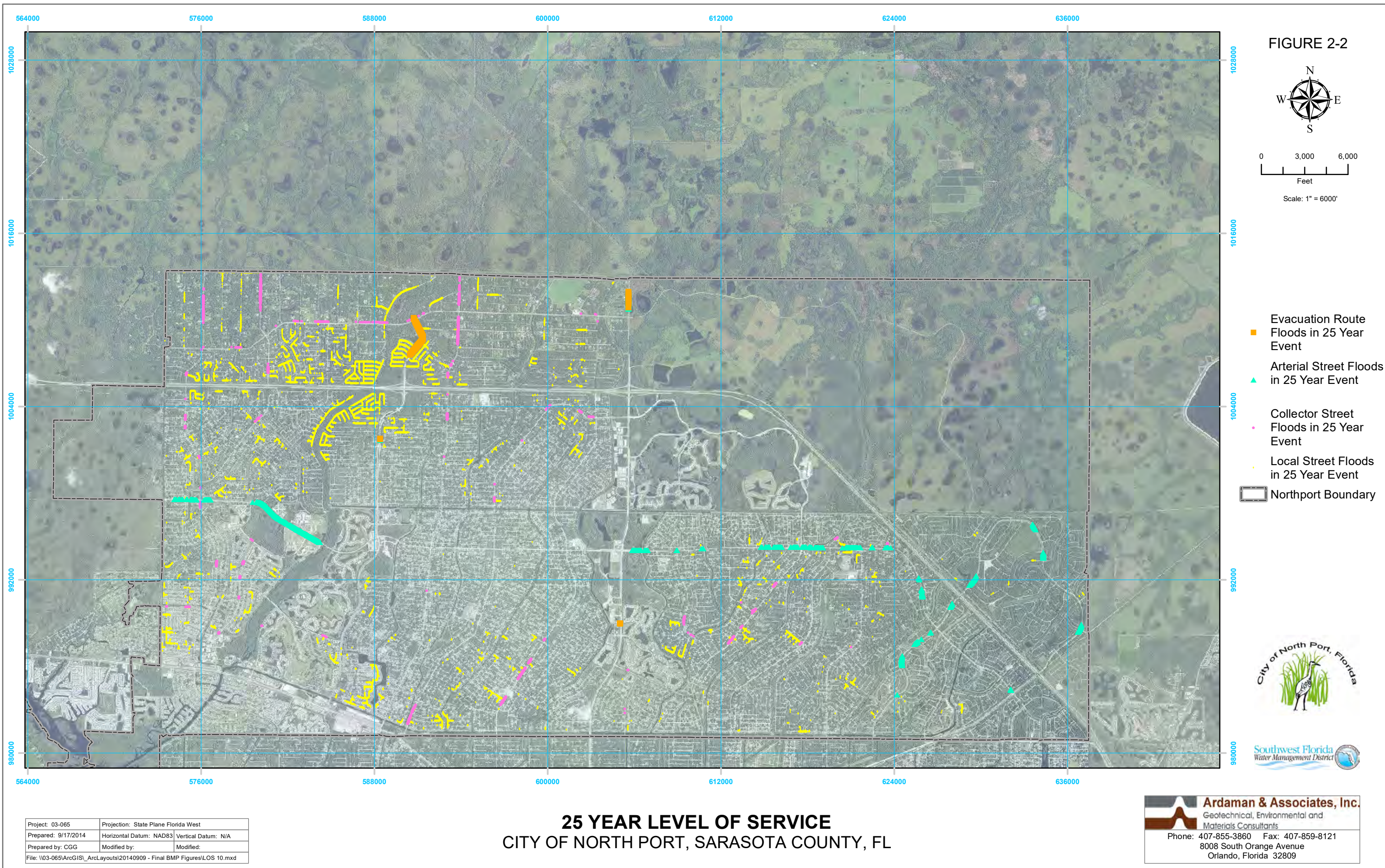
10/10/2014

Shankar Gautam
N.A.
Shankar Gautam, P.E.
Project Engineer

cc: Elizabeth Wong, City of North Port

FIGURES





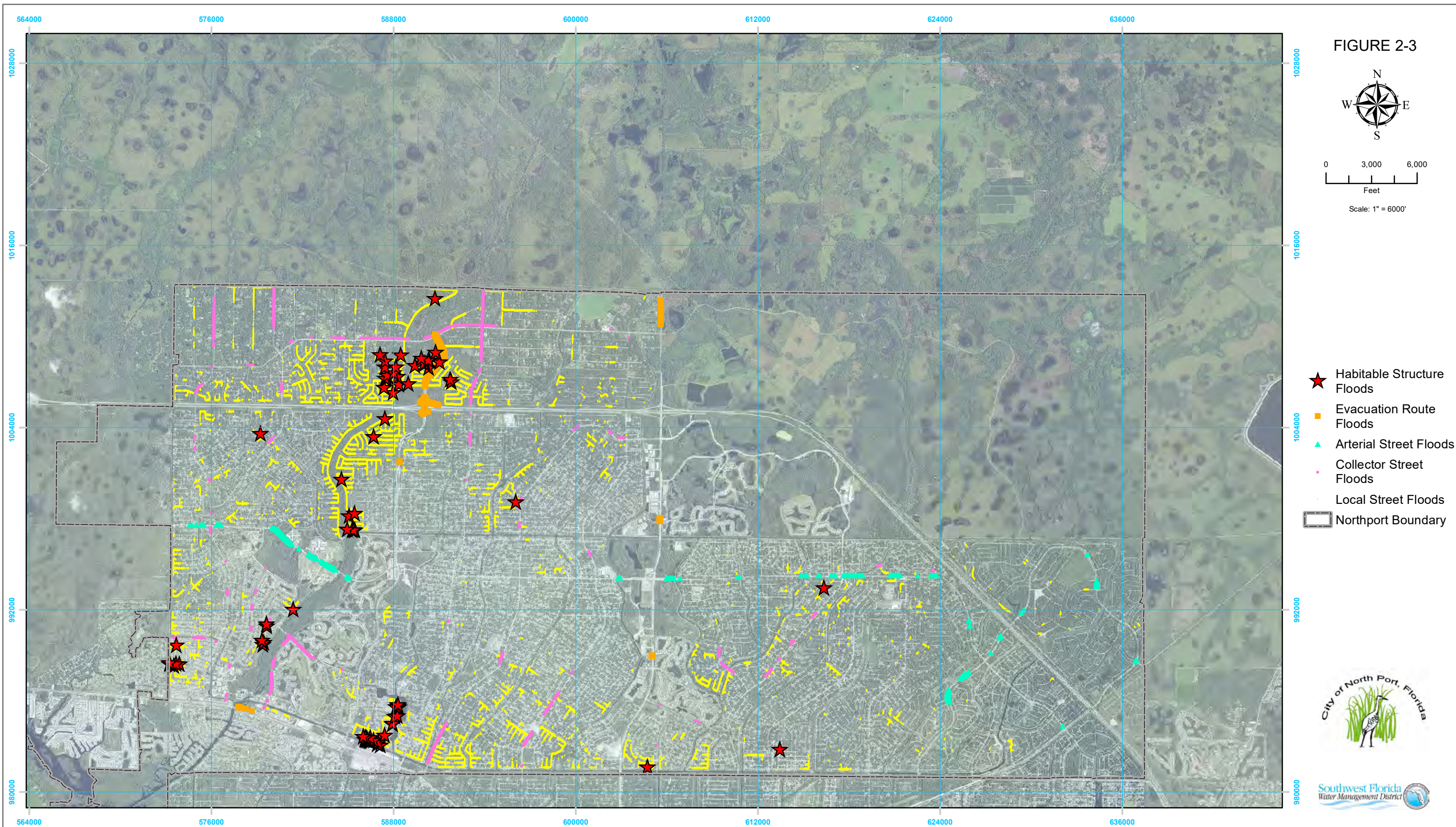
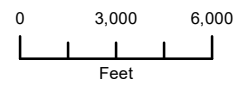


FIGURE 2-3



Scale: 1" = 6000'

- ★ Habitable Structure Floods
- Evacuation Route Floods
- ▲ Arterial Street Floods
- Collector Street Floods
- Local Street Floods
- Northport Boundary



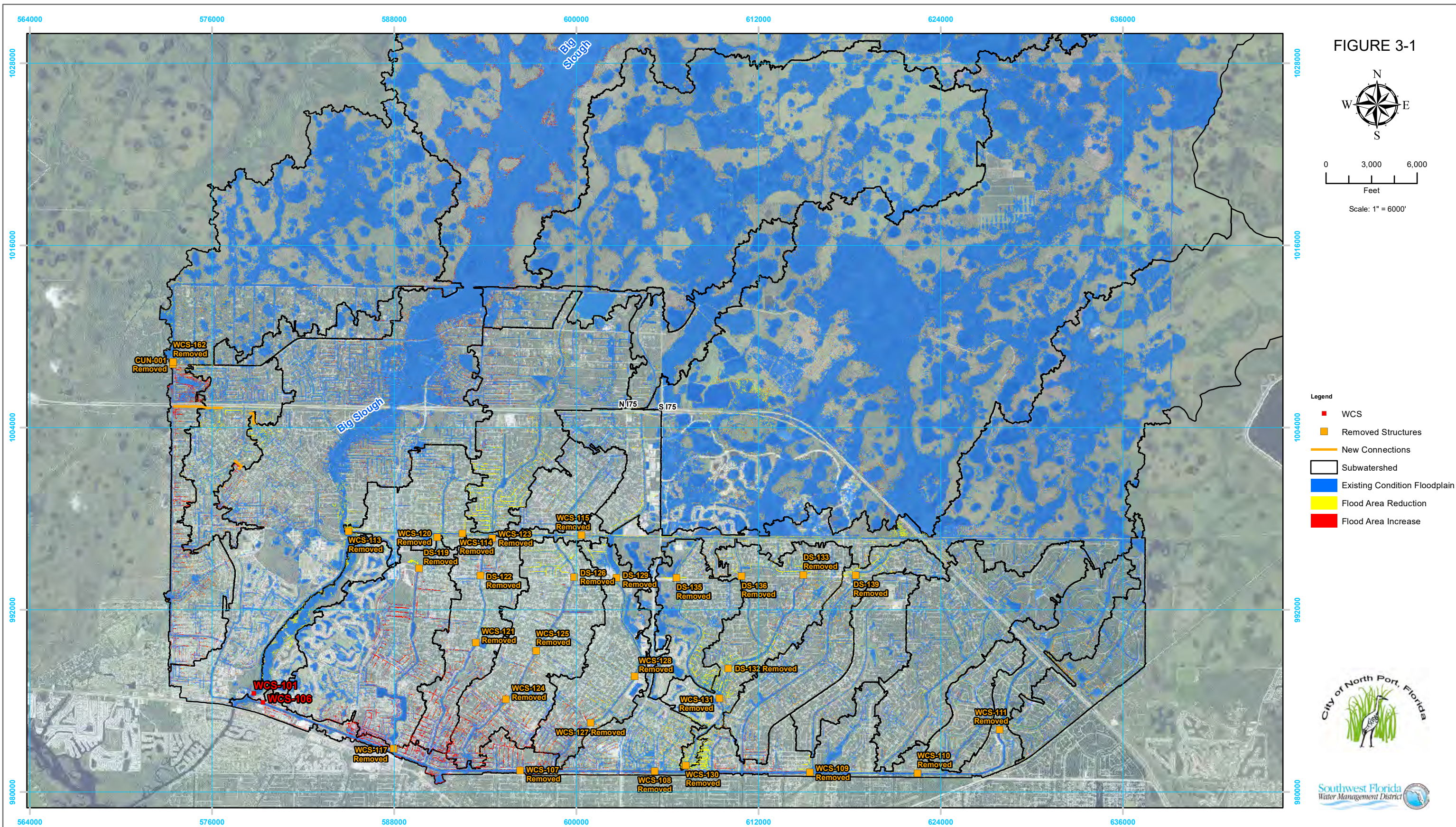
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Prepared: 9/17/2014	Horizontal Datum: NAD83	Vertical Datum: N/A
Prepared by: CGG	Modified by:	Modified:
File: \\03-065\\ArcGIS_ArcLayouts\\20140909 - Final BMP Figures\\LOS 100.mxd		

100 YEAR LEVEL OF SERVICE

CITY OF NORTH PORT, SARASOTA COUNTY, FL

Ardaman & Associates, Inc.
 Geotechnical, Environmental and
 Materials Consultants

Phone: 407-855-3860 Fax: 407-859-8121
 8008 South Orange Avenue
 Orlando, Florida 32809



Project: 03-065	Projection: Florida East West	
Prepared: 10-11-07	Horizontal Datum: NAD83	Vertical Datum: N/A
Prepared by: CGG	Modified by:	Modified:
File: \\03-065\ArcGIS\ArcLayouts\20140909 - Final BMP Figures\BMP1.mxd		

NORTH PORT / BIG SLOUGH WMP

BMP ALTERNATIVE 1 - 1 DAY 100 YEAR EVALUATION

Ardaman & Associates, Inc.
 Geotechnical, Environmental and
 Materials Consultants

Phone: 407-855-3860 Fax: 407-859-8121
 8008 South Orange Avenue
 Orlando, Florida 32809

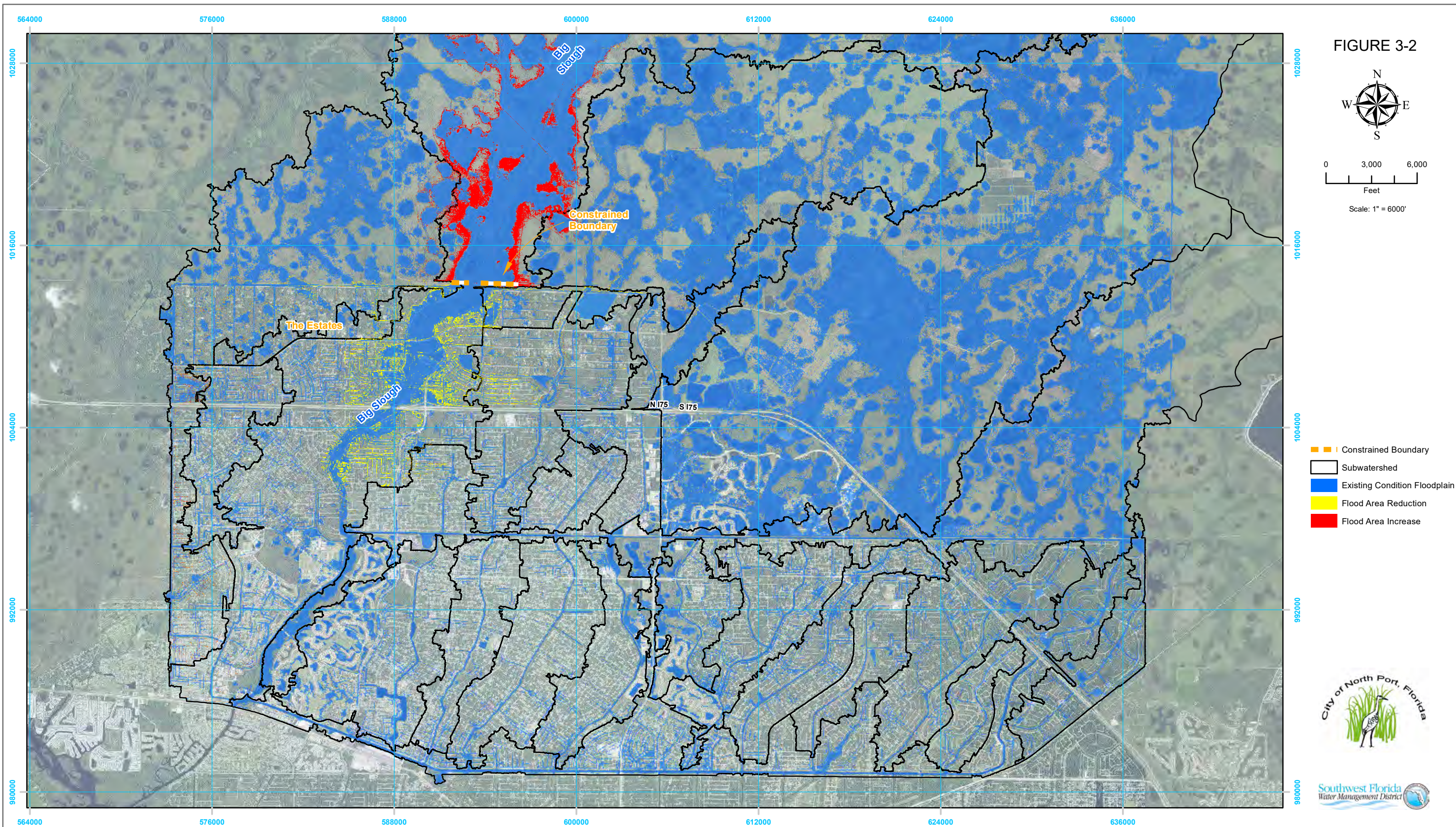
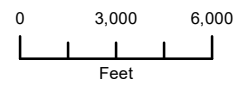


FIGURE 3-2



Scale: 1" = 6000'

- - - Constrained Boundary
- Subwatershed
- Existing Condition Floodplain
- Flood Area Reduction
- Flood Area Increase



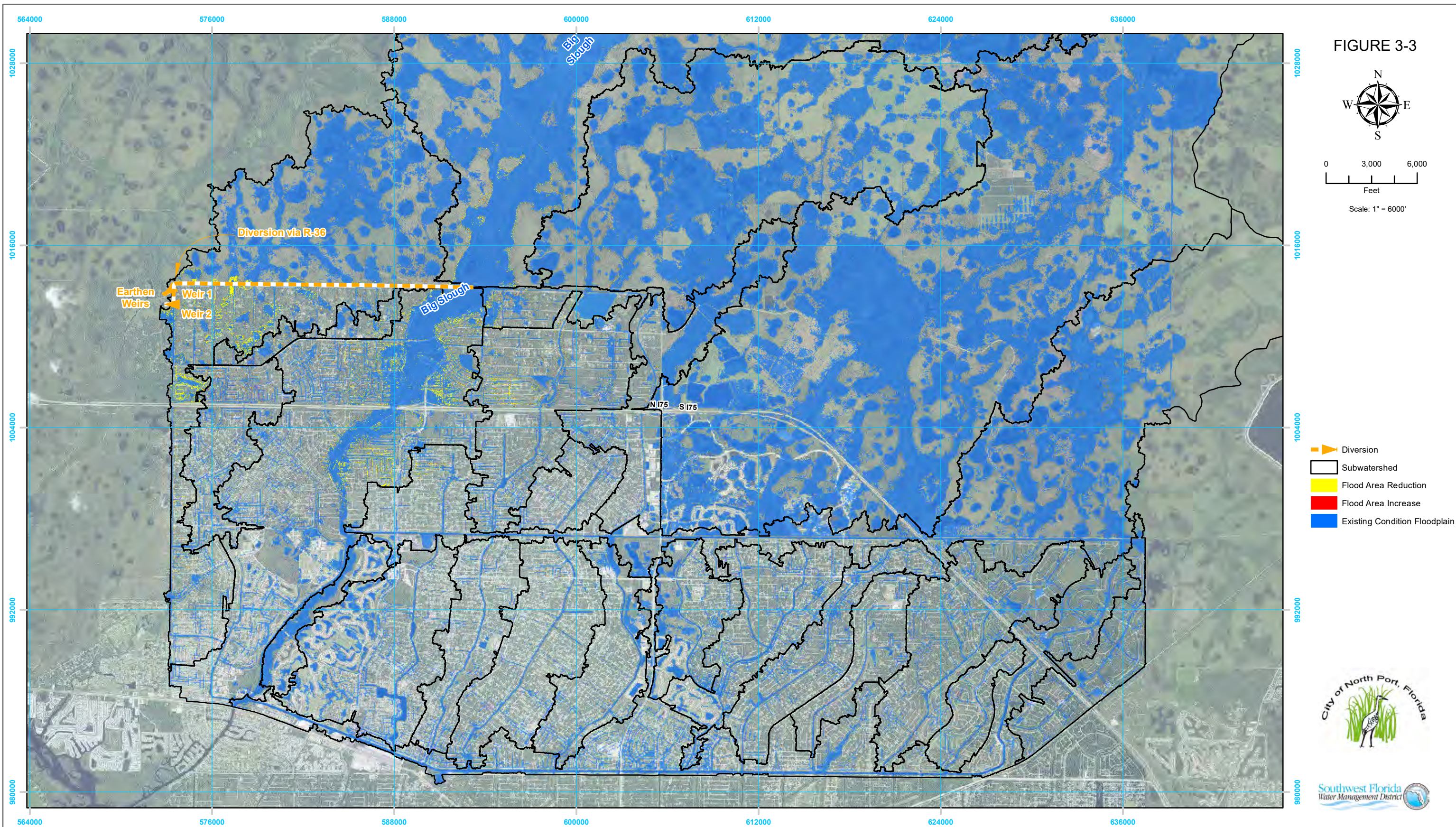
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Prepared: 9/9/2014	Horizontal Datum: NAD83	Vertical Datum: N/A
Prepared by: CGG	Modified by:	Modified:
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NORTH PORT / BIG SLOUGH WMP

BMP ALTERNATIVE 2 - 1 DAY 100 YEAR EVALUATION

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Project: 03-065	Projection: State Plane Florida West	
Prepared: 9/9/2014	Horizontal Datum: NAD83	Vertical Datum: N/A
Prepared by: CGG	Modified by:	Modified:
File: \\03-065\ArcGIS\ArcLayouts\20140909 - Final BMP Figures\BMP3.mxd		

NORTH PORT / BIG SLOUGH WMP **BMP ALTERNATIVE 3 - 1 DAY 100 YEAR EVALUATION**

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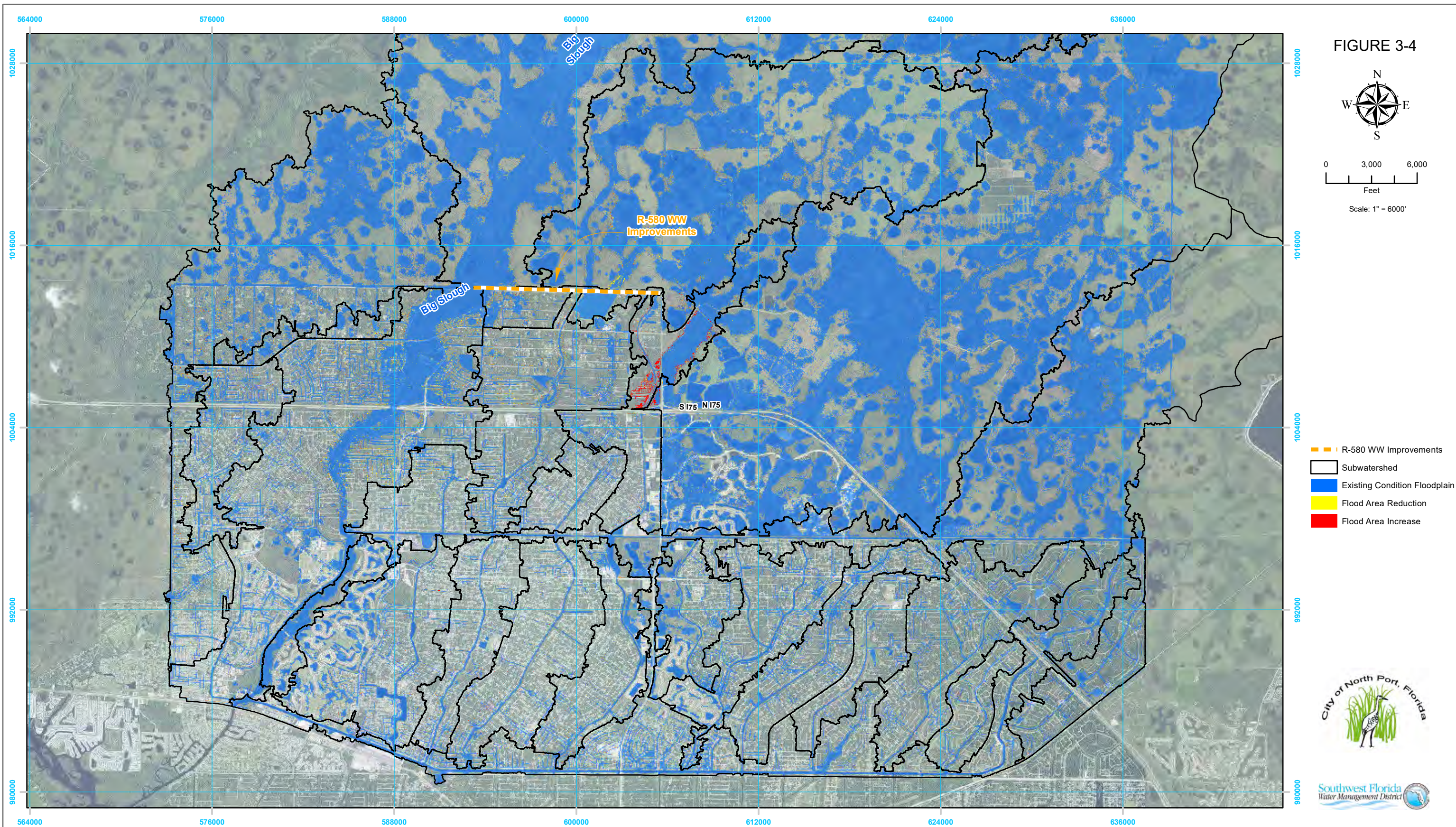
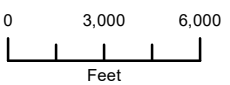


FIGURE 3-4



Scale: 1" = 6000'

- R-580 WW Improvements
- Subwatershed
- Existing Condition Floodplain
- Flood Area Reduction
- Flood Area Increase



Project: 03-065	Projection: State Plane Florida West	
Prepared: 9/9/2014	Horizontal Datum: NAD83	Vertical Datum: N/A
Prepared by: CGG	Modified by:	Modified:
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NORTH PORT / BIG SLOUGH WMP

BMP ALTERNATIVE 4 - 1 DAY 100 YEAR EVALUATION

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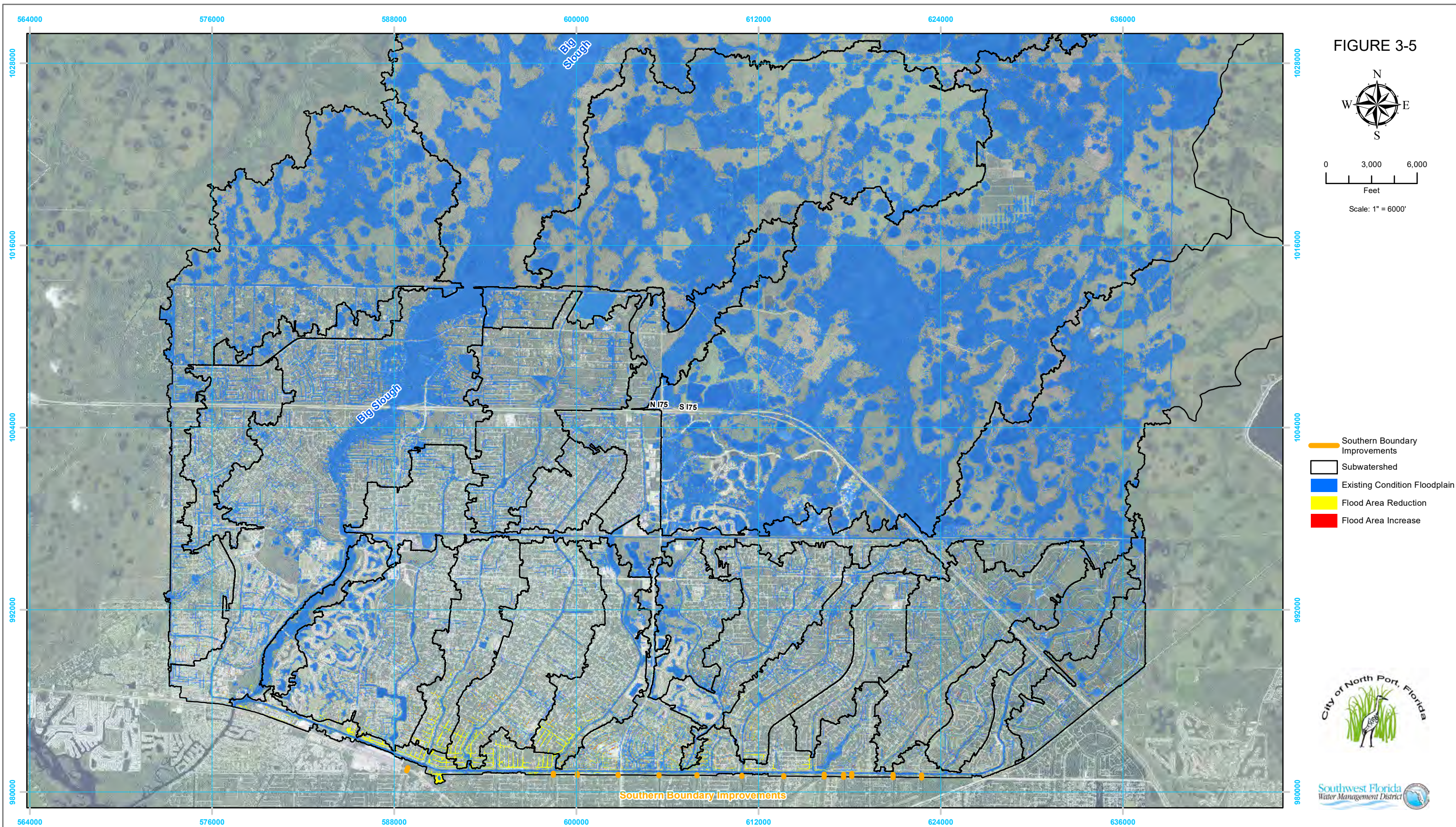
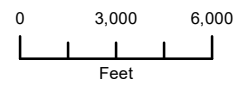







FIGURE 3-5



Scale: 1" = 6000'

-  Southern Boundary Improvements
-  Subwatershed
-  Existing Condition Floodplain
-  Flood Area Reduction
-  Flood Area Increase



Project: 03-065	Projection: State Plane Florida West	
Prepared: 9/9/2014	Horizontal Datum: NAD83	Vertical Datum: N/A
Prepared by: CGG	Modified by:	Modified:
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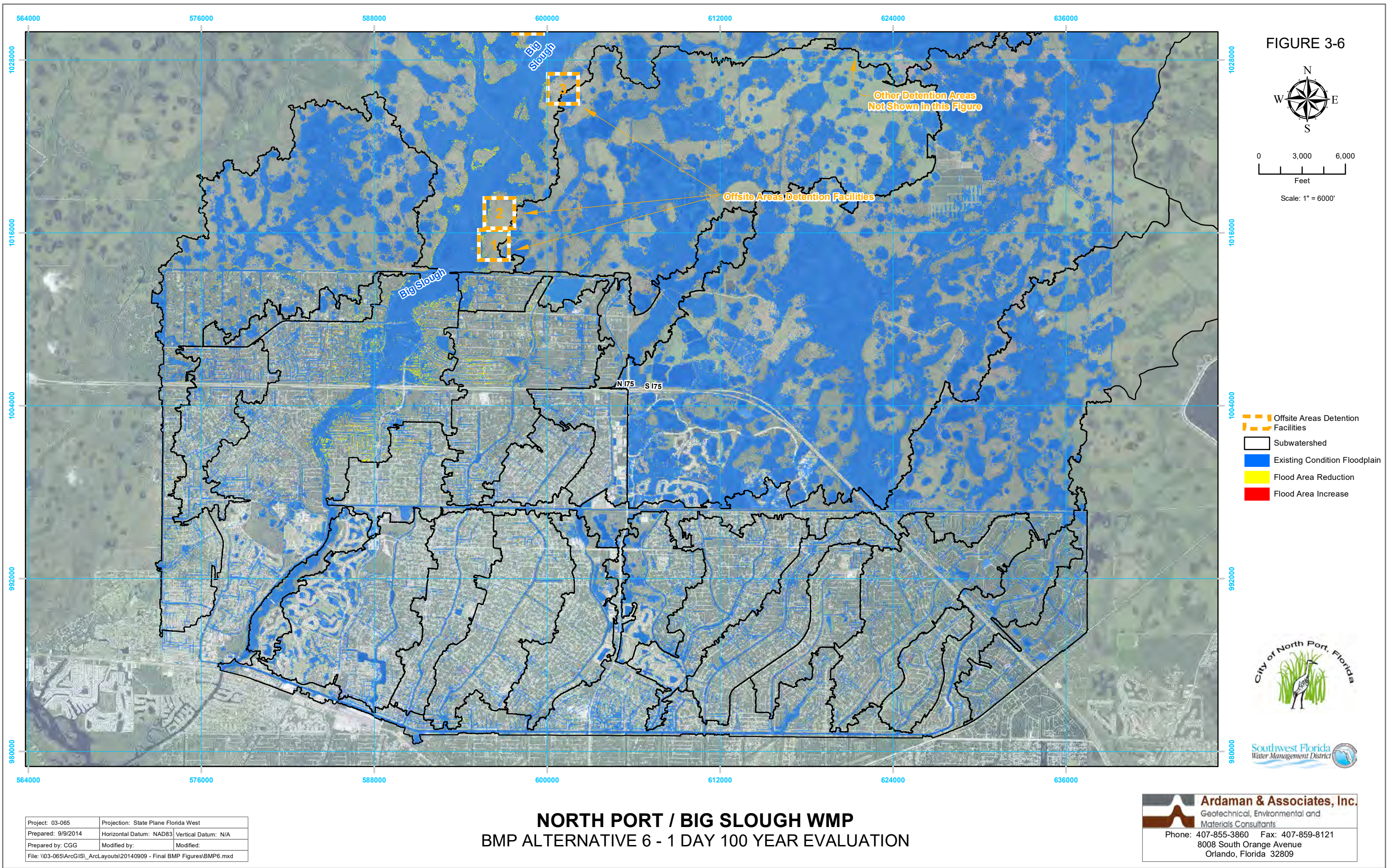
NORTH PORT / BIG SLOUGH WMP

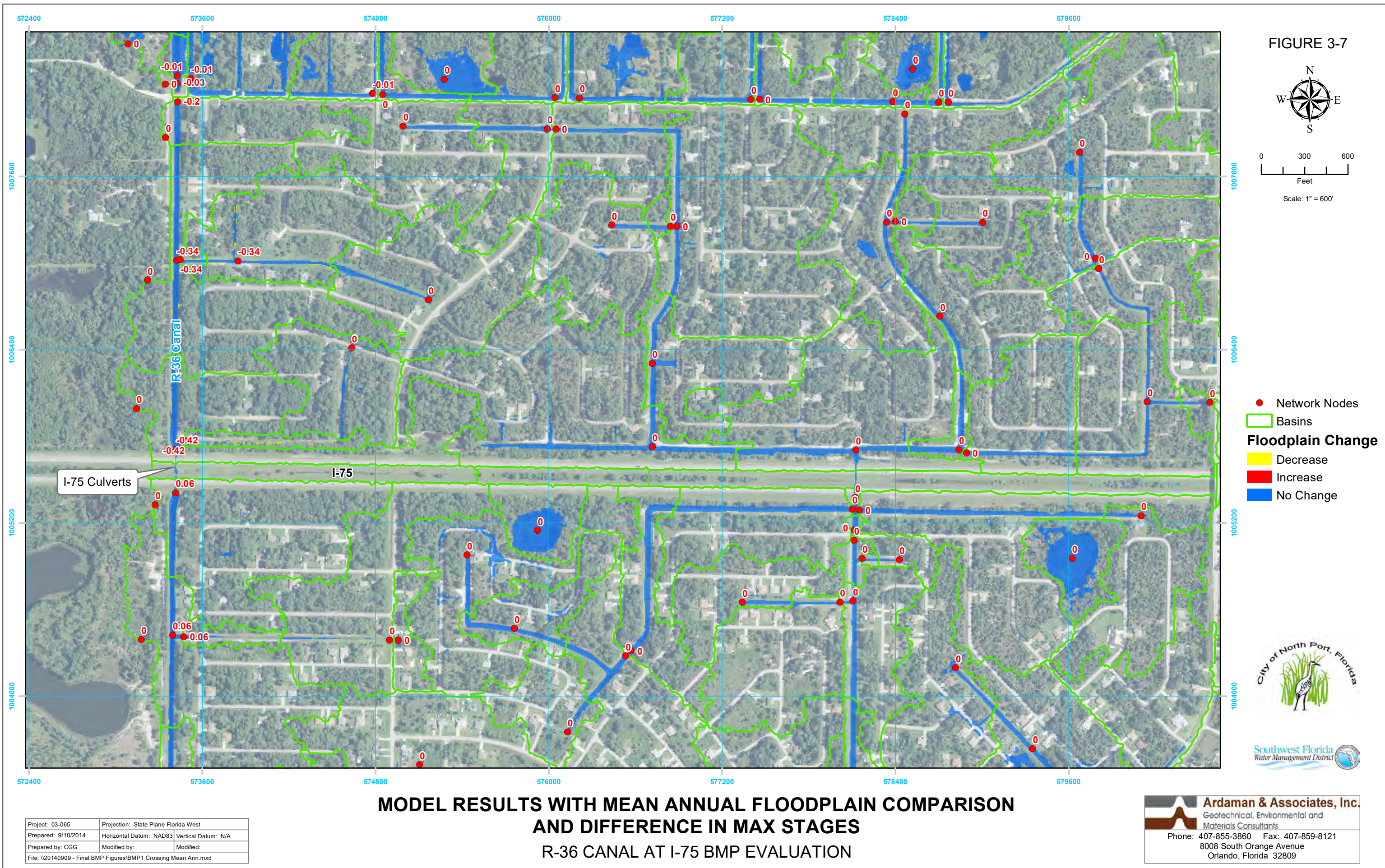
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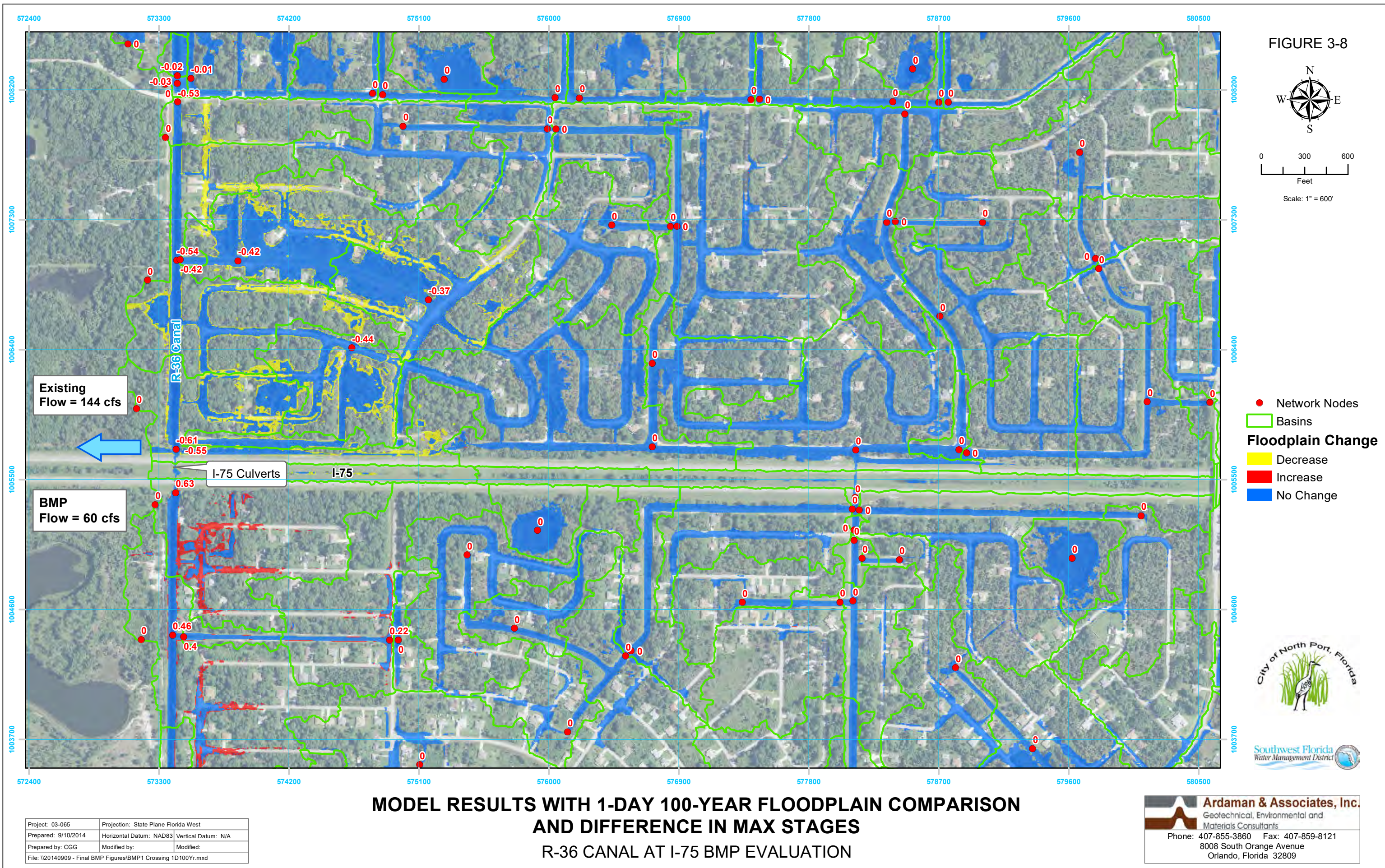


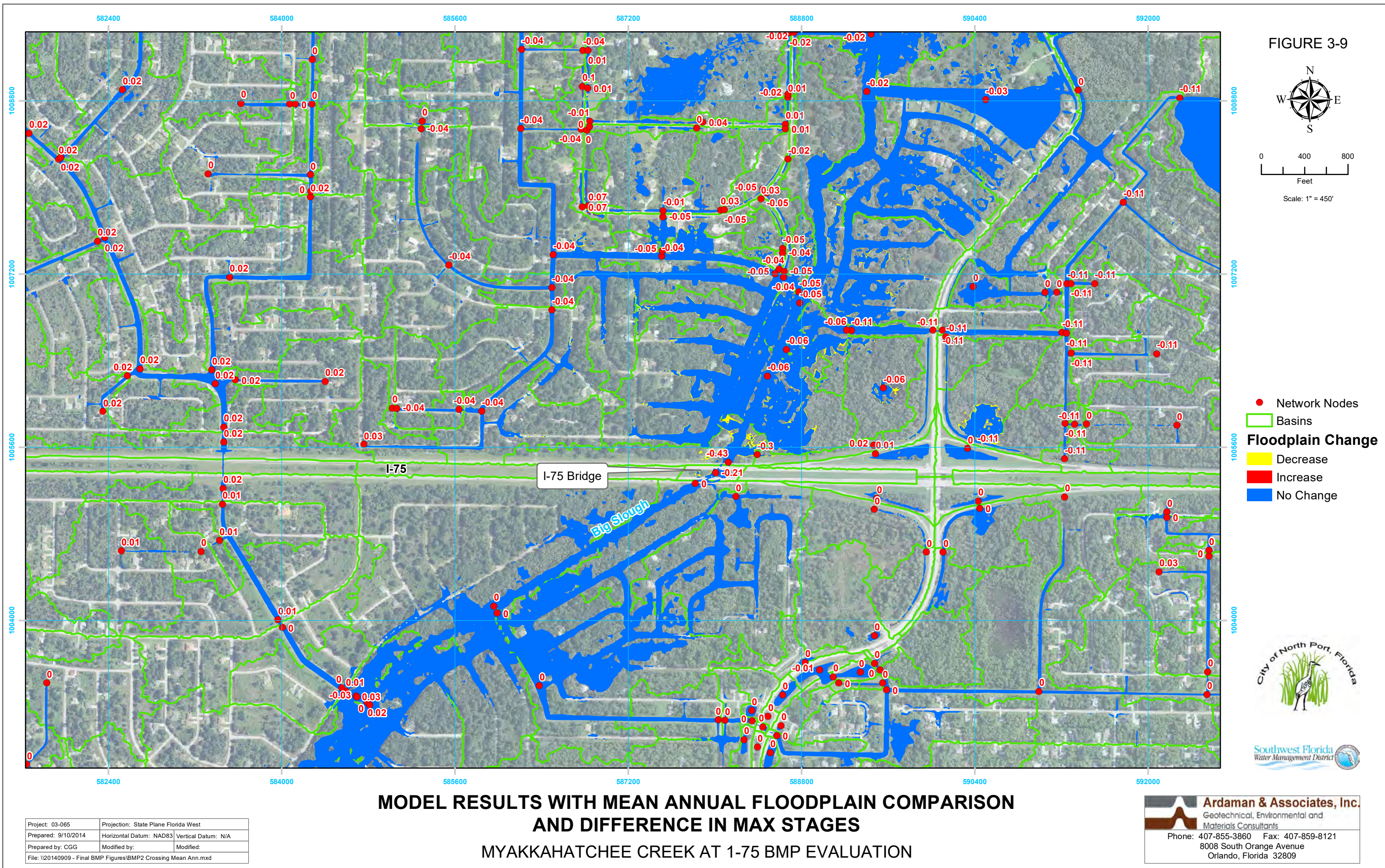
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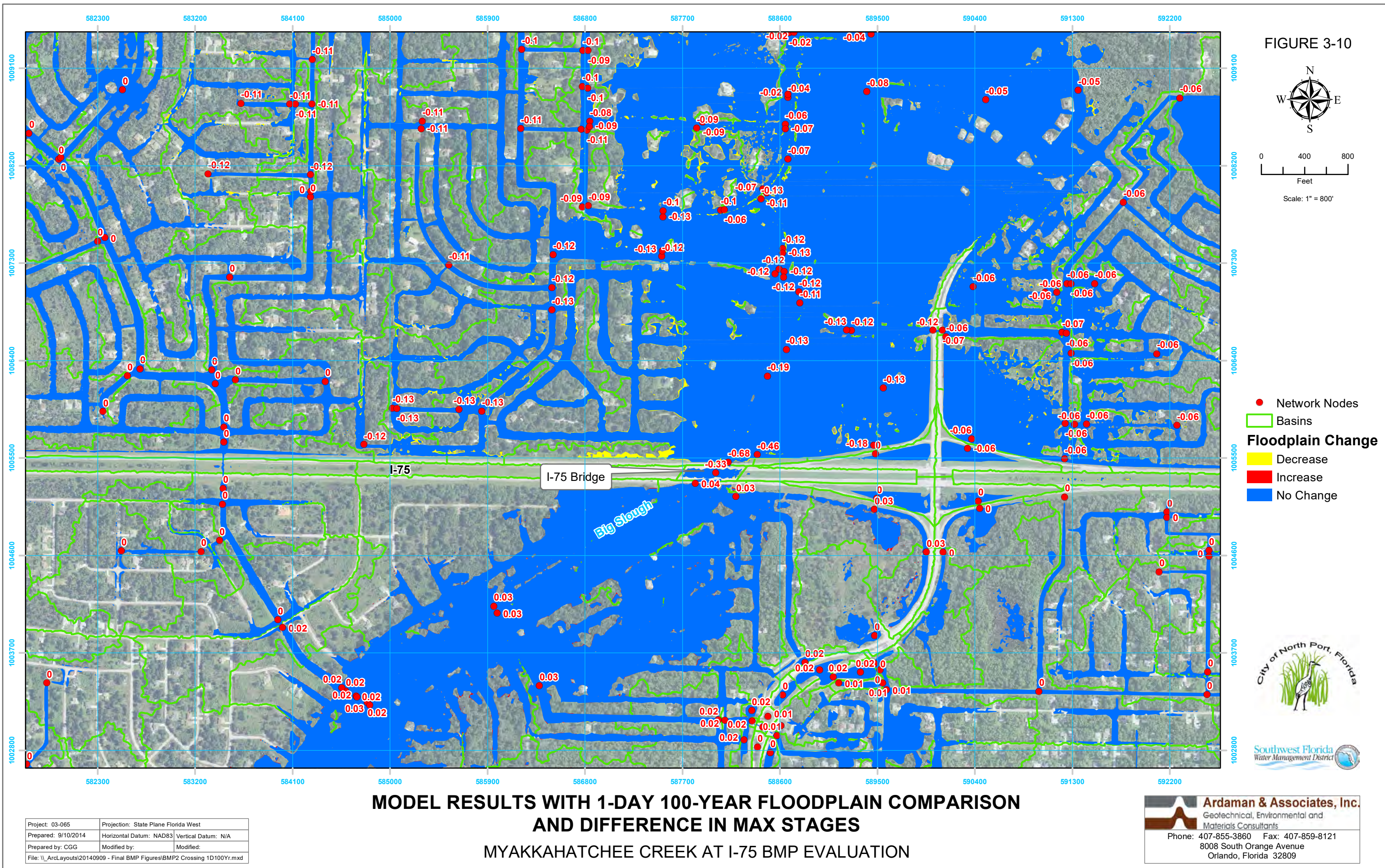
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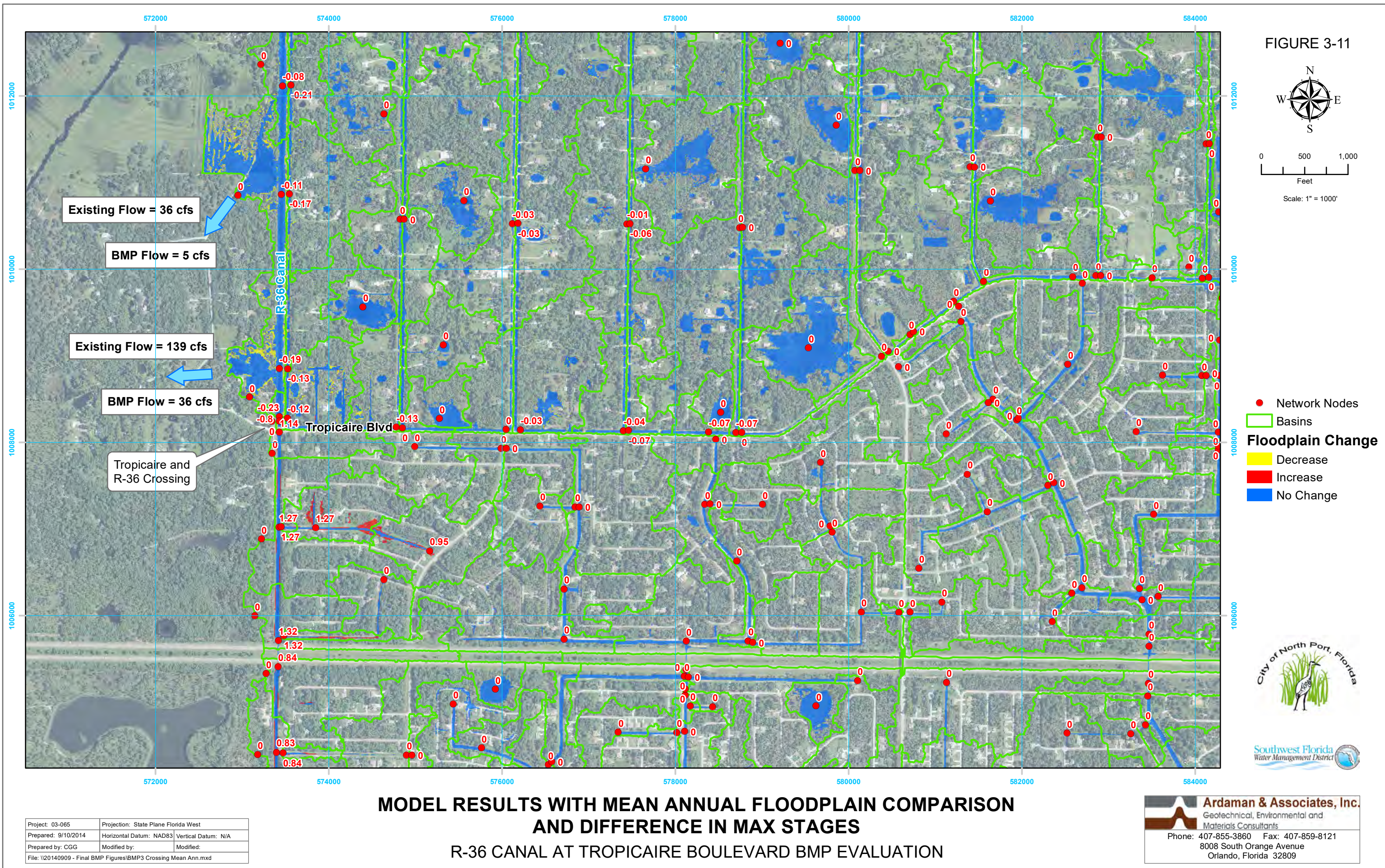


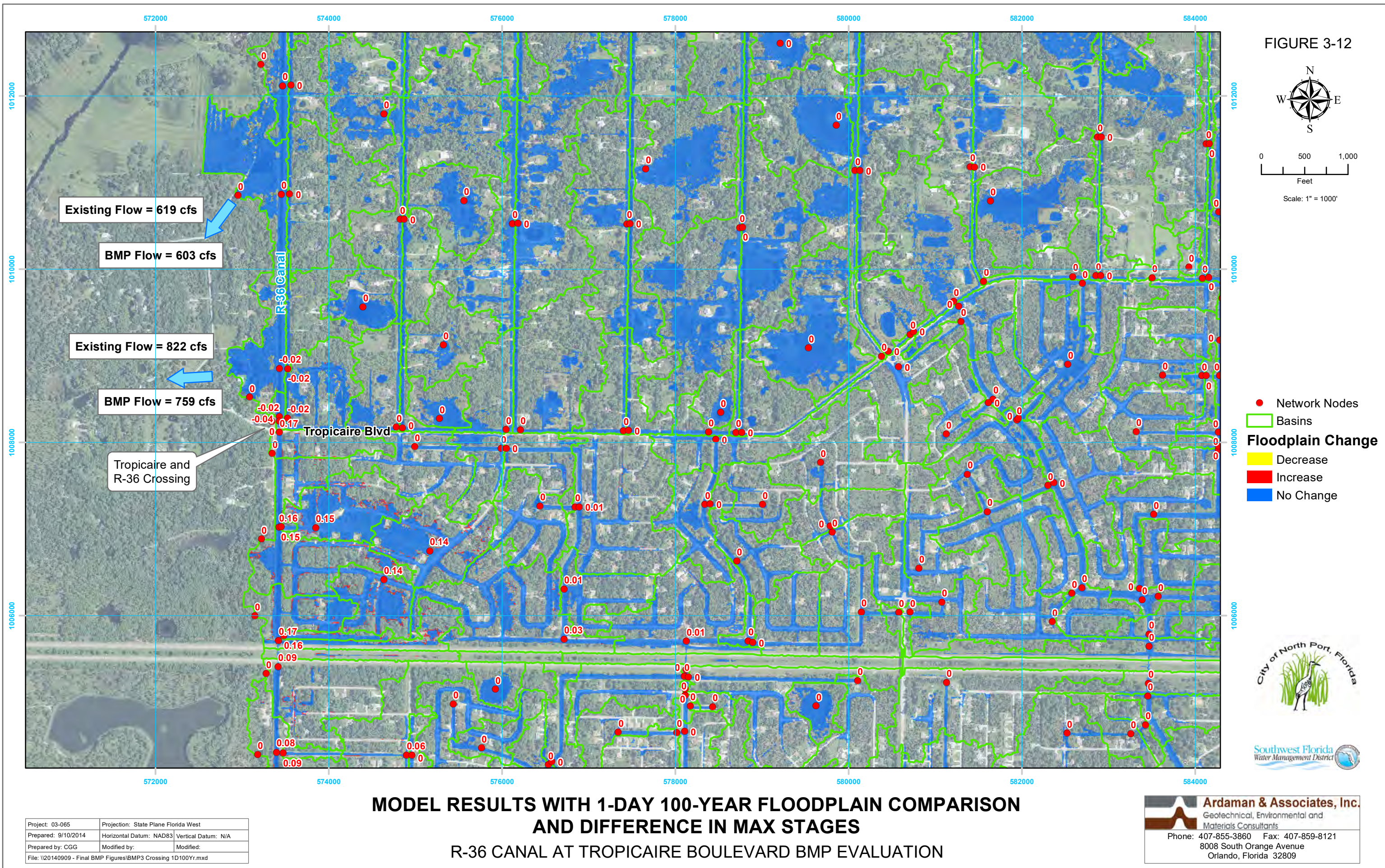


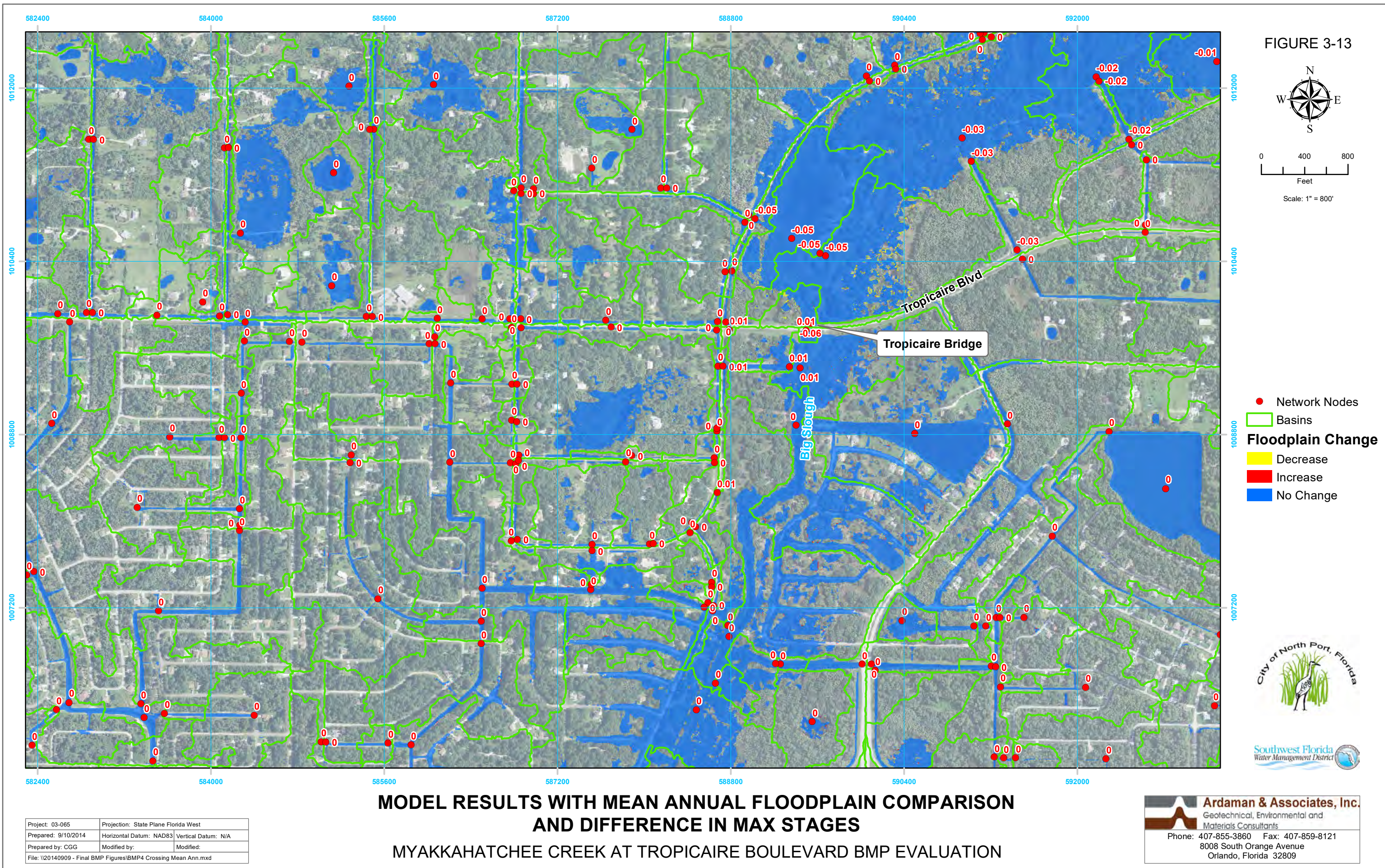


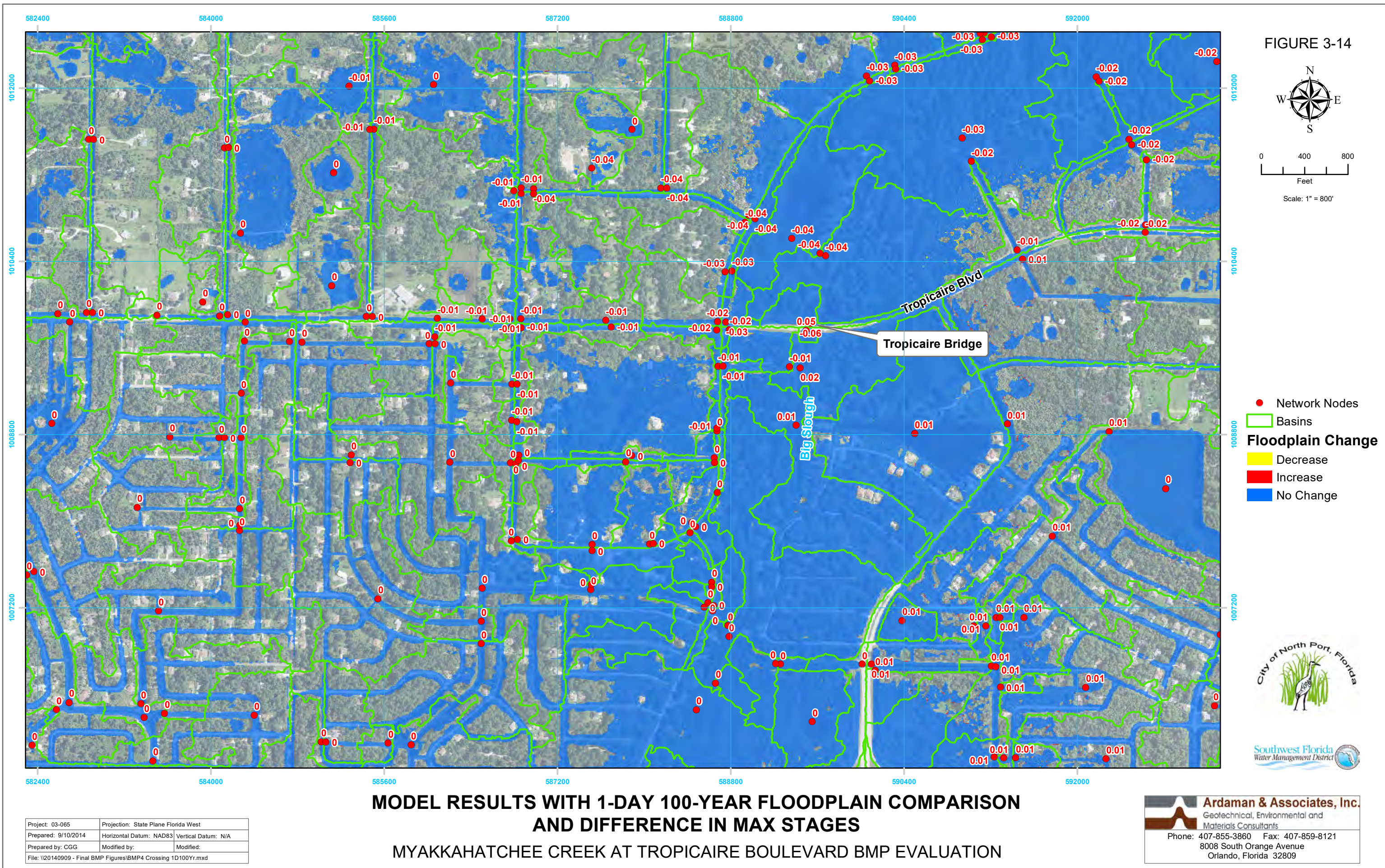












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Prepared by: CGG	Modified by:	Modified:
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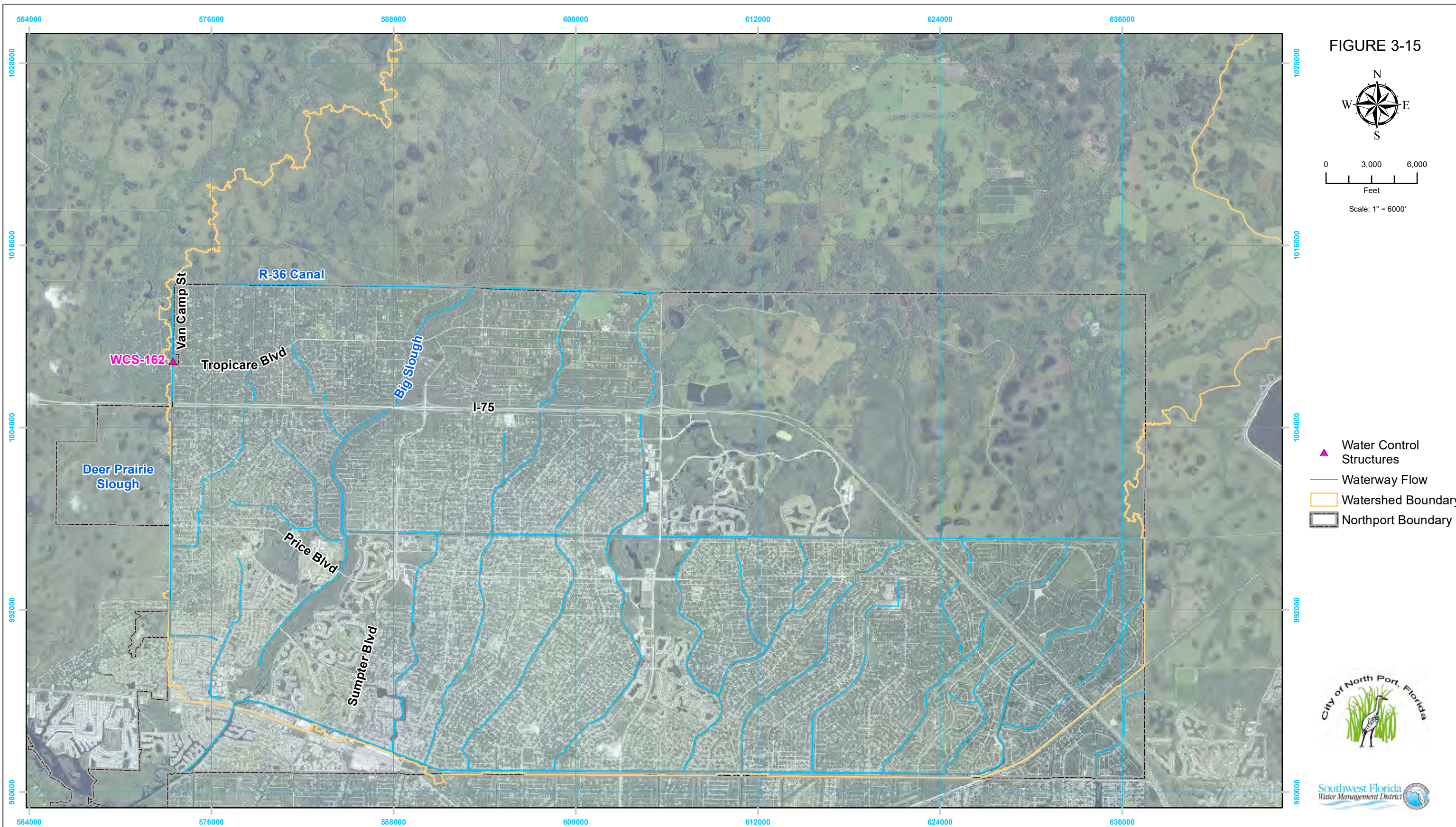
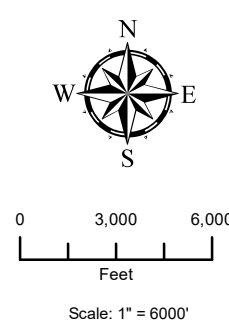






FIGURE 3-15



-  Water Control Structures
-  Waterway Flow
-  Watershed Boundary
-  Northport Boundary



Project: 03-065	Projection: State Plane Florida West	
Prepared: 9/9/2014	Horizontal Datum: NAD83	Vertical Datum: N/A
Prepared by: CGG	Modified by:	Modified:
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LOCATION OF WCS-162

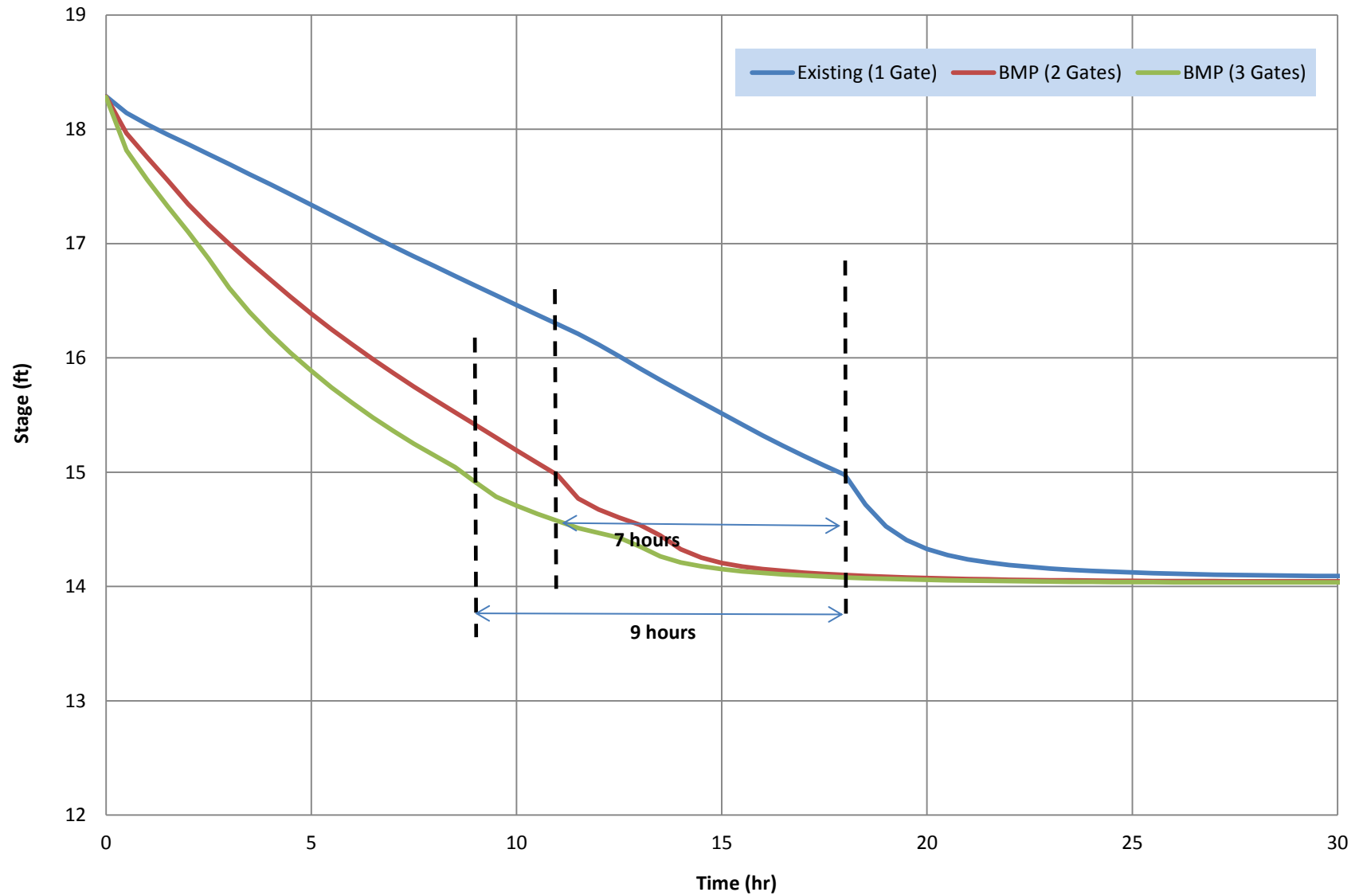
CITY OF NORTH PORT, SARASOTA COUNTY, FL



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Figure 3-16. Stage at R-36 Canal Upstream of WCS-162



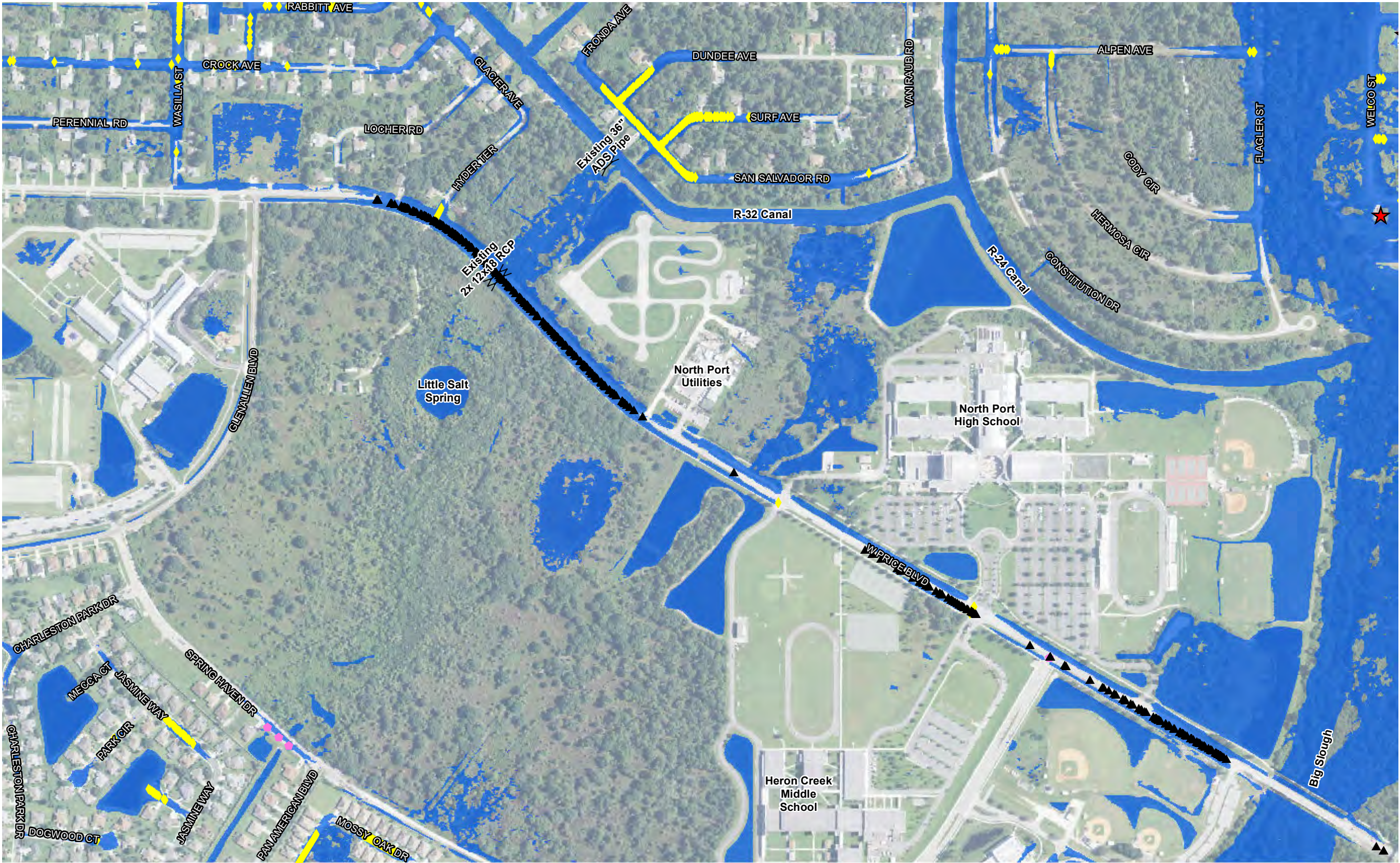
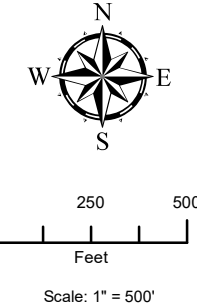


FIGURE 3-17



- Habitable Structure Floods in 100 Year Event
- Arterial Street Floods in 100 Year Event
- Evacuation Route Floods in 100 Year Event
- Collector Street Floods in 25 Year Event
- Local Street Floods in 25 Year Event



EXISTING CONDITION LOS AND 100-YEAR FLOODPLAIN NORTH PORT/BIG SLOUGH WMP

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Prepared: 08-05-14	Horizontal Datum: HARN Vertical Datum: N/A
Prepared by: TJC	Modified by:
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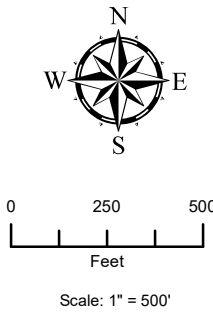
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FIGURE 3-18



- Habitable Structure Floods in 100 Year Event
- Arterial Street Floods in 100 Year Event
- Evacuation Route Floods in 100 Year Event
- Collector Street Floods in 25 Year Event
- Local Street Floods in 25 Year Event



UPDATED EXISTING CONDITION 100-YEAR FLOODPLAIN NORTH PORT/BIG SLOUGH WMP

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Prepared: 08-05-14	Horizontal Datum: HARN Vertical Datum: N/A
Prepared by: TJC	Modified by:
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Ardaman & Associates, Inc.

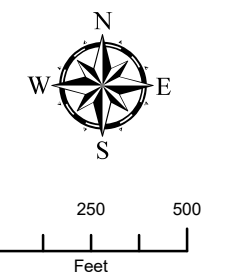
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FIGURE 3-19



- Node
(Maxstage Change)
- BMP_1
- Decrease
- Increase
- No Change



BMP_1 25-YEAR FLOODPLAIN COMPARISON NORTH PORT/BIG SLOUGH WMP

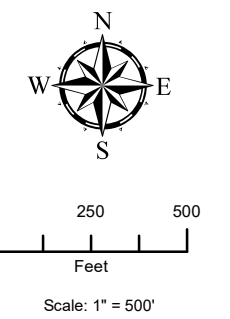
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FIGURE 3-20



- Node (Maxstage Change)
- - - BMP_1
- Decrease
- Increase
- No Change



BMP_1 100-YEAR FLOODPLAIN COMPARISON **NORTH PORT/BIG SLOUGH WMP**

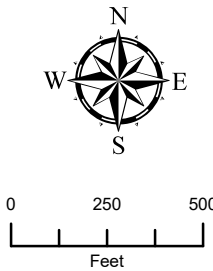
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FIGURE 3-21



- Node
(Maxstage Change)
- BMP_2
- Decrease
- Increase
- No Change



BMP_2 100-YEAR FLOODPLAIN COMPARISON **NORTH PORT/BIG SLOUGH WMP**

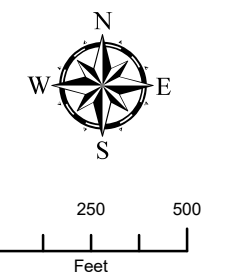
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Prepared by: TJC	Modified by:
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FIGURE 3-22



- Node (Maxstage Change)
- BMP_3
- Decrease
- Increase
- No Change



BMP_3 100-YEAR FLOODPLAIN COMPARISON **NORTH PORT/BIG SLOUGH WMP**

Project: 03-065	Projection: State Plane Florida West
Prepared: 08-05-14	Horizontal Datum: HARN Vertical Datum: N/A
Prepared by: TJC	Modified by:
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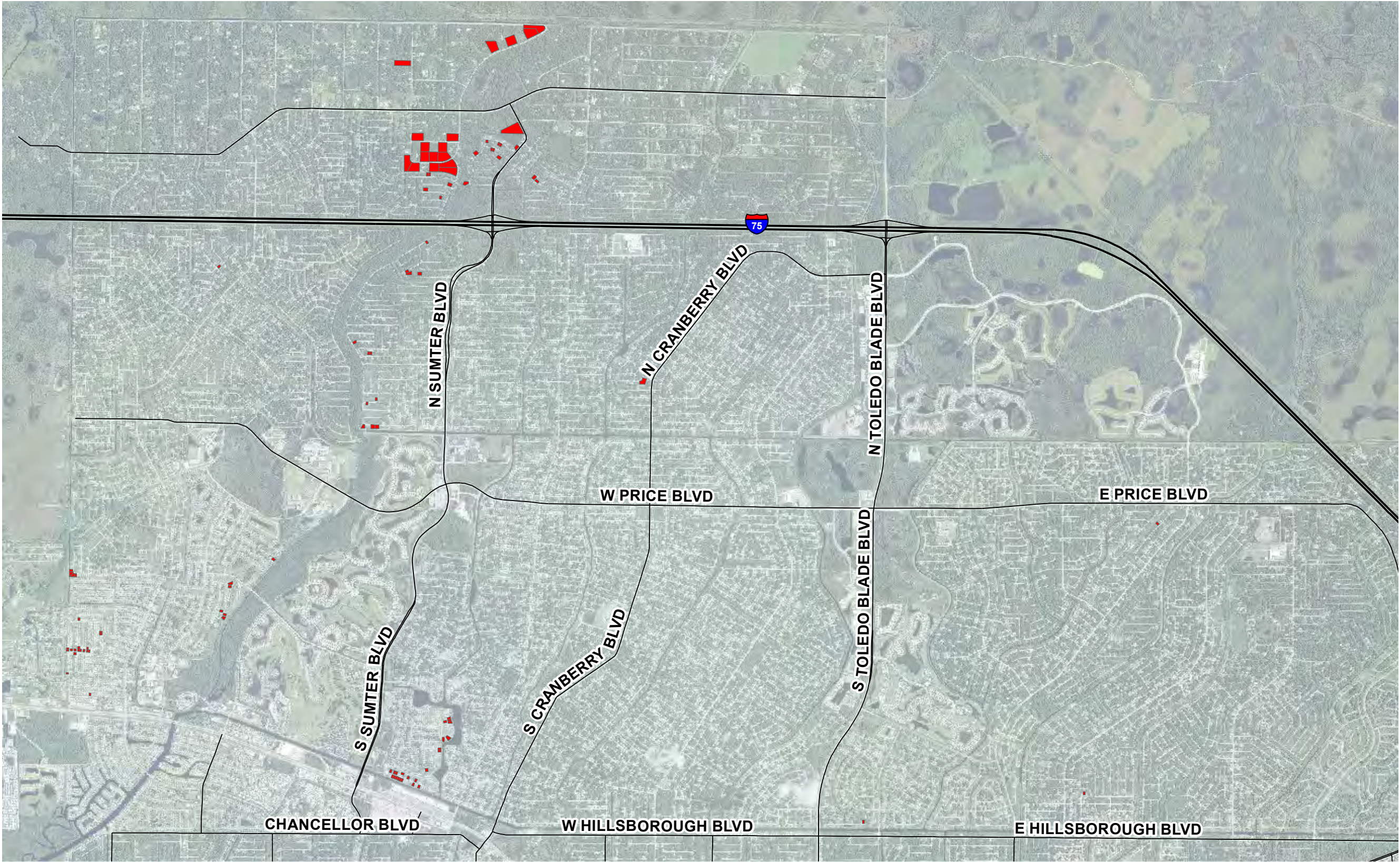
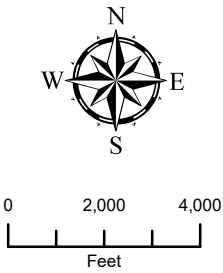


FIGURE 5-1



FLOODED PARCELS TO SURVEY **NORTH PORT/BIG SLOUGH WMP**

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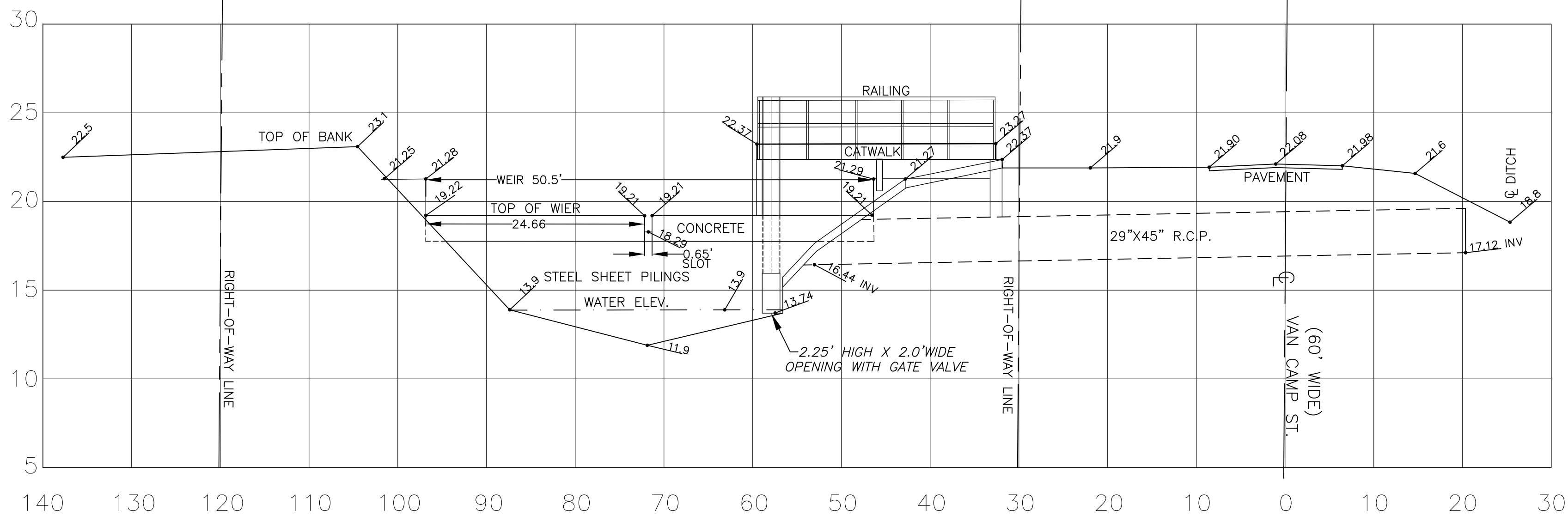
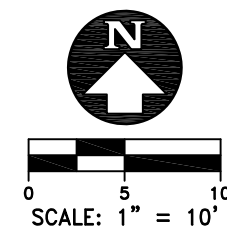
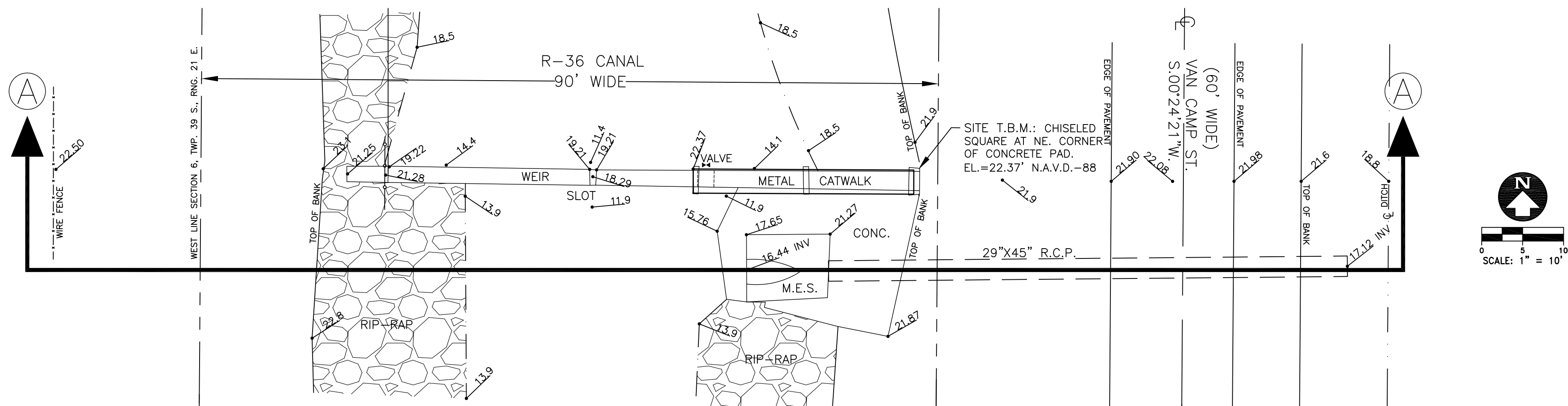


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APPENDIX A

2014 Survey Data of WCS-162



SCALE:
1" = 10' HORIZ.
1" = 5' VERT.

SECTION "A" - "A" WATER CONTROL STRUCTURE #162

LEGEND

T.B.M. TEMPORARY BENCH MARK
E.O.P. EDGE OF PAVEMENT
C CENTERLINE
7.7 TYPICAL SPOT ELEVATION
R.C.P. REINFORCED CONCRETE PIPE
M.E.S. MITERED END SECTION

SURVEYOR'S NOTES/REPORT:

- BEARINGS ARE BASED ON AN ASSUMED MERIDIAN. A BEARING OF S.00°24'21"W. WAS ASSIGNED TO THE CENTERLINE OF VAN CAMP STREET PER RECORD PLAT OF NORTH PORT CHARLOTTE ESTATES.
- ELEVATIONS SHOWN ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988. F.D.E.P. BENCH MARK N-698-2007.
- THE ACCURACY OF THIS MAP OF SURVEY IS BASED ON CONTROL MEASUREMENTS THAT MEET OR EXCEED THE MINIMUM ACCURACY REQUIREMENTS FOR THIS TYPE OF SURVEY AS SPECIFIED IN CHAPTER 5J-17, FAC. THIS MAP'S DIGITAL DATA IS INTENDED TO BE DISPLAYED AT A SCALE OF 1"=20' OR SMALLER.
- SURVEY PERFORMED FOR THE "SPECIFIC PURPOSE" OF PROVIDING ELEVATION AND DIMENSION DETAILS OF THE WATER CONTROL STRUCTURE FOR USE BY THE CITY OF NORTH PORT DEPARTMENT OF ENGINEERING.

FOR: CITY OF NORTH PORT
DEPARTMENT OF ENGINEERING

CERTIFICATE

I, hereby certify that this Map/Report of Survey as shown and/or described herein represents the results of Field Surveys performed under my supervision, that it is true and correct to the best of my knowledge, information and belief and meets the requirements of Chapter 5J-17, F.A.C. pursuant to Section 472.027, F.S. Subject to all notations as shown herein.

Van Buskirk / Fish & Associates, Inc., LB#3739

By: *Alan K. Fish*
Alan K. Fish, P.S.M.
Registered Professional Surveyor & Mapper
Florida Certificate No. 3941

Date of Survey: JUNE 19TH, 2014

"Not valid without the signature and the original raised seal of a Florida licensed surveyor and mapper."

REVISIONS:	BY:

MAP OF "SPECIFIC PURPOSE SURVEY,
OF WATER CONTROL STRUCTURE # 162
IN NORTH PORT CHARLOTTE ESTATES
CITY OF NORTH PORT, SARASOTA COUNTY, FLORIDA

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Van Buskirk / Fish & Associates, Inc.
SURVEYORS - MAPPERS -
DEVELOPMENT CONSULTANTS
12450 Unit C Tamiami Trail - North Port, FL 34287 - (941) 426-0681

DATE:	6-19-2014
SCALE:	AS NOTED
DRAWN:	GC
PROJECT NO.	14-1087
SHEET	1
OF 1 SHEETS	

APPENDIX B

WCS-162 Pictures



Looking North-West from the downstream of WCS-162



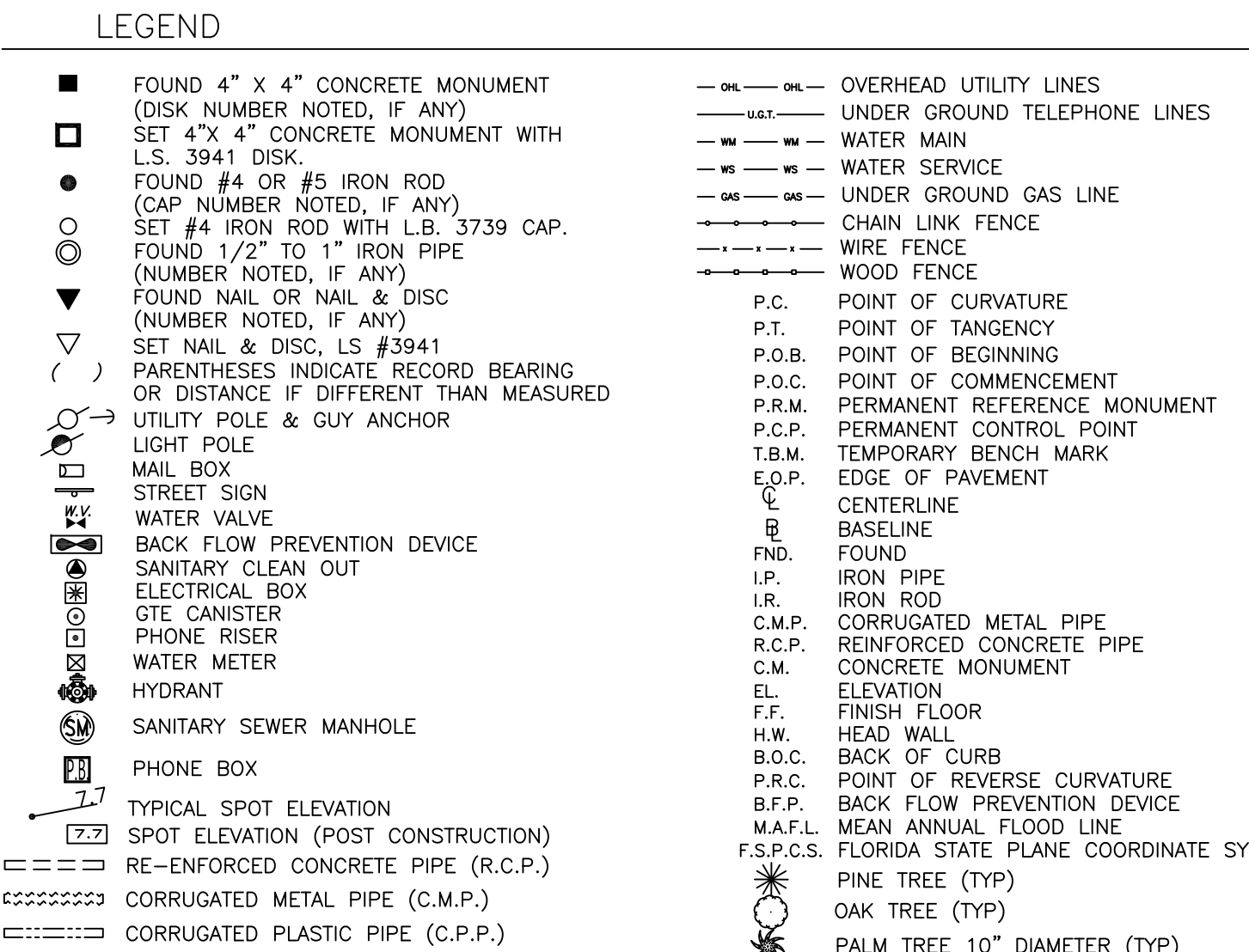
Looking South-West from the upstream of WCS-162



Looking South-West from the upstream of WCS-162


APPENDIX C

2014 Survey Data of West Price Boulevard



- 1) BEARINGS ARE BASED ON "GRID NORTH" FLORIDA STATE PLANE COORDINATE SYSTEM, "WEST ZONE". COORDINATES ARE NAD 1983/2007.
- 2) ELEVATIONS SHOWN ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM.
- 3) THIS SURVEY WAS PERFORMED FOR THE "SPECIFIC PURPOSE" OF PROVIDING TOPOGRAPHIC SPOT ELEVATIONS, CULVERT AND STORM DRAIN PIPE SIZES AND ELEVATIONS, OR ELEVATIONS OF EXISTING OR OTHER SELECTED ELEVATION DATA FOR USE IN A DRAINAGE STUDY OF THE PORTIONS OF PRICE BLVD. SHOWN IN THIS MAP. THIS SURVEY WAS NOT FOR:
- 4) EASEMENTS SHOWN IF AND ARE INTERPRETED FROM RECORD PLAT DEDICATIONS OR TITLE INFORMATION SUPPLIED TO OR ACQUIRED BY THE SURVEYOR AT THE TIME OF THE SURVEY. THIS SURVEY MAY BE SUBJECT TO OTHER RESERVATIONS, RESTRICTIONS, COVENANTS, EASEMENTS OR AGREEMENTS AFFECTING THE INTERESTS AND RIGHTS OF THE SURVEYED LAND. UNDERGROUND UTILITIES HAVE NOT BEEN LOCATED. IF UTILITY LINES ARE SHOWN, THEY WERE LOCATED AND IDENTIFIED BY OTHER MEANS. THE SURVEYOR ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OR THE COMPLETENESS OF SAID UTILITY LOCATIONS.
- 5) THE ACCURACY OF THIS MAP OF SURVEY IS BASED ON THE CONTROL MEASUREMENTS AND THE PRECISION OF THE MINIMUM ACCURACY REQUIREMENTS FOR THE TYPE OF SURVEY AS SPECIFIED IN CHAPTER 55-17, F.A.C. THIS MAP'S DATA ACCURACY IS INTENDED TO BE DISPLAYED AT A SCALE OF 1"=20' OR SMALLER.

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By: 

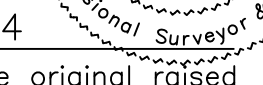
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Registered Professional Surveyor & Mapper

Florida Certificate No. 3941

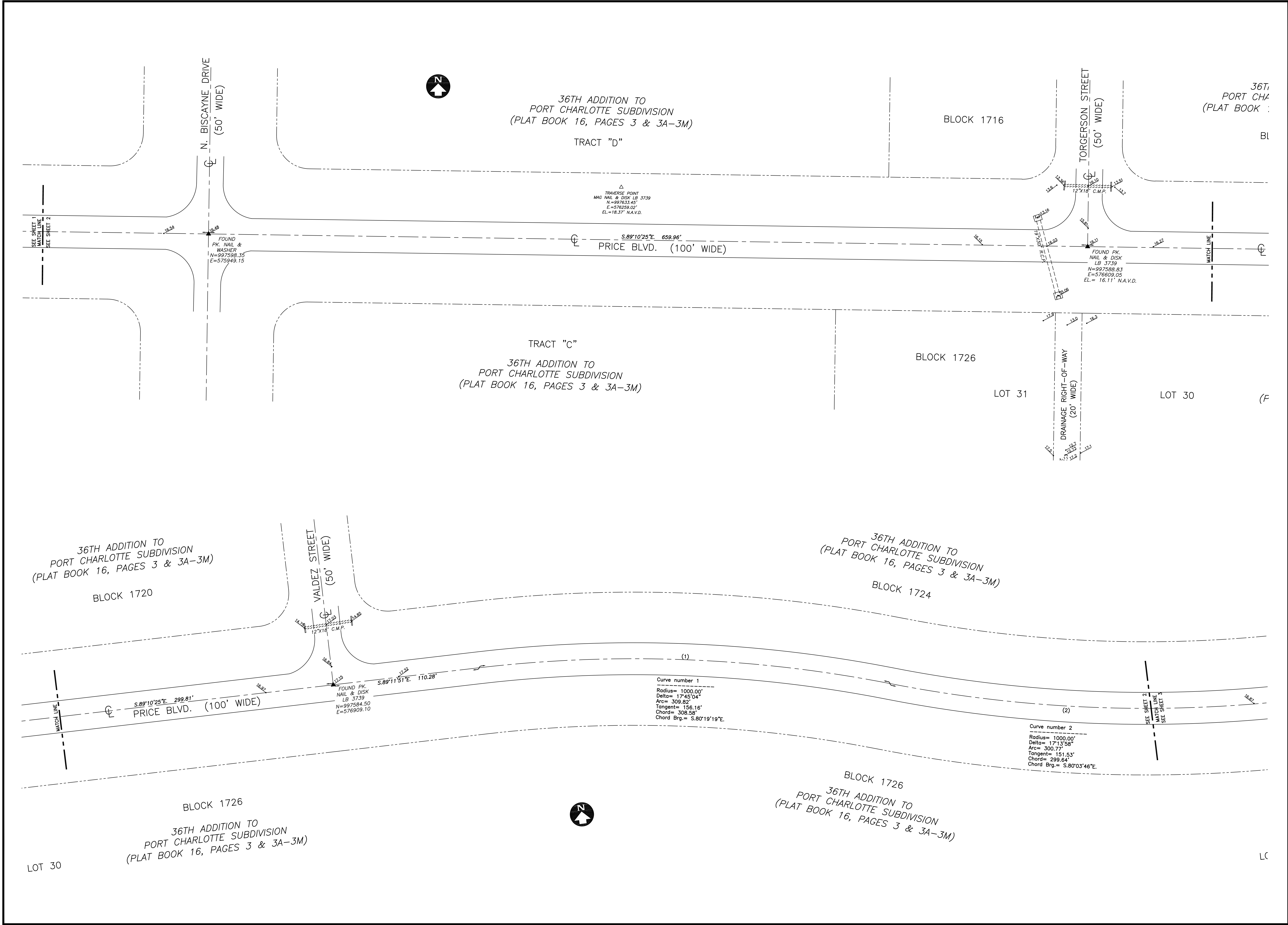
Date of Survey: JUNE 17, 2014

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MAP OF "SPECIFIC PURPOSE SURVEY" SHOWING FIELD SURVEY DATA COLLECTED FOR A DRAINAGE STUDY ALONG A PORTION OF PRICE BLVD. IN THE CITY OF NORTH PORT, FLORIDA

DATE: 6-17-2014
SCALE: 1" = 30'
DRAWN: GC
PROJECT NO. 14-1088
SHEET 1
OF 7 SHEETS



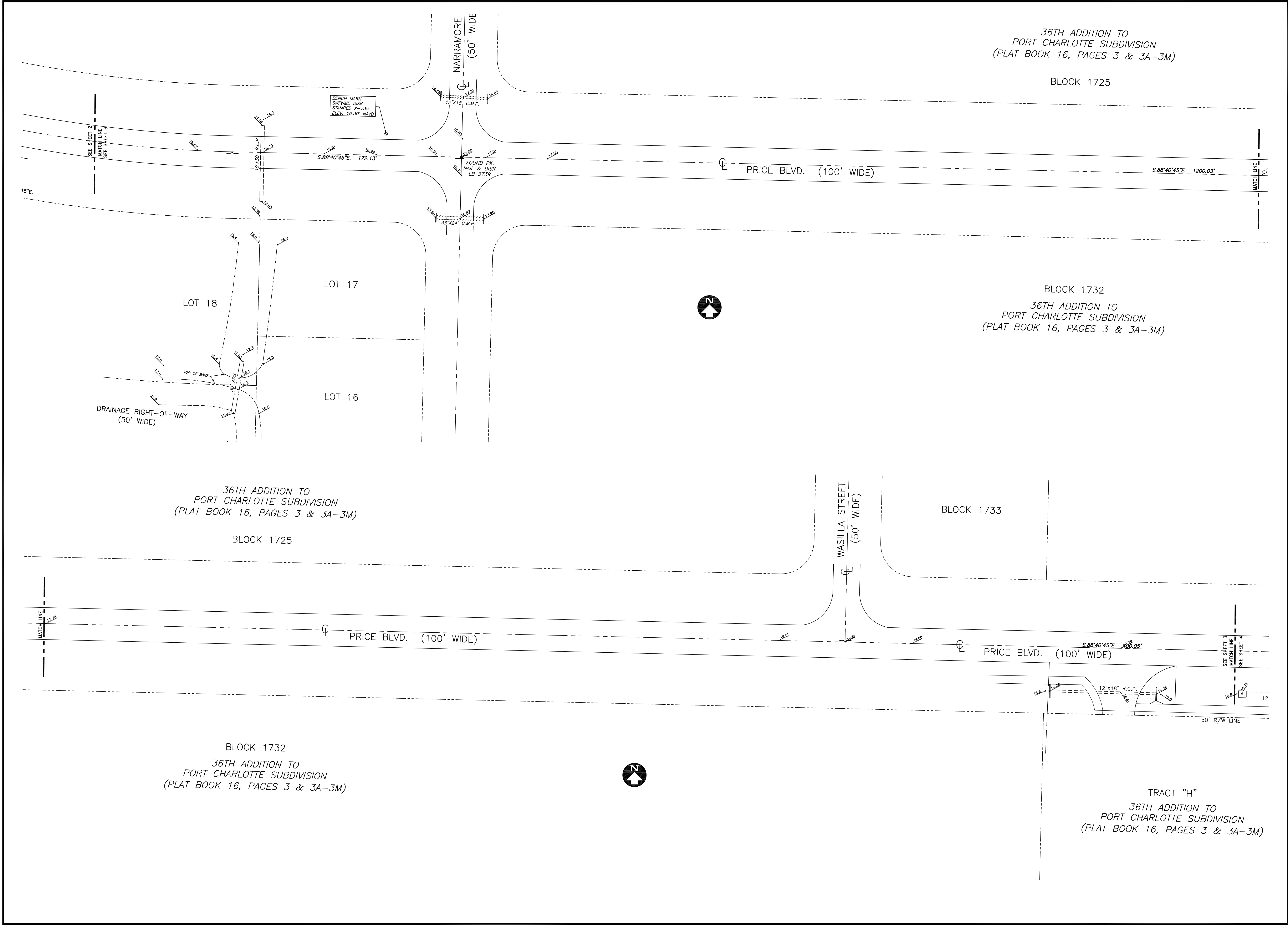
REVISIONS:	BY:

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DATE: 6-17-2014
SCALE: 1" = 30'
DRAWN: GC
PROJECT NO. 14-1088
SHEET 2 OF 7 SHEETS

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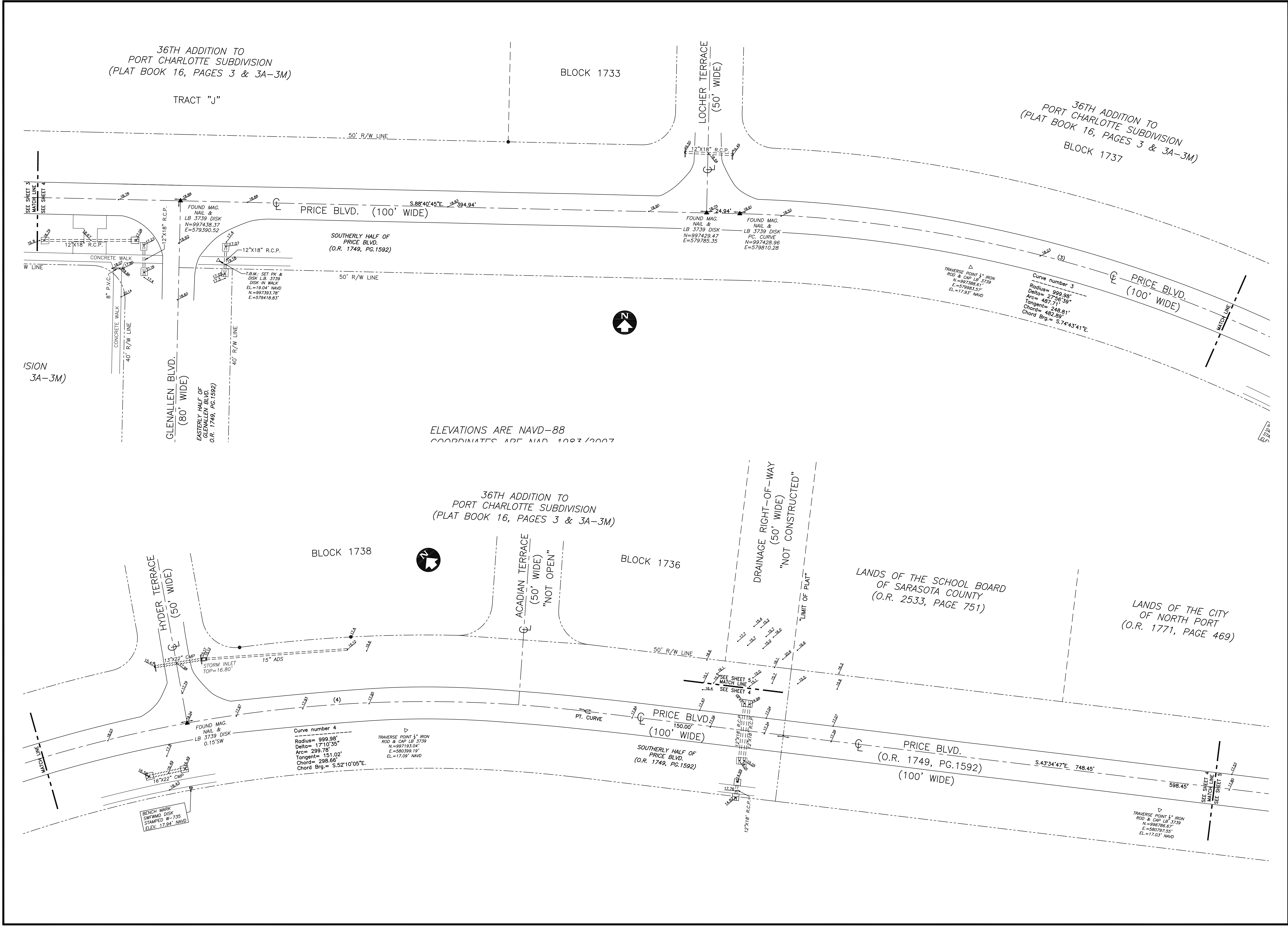
REVISIONS:	BY:

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DATE:	6-17-2014
SCALE:	1" = 30'
DRAWN:	AKF
PROJECT NO.	14-1088
SHEET	3
OF 7 SHEETS	



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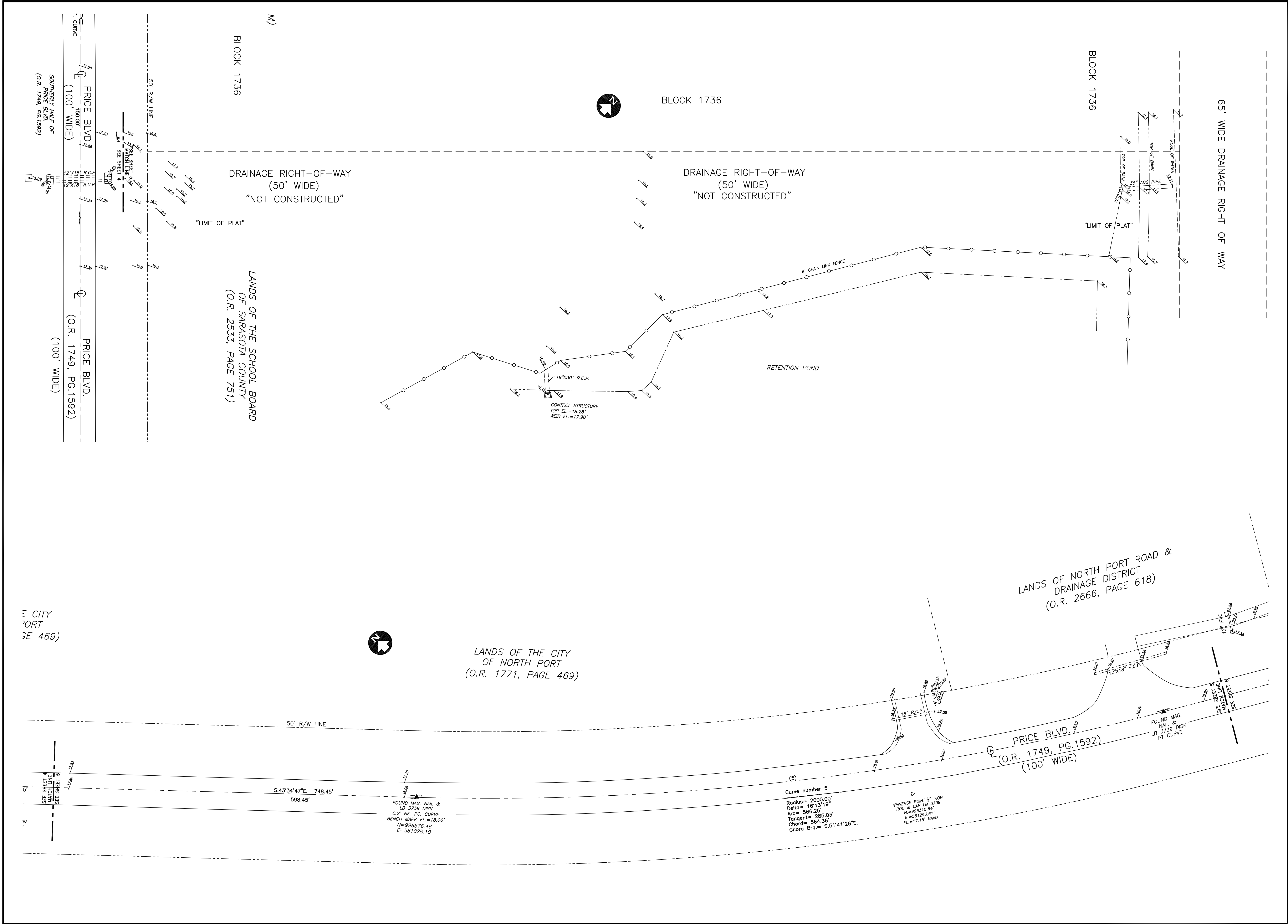
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SCALE:	1" = 30'
DRAWN:	AKF
PROJECT NO.	14-1088
SHEET	4
OF 7 SHEETS	



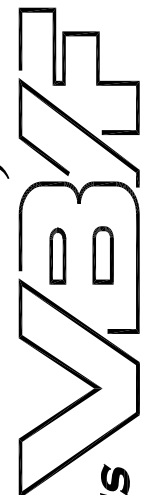
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MAP OF "SPECIFIC PURPOSE SURVEY" SHOWING FIELD SURVEY DATA COLLECTED FOR A DRAINAGE STUDY ALONG A PORTION OF PRICE BLVD. IN THE CITY OF NORTH PORT, FLORIDA

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6-17-2014

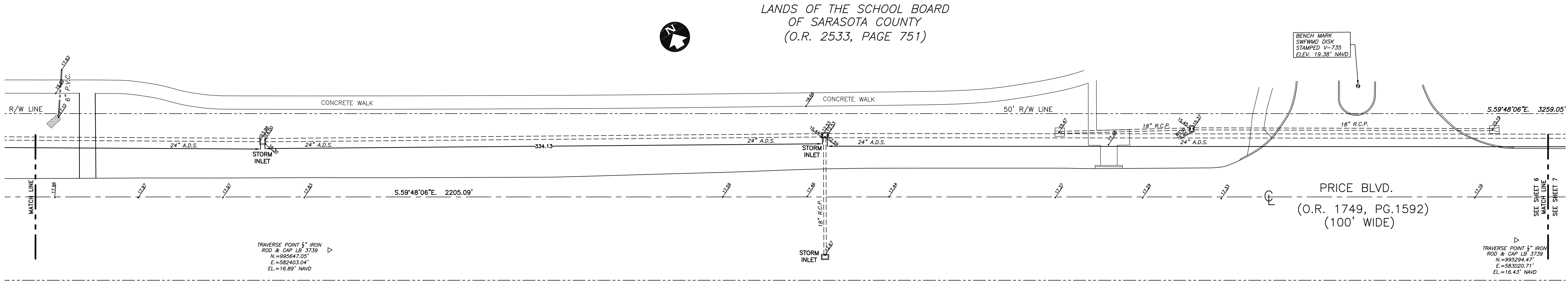
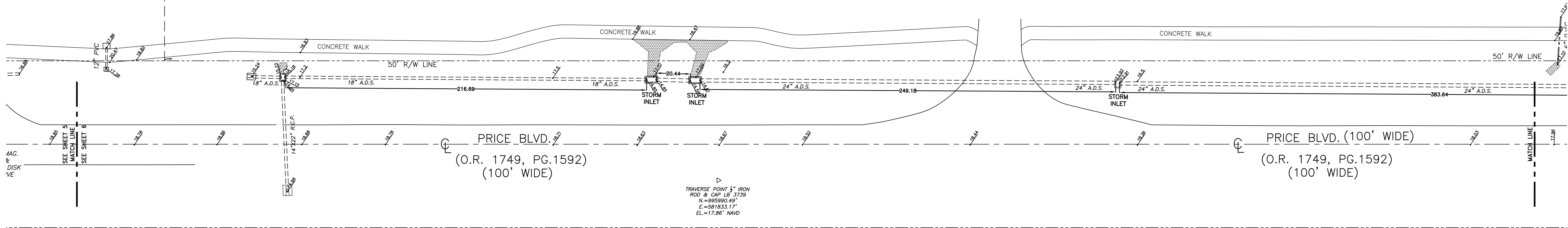
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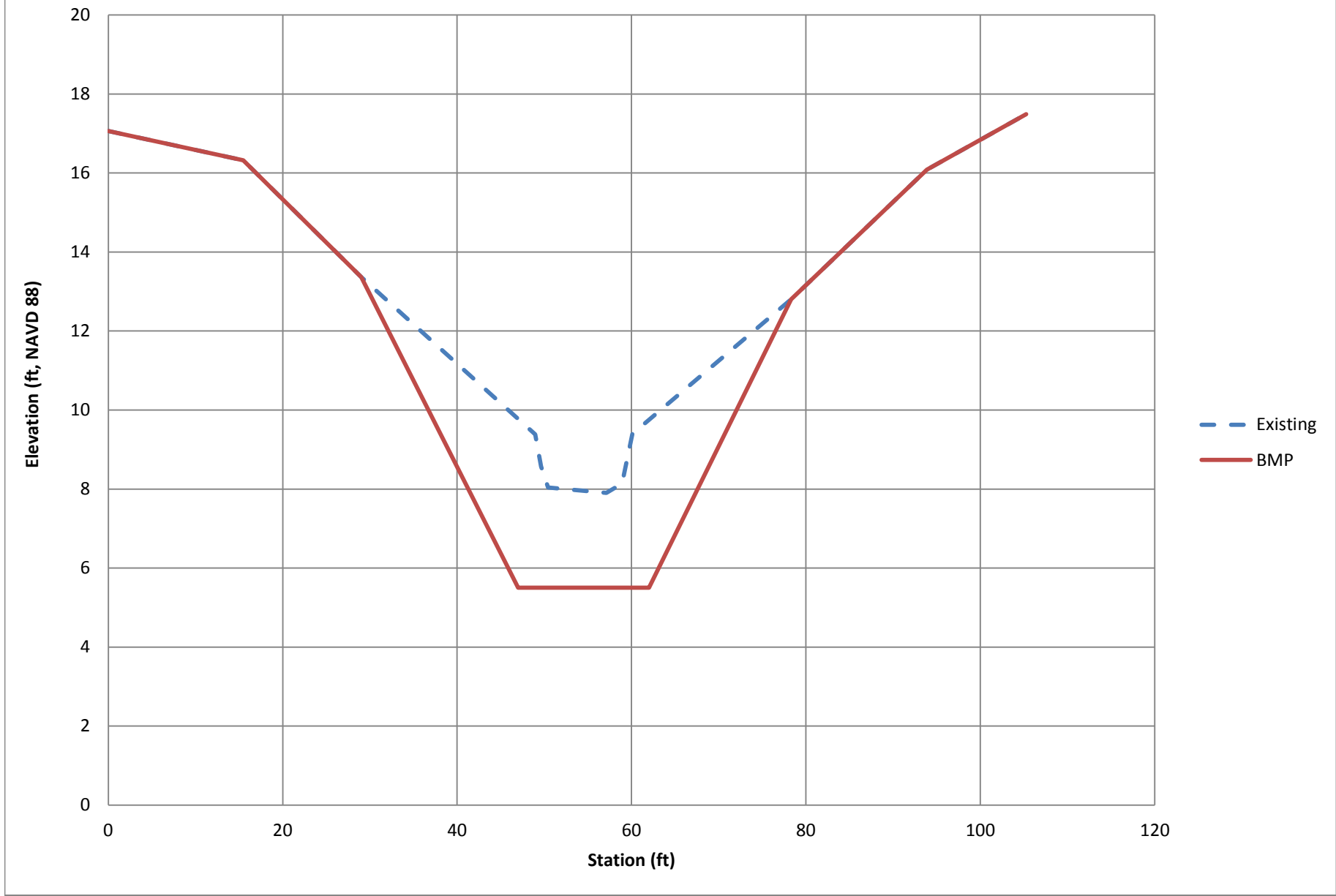
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SHEET 6 OF 7 SHEETS

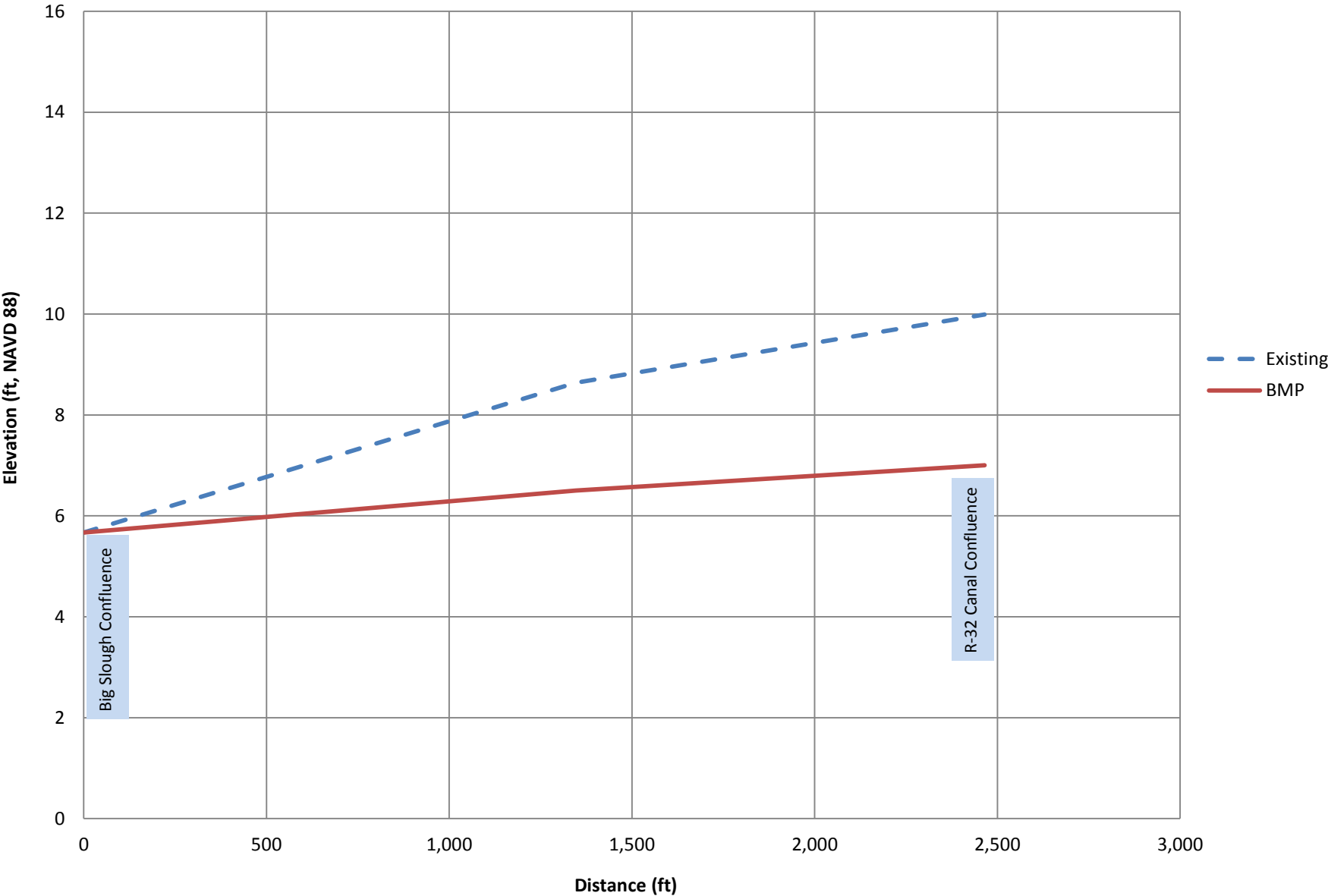
APPENDIX D

Canal Cross-sections and Profiles

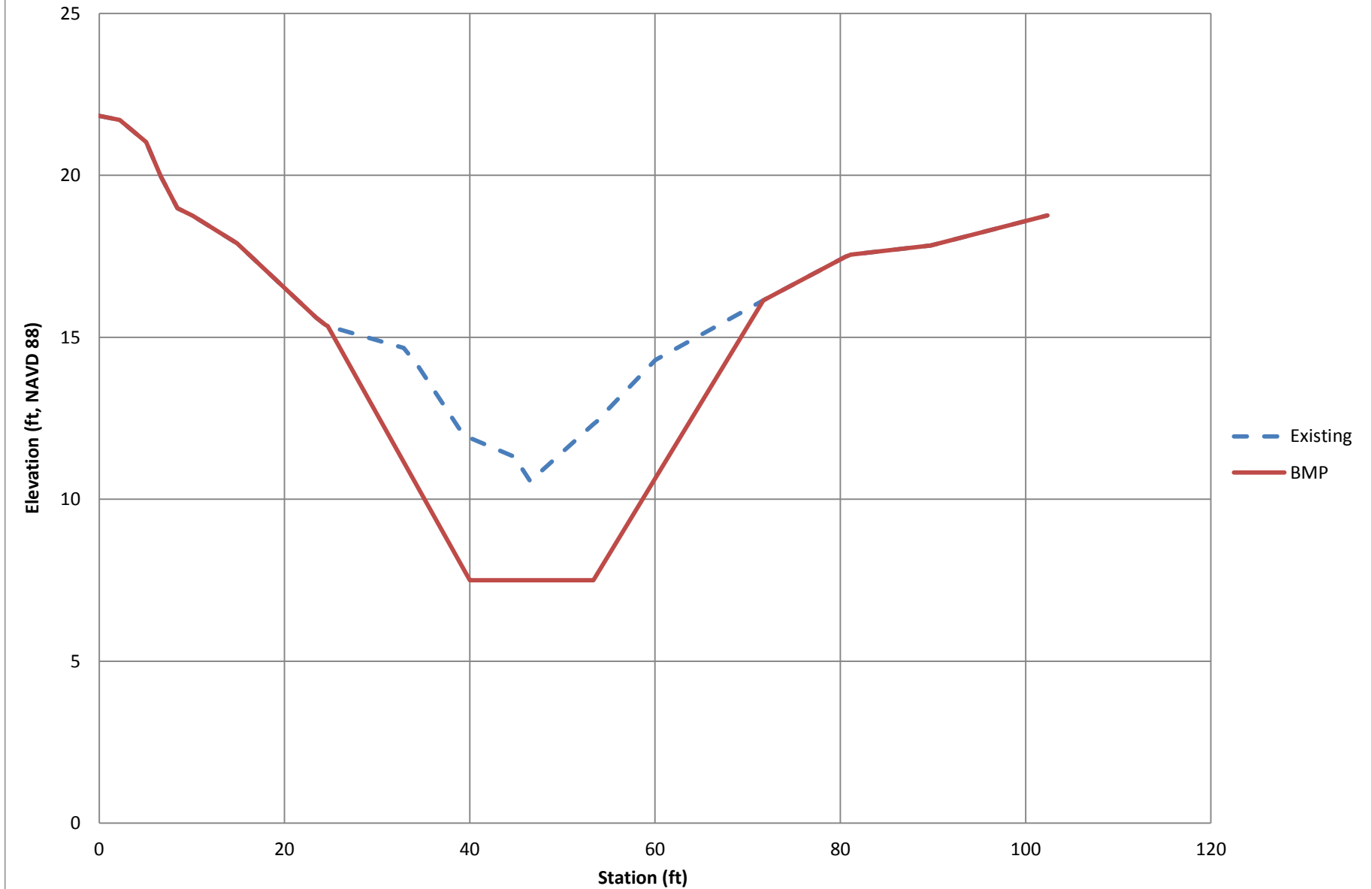
Existing and BMP Sections R-24 Canal



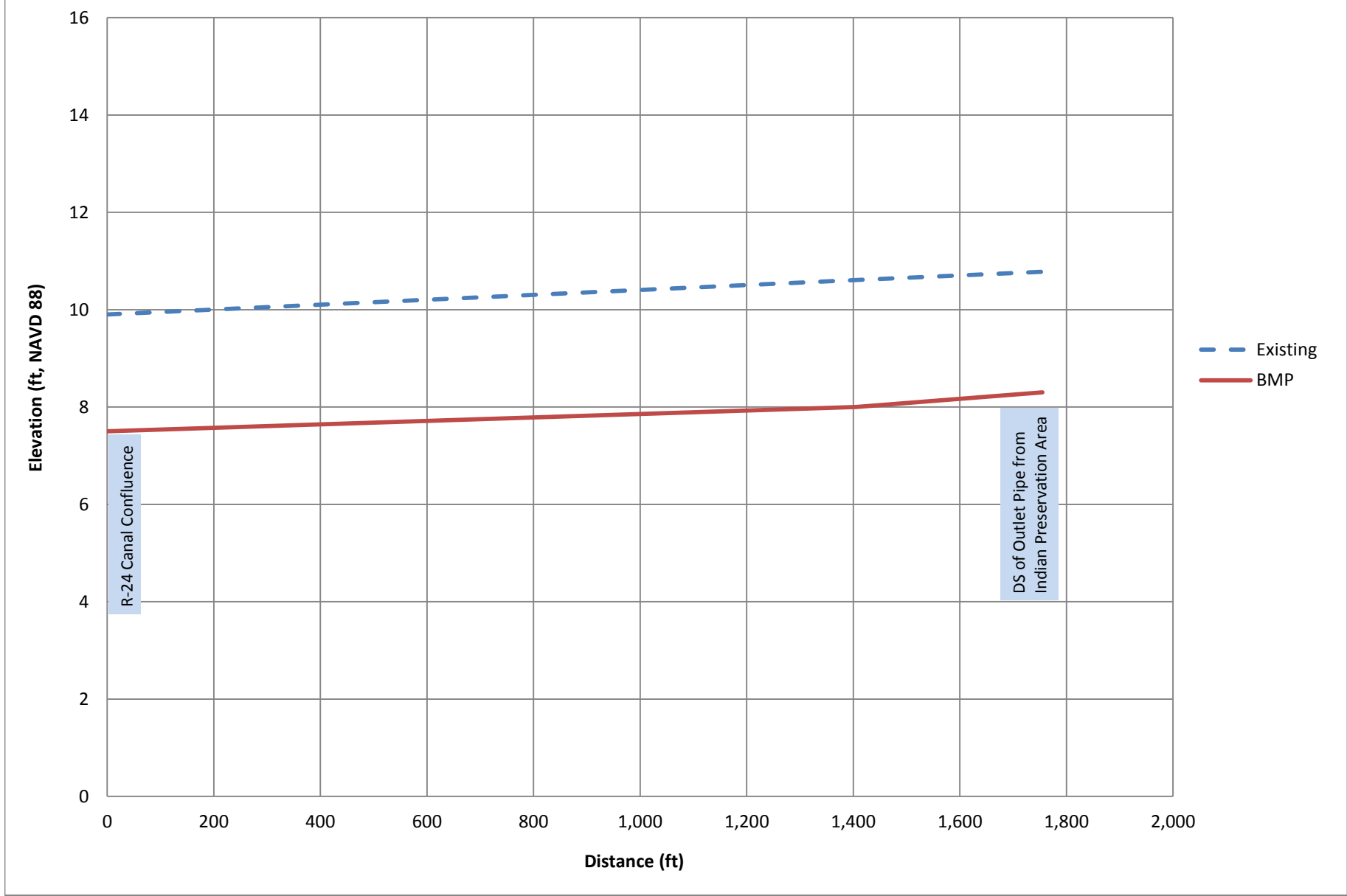
R-24 Canal Bottom Profile



Existing and BMP Sections R-32 Canal



R-32 Canal Bottom Profile



APPENDIX E

Preliminary Cost Estimates

BMP No. 1 (Dredging R-24 and R-32 Canals) Preliminary Cost Estimates

Item	Length (ft)	Width (ft)	Cross Section area	Quantity	Unit	Unit Cost *	Estimated Cost	Comments
Dredging and removal of dredgings - 1,800 ft of R-32 Canal	1800		144.5	9633	CY	\$ 25	\$ 240,833	
Dredging and removal of dredgings - 2,300 ft of R-24 Canal	2300		118.3	10077	CY	\$ 25	\$ 251,935	
Bank Stabilization R-32 Canal Assume 1, 800ft long 20 feet wide on each side	1800	38		7600	SY	\$ 2	\$ 15,200	
Bank Stabilization R-24 Canal Assume 2,300 ft long 20 feet wide on each side	2300	38		9711	SY	\$ 2	\$ 19,422	
36-inch Pipe Crossing				40	LF	\$ 50	\$ 2,000	
Erosion and Sediment Control							\$ -	
MOT				1	LS	\$ 5,000	\$ 5,000	
Mobilization and Demobilization				1	LS	\$ 5,000	\$ 5,000	
Other Project Costs				1	LS	\$ 5,000	\$ 5,000	
Subtotal							\$ 544,391	
Design and Permitting Consultant Services (15%)							\$ 81,659	
Construction and Inspection Consultant Services (5%)							\$ 27,220	
Contingency (10%)							\$ 65,327	
Total FY 2014 cost							\$ 718,596	
Total FY 2017 Inflated Cost (5% per year)							\$ 831,864	

* Estimated Costs from Thomas Marine Construction

BMP No. 2 (Raising 1,900 ft of Price Boulevard) Preliminary Cost Estimates

Item	Length (ft) *	Width (ft)	Depth (in)	Quantity	Unit	Unit Cost	Estimated Cost **	Comments
Detail Topographic Survey				1	ea	\$ 5,000	\$ 5,000	
Mill Existing Asphalt	2100	24		5600	SY	\$ 15	\$ 84,000	
Add road base to elevate road 1.2'	2100	26	15	6067	SY	\$ 30	\$ 182,000	\$15 per SY per 8" thickness. Double cost for 15" thickness.
Type SP Structural Course 1.5"	2100	26	1.5	455	TON	\$ 100	\$ 45,500	100lb per SY per inch thickness / 2000lb per ton
Friction Course 1.5"	2100	26	1.5	455	TON	\$ 120	\$ 54,600	
Swale Regrading and sodding (assume 20 ft wide each side of Price Blvd)	2100	20		9333	SY	\$ 5	\$ 46,667	
Surveying (Construction staking, surveying, as-builts)				1	LS	\$ 7,500	\$ 7,500	
Erosion and Sediment Control				1	LS	\$ 5,000	\$ 5,000	
MOT				1	LS	\$100,000	\$ 100,000	Need bypass lanes
Mobilization and Demobilization (6%)				1	LS	\$ 31,816	\$ 31,816	
Subtotal							\$ 562,083	
Design and Permitting Consultant Services (15%)							\$ 84,312	
Construction and Inspection Consultant Services (5%)							\$ 28,104	
Contingency (10%)							\$ 67,450	
Total FY 2014 cost							\$ 741,949	
Total FY 2017 Inflated Cost (5% per year)							\$ 858,899	

* Add 100 feet on each for transition to existing road pavement elevation

** Cost inflated about 15% from 2014 Sumter/Price Intersection improvements cost from Ben Newman

BMP No. 3 (Raising 950 ft of Price Boulevard and Dredging R-24 and R-32 Canals) Preliminary Cost Estimates

Item	Length (ft) *	Width (ft)	Depth (in)	Quantity	Unit	Unit Cost	Estimated Cost **	Comments
Detail Topographic Survey				1	ea	\$ 5,000	\$ 5,000	
Mill Existing Asphalt	1150	24		3067	SY	\$ 15	\$ 46,000	
Add road base to elevate road 8"	1150	26	8	3322	SY	\$ 15	\$ 49,833	\$15 per SY per 8" thickness.
Type SP Structural Course 1.5"	1150	26	1.5	249	TON	\$ 100	\$ 24,917	100lb per SY per inch thickness / 2000lb per ton
Friction Course 1.5"	1150	26	1.5	249	TON	\$ 120	\$ 29,900	
Swale Regrading and sodding (assume 20 ft wide each side of Price Blvd)	1150	20		5111	SY	\$ 5	\$ 25,556	
Surveying (Construction staking, surveying, as-builts)				1	LS	\$ 7,500	\$ 7,500	
Erosion and Sediment Control				1	LS	\$ 5,000	\$ 5,000	
MOT				1	LS	\$100,000	\$ 100,000	Need bypass lanes
Mobilization and Demobilization (6%)				1	LS	\$ 17,622	\$ 17,622.33	
Dredging R-24 and R-34 Canals (see BMP 1 cost estimate for detailed cost breakdown)							\$ 544,391	
Subtotal							\$ 855,719	
Design and Permitting Consultant Services (15%)							\$ 128,358	
Construction and Inspection Consultant Services (5%)							\$ 42,786	
Contingency (10%)							\$ 102,686	
Total FY 2014 cost							\$ 1,129,549	
Total FY 2017 Inflated Cost (5% per year)							\$ 1,307,594	

* Add 100 feet on each for transition to existing road pavement elevation

** Cost inflated about 15% from 2014 Sumter/Price Intersection improvements cost from Ben Newman

Appendix D

Task 1.1.3 Big Slough Flood Reduction Study, Summary of Prior BMP Evaluations

DeLoach Engineering Science, PLLC., November 2016

► MEMORANDUM

To: Elizabeth Wong, PE (City of North Port)
From: Dave DeLoach, PE; Trillian Baldassari, PE
Copy: Rod Ghioto, PE
File: 14-00400-00

Subject: Task 1.1.3 Big Slough Flood Reduction Study, Summary of Prior BMP Evaluations

November 21, 2016

Summary of Prior BMP Evaluations

The Big Slough watershed and City of North Port stormwater management system have been the subjects of prior investigations. The Big Slough Flood Reduction Study will build upon that prior work to advance previously developed concepts and develop original ideas to achieve some degree of flood mitigation in areas where residential structures are shown as flooding in recently updated Flood Insurance Rate Maps (FIRMs). Flood reduction performance of proposed improvements will be considered relative to storm events from mean annual to the 100-year recurrence to more broadly evaluate cost and benefit relationships. This memorandum briefly summarizes prior BMP evaluations that were performed and their findings, using much of the same language found in those prior reports.

Stormwater Management Master Plan (1993)

As part of the City of North Port's stormwater improvement program, Camp Dresser & McKee, Inc. (CDM) developed a Stormwater Management Master Plan (SWMMP) for the Big Slough watershed. The plan sought to evaluate flooding problems and determine engineering solutions, and was conducted in three phases. The third phase included analyses of alternatives for flood reduction. Detailed modeling was conducted to assess potential flood reduction afforded by alternatives. A cost/benefit analysis was conducted to evaluate the alternatives and recommend a plan for detailed design.

Development of Conceptual Solutions

A Phase III, Task I interim report (CDM, 1992) outlined conceptual solutions to identified flooding problems. Preliminary stormwater model runs were conducted to provide an initial assessment of each solution's effectiveness in reducing flooding. Results and preliminary cost estimates were developed for each solution. The costs and benefits of each conceptual solution were compared in a matrix.

Solutions considered in the preliminary evaluation included the following:

- Acquisition: Purchase of flooded lands would preclude flooding damage by preventing the development of the property, but would not prevent roadway flooding.
- Storage: Construction of stormwater detention basins would detain flow from the agricultural areas north of the city would reduce and attenuate peak flow rates.
- Diversion: Stormwater flows would be diverted into an adjacent watershed to the west (Deer Prairie Slough), thus reducing flow through the city.
- Conveyance: Increased conveyance capacity of the city's hydraulic system would include excavating existing channels, resizing culverts at stream crossings, cleaning existing channels, and constructing relief channels parallel to existing channels.

Based upon preliminary analyses, purchase of flooded lands was removed from consideration and the three remaining alternatives, and combinations of those alternatives, were examined in more detail.

Evaluation of Alternatives

City of North Port Big Slough Watershed Study Phase III Task 2 Final Report, Stormwater Management Master Plan (CDM, 1993) presents conceptual solutions for flooding as well as assessments of potential water supplies and of nonpoint source pollution and describes a stormwater management plan to reduce flooding during extreme storm events.

The specific set of alternatives evaluated in greater detail included:

- Alternative 1: Relief channel+ culvert improvements
- Alternative 2: Stormwater diversion by pumping + culvert improvements
- Alternative 3: Stormwater diversion by channel + culvert improvements
- Alternative 4: Upstream detention
- Alternative 5: Combination of Alternatives 1 and 2
- Alternative 6: Combination of Alternatives 1 and 3

Culvert improvements were recommended for the first phase of each alternative and included replacement of culverts on the R-36 canal at Bullard and Biscayne and on Cosmic and Creighton waterways at Tropicair Blvd. Cleaning of portions of the Creighton and Cosmic waterways was also recommended to return those canals to original design dimensions. Flood reduction effects from the culvert improvements would be predominantly local, but some flooding would also be relieved by transferring flow from the upper reaches of the Big Slough and R-36 to the R-580 and Snover waterways.

The relief channel (Alternative 1) under consideration would reach from the northern boundary of the city to the Snover waterway. It could act as a parallel conveyance for peak storm flows and be integrated into a linear park system along the Big Slough. The channel would be 5 feet deep, have gentle grassed side slopes, and would be dry except during extreme storm events. When the relief channel is combined with the culvert improvements, the expected flooded area would be reduced by 540 residences.

The diversion alternative had two options: a pumping option and a channel option. The diversion pumping option (Alternative 2) would require a pumping station with a weir near Price Boulevard on the R-36 canal to convey stormwater to a bermed storage area on the Futrell tract. Release from the tract to Deer Prairie Slough would be at the existing rate and would take about a week to drain down under 25-year/24-hour storm conditions. Normally, pumping would only be initiated under high storm flow (2 feet above weir crest) conditions. To minimize noise, primary power would be by direct connection to Florida Power & Light with a diesel generator back-up.

The diversion channel option (Alternative 3) would utilize two weirs for diversion to a channel south of the Futrell tract, directly connected to the Deer Prairie Slough. The weir discharge rate would closely match the pumping capacity and would also discharge only under storm conditions. Both the pumping and channel options would have similar results by reducing downstream flooding along the R-36 canal. They provide flood relief only in the southwest area of the city, but more than 1,000 residences would benefit from this alternative by diverting water from the existing flooding area.

Upstream detention (Alternative 4) would consist of a berm designed to detain flood waters north of the city and slowly release those waters after the peak flows had passed. Six foot berms were proposed with a total storage capacity of 4,011 acre feet and 1 foot of freeboard. Little flood reduction was evident when compared to the other alternatives. The amount of land necessary and the limited benefit restricted the viability of this alternative.

Alternatives 5 and 6 combined the relief channel with each of the diversion alternatives. Simulation results indicated a significant reduction in flooding along Sumter Boulevard, as well as those areas mentioned previously. A reduction in flooded land of 4,200 acres, 1,152 residences, and 10.1 miles of roadway was predicted from the modeling.

Flooding problems along the Cocoplum Waterway were not alleviated by any of the suggested alternatives. Preliminary modeling results indicated that structural solutions to the flooding problems along the Cocoplum Waterway are cost-prohibitive. Consequently, non-structural measures should be considered.

Comparison of Alternatives/Recommendation

Alternatives were evaluated per the following weighted criteria:

- Flood protection benefit (10 point maximum)
- Annual cost (30 point maximum)
- Implementability (20 point maximum)
- Water quality benefits (10 point maximum)
- Water supply benefits (10 point maximum)

Evaluation results indicated that Alternative 2 (diversion pumping option to Futrell tract coupled with culvert improvements) scored highest (62 total points). Alternative 5, which is Alternative 2 with the addition of the relief channel, was tied for second place (60 points) with Alternative 3 (diversion channel

option plus culvert improvements). While total scores were close, Alternative 5 provided considerably more flood protection than Alternatives 2 and 3. Alternative 5 was recommended because it included the top ranked alternative, provided the greatest flood protection benefit, and could be phased.

The culvert improvements and the stormwater diversion phases were recommended first because they addressed existing flooding problems in an area of the city that is already populated. The relief channel would provide much of its benefit in areas that are currently sparsely populated but expected to grow.

For the Cocoplum Waterway, non-structural methods of flood reduction were recommended, since any feasible structural measures would be cost-prohibitive. Measures to be considered included specifying minimum first floor elevations in the city's zoning requirements, based on the 25-year or 100-year flood maps. For existing development, primarily around Blueridge Lake, local measures were recommended, such as raising structures, constructing small walls or levees around structures, and adding watertight flood shields for windows and exterior doors. While these measures will not reduce roadway flooding, they will reduce the potential structural damage from an extreme storm event.

Status of Recommendations

The 1993 Stormwater Management Master Plan was partially implemented, providing increased local conveyance through replacement of culvert structures at four locations. Those improvements are accounted for in the current Existing Conditions model. Other plan components were not completed including those for storage and flow diversion, apparently due to regulatory and financial constraints.

Watershed Management Program Consulting Services in the Big Slough Watershed (2014)

Ardaman & Associates, Inc. evaluated various BMP alternatives to address flooding conditions based on effectiveness, permissibility, and economic viability. Under the WMP project, an Existing Conditions model was developed and six regional BMP alternatives were evaluated that could potentially reduce flooding through combinations of conveyance improvements, stormwater management storage areas, flood proofing, and flow diversion. Although the regional alternatives developed under the WMP project were not incorporated into a specific plan for implementation, the work provides insight to the system's hydraulic response and BMP limitations. Performance of several additional, site-specific BMPs were also evaluated and are also briefly discussed, here.

Regional BMPs

Simulations were performed of six regional BMP scenarios to evaluate the impact of various large-scale flood mitigation concepts. The benchmark scenario for comparison and performance evaluation was the SWFWMD Governing Board-approved 100-year 24-hour existing condition model.

- Remove structures throughout City of North Port waterways.
 - The objective of evaluating this BMP was to understand primary drainage system capacity assuming no losses due to water control structures or drop structures. Additional connectivity was provided among a few R canals southwest of the I-75 corridor to transferring some of the existing load to less compromised areas.

- Water control structures (WCS) and drop structures (DS) were removed and replaced with an equivalent channel section that mimics the immediate upstream canal's section. The R-36 canal was connected to the R-43 canal via a weir with equivalent channel geometry and the R-43 canal was similarly connected to the R-24 and R-32 canals.
- Results indicate flood stage reduction immediately north of Price Blvd and along Bass Point waterway while increasing flooding between S Toledo Blvd and S Sumter Blvd. Also, improvements are observed southwest of I-75 where new canal connectivity was provided. It was noted that structure removal may not be feasible due to potential loss of potable water supply, fish and wildlife habitat, and wetlands.
- Constrain Flow Entering City of North Port at Big Slough Canal
 - The objective of this BMP was to constrain the volume of water coming from offsite areas through the Big Slough canal prior to entering the City in the Estates area. The BMP would involve real estate acquisition, maintenance activities, dam construction and removal of existing hydraulic structures.
 - On the northwest City boundary, at the intersection of Big Slough canal with R-36 and R-580 waterways, all existing earthen weirs were raised to limit runoff from offsite areas, leaving the Big Slough canal as the only conveyance system into the western portion of the City. All earthen weirs farther north, at the intersection of Big Slough canal and Power Line Road were raised as well.
 - Results indicate approximately 0.5 feet flood stage reduction near the Big Slough canal from the City's northern boundary to just south of I-75 while flood stages increase approximately 1.0 foot in offsite areas north of the R-36 and R-580 waterways.
- Diversion Alternative
 - The purpose of this BMP is to divert flows from offsite areas via the existing R-36 canal, by increasing its capacity and improving its hydraulic connectivity with Deer Prairie Slough canal. This BMP would involve construction of new structures, maintenance activities, real estate acquisition, and detailed hydrologic and hydraulic evaluation of the western boundary (Deer Prairie Slough watershed).
 - On the northwest boundary, along R-36 canal, two earthen overflow weirs were provided to enhance the R-36 waterway connectivity with Deer Prairie Slough canal. Weir location and parameters were selected based on terrain and hydraulic constraints. The weirs were located on the northwest corner to address flooding in the Estates area and along Big Slough canal. R-36 canal capacity was also doubled by replacing the existing cross-section with a 60 feet bottom width trapezoidal channel with 4:1 side slopes. The current model assumes no tailwater influence from Deer Prairie Slough.
 - Results indicate flood reduction throughout the Estates area, along the Big Slough Canal between the R-36 canal and I-75 corridor as well as in the localized area along Big Slough south of I-75, with flood stage reductions between 0.1 foot and 1.0 foot throughout those areas. Impacts of additional flow into the Deer Prairie Slough watershed were not considered.

- R-580 Improvements
 - The purpose of this BMP is to induce additional flows through Creighton waterway by improving conveyance capacity in the R-580 waterway.
 - The R-580 waterway's bottom profile was reconfigured, assuming a flat ditch along its entire length at elevation 15.0 feet, NAVD. The current bottom sags to elevation 15.0 feet and reaches 17.7 feet and 23.0 feet at its western and eastern ends, respectively.
 - Results indicate small improvements near Big Slough. However, inducing additional flow through Creighton Waterway causes additional flooding near I-75.
- Increase Capacity on Southern Boundary
 - The objective of this alternative was to evaluate system response when doubling the southern boundary discharge capacity along the County line into Port Charlotte. The BMP would involve conveyance improvements, construction of new structures and/ or reconditioning of existing structures, maintenance activities, real estate acquisition, and evaluation of the receiving waters through hydrologic and hydraulic modeling.
 - All structures within Cocoplum Waterway and discharging beneath Hillsborough Boulevard were doubled in size. This included 6 lateral weirs along Cocoplum waterway and 13 structures beneath Hillsborough Boulevard.
 - Results indicate that improvements relative to house flooding were not significant. However, roads experienced a considerable flood reduction between S Sumter Blvd and Atwater Drive. This alternative was evaluated for information purposes only, as it is understood that allowing additional flows into Port Charlotte may not be desirable.
- Upstream Detention Alternative
 - The objective of this analysis is to examine the effects when attenuating peak flow rates in agricultural areas along the Big Slough canal with a series of new detention facilities. This BMP would involve construction of stormwater management storage areas, maintenance activities and real estate acquisition.
 - Seven detention facilities were added to the model in upstream offsite areas. Each detention area has a 100-acre footprint and is more than 10 feet deep. These areas were located on upland sites along Big Slough canal where feasible. Bottom elevations of the detention areas were set at the adjacent canal initial water level. Each was linked to the Big Slough canal by a 500-foot weir. Weir crest elevations were set at the bottom of the pond. The total anticipated detained volume is 600 acre-feet per detention site for a total of 4,200 acre-ft.
 - Results indicate relatively small reduction in peak water surface elevations on the order of 0.1 to 0.6 feet along Big Slough. The extent of flooding for this BMP is essentially the same as the existing scenario with few flood reduction areas along the Big Slough canal.

BMP Evaluation of Four Road Crossings

Simulations were performed to assess hydraulic performance and the effects of potential conveyance improvements at four sites, including: R-36 Canal at I-75, Myakkahatchee Creek at I-75, R-36 Canal at Tropicair Boulevard, and Myakkahatchee Creek at Tropicair Boulevard. A systematic evaluation was

conducted to understand existing hydraulic behavior at each of the four crossings under various synthetic storm events. Head differences across each structure, flow conditions at peak discharge, and hydraulic connectivity (including flow patterns in adjacent areas) were reviewed at each crossing.

To evaluate effectiveness of potential BMP improvements at these four locations (including resulting flood reduction and/or downstream flood increase), conveyance capacity at each site was increased by doubling the number of existing structures. This was achieved by adding a duplicate set of model reach elements at each location.

- R-36 Canal at I-75 Evaluation
 - Existing condition model results indicate that more than two feet of head difference occurs across this structure during the 100-year storm event. Under proposed BMP conditions, model results indicate that a peak stage reduction of up to 0.6 feet occurs upstream of the crossing, while a stage increase of approximately 0.6 feet occurs in downstream areas. It is notable that reduced discharges are observed from the R-36 Canal westward into the adjacent Deer Prairie Slough watershed for the proposed BMP condition. This overflow connection with the adjacent watershed to the west is located north of I-75. The reduced overflow results in an increased total volume remaining within the North Port area, by virtue of the improved conveyance capacity of the proposed BMP.
 - Increasing the crossing capacity of the R-36 Canal at I-75 may reduce water levels upstream of the crossing, but also raises flood elevations in the downstream areas. Mitigation of flooding in downstream areas was beyond the scope of this evaluation.
- Myakkahatchee Creek at I-75 Evaluation
 - Existing condition model results indicate that approximately one foot of head difference occurs across this structure during extreme storm events. This head difference is relatively small considering the magnitude of flow that arrives from the upstream contributing watershed (up to 8000 cubic feet per second). The applied BMP at this location assumes that the conveyance capacity of the bridge crossing was doubled. In other words, an identical, parallel 540-foot bridge span was added to investigate the benefit of increasing bridge capacity. Under this hypothetical scenario, model results indicate that a localized stage reduction of 0.7 feet is observed immediately at the upstream end of the crossing. However, peak stage reductions decrease further upstream of the crossing along the creek. No significant change in peak elevations is observed 1,200 feet upstream of the crossing. Also, no significant change to flooding conditions is observed in areas downstream of the crossing.
 - Increasing conveyance capacity of the bridge over Myakkahatchee Creek at I-75 may reduce water levels immediately upstream of the crossing, but does not generally improve flooding conditions north of I-75. The area impacted by this improvement is very localized and would not justify the cost of the improvement.

- R-36 Canal at Tropicaire Boulevard Evaluation
 - Existing condition model results indicate that up to three feet of head difference occurs across this structure during various storm events. Under proposed BMP conditions, model results indicate a peak stage reduction of approximately 0.8 feet upstream of the crossing, while a stage increase of up to 1.1 feet occurs downstream of Tropicaire. During all events, discharges from the R-36 canal into Deer Prairie Slough watershed are observed north of Tropicaire Boulevard. The proposed BMP results in a reduction of those discharges to Deer Prairie Slough and a resulting increased total volume remaining within the North Port area.
 - While increasing the crossing capacity of the R-36 Canal at Tropicaire Boulevard may reduce water levels upstream of the crossing, it also raises flood elevations in downstream areas. Mitigation of flooding in downstream areas was beyond the scope of this evaluation.
- Myakkahatchee Creek at Tropicaire Boulevard Evaluation
 - Existing condition model results indicate that the maximum calculated head difference for the various storm events is 0.2 feet; therefore, the bridge is not causing a flow restriction. Regardless, a BMP was applied, for evaluation, and assumes that the conveyance capacity was increased (doubled) by adding an identical bridge element in parallel to the existing structure. Under this scenario, model results indicate that a maximum localized stage reduction of approximately 0.1 feet was calculated, yet no significant change is observed further upstream nor downstream of the crossing.
 - Increasing the crossing capacity of the bridge over Myakkahatchee Creek at Tropicaire Boulevard does not substantially improve flooding conditions north of I-75.

WCS-162 Evaluation

WCS-162 is located on the R-36 Canal, north of Interstate 75, and immediately upstream of Tropicaire Boulevard. This is the only gated weir structure on the R-36 Canal, with one 2.25 feet high by 2 feet wide pull up slide gate. The City generally operates this structure by fully opening the gate in anticipation of a storm event to lower the water level in the R-36 canal to minimize potential upstream flooding; otherwise, the gate remains closed. The City staff would like to determine if adding gates would help draw down the canal more quickly and increase conveyance capacity.

- R-36 Canal Drawdown Evaluation
 - To reduce impacts downstream of WCS-162 while improving peak conditions upstream of the structure, an evaluation was performed to determine the benefits of adding additional gates. The evaluation included calculating the drawdown time for the R-36 canal and the additional conveyance capacity provided by the additional gates.
 - The benefits of reducing time required to lower R-36 canal elevation by adding gates at WCS-162 upstream of the structure were assessed by performing a drawdown analysis. For the drawdown evaluation, the R-36 canal upstream of WCS-162 was assumed to be at the control elevation of the weir (elevation 18.3 feet NAVD88). The water level at the

canal was simulated by fully opening the existing gate with no additional flows coming into the canal. The existing condition drawdown simulation results indicates that it would take approximately 18 hours to lower the canal to elevation 15 feet.

- The canal drawdown simulation was repeated for one and two additional gates scenarios. The time required to drawdown R-36 canal will decrease to 11 hours by adding an identical gate. When 2 additional matching gates are provided, the time required to drawdown R-36 canal would decrease to 9 hours. Therefore, the total time required to drawdown R-36 canal (to elevation 15 feet) upstream of WCS-162 will be reduced by 7 and 9 hours by adding one and two additional gates respectively.

The mean annual, 5-year, and 10-year storm events were simulated using the updated existing condition model with 2014 survey information. The City's water control structure operation criteria were employed in these simulations. The gates are closed at the beginning of the simulation, and they will be fully open when Big Slough Canal stage at Tropicaire rises to Elevation 15.88 feet NAVD88.

Benefits of flood control upstream of WCS-162 during a storm event were evaluated by simulating the mean annual storm event starting at the drawdown stage levels (Elevation 15 feet NAVD88). For this evaluation, initial stages in R-36 Canal upstream of WCS-162 were set to the drawdown levels, i.e. simulated canal stages after 18 hours of drawdown simulation. The lower elevations will account for the additional available canal storage capacity upstream of WCS-162. During the lower initial condition simulation, the WCS-162 gate was assumed to be opened throughout the simulation. Model results with lowered initials were compared to the results with the normal initial stage, which is at the invert elevation (at elevation 18.29 feet NAVD88) of WCS-162 weir. Simulated results suggest that there will be no difference in peak stages in R-36 canal due to the lower initial canal stage. It should be noted that model results suggest the 50-foot wide weir at WCS-162 overtops by 2.6 feet conveying 328 cfs of peak flow across the structure during the mean annual storm event. The R-36 Canal upstream of WCS-162 holds approximately 30 acre-feet of storage capacity behind the gate, whereas more than 3,000 acre-feet of runoff volume is conveyed by the canal during the mean annual storm event. The additional available storage seems to be insignificant compared to the runoff conveyed by the canal during the storm event.

In addition, benefits of having one additional gate with the lowered R-36 canal stages upstream of WCS-162 were also evaluated. For this scenario, both gates (one existing and one additional BMP gate) were assumed to be fully opened throughout the simulation. Simulated results suggest that there will be no difference in R-36 canal max stages upstream of WCS-162 with an additional gate at the structure. As no difference in peak stages were predicted for the mean annual storm event, no other higher return period storm events (5-year and 10-year) were analyzed with additional gates.

In conclusion, providing one or two additional gates at WCS-162 will help to reduce the time required to draw down canal levels upstream of the structure. However, model results suggest that lower initial levels in R-36 canal upstream of the structure will provide no benefits in terms of reducing flooding at the upstream areas even for small storm events such as mean annual storm event. Modeling results suggest that there would be no adverse impacts downstream of WCS-162 due to the additional gate.

Price Boulevard LOS Improvements

Existing condition model results (May 2012 Governing Board approved model) predict that West Price Boulevard would intermittently flood between Locher Road and the Big Slough Canal during the 10, 25, and 100-year, 24-hour storm events. The West Price Boulevard stretch is identified as an arterial street that floods during the 100-year, 24-hour design storm event.

This arterial street is critical to stormwater emergency response since it provides access to emergency facilities such as North Port Utilities Building, North Port High School and Heron Creek Middle School. Therefore, the City of North Port requested further evaluation of the stretch of West Price Boulevard between North Biscayne Boulevard and the Big Slough Canal to provide BMP recommendations to meet the City of North Port LOS criteria. City Unified Land Development Code Chapter 18 Level of Service criteria for arterial roads states that flooding must be less than 6 inches, as measured at the outside edge of pavement in a 100-year, 24-hour design storm event.

Ardaman staff reviewed the May 2012 Governing Board approved model setup within the area of interest (AOI) to verify whether the current model adequately represents the 2014 condition. With desktop and field reconnaissance of the area, it was observed that a section of the surface and sub-surface drainage systems near the North Port High School had been recently updated. Ardaman recommended surveying the area of interest to better represent the existing condition. The survey data was provided by Van Buskirk/Fish & Associates, Inc.

Based on recent survey, stormwater runoff collected from the north and south swales of West Price Boulevard generally flows west from the North Port Utilities Building, whereas stormwater runoff from the remaining areas flows east from this location. Accumulated stormwater runoff going west from the North Port Utilities Building ultimately flows north via the Indian burial ground toward the R-32 canal. Stormwater runoff going east toward Big Slough is routed through a series of surface water features (ditches, swales and inlets) which connects to a sub-surface system along the north side of West Price Boulevard.

The May 2012 Governing Board approved model was updated using the 2014 survey provided by Van Buskirk/Fish & Associates, Inc. The revised 100-year storm event model results indicate that West Price Boulevard would not flood near the North Port High School as previously predicted. However, the stretch of West Price Boulevard north of Little Salt Spring would still flood by 0.4 feet at the crown during the 10-year storm event. Survey data indicates that road overtopping would occur at the lowest point (near the culvert crossing) at 17.3 feet NAVD88. The model predicted the 25-year and 100-year storm maximum stages at West Price Boulevard are 17.9 and 18.2 feet NAVD88 respectively.

The objective of this series of BMPs is to mitigate flooding along the stretch of West Price Boulevard near the Indian burial ground to meet the existing City of North Port LOS criteria. Five different BMP alternatives were considered.

Only the three alternatives that were determined to be effective in improving the LOS are described below:

- West Price Boulevard BMP 1- Dredging the R-24 and R-32 canals
 - This alternative would require: dredging 2,300 feet of R-24 canal and 1,800 feet of R-32 canal to add approximately 2 to 3 feet of depth; and installing one extra parallel 36-inch pipe at the existing culvert crossing, between Indian burial ground and the R-32 canal. The City is not allowed to disturb the 50-foot wide drainage right-of-way through the Indian burial ground.
 - Model results suggest that West Price Boulevard would not overtop during the 25-year storm event. In addition, this alternative would reduce flooding on some local streets (Dundee Ave, Surf Ave, and San Salvador Road) located north of R-32 canal.
 - The model predicted that the 100-year maximum stage at West Price Boulevard will be reduced from 18.2 to 17.5 feet NAVD88. West Price Boulevard would still overtop by 0.2 feet over the crown of the road at the lowest section during the 100-year storm event. However, the road would be passable per City of North Port LOS criteria. Model results also indicate that there will be no adverse impacts at downstream areas.
- West Price Boulevard BMP 2 - Raising the Road
 - This alternative would involve raising approximately 1,900 feet of West Price Boulevard to an elevation of 18.5 feet NAVD88. Survey data suggests that the lowest segment of the road, which is located at the culvert crossing, needs to be raised by 1.2 feet to reach an elevation of 18.5 feet NAVD88.
 - Model results suggest that the 100-year peak stages upstream and downstream of the culvert across West Price Boulevard would be 18.2 feet NAVD88 with this alternative. The model predicted the 100-year maximum stage at West Price Boulevard is below the recommended raised road crown elevation of 18.5 feet NAVD88. The peak stage model results suggest that there will be no adverse impacts or increase in stages upstream or downstream of the improvement for any modeled storm event.
 - Additional right-of-way requirement to raise the road and its availability should be thoroughly assessed prior to selecting this BMP alternative.
- West Price Boulevard BMP 3 - Dredging the R-32 and R-24 canals and Raising the Road
 - This alternative incorporates all of the aforementioned West Price Blvd improvements.
 - Model results suggest that the 100-year peak stage upstream of the culvert across West Price Boulevard would be 17.6 feet NAVD88 with this alternative. This alternative would require raising approximately 950 feet of West Price Boulevard to elevation 18.0 feet NAVD88. Compared to BMP 2 improvements, this alternative would reduce the required road improvement length by half at a lower elevation (6 inches lower than BMP 2). Like BMP 1 and BMP 2, the peak stage model results suggest that there will be no adverse impacts or increase in stages upstream or downstream of the road improvement.

In addition to the three previously described BMP alternatives, a few other BMPs were evaluated. However, modeling results suggest that these BMPs would not mitigate the flooding conditions along the evaluated stretch of West Price Boulevard.

- One of the other BMPs evaluated was to install a 24-inch pipe at the south side of West Price Boulevard near the culvert that would run approximately 1,400 feet to the east and connect to the existing sub-surface system inlet. This BMP did not show any improvements since the BMP pipe is too long and there was not sufficient hydraulic gradient available to convey the necessary flow rate.
- Another BMP evaluated was to provide a 20-foot wide cut/swale that would connect the flooded area south of West Price Boulevard to the south towards the Little Salt Spring basin. 25-year storm event model results suggest that this BMP alternative would lower peak stages at West Price Boulevard only by 0.2 feet. However, the road would still flood during this event. Also, this BMP may raise environmental concerns considering that it would require diverting stormwater runoff from the road towards Little Salt Spring basin.

Conclusions

It was recommended that the City of North Port purchase the small number of habitable structures in which flooding is predicted for the 100-year event. Purchasing the affected properties may be more cost effective than implementing BMPs evaluated under the WMP project.

Status of Recommendations

The 2012 WMP project did not result in a plan for improvements.

The Big Slough Flood Reduction Study (current)

The Big Slough Flood Reduction Study will build upon the above prior work to advance previously developed concepts and develop original ideas to mitigate flooding. The City of North Port has also provided a list of BMP concepts for consideration. These and other concepts will be the subject of discussion between the Consultant team and City staff prior to evaluation.

Appendix E

Task 1.2 Big Slough Flood Reduction Study, Definition of Existing Flooding Problems

DeLoach Engineering Science, PLLC., January 2017

► MEMORANDUM

To: Elizabeth Wong, PE (City of North Port)
From: Dave DeLoach, PE; Trillian Baldassari, PE
Copy: Rod Ghioto, PE
File: 14-00400-00

Subject: Task 1.2 Big Slough Flood Reduction Study, Definition of Existing Flooding Problems

January 30, 2017

Definition of Existing Flooding Problems

This memorandum briefly describes existing flooding problems that are routinely experienced in portions of the Big Slough watershed, specifically along Myakkahatchee Creek near I-75 and within the Jockey Club. Information presented in this memorandum addresses the following elements of the Project Plan (Task 1.2).

- Define Existing Flooding Problems
 - Confirm Ability to Reproduce WMP Project Model Results
 - Simulations of Mean Annual to 100-Year Events
 - Flood Mapping and Comparison to Ardaman Results
 - Update Model to include a Small Number of Prior Conveyance Improvements
 - Flood Mapping and Comparison of Updated Model to Ardaman Results
 - Characterize Local Flooding Conditions
 - Myakkahatchee Creek at I-75
 - Jockey Club

Ability to Reproduce WMP Project Model Results

As discussed in the Big Slough Flood Reduction Study Project Plan, this project builds upon prior work performed and utilizes modeling tools previously developed by others under the Southwest Florida Water Management District (SWFWMD) Watershed Management Program (WMP). Before using those modeling tools for evaluation and development of flood reduction alternatives, it is important to confirm the ability to reproduce simulation results and inundation mapping of previous studies.

Simulations of Mean Annual to 100-year Events

Simulations were performed for the mean annual, 10-year, and 100-year 24-hour design storm events using both the 2012¹ and 2014² Versions of the 2004 Condition model (by Ardaman). Model network and runtime control files were retrieved directly from WMP project deliverable folders and used to perform the simulations. No changes were made to the retrieved model parameters or runtime controls.

Computed peak stages for each simulation were tabulated and compared to results taken directly from files provided as deliverables by Ardaman under the WMP project. Table 1 presents comparisons of Ardaman results to DES results for each design storm event and model version. Only those nodes with differences greater than 0.01-foot are shown.

Table 1 - Comparison of Computed Peak Stage for 24-Hour Design Storm Events, 2012 to 2014 Versions (A=Ardaman, D=DES)

Node	Version 2012									Version 2014								
	2.33-Yr			10-Yr			100-Yr			2.33-Yr			10-Yr			100-Yr		
	A	D	Δ	A	D	Δ	A	D	Δ	A	D	Δ	A	D	Δ	A	D	Δ
NU9091	26.42	26.42	-	26.65	26.65	-	26.92	26.91	-0.01	26.42	26.42	-	26.65	26.65	-	26.91	26.91	-
NB4856	18.71	18.73	0.02	20.40	20.40	-	21.39	21.39	-	18.71	18.71	-	20.40	20.40	-	21.39	21.39	-

Computational differences between Ardaman and DES results are very few in number and very small in magnitude, and may result from different runtime environments (computers, operating systems, etc.). It is possible that some model parameters or controls were slightly different at the time that the Ardaman simulations were performed and results compiled as compared to those that made their way into final project deliverables. Regardless, **simulation results indicate that DES can replicate Ardaman results reasonably well with the files retrieved from WMP project deliverables.** Mapping of 100-year inundation areas was performed and confirmed the ability to replicate prior Ardaman floodplain mapping.

Differences between the 2012 and 2014 versions of the model, as depicted in Figure 1 and Table 2, are substantially larger in magnitude than the foregoing computational differences and are owing to several specific model updates that were performed by Ardaman over the period from 2012 to 2014. These differences in computed peak stage reflect modifications that were made to the conveyance system (e.g., accounting for drainage improvements in the vicinity Price Boulevard) and/or changes in the accuracy of the model input data in describing certain features (e.g., using field survey data collected by a PLS in the vicinity of WCS-162). The 2014 results are considered more representative of conditions in the watershed in those local areas that were updated, but it should be noted that both the 2012 and 2014 models generally reflect a 2004 land use condition.

¹ SWFWMD Governing Board approved (May 22, 2012)

² Big Slough Watershed Study, K883 (October 10, 2014)

Table 2 - Difference Between Computed Peak Stages for 2012 and 2014 Model Versions

Node	2.33-Yr			10-Yr			100-Yr		
	2012	2014	Δ	2012	2014	Δ	2012	2014	Δ
NB0905	16.12	15.54	-0.58	16.62	16.23	-0.38	16.89	16.68	-0.20
NB0907	16.12	15.93	-0.19	16.62	16.23	-0.38	16.94	16.69	-0.26
NB0934	15.57	13.98	-1.58	15.87	14.99	-0.88	16.26	15.54	-0.72
NB0935	15.56	14.93	-0.64	15.85	15.25	-0.60	16.16	15.57	-0.59
NB0936	15.89	15.60	-0.29	16.16	15.65	-0.51	16.36	15.70	-0.67
NB0938	16.42	15.78	-0.64	16.47	16.06	-0.42	16.53	16.79	0.26
NB0943	14.27	14.27	-	14.95	14.95	-	16.09	15.42	-0.68
NB0945	14.93	14.93	-	15.14	15.14	-	16.15	15.51	-0.64
NB9035	18.07	19.37	1.30	18.10	19.40	1.30	18.14	19.43	1.29
NB9045	17.54	16.36	-1.18	17.94	17.27	-0.67	18.07	17.88	-0.20
NB9073	16.89	14.58	-2.31	17.03	16.02	-1.01	17.17	16.86	-0.31
NB9080	16.89	14.37	-2.52	17.03	16.01	-1.02	17.17	17.02	-0.15
NB9090	16.16	14.43	-1.73	16.27	14.50	-1.77	16.48	16.13	-0.34
NB9095	16.48	16.48	-	16.59	16.58	-	16.81	16.66	-0.15
NB9100	16.14	12.30	-3.84	16.19	14.48	-1.71	16.37	16.13	-0.23
NB9110	15.22	14.11	-1.11	15.87	14.16	-1.71	16.26	15.52	-0.74
NB9120	14.30	12.11	-2.19	15.87	13.44	-2.43	16.26	15.52	-0.74

Update of Selected Model Parameters Using Existing Available Data

The base model for this project was planned to be the SWFWMD Governing Board-approved 2012 Version of 2004 Condition model. City of North Port staff requested, and DES agreed, that a specific set of model features be updated in that 2012 Version of the model, as follows:

- add a single 24-inch PVC pipe from Public Works site to Creighton WW (check)
- utilize available as-built survey data and add two (2) gates at WCS 101
- incorporate available survey and storm pipe data in Price Blvd area
- change 30-inch ADS pipe, flowing from Price Blvd to R-32, to 36-inch ADS
- add three (3) 48-inch CMP beneath Appomattox Blvd (Stantec plans available)

It is evident from review of prior WMP project reports that many of these same revisions were already implemented by Ardaman over the period from 2012 through 2014, with the SWFWMD Governing Board-approved 2012 Version of 2004 Condition model as a base. In some cases, during Ardaman's development of the 2014 Version of 2004 Condition model, design-level (not "as-built") information was employed and will need to be revised. However, in other cases, site-specific field survey data was collected by a Professional Land Surveyor (PLS) and employed in Ardaman model updates. Specifically, Ardaman incorporated field survey data that was collected by a PLS at Water Control Structure WCS-162 and throughout the vicinity of Price Boulevard.

In the Ardaman WMP Project report, entitled “North Port/Big Slough Watershed Management Program (K883), Work Order #4, Completion Report for Task 1.1.3.7b – Formulation and Evaluations of BMPs for WCS-162” (Sep 2, 2014), reference is made to model revisions near WCS-162:

“To evaluate BMPs at WCS-162, Ardaman requested to survey the structure to better understand the geometry of the structure and canal with the purpose of assessing availability of adequate space for additional gates. The survey data provided by Van Buskirk/Fish & Associates, Inc. is included in Attachment A, and the structure pictures are provided in Attachment B. The existing condition model was revised using the latest (2014) survey information for this BMP Evaluation. The update model simulated results rendered no change in model results compared to the May 2012 Governing Board approved model.”

In the Ardaman report, entitled “North Port/Big Slough Watershed Management Program (K883), Work Order #4, Completion Report for Task 1.1.3.7b – Formulation and Evaluation of BMPs for Price Boulevard to Improve LOS” (Sep 22, 2014), reference is made to model revisions along Price Boulevard:

“Ardaman staff reviewed the May 2012 Governing Board approved model setup within the area of interest (AOI) to verify whether the current model adequately represents the 2014 condition. With desktop and field reconnaissance of the area, it was observed that a section of the surface and sub-surface drainage systems near the North Port High School had been recently updated. Ardaman recommended surveying the AOI to better represent the existing condition...”

“Based on recent survey, stormwater runoff collected from the north and south swales of West Price Boulevard generally flows west from the North Port Utilities Building, whereas stormwater runoff from the remaining areas flows east from this location. Accumulated stormwater runoff going west from the North Port Utilities Building ultimately flows north via the Indian burial ground toward the R-32 canal. Stormwater runoff going east toward Big Slough is routed through a series of surface water features (ditches, swales and inlets) which connects to a sub-surface system along the north side of West Price Boulevard...”

“The May 2012 Governing Board approved model was updated using the 2014 survey provided by Van Buskirk/Fish & Associates, Inc. The revised 100-year storm event model results indicate that West Price Boulevard would not flood near the North Port High School as previously predicted. However, the stretch of West Price Boulevard north of Little Salt Spring would still flood by 0.4 feet at the crown during the 10-year storm event.”

It is evident from those prior reports that the model network input data changes, particularly in the Price Boulevard area, were quite extensive. It is also understood that most of the other requested model updates (see bulleted items, above) were already incorporated and tested prior to development of the September 22, 2014 version of the Existing Condition model by Ardaman.

To expedite the 2016 model update, the September 22, 2014 version of the 2004 Condition model was used as a starting point. An added benefit to using this model as a starting point is that model element naming conventions are preserved and will match all references in reports, notes, and correspondence generated by Ardaman during the period from 2012 through 2014.

Rather than replicating modifications already made, DES staff reviewed and supplemented the 2014 model revisions as discussed in the following.

- **Add a single 24-inch PVC pipe from Public Works site to Creighton WW (check).**

The Ardaman Sep 22, 2014 model was found to contain the 24-inch PVC pipe. Specifically, model Reach RI0016 from Node NI0016 to Node NI0020 contains a 77-foot 24-inch pipe with upstream invert 20.21 feet, NAVD, and downstream invert 17.65 feet, NAVD. A Network_Arc feature was added to the project geodatabase as the pipe was not included in the Ardaman geodatabase.

- **Utilize available as-built survey data and add two (2) gates at WCS 101**

The Ardaman Sep 22, 2014 model does not contain up to date control structure data for the additional gates. As-built drawings provided to DES by the City of North Port were used to update model reach data for the gates as well as to correct adjacent weir lengths. Specifically, no changes were made to RB1060A representing the four original gates, RB1060B was added to represent the two new gates, and weir reaches RB1060E, F, and G were replaced with RB1060C. Network_Arcs were edited in the project Geodatabase to reflect these changes.

- **Incorporate available survey and storm pipe data in Price Blvd area**

The Ardaman Sep 22, 2014 model was found to incorporate site-specific field survey data collected in the Price Boulevard area. Model input was compared to survey drawings (Van Buskirk / Fish & Associates, June 17, 2014) for consistency, and no revisions were deemed necessary.

- **Change 30-inch ADS pipe, flowing from Price Blvd to R-32, to 36-inch ADS**

The Ardaman Sep 22, 2014 model was found to correctly reflect a 36-inch diameter pipe with inverts as indicated on field survey Sheet 5 of 7 Van Buskirk / Fish & Associates dated June 17, 2014.

- **Add three (3) 48-inch CMP beneath Appomattox Blvd (Stantec plans available)**

The Ardaman Sep 22, 2014 model does not include these conveyance features. Three (3) 48-inch corrugated metal pipes (CMPs) were added to the model input data set per information contained in plans provided to DES by the City of North Port. Specifically, model Reach RH0110A was added from Node NH0110 to Node NH0130, containing three 48" CMPs with upstream inverts 3.09, 2.92, and 2.87 feet, NAVD, and downstream inverts 2.51, 2.79, and 2.76 feet, NAVD. Information was taken from Stantec design drawings provided by the City of North Port for Phase 3 Reclaimed Water Main Extension Appomattox Drive (2014), assuming NAVD and estimating 100-ft pipe lengths. One Network_Arc was added to the project Geodatabase to reflect pipe connectivity.

Flood Mapping and Comparison of Updated Model to Ardaman Results

Simulations were performed for the mean annual, 10-year, and 100-year 24-hour design storm events to allow comparison of the 2016 Version (DES) to the 2014 Version (Ardaman) of the 2004 Condition. The sole differences between the 2016 and 2014 versions of the model include WCS-101 control structure improvements and three 48-inch CMP culverts at Appomattox Boulevard using as-built information.

Differences in computed peak stage between the 2014 and 2016 versions of the model are depicted in Figure 2 and Table 3. Mapping of inundation areas was performed to confirm the very small spatial extent of changes resulting from the revisions. Stage differences, found only in results of simulations of the 100-year storm event, are related to model stability and result from a change in the computational time step from 0.1 seconds (for the 2014 model) to 1 second (for the 2016 model).

Table 3 - Comparison of Computed Peak Stage for 24-Hour Design Storm Events, 2014 to 2016 Versions (2014 Version by DES)

Node	2.33-Yr			10-Yr			100-Yr		
	2014	2016	Δ	2014	2016	Δ	2014	2016	Δ
NE7053	13.07	13.07	-	13.68	13.68	-	14.19	14.32	0.12
NS5578	17.65	17.65	-	17.99	17.99	-	18.30	18.51	0.21
NS2810	20.91	20.91	-	21.07	21.07	-	21.24	21.13	-0.11
NU9087	26.95	26.95	-	27.14	27.14	-	27.13	27.31	0.18

Characterize Local Flooding Conditions

The City has routinely experienced flooding in the Big Slough Watershed. Two such flood zones are the areas near Myakkahatchee Creek at I-75 and the areas in and around the Jockey Club.

Myakkahatchee Creek at I-75

The Myakkahatchee Creek at I-75 Study Area covers approximately 335 acres adjacent to the Myakkahatchee Creek. The area is bounded on the east by Sumter Boulevard and traversed from east to west by Interstate Highway 75. Figure 2a depicts existing mean annual and 10-year floodplains within the I-75 study area adjacent to Myakkahatchee Creek, both north and south of the interstate, as developed during the North Port/Big Slough WMP project. Figure 2b shows sub-basin delineations and the model network features used to simulate response to rainfall during the WMP project. Figure 2c depicts hydrologic soils groups.

Routine flooding of the area is due to Myakkahatchee Creek exceeding its banks in low areas of poorly drained soils. Comparison of hydrologic soil groups to areas of inundation suggest that the slough has historically flooded these low areas on a frequent basis. Alternative development will focus on reducing flows in this section of Myakkahatchee Creek, through diversion, storage, bypass, or other means.

Myakkahatchee Creek at Jockey Club

The northern section of the Jockey Club Study Area covers approximately 62 acres and is bounded on the north by Appomattox Drive, on the west by Pan American Boulevard, and on the east by Myakkahatchee Creek. The southern section of the Jockey Club Study Area near Ketona Road is also included and is approximately 82 acres in size. Figure 3a depicts existing mean annual and 10-year floodplains within the Jockey Club study area adjacent to Myakkahatchee Creek, both north and south of the interstate, as developed during the North Port/Big Slough WMP project. Figure 3b shows sub-basin delineations and the model network features used to simulate response to rainfall during the WMP project. Figure 3c depicts hydrologic soils groups.

Flooding may result from either backwater effects or local collection system capacity, depending upon the event. Recent improvements to the collection system (ditch lining) may improve capacity during short-duration local rainfall events. Alternative development will focus on improving flooding conditions related to backwater conditions.

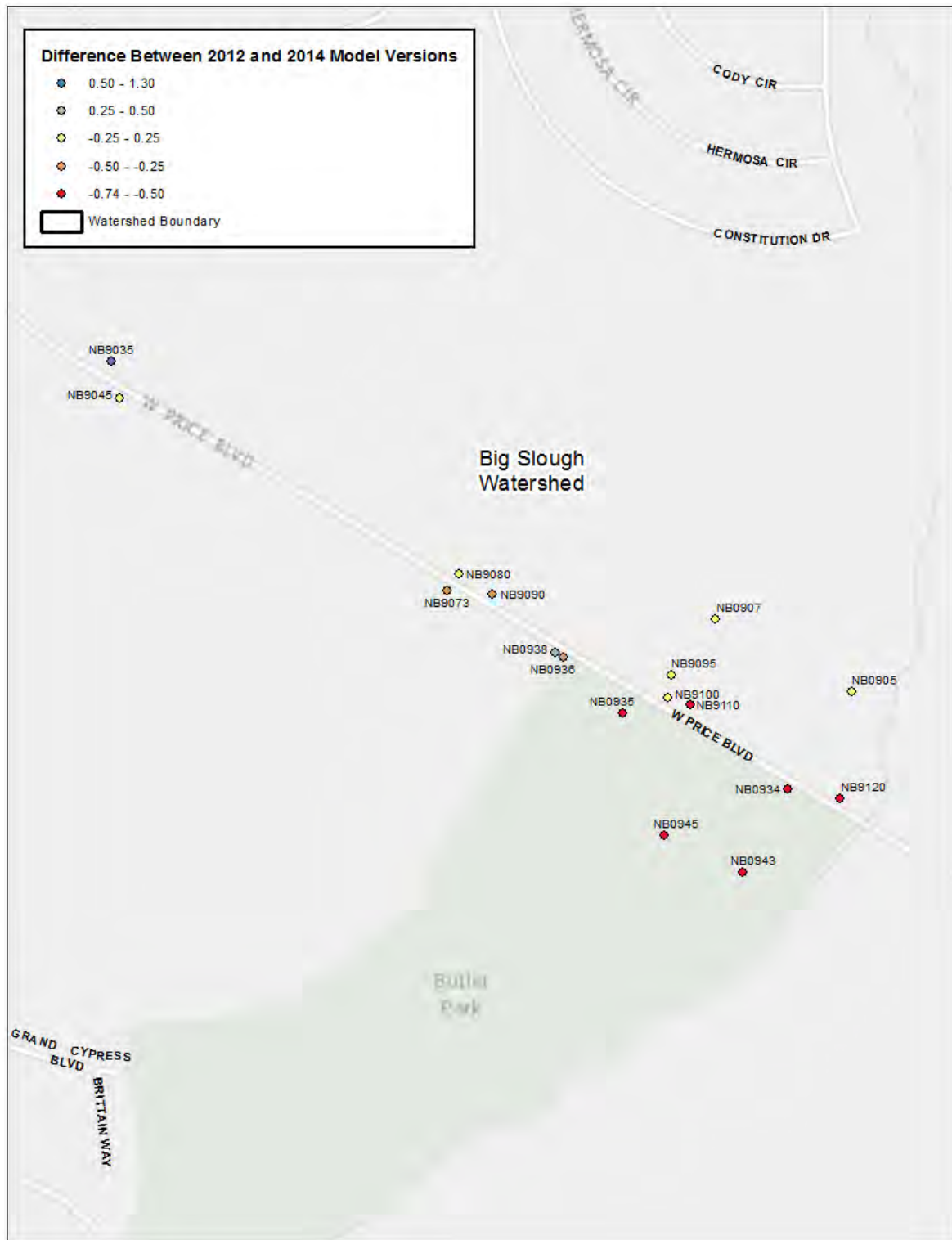


Figure 1 – Locations of Differences in Computed Peak Stages between 2012 and 2014 Model Versions

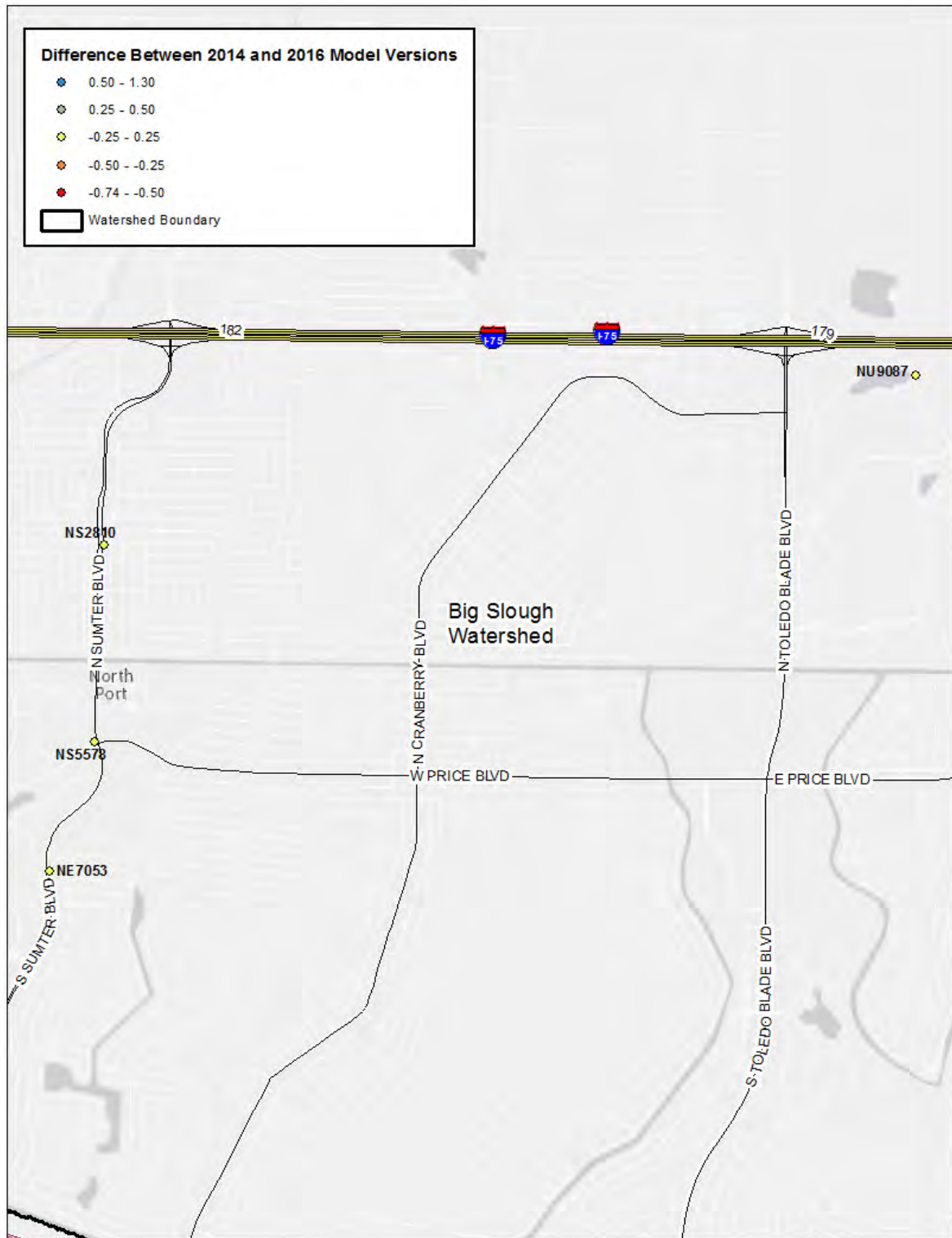


Figure 2 - Locations of Differences in Computed Peak Stages between 2014 and 2016 Model Versions

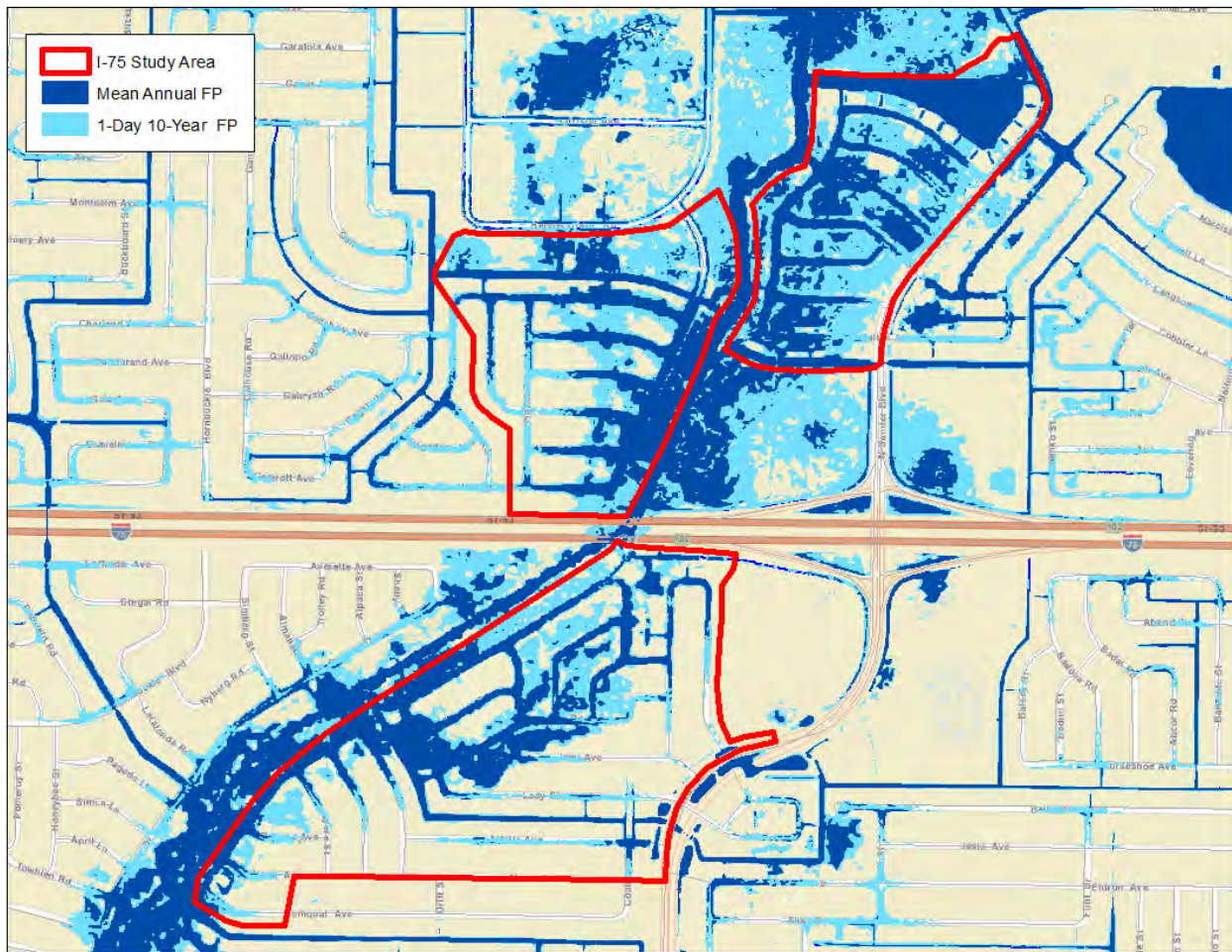


Figure 3a: I-75 Study Area, Mean Annual and 10-Year Floodplains

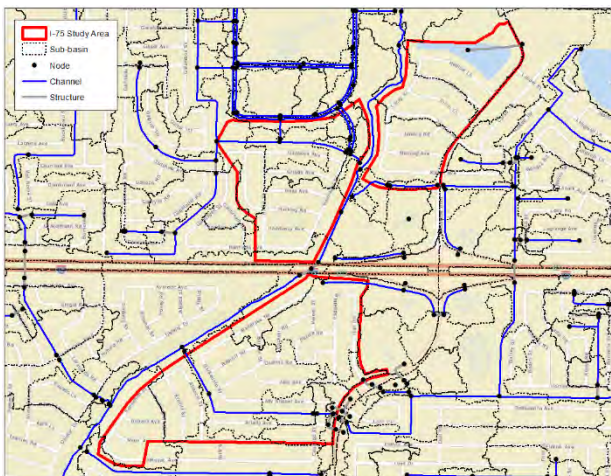


Figure 3b: I-75 Study Area, Model Network

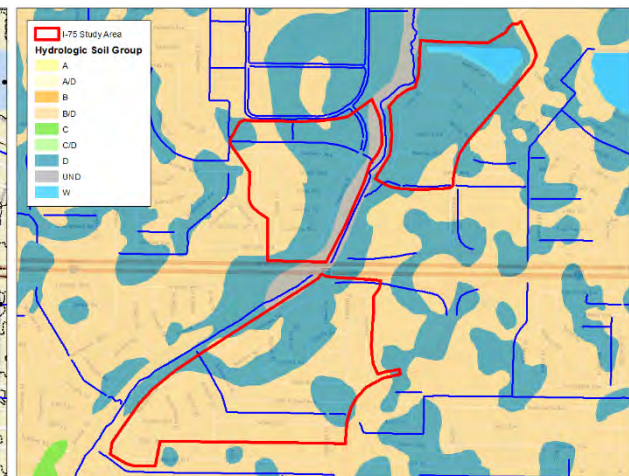


Figure 3c: I-75 Study Area, Hydrologic Soil Groups

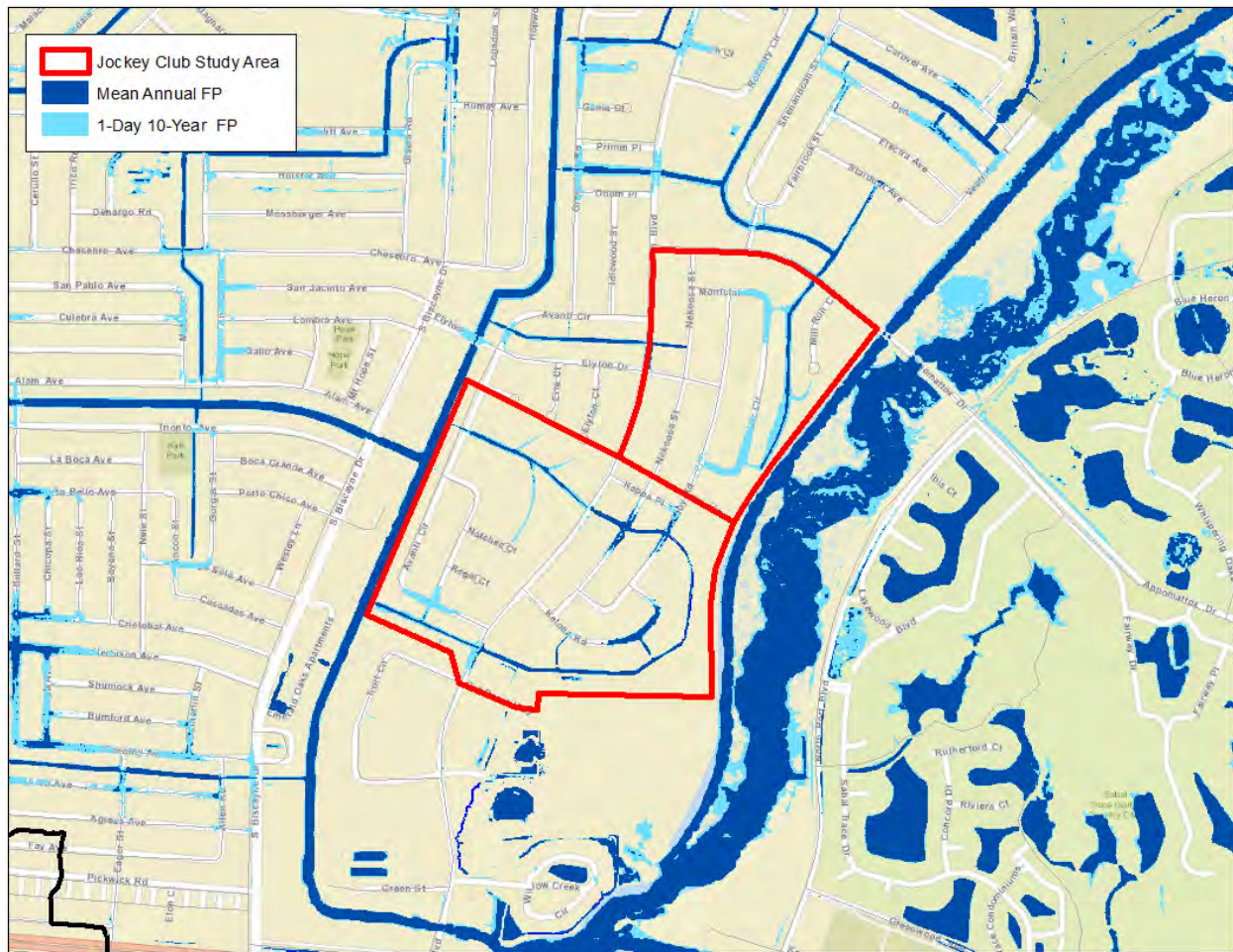


Figure 4a: Jockey Club Study Area, Mean Annual and 10-Year Floodplains

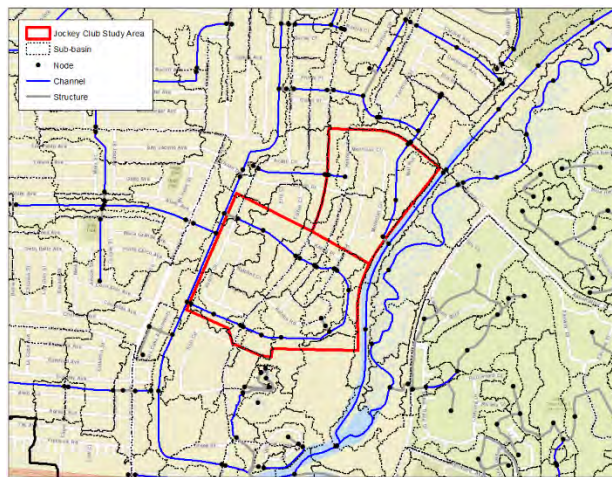


Figure 4b: Jockey Club Study Area, Model Network

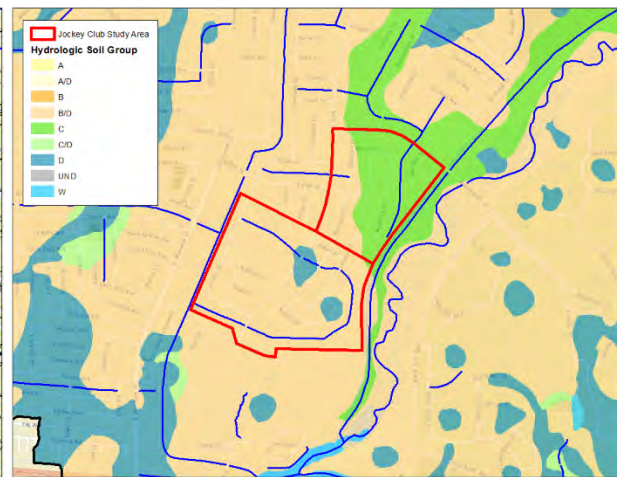


Figure 4c: Jockey Club Study Area, Hydrologic Soil Groups

Appendix F

Task 1.4 Big Slough Flood Reduction Study, Potential Solutions for Hydraulic Evaluation

DeLoach Engineering Science, PLLC., January 2017

► MEMORANDUM

To: Elizabeth Wong, PE (City of North Port)
From: Dave DeLoach, PE; Trillian Baldassari, PE
Copy: Rod Ghioto, PE
File: 14-00400-00

Subject: Task 1.4 Big Slough Flood Reduction Study, Potential Solutions for Hydraulic Evaluation

January 30, 2017

Potential Solutions for Hydraulic Evaluation

As discussed in the Big Slough Flood Reduction Study Project Plan, this project builds upon prior work performed while advancing and supplementing flood reduction concepts previously developed by others. This memorandum briefly summarizes potential solutions which have been considered, including data needs and constraints on implementation, and identifies a specific set of alternatives selected from among the potential solutions for hydraulic evaluation. Information presented in this memorandum addresses the following elements of the Project Plan (Task 1.3).

- Formulate List of Potential Solutions for Hydraulic Evaluation
 - Describe Each Potential Solution and Any Known or Expected Obstacles to Success
 - Identify Additional Data Needs to Support Hydraulic Evaluation
 - Meeting to Review and Discuss List of Potential Solutions
 - Select a Set of Alternatives from Among Potential Solutions for Hydraulic Evaluation

Potential Solutions and Obstacles to Success

One-page descriptions of potential solutions (Attachment 1) were distributed for review and discussion by team members. These solutions may be applicable to either Task 1 Myakkahatchee Creek at I-75 and Jockey Club areas or Task 2 regional flood reduction objectives, or both.

Flood reduction solutions that were formulated generally included:

- | | |
|---|-------------------------|
| • Internal Flow Diversion and Increased Conveyance Capacity | • Gate Operations |
| • External Flow Diversion | • Floodproofing |
| • Offsite Storage | • Property Acquisition |
| | • Elevation of Roadways |

Meeting to Review and Discuss List of Potential Solutions

A project team meeting was held on December 20, 2016 to discuss potential solutions to achieve flood reduction and to develop a selected set of alternatives for hydraulic evaluation. For each concept, prior work and findings were discussed and expected obstacles to success were considered. Comments from the meeting are included in Attachment 2. From this collaboration, a set of alternatives were selected by the team for Task 1 and Task 2 hydraulic evaluations. Hydraulic evaluations will serve to better inform the team as to effectiveness of the individual solutions and will point the way toward a preferred plan for improvements.

Selected Alternatives for Hydraulic Evaluation

The following set of alternatives were selected by the team for hydraulic evaluations.

Internal Flow Diversion and Increased Conveyance Capacity

- **Parallel Relief Channel Construction**

A new, parallel canal could be constructed from the northern City boundary to Price Boulevard along Tier 1 and Tier 2 lots that have been acquired on the west side of the Myakkahatchee Creek. The additional conveyance may reduce flow rate and thus peak stages along the main channel from start to end of the parallel relief channel.

- **Channel Improvements along R-580**

The R-580 waterway's bottom profile could be reconfigured, creating a more uniform and hydraulically efficient conveyance way. Improvement of the R-580 Waterway would induce more flow eastward from Big Slough along the City's northern boundary toward Creighton Waterway, resulting in reduced flows and flood stages in Myakkahatchee Creek.

- **R-36 Improvements to South of WCS-101**

A whole series of improvements could be made to canal segments and structures to enhance the overall conveyance capacity of the R-36 waterway system. The additional stormwater conveyance capacity may induce higher westward flow out of Big Slough at the north boundary of the City. Diverting those higher flows southward to WCS-101 would reduce flow and stages along the more flood prone segments of Myakkahatchee Creek.

- **Snover Waterway to Cocoplum Waterway**

Improvements could be made to existing structures along Snover Waterway and beneath Price Boulevard to increase flow through canals that connect with Cocoplum Waterway. The additional conveyance capacity may induce higher eastward flow out of Big Slough into Snover Waterway. Diverting those higher flows southward to Cocoplum Waterway would reduce flow and stages along the more flood prone segments of Myakkahatchee Creek.

- **Other Miscellaneous Improvements**

Canals and structures throughout the area will be reviewed for opportunities to increase conveyance.

External Flow Diversion

- Connection to Deer Prairie Slough

Stormwater flows could be diverted westward to the adjacent Deer Prairie Slough watershed, reducing flow through the City. Several variations could be considered, including gravity and pumped diversions both with and without added storage facilities.

- Enhanced Discharges Along Southern Boundary to Port Charlotte – Tidal Outfalls Only

Structures located within the Cocoplum Waterway and discharging beneath Hillsborough Boulevard could be improved to facilitate increased discharges into the adjacent Port Charlotte conveyance system. Additional conveyance capacity would effectively divert stormwater southward and may reduce flooding throughout the southern portion of the City.

Offsite Storage

- Constrain Inflows to City with Increased Upstream Floodplain Storage

Raise existing earthen berms on the northwest City boundary at the intersection of Big Slough canal with R-36 and R-580 waterways. Also, raise earthen weirs farther north at the intersection of Big Slough canal and Power Line Road. Improvements would leave the Big Slough canal as the only conveyance system into the western portion of the City. Inflows would be reduced, dropping peak stages along Myakkahatchee Creek.

- Creation of Upstream Detention, Reservoirs, or Joint Use Facilities

One or more detention ponds, reservoirs, or joint-use facilities could be constructed to provide offsite upstream stormwater detention. The facilities would reduce inflow rates and thus peak stages along Myakkahatchee Creek.

Acquisition

- Purchase of Flood Prone Lands and/or Flood Prone Structures

Some communities turn to property acquisition to mitigate flood risk by establishing permanent, public open space and to get homeowners in flood-prone areas permanently out of harm's way. In North Port, many lots have already been acquired on the west side of the Myakkahatchee Creek to serve as a linear park. Additional acquisition may be considered to remove other lands and/or structures from the 100-year floodplain. Removal of those properties would reduce future flood-related damages but would not impact flood levels.

Additional Data Needs to Support Hydraulic Evaluation

No additional data needs were identified during the meeting. Additional information will be gathered during subsequent meetings, such as regarding the Deer Prairie Slough restoration project. Field survey will be postponed until needed during Task 1.8.1 Finalize Recommended Plan and Project Deliverables.

Attachment 1: Team Meeting – Discussion Sheets

The following one-page descriptions of potential solutions were distributed for review and discussion at the December 20, 2016 team meeting.

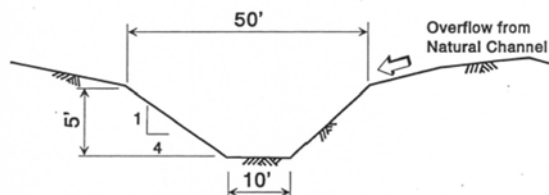
Increased Conveyance Capacity - Parallel Relief Channel Construction

Description and Potential Performance Improvement: A new, parallel canal could be constructed from the northern City boundary to Price Boulevard along Tier 1 and Tier 2 lots that have been acquired on the west side of the Myakkahatchee Creek. The additional conveyance may reduce flow rate and thus peak stages along the main channel from start to end of the parallel relief channel.

Prior Work Performed: The relief channel under consideration by CDM (1993) would have reached from the northern boundary of the city to the Snover waterway. The relief channel was conceived to act as a parallel conveyance for peak storm flows and be integrated into a linear park system along the Big Slough. CDM proposed that the channel would be about 5 feet deep, have gentle grassed side slopes, and would be dry except during extreme storm events. The concept was brought forward as a main component of the 1993 master plan for improvements but was never constructed, apparently due to environmental permitting issues.

Constraints on Implementation: While the relief channel would be constructed within Tier 1 and Tier 2 lots that have been (or are being) acquired by the City, not all lands are currently in City ownership. Also, no improvements were proposed by CDM at the Tropicaire or I-75 crossings to accommodate reconfiguration of the main and parallel relief channels, and this may be a point of greater focus by DES given concerns that hydraulic deficiencies at those two crossings may have contributed to past flooding. Construction impacts to existing wetlands would likely be significant and require mitigation. Depending on the design of the parallel relief channel, it is possible that some wetlands would be created by the project, but it is unlikely that impacts would be entirely offset by the channel design and at least some wetland mitigation would need to be performed offsite. Also, depending on design performance, any reduction in flow attenuation along the main channel may result in higher flows downstream of the relief channel, which would need to be addressed by other means (i.e., downstream improvements).

Data Needs for Evaluation: none – DES will employ the existing watershed model, terrain information, and parcel ownership data to perform a feasibility evaluation of this flood reduction concept.



Parallel Relief Channel (as Conceived by CDM, 1993)



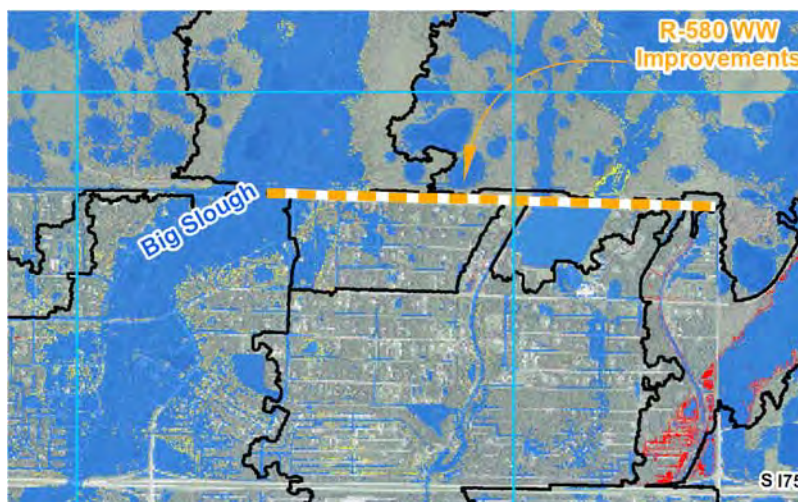
Diversion of Flow within North Port Drainage System - Channel Improvements along R-580

Description and Potential Performance Improvement: The R-580 waterway's bottom profile could be reconfigured, creating a more uniform and hydraulically efficient conveyance way. Improvement of the R-580 Waterway would induce more flow eastward from Big Slough along the City's northern boundary toward Creighton Waterway, resulting in reduced flows and flood stages in Myakkahatchee Creek.

Prior Work Performed: The channel improvements under consideration by Ardaman (2014) assumed a flat ditch along its entire length at elevation 15.0 feet, NAVD. The current bottom sags to elevation 15.0 feet at its mid-point and reaches 17.7 feet and 23.0 feet at its western and eastern ends, respectively. Results indicated small improvements (peak stage reductions) near Big Slough. However, inducing additional flow through Creighton Waterway caused additional flooding near I-75.

Constraints on Implementation: While channel improvements would be contained within existing right of way boundaries along the R-580 waterway, construction access may require additional temporary easements. There would likely be temporary construction impacts to existing wetlands. Subsurface conditions are not well-defined and there may be unknown utility conflicts or other issues that will need to be addressed by the waterway improvement design. Also, depending on hydraulic performance, any increase in conveyance capacity of the waterway may result in higher stages and flows downstream along the Creighton Waterway which would need to be addressed by other means (i.e., additional downstream improvements).

Data Needs for Evaluation: none – DES will employ the existing watershed model, terrain information, and parcel ownership data to perform a feasibility evaluation of this flood reduction concept.



R-580 Waterway Improvements (as Conceived by Ardaman, 2014)

Increase Conveyance Capacity - Channel Improvements along R-24 and R-32

Description and Potential Performance Improvement: Dredging of the R-24 and R-32 waterways could add two to three feet of depth, creating more hydraulically efficient conveyance ways downstream of Price Boulevard. Improvement of the waterways would induce more flow eastward toward Big Slough and reduce flooding along Price Boulevard and on some local streets located north of the R-32 canal.

Prior Work Performed: The channel improvements under consideration by Ardaman (2014) assumed dredging 2,300 feet of R-24 canal and 1,800 feet of R-32 canal to add approximately 2 to 3 feet of depth; and installing one extra parallel 36-inch pipe at an existing culvert crossing located between an Indian burial ground and the R-32 canal. Results indicated that West Price Boulevard would not overtop during the 25-year storm event and flooding would be reduced on some local streets (Dundee Ave, Surf Ave, and San Salvador Road) located north of R-32 canal. The model predicted that the 100-year maximum stage at West Price Boulevard will be reduced from 18.2 to 17.5 feet NAVD88. West Price Boulevard would still overtop by 0.2 feet over the crown of the road at the lowest section during the 100-year storm event. However, the road would be passable per City of North Port LOS criteria. Model results also indicated that there will be no adverse impacts in downstream areas.

Constraints on Implementation: While channel improvements would be contained within existing right of way boundaries along the R-24 and R-32 waterways, construction access may require additional temporary easements. There would likely be temporary construction impacts to existing wetlands. Subsurface conditions are not well-defined and there may be unknown utility conflicts or other issues that will need to be addressed by the waterway improvement design. It should be noted that the City is not allowed to disturb the 50-foot wide drainage right-of-way through the Indian burial ground.

Data Needs for Evaluation: none – DES will employ the existing watershed model, terrain information, and parcel ownership data to perform a feasibility evaluation of this flood reduction concept.



R-24 and R-32 Waterway Improvements (as Conceived by Ardaman, 2014)

Increased Conveyance Capacity - Increased Culvert Capacity of R-36 Canal at I-75

Description and Potential Performance Improvement: The existing R-36 canal culvert crossing at I-75 is comprised of two (2) 7.5' x 6' box culverts and could be improved by placing additional parallel box culverts to provide greater conveyance capacity. Increasing the capacity of the R-36 Canal at I-75 may reduce water levels in upstream areas.

Prior Work Performed: Ardaman's 2014 existing condition model results indicated that more than two feet of head difference occurs across this structure during the 100-year storm event. Under proposed BMP conditions, model results indicated that a peak stage reduction of up to 0.6 feet occurs upstream of the crossing. However, a stage increase of approximately 0.6 feet was found to result in downstream areas. Mitigation of flooding in downstream areas was beyond the scope of Ardaman's evaluation. It is notable that by reducing peak stage upstream of I-75 reduced discharges were observed from the R-36 Canal westward into the adjacent Deer Prairie Slough watershed for the proposed BMP condition. The reduced westward overflow causes an increased volume to remain within the North Port area. It may be possible to mitigate downstream stage increases by discharging westward to Deer Prairie Slough north of I-75 at lower elevations while matching existing condition peak flow rates.

Constraints on Implementation: Any conveyance improvements beneath I-75 would comprise a major undertaking. While culvert improvements would likely be contained within existing road right of way boundaries, construction access may require additional temporary easements. There would likely be temporary construction impacts to existing wetlands. Subsurface conditions are not well-defined and there may be unknown utility conflicts or other issues that will need to be addressed by the design. Depending on hydraulic performance, and as noted above, increase in capacity of the crossing may result in higher stages and flows downstream of I-75 which would need to be addressed by other means (i.e., adjustments to flows toward Deer Prairie Slough and/or additional downstream improvements).

Data Needs for Evaluation: none – DES will employ the existing available watershed model, terrain information, and parcel ownership data to perform an evaluation of this flood reduction concept.



R-36 Canal Culvert Crossing Improvements at I-75 (as Conceived by Ardaman, 2014)

Increased Conveyance Capacity - Increased Culvert Capacity of R-36 Canal at Tropicaire

Description and Potential Performance Improvement: The existing R-36 canal culvert crossing at Tropicaire is comprised of two (2) 5-foot diameter RCP culverts and could be improved by placing additional culverts to provide greater conveyance capacity. Increasing capacity of the R-36 Canal at Tropicaire may reduce upstream water levels, particularly in association with other R-36 improvements.

Prior Work Performed: Ardaman's 2014 existing condition model results indicated that up to three feet of head difference occurs across this structure during various storm events. Under proposed BMP conditions, model results indicated a peak stage reduction of approximately 0.8 feet upstream of the crossing. However, a stage increase of up to 1.1 feet was found to result in downstream areas. Mitigation of flooding in downstream areas was beyond the scope of Ardaman's evaluation. During all events, discharges from the R-36 canal westward into the adjacent Deer Prairie Slough watershed were observed north of Tropicaire Boulevard. The proposed BMP results in a reduction of those discharges to Deer Prairie Slough and a resulting increased total volume remaining within the North Port area. It may be possible to mitigate downstream stage increases resulting from culvert improvements by discharging westward to Deer Prairie Slough at lower elevations while matching existing condition peak flow rates.

Constraints on Implementation: While culvert improvements would likely be contained within existing road right of way boundaries, construction access may require additional temporary easements. There would likely be temporary construction impacts to existing wetlands. Subsurface conditions are not well-defined and there may be unknown utility conflicts or other issues that will need to be addressed by the design. Depending on hydraulic performance, and as noted above, increase in capacity of the crossing may result in higher stages and flows downstream of Tropicaire which would need to be addressed by other means (i.e., adjustments to flows toward Deer Prairie Slough and/or additional downstream improvements).

Data Needs for Evaluation: none – DES will employ the existing available watershed model, terrain information, and parcel ownership data to perform an evaluation of this flood reduction concept.



R-36 Canal Culvert Crossing Improvements Tropicaire (as Conceived by Ardaman, 2014)

Flow Diversion Away from North Port Drainage System - Connection to Deer Prairie Slough

Description and Potential Performance Improvement: Stormwater flows could be diverted westward to the adjacent Deer Prairie Slough watershed, reducing flow through the City. Several variations could be considered, including gravity and pumped diversions both with and without added storage facilities.

Prior Work Performed: CDM (1993) considered a diversion plan which called for a pumping station and weir near Price Boulevard on the R-36 canal to convey stormwater to a bermed storage area on the Futrell tract. Release from the tract to Deer Prairie Slough would be at the existing rate and would take a week to drain down under 25-year/24-hour storm conditions. CDM's diversion channel option called for two weirs to convey stormwater to a channel located south of the Futrell tract, directly connected to Deer Prairie Slough. The weir discharge rate would closely match the pumping capacity and would also discharge only under storm conditions. Ardaman (2014) contemplated two earthen overflow weirs to enhance the R-36 waterway connectivity with Deer Prairie Slough canal and R-36 canal capacity was doubled by replacing its existing cross-section with a 60-foot bottom width trapezoidal channel with 4:1 side slopes. Each of the prior concepts had similar outcomes in reducing flooding along the R-36 canal.

Constraints on Implementation: A range of technical and non-technical issues would need to be addressed in order to implement a diversion into Deer Prairie Slough. This BMP would involve construction of new facilities, maintenance activities, real estate acquisition, and would likely require detailed hydrologic and hydraulic evaluation of the Deer Prairie Slough watershed to support statewide environmental resource permitting. For a storage component, impacts to existing wetlands could be significant and require mitigation. Also, depending on design performance, any increase in rate or volume of flow to Deer Prairie Slough would need to be addressed, and outcomes would need to be proven compatible with the ongoing Deer Prairie Slough Restoration Project.

Data Needs for Evaluation: none – DES will employ the existing available watershed model, terrain information, and parcel ownership data to perform an evaluation of this flood reduction concept.



Diversion to Deer Prairie Slough, Pumped with Storage on Futrell Tract (as Conceived by CDM, 1993)

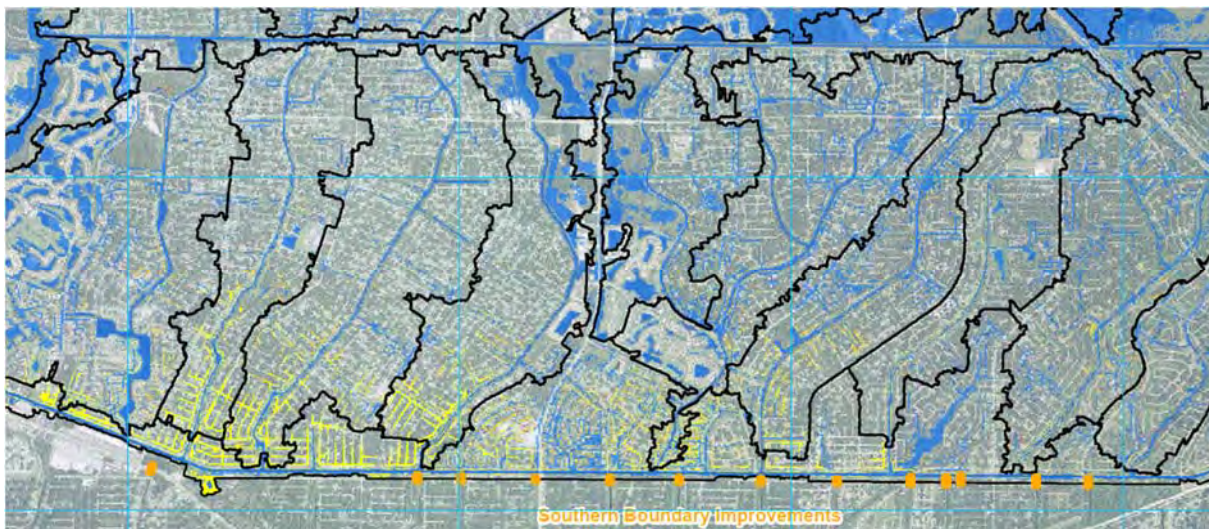
Increased Conveyance Capacity - Enhanced Discharges Along Southern Boundary to Port Charlotte

Description and Potential Performance Improvement: Structures located within the Cocoplum Waterway and discharging beneath Hillsborough Boulevard could be improved to facilitate increased discharges into the adjacent Port Charlotte conveyance system. Additional conveyance capacity would effectively divert stormwater southward and may reduce flooding throughout the southern portion of the City.

Prior Work Performed: This alternative was evaluated by Ardaman (2014) for information purposes, as it is understood that allowing additional flows into Port Charlotte may not be desirable. Six lateral weirs along the Cocoplum waterway and thirteen structures beneath Hillsborough Boulevard were doubled in size. Results indicated that improvements relative to house flooding were not significant. However, roads experienced a considerable flood reduction between Sumter Boulevard and Atwater Drive.

Constraints on Implementation: Enhancing the southerly flow of stormwater out of North Port would involve conveyance improvements, construction of new structures and/or reconditioning of existing structures, maintenance activities, real estate acquisition, and evaluation of receiving waters through hydrologic and hydraulic modeling. As the receiving water system is comprised of both controlled and tidal canals, additional channel and/or structural improvements may need to be made in downstream areas to mitigate the impacts of the diversion.

Data Needs for Evaluation: none – DES will employ the existing available watershed model, terrain information, and parcel ownership data to perform an evaluation of this flood reduction concept.



Diversion for Enhanced Discharge to Port Charlotte (as Conceived by Ardaman, 2014)

Diversion of Flow within North Port Drainage System - R-36 Improvements to South of WCS-101

Description and Potential Performance Improvement: A whole series of improvements could be made to canal segments and structures to enhance the overall conveyance capacity of the R-36 waterway system. The additional stormwater conveyance capacity may induce higher westward flow out of Big Slough at the north boundary of the City. Diverting those higher flows southward to WCS-101 would reduce flow and stages along the more flood prone segments of Myakkahatchee Creek.

Prior Work Performed: Improvements to the complete R-36 system have not been evaluated, although local improvements to portions of that system have been evaluated in a piecemeal fashion.

Constraints on Implementation: Channel improvements along the R-36 waterway may require additional right of way acquisition, and construction access may require additional temporary easements. There would likely be temporary construction impacts to existing wetlands. Subsurface conditions are not well-defined and there may be unknown utility conflicts or other issues that will need to be addressed by the waterway improvement design. Also, depending on hydraulic performance, any increase in conveyance capacity of the waterway may result in higher stages and flows downstream of WCS-101 which would need to be addressed by other means (i.e., additional downstream improvements).

Data Needs for Evaluation: none – DES will employ the existing available watershed model, terrain information, and parcel ownership data to perform an evaluation of this flood reduction concept.

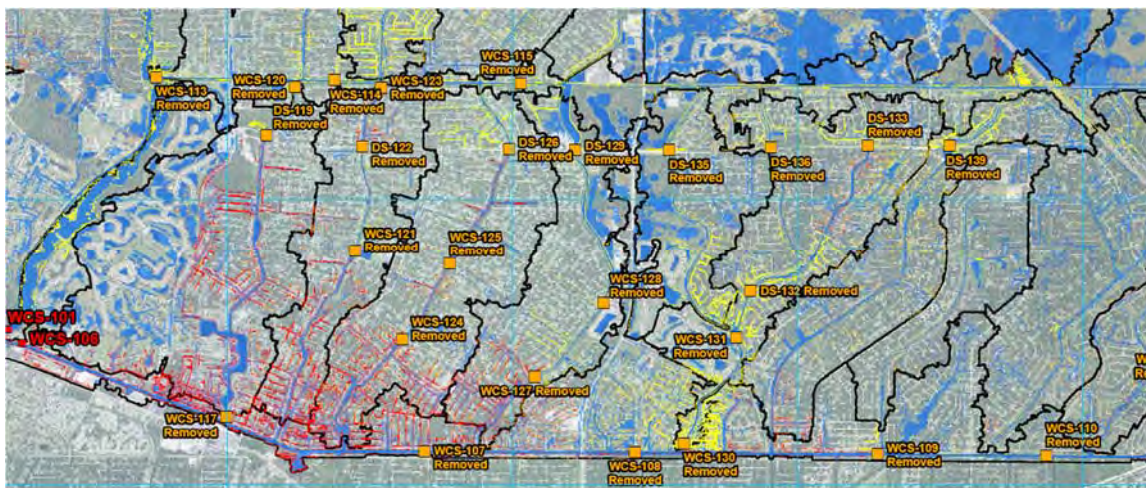
Diversion of Flow within North Port Drainage System - Snover Waterway to Cocoplum Waterway

Description and Potential Performance Improvement: Improvements could be made to existing structures along Snover Waterway and beneath Price Boulevard to increase flow through canals that connect with Cocoplum Waterway. The additional conveyance capacity may induce higher eastward flow out of Big Slough into Snover Waterway. Diverting those higher flows southward to Cocoplum Waterway would reduce flow and stages along the more flood prone segments of Myakkahatchee Creek.

Prior Work Performed: Specific improvements to the Snover-Cocoplum system have not been explicitly evaluated. Ardaman (2014) did evaluate overall system capacity assuming no losses due to water control structures or drop structures (i.e., water control structures and drop structures were removed). Results of that evaluation provide an indication that flood stages could be reduced north of Price Boulevard and along Bass Point waterway but operational controls or mitigation would be required to avoid or address increased flooding between South Toledo Boulevard and South Sumter Boulevard.

Constraints on Implementation: Structure improvements along Snover Waterway and Price Boulevard should be performed within existing right of way, but construction access may require temporary easements. There would likely be temporary construction impacts to existing wetlands. Subsurface conditions are not well-defined and there may be unknown utility conflicts or other issues that will need to be addressed by the design. Also, depending on hydraulic performance, any increase in conveyance capacity of the affected system may result in higher stages and flows in flood prone areas downstream which would need to be addressed by other means (i.e., additional downstream improvements).

Data Needs for Evaluation: none – DES will employ the existing available watershed model, terrain information, and parcel ownership data to perform an evaluation of this flood reduction concept.



Diversion of Flows Southward, by System-wide Structure Removal (as Conceived by Ardaman, 2014)

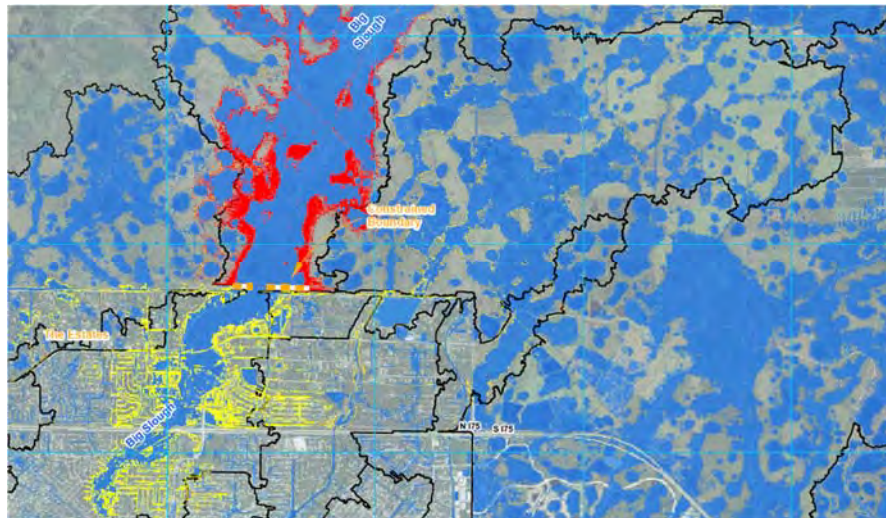
Storage – Constrain Inflows to City with Increased Upstream Floodplain Storage

Description and Potential Performance Improvement: Raise existing earthen berms on the northwest City boundary at the intersection of Big Slough canal with R-36 and R-580 waterways. Also, raise earthen weirs farther north at the intersection of Big Slough canal and Power Line Road. Improvements would leave the Big Slough canal as the only conveyance system into the western portion of the City. Inflows would be reduced, dropping peak stages along Myakkahatchee Creek.

Prior Work Performed: Ardaman developed this BMP concept to constrain the rate and volume of water coming from offsite areas through the Big Slough canal prior to entering the City in the Estates area. Results indicated approximately 0.5 feet flood stage reduction near the Big Slough canal from the City's northern boundary to just south of I-75. However, flood stages increase approximately 1.0 foot in offsite areas north of the R-36 and R-580 waterways. Variations on the concept could consider performance under smaller storm events (Ardaman focused on the 100-year event) and installation of a flow control structure at the northern boundary.

Constraints on Implementation: Offsite lands where floodplain storage is increased are not currently in City ownership, and acquisition or easements would be required. Depending on the extent of modifications required, it is possible that wetlands would be impacted by raising berms. Hydroperiod impacts to upstream existing wetlands would need to be evaluated.

Data Needs for Evaluation: none – DES will employ the existing available watershed model, terrain information, and parcel ownership data to perform an evaluation of this flood reduction concept.



Constrained Inflows and Increased US Floodplain Storage (as Conceived by Ardaman, 2014)

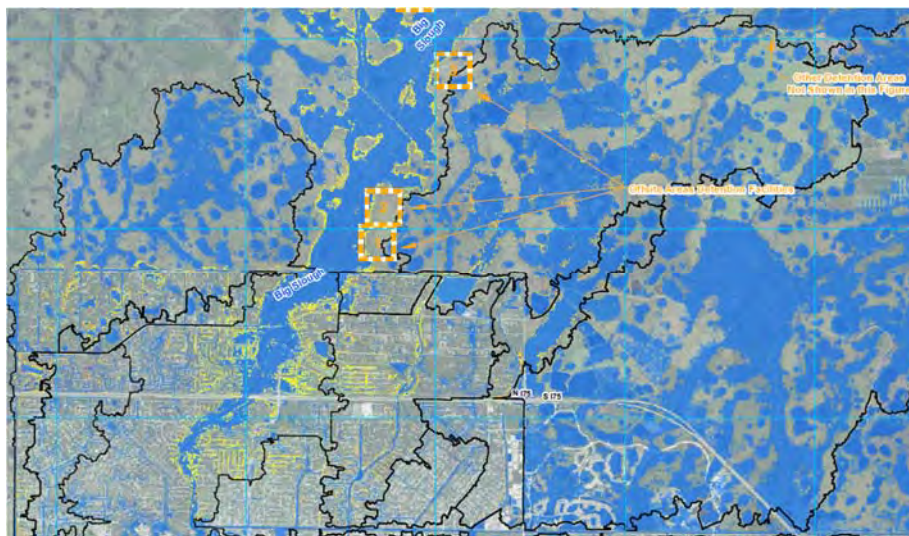
Storage – Creation of Upstream Detention, Reservoirs, or Joint Use Facilities

Description and Potential Performance Improvement: One or more detention ponds, reservoirs, or joint-use facilities could be constructed to provide offsite upstream stormwater detention. The facilities would reduce inflow rates and thus peak stages along Myakkahatchee Creek.

Prior Work Performed: CDM (1993) considered upstream detention consisting of a berm designed to detain flood waters north of the city and slowly release those waters after the peak flows had passed. Six foot berms were proposed with a total storage capacity of 4,000 acre feet and 1 foot of freeboard. Little flood reduction was evident when compared to the other alternatives and the amount of land necessary to achieve little benefit restricted the viability of this alternative. Ardaman developed a concept for creation of seven (7) individual 100-acre detention facilities located on upland sites along Big Slough canal. Each stormwater detention area was linked to the Big Slough canal by a 500-foot weir and held a volume of about of 600 acre-feet for a total of 4,200 ac-ft of storage. Results indicated relatively small reduction in water surface elevations on the order of 0.1 to 0.6 feet along Big Slough.

Constraints on Implementation: Land acquisition and cost of construction will certainly be constraining factors. Construction impacts to existing wetlands could be significant and require mitigation.

Data Needs for Evaluation: none – DES will employ the existing available watershed model, terrain information, and parcel ownership data to perform an evaluation of this flood reduction concept.



Upstream Detention Storage (as Conceived by Ardaman, 2014)

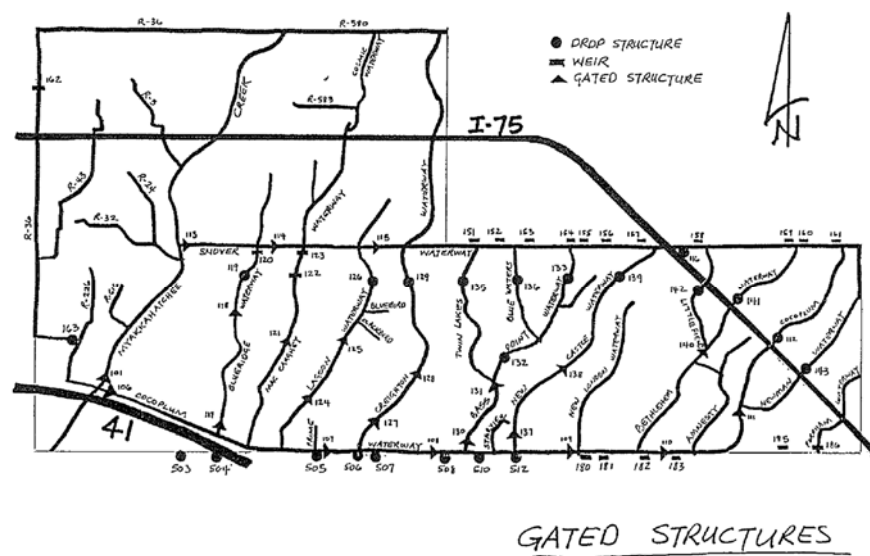
Operational – Drawdown and Other Changes to Schedule of Gate Operations

Description and Potential Performance Improvement: Modifications could be made to existing gate operation schedules to facilitate early drawdown and/or redirection of flows within the North Port drainage system. Creation of initial storage capacity and re-routing of flows may relieve pressure on some flood-prone areas including Myakkahatchee Creek, particularly under lesser storm events.

Prior Work Performed: Ardaman (2014) investigated several concepts associated with gate operations including system-wide and localized (R-36 Canal) drawdown. Generally, drawdown was found to be ineffective in lowering 100-year flood elevations. However, a more rigorous evaluation of gate operations to both draw down initial water levels and re-route flows under a variety of storm event scenarios has not specifically been performed, and gate operation schedule changes may prove more effective when combined with other structural modifications to the system in order to obtain a greater flood reduction benefit or mitigate impacts of other improvements.

Constraints on Implementation: Changes to the operational schedule should consider factors beyond flood control performance, including but not limited to environmental, water supply, and aesthetic impacts of canal drawdown. Evaluations should consider drawdown using existing infrastructure as well as identify infrastructure improvements to expedite drawdown, and such infrastructure improvements may present additional constraints on implementation.

Data Needs for Evaluation: none – DES will employ the existing available watershed model, terrain information, and parcel ownership data to perform an evaluation of this flood reduction concept.



Locations of Gated Structures (City of North Port, 2005)

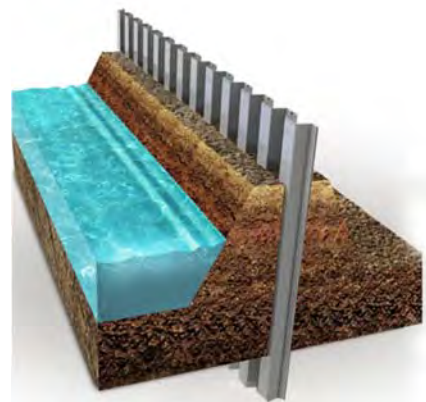
Floodproofing – Including Large-scale Concepts such as Raising Roads and Flood Barrier Walls

Description and Potential Performance Improvement: Floodproofing of existing infrastructure can reduce recurrent damages in areas where flood elevations cannot be cost-effectively reduced by other means. Floodproofing is any combination of structural and non-structural additions, changes, or adjustments to structures which reduce or eliminate flood damage to property, facilities, structures and their contents. In the context of this project, we include raising of flood prone roads and installation of flood walls to protect flood prone areas as examples of large-scale floodproofing. Flood proofing can be included along with other designs. For example, a permanent or temporary flood barrier wall could be incorporated into the linear park flow diversion concept to increase the level protection provided in that footprint.

Prior Work Performed: Ardaman (2014) investigated raising approximately 1,900 feet of West Price Boulevard to an elevation above the predicted 100-year flood stage. Model results indicated no adverse impacts or increase in stages upstream or downstream of the improvement for any modeled storm event. Cost and right-of-way requirements to raise the road were not addressed. Preliminary testing of other flood proofing concepts (e.g., raising roads and homes in flood prone areas located adjacent to Myakkahatchee Creek) was performed, but findings were not well-documented.

Constraints on Implementation: Floodproofing can often be accomplished within existing right of way, although construction access may require additional temporary easements and there can be impacts to existing wetlands. Subsurface conditions are not well-defined and there may be unknown utility conflicts or other issues that will need to be addressed by the floodproofing improvement design. Also, depending on hydraulic performance, any large-scale flood proofing of facilities such as raising of roads may result in higher stages upstream unless sufficient storage or flow capacity is provided in the design.

Data Needs for Evaluation: none – DES will employ the existing available watershed model, terrain information, and parcel ownership data to perform an evaluation of this flood reduction concept.



Raising of Road (as Conceived by Ardaman, 2014) and Barrier Wall (as illustrated by Crane Materials International, 2016)

Acquisition – Purchase of Flood Prone Lands and/or Flood Prone Structures

Description and Potential Performance Improvement: Some communities turn to property acquisition to mitigate flood risk by establishing permanent, public open space and to get homeowners in flood-prone areas permanently out of harm's way. In North Port, many lots have already been acquired on the west side of the Myakkahatchee Creek to serve as a linear park. Additional acquisition may be considered to remove other lands and/or structures from the 100-year floodplain. Removal of those properties would reduce future flood-related damages but would not impact flood levels.

Prior Work Performed: CDM's preliminary evaluation (1993) considered that purchase of flooded lands would preclude flooding damage by preventing development of the property but would not prevent roadway flooding. Based upon their preliminary analyses, purchase of flooded lands was removed from consideration. Ardaman (2012) recommended that the City of North Port purchase habitable structures in which flooding is predicted in the 100-year event, as purchasing the affected properties may be more cost effective than implementing other BMPs. About 100 parcels were identified to be surveyed and for finished floor elevations to be compared with modeled 100-year event flood stages, to determine which properties are damaged in the 100-year event.

Constraints on Implementation: Constraints are related to cost, funding, and property availability. Property acquisition is generally performed through voluntary buyout programs presented to homeowners in neighborhoods that have been subject to repeated flooding. As such, acquisition depends upon having willing sellers and reaching an agreement on fair market value of properties. For eligible communities, FEMA typically funds a portion of the cost of property acquisition with the municipality contributing the remaining amount.

Data Needs for Evaluation: none – DES will employ the existing available watershed model, terrain information, and parcel ownership data to perform an evaluation of this flood reduction concept.



Properties to be Surveyed for Finished Floor Elevation (as Identified by Ardaman, 2014)

Attachment 2: Team Meeting – Comments on Potential Solutions

Summary of meeting minutes from December 20, 2016 team meeting

Increased Conveyance Capacity - Parallel Relief Channel Construction

Meeting comments: Staff indicated that this project would need to show promise with properties acquired to date or with additional properties which could reasonably be expected to be acquired by means other than eminent domain.

Diversion of Flow within North Port Drainage System - Channel Improvements along R-580

Meeting comments: Staff was interested in seeing this concept brought forward in the master plan, noting that they cannot currently control the amount of water entering the system during a large storm event. DES was directed to look at existing gate schedules or improvements, as well as installation of gates on the MacCaughey and Lagoon Waterway crossings that could assist with making the flow diversion and improve flood control performance under smaller events.

Increase Conveyance Capacity - Channel Improvements along R-24 and R-32

Meeting comments: Staff directed DES to remove this concept from the master plan – outside current areas of interest, already evaluated sufficiently in prior analyses, and provides local improvements which may be better addressed through future raising of Price Boulevard.

Increased Conveyance Capacity - Increased Culvert Capacity of R-36 Canal at I-75

Meeting comments: None (see discussion on R-36 Improvements to South of WCS-101).

Increased Conveyance Capacity - Increased Culvert Capacity of R-36 Canal at Tropicaire

Meeting comments: None (see discussion on R-36 Improvements to South of WCS-101).

Flow Diversion Away from North Port Drainage System - Connection to Deer Prairie Slough

Meeting comments: Staff inquired whether it is possible to determine how much stormwater historically moved into Deer Prairie Slough from the Big Slough and City of North Port systems prior to construction of canals by GDC. DES staff indicated that a rough calculation could be made but that it wouldn't have much of an effect on decision making. Rather, we should gather and review available information on the Deer Prairie Slough restoration project and coordinate with District staff on potential offsite inflow restoration. City staff requested that the District share any reports that are available and identify individuals to contact for a January follow-up meeting. DES staff inquired as to the status of the Futrell tract and City staff indicated that the District did not look favorably on using the tract for a reservoir. Additional District staff could be invited to attend the follow-up meeting to discuss alternate uses of the Futrell tract that might be of mutual benefit.

Increased Conveyance Capacity - Enhanced Discharges Along Southern Boundary to Port Charlotte

Meeting comments: City staff asked DES to focus on the two tidal canals (Apollo and Jupiter waterways) for enhanced discharge. The city replaced dilapidated metal pipes and gates in 2007. Staff indicated that they receive water level complaints in the Cocoplum and Toledo Blade waterways and they would like for DES to look at enhanced discharge from the Cocoplum Waterway.

Diversion of Flow within North Port Drainage System - R-36 Improvements to South of WCS-101

Meeting comments: Team agree to include this concept in the master plan, understanding that it also encompasses improvements to existing culverts at Tropicaire and I-75. During prior analysis, some coordination was held with FDOT and concept was shelved because of downstream impacts which were beyond the scope of that earlier analysis. Window of opportunity may have closed with FDOT on near-term improvements at I-75. One concern is whether the downstream infrastructure can handle the increased flow without substantial modification. Staff pointed out that the WCS-101 structure is tidally influenced and suggested evaluation should consider worst case tidal conditions.

Diversion of Flow within North Port Drainage System - Snover Waterway to Cocoplum Waterway

Meeting comments: Staff indicated that there may be an opportunity to store more water in the existing canal system for smaller events by raising gates. DES pointed out that the Panacea community discharges to some of those canals and that raising levels may have adverse impacts on those upstream stormwater management systems.

Storage – Constrain Inflows to City with Increased Upstream Floodplain Storage

Meeting comments: The team agreed that prior work focused mainly on larger storm events and that this project may be able to achieve benefits for smaller storms with upstream impacts that might be successfully mitigated.

Storage – Creation of Upstream Detention, Reservoirs, or Joint Use Facilities

Meeting comments: Staff indicated that the City Manager recently toured (and is interested in developing facilities similar to) the Celery Fields in Sarasota County and inquired as to whether additional District funding might be available in the project combined flood reduction and water quality benefits. Staff also pointed out that operating and maintaining multiple offsite reservoirs (six were considered in the prior evaluation) would be challenging.

Operational – Drawdown and Other Changes to Schedule of Gate Operations

Meeting comments: The team agreed that City staff have a firm grasp on gate operations, by virtue of working with the system for decades including during large flood events, and an evaluation of wholesale changes to gate operations is not needed. Localized changes to allow diversions (as part of other concepts listed here) may still be made.

Floodproofing – Including Large-scale Concepts such as Raising Roads and Flood Barrier Walls

Meeting comments: City staff indicated that raising roads out of the floodplain, pumping for stormwater control, and installation of flood barriers were not appealing options for large-scale flood reduction. These concepts, including raising roads, may be considered (as part of other concepts listed here).

Acquisition – Purchase of Flood Prone Lands and/or Flood Prone Structures

Meeting comments: City staff indicated that acquisition should be considered as part of the master plan.

Appendix G

**Tasks 1.5 and 2.3 Big Slough Flood Reduction Study, Evaluate Performance
of Selected Set of Alternatives**

DeLoach Engineering Science, PLLC., May 2017

► MEMORANDUM

To: Elizabeth Wong, PE (City of North Port)
From: Dave DeLoach, PE; Trillian Baldassari, PE
Copy: Rod Ghioto, PE
File: 16-00400-00

Subject: Tasks 1.5 and 2.3 Big Slough Flood Reduction Study, Evaluate Performance of
Selected Set of Alternatives

May 21, 2017

Hydraulic Performance of Alternatives to Achieve Flood Reduction

A set of alternatives was previously identified by the project team from among numerous potential solutions considering expected performance, constraints on implementation, and other factors. Those selected alternatives have been combined and incorporated into the Big Slough watershed model to allow for an initial screening-level review of hydraulic performance. This memorandum summarizes work performed to incorporate the alternatives into the model, summarizes hydraulic performance for the mean annual, 10-year, and 100-year 24-hour storm events, and presents a synopsis of take-aways from the associated April 28, 2017 team meeting to discuss hydraulic performance.

Alternatives may be applicable to either Task 1 Myakkahatchee Creek at I-75 and Jockey Club areas or Task 2 regional flood reduction objectives, or both. Thus, work performed and information presented in this memorandum addresses the following elements of the Project Plan (Task 1.5 and Task 2.3).

- Task 1.5 Evaluate Hydraulic Performance of Selected Set of Alternatives
 - Perform Hydraulic Analyses
 - Summarize Hydraulic Performance
 - Meeting to Review and Discuss Performance of Alternatives
 - Identify Preferred Plan(s) of Improvements
- Task 2.3 Evaluate Hydraulic Performance of Selected Set of Alternatives
 - Perform Screening-Level Hydraulic Analyses
 - Summarize Hydraulic Performance
 - Meeting to Review and Discuss Performance of Alternatives
 - Identify Preferred Plans for Regional Improvements

Alternatives Considered

A project team meeting was held on December 20, 2016 to (1) discuss potential solutions to achieve flood reduction and (2) select a set of alternatives for initial hydraulic evaluation. Some flood reduction concepts, including raising roads out of the floodplain, pumping for stormwater control, and installation of flood barriers, were rejected by the project team as they were not appealing options for large-scale flood reduction. A more complete discussion regarding initial selection of alternatives is provided in the January 30, 2017 memorandum on Task 1.4 completion.

The following set of alternatives was selected by the team for initial hydraulic evaluation.

- Internal Flow Diversion and Increased Conveyance Capacity
 - Parallel Relief Channel Construction
 - Channel Improvements along R-580
 - R-36 Improvements to South of WCS-101
 - Snover Waterway to Cocoplum Waterway
 - Other Miscellaneous Improvements
- External Flow Diversion
 - Connection to Deer Prairie Slough
 - Enhanced Discharges Along Southern Boundary to Port Charlotte – Tidal Outfalls Only
- Offsite Storage
 - Constrain Inflows to City with Increased Upstream Floodplain Storage
 - Creation of Upstream Detention, Reservoirs, or Joint Use Facilities
- Acquisition
 - Purchase of Flood Prone Lands and/or Flood Prone Structures

Incorporation of Storage and Conveyance Alternatives into Big Slough Watershed Model

Selected alternatives were combined and incorporated into the Big Slough watershed model to allow for an initial screening-level review of hydraulic performance. The attached tables describe changes made to model elements to represent conceptual improvements. The tables also include notes on limitations and the manner in which alternatives were incorporated.

Hydraulic Performance

Proposed condition simulations were performed for the mean annual, 10-year, and 100-year 24-hour storm events, with stages and flows compared to the existing condition. Flood inundation areas for each simulation were mapped and used to depict areas removed from the floodplain. Flood reduction concepts are generally effective in reducing flood levels in the watershed, particularly in the I-75 study area, given assumptions and simplifications made while developing the screening-level models. Potential adverse impacts can also be seen in the model results. These initial storm event simulation results provide general information on potential performance characteristics of the flood reduction concepts. A more refined plan may not result in these same reductions, and preliminary model results and flood mapping should not be construed as a proposed future watershed condition.

Team Meeting

A Team Meeting was held on April 28 to discuss plan concepts and preliminary hydraulic performance. A copy of the presentation is attached and, for brevity, the reader is referred to that presentation for viewing of preliminary model results. The following summarizes notable points that were raised during the team meeting and the important issues that will be addressed as the project moves forward.

- Refinement and future performance evaluations of structure modifications at the upstream inflow point (to constrain and reduce inflows to the City of North Port) should consider a wider range of control elevations and results used by the District for decision-making on allowable changes to area, depth, and duration of inundation in upstream District lands.
- Refinement and future performance evaluations of the R-36 conceptual plan for improvements should consider channel widening with and without structure improvements providing additional conveyance beneath Tropicaire and I-75.
- Refinement of the R-36 conceptual plan for improvements should include matching pre/post discharge rates westward into the Deer Prairie system, so as to minimize increased flows downstream in the City of North Port. Preliminary modeling did not make full use of available discharge capacity to the west. No increase in rate of discharge to the Deer Prairie system should be considered, at this time.
- Refinement of the R-36 conceptual plan for improvements should consider (and preferably conform to) existing rights-of-way and drainage easements. City of North Port can provide existing ROW information as depicted on drainage system as-builts. However, acquisition of additional drainage easements along the western boundary from Sarasota County is not out of the question.
- Refinement of the R-36 conceptual plan for improvements should look more closely at existing bridge crossings and available right-of-way for channel enlargement to its confluence with R-226 and further downstream to Myakkahatchee Creek.
- Two culvert locations on the west boundary of Jockey Club should be evaluated and recommendations made regarding sufficiency and/or modifications needed to reduced flooding in the Jockey Club area (considering any increase in water levels that may result from the R-36 improvements and associated re-routing of flows).
- Refinement and future performance evaluations of the parallel bypass canal should include a more accurate representation of the combined conveyance, and should eliminate double accounting of conveyance as a result of overlapping open channel cross sections. A request has been made to the District for cross section source data, cross section extents, surveyed point locations, conveyance way boundaries, etc., from the District's North Port/Big Slough WMP project files (including intermediate deliverables).
- Only two Price Boulevard drop structures are scheduled to be replaced with the widening project. City of North Port will identify those structures and the other remaining structures will be revised to again match the existing condition model configuration. Future performance evaluations will include the two identified structures as operable gates.

Identification of the Preferred Plan

Based upon the Project Team's review and discussion of preliminary hydraulic evaluation results, the following set of alternatives are recommended for further development of the "preferred plan" of improvements to achieve flood reduction.

- Internal Flow Diversion and Increased Conveyance Capacity
 - Parallel Relief Channel Construction
 - Option 1 – Tier 1 only, reduced width, deeper excavation
 - Option 2 – Tier 1 only, full width, shallower excavation
 - Option 3 – No parallel relief channel
 - Channel Improvements along R-580
 - Option 1 – Constrained width, remains within existing available ROW
 - Option 2 – Unconstrained width, requires ROW or easement acquisition
 - Option 3 – No R-580 channel improvements
 - R-36 Improvements to South of WCS-101
 - Option 1
 - Constrained width, remains within existing available ROW
 - No additional culvert capacity beneath Tropicaire or I-75
 - Option 2
 - Unconstrained width, requires ROW or easement acquisition
 - Additional culvert capacity beneath Tropicaire and I-75
 - Option 3
 - No R-36 Improvements
 - Snover Waterway to Cocoplum Waterway Improvements, as needed to mitigate impacts
 - Price Boulevard Structures and Other Miscellaneous Improvements, as planned by City
- External Flow Diversion
 - Connection to Deer Prairie Slough – maintain pre/post, no increased offsite discharge
- Offsite Storage
 - Constrain Inflows to City with Increased Upstream Floodplain Storage
 - Option 1 – No structure overflow up to 5-year event
 - Option 2 – No structure overflow up to 10-year event
- Acquisition
 - Purchase of Flood Prone Lands and/or Flood Prone Structures, as needed
 - Acquisition of Additional Drainage Easements, as needed

The above concepts and options will be further refined and combined into a small number of candidate plans. Hydraulic performance of the candidate plans will be evaluated using the Big Slough watershed model. The project team will select a plan of improvements from among the candidate plans, based on performance. The preferred plan will then be finalized and evaluated for costs and benefits, etc.

Reduce Inflow			
Flood Reduction Concept: Raise existing earthen berms on the northwest City boundary at the intersection of Big Slough canal with R-36 and R- 580 waterways. Also, raise earthen weirs farther north at the intersection of Big Slough canal and Power Line Road. Improvements would leave the Big Slough canal as the only conveyance system into the western portion of the City. Inflows would be reduced, dropping peak stages along Myakkahatchee Creek.			
Notes: Additional configurations to be evaluated as part of preferred plan evaluation. Field visit required to better understand and conceptualize configuration.			
Reach ID	Waterway	Structure	Description of Model Revision
RB0620B			Change to Bridge w/, 150' control at 24.0, 4' notch at 17.5
RB0620C			Change to Culvert Riser, 25' control at 24.0
W13208_W W4701_W W4707_W			Raise weir sub-elements above 5-year flood to 25.0001

Channel Improvements along R-580			
Flood Reduction Concept: The R-580 waterway's bottom profile could be reconfigured, creating a more uniform and hydraulically efficient conveyance way. Improvement of the R-580 Waterway would induce more flow eastward from Big Slough along the City's northern boundary toward Creighton Waterway, resulting in reduced flows and flood stages in Myakkahatchee Creek.			
Notes: Enlargement of the R-580 canal reflects preliminary sizing performed by Ardaman & Associates, Inc. during the prior Big Slough WMP project. Node bottom elevations associated with this channel were adjusted to provide a uniform slope from the Big Slough canal eastward to Creighton Waterway.			
Reach ID	Waterway	Structure	Description of Model Revision
RP0003 RP0010A RP0016 RP0020 RP0030 RP0040A RP0050 RP0060 RP0070 RP0080 RP0090	R-580		Widen channel to 60ft bottom width trapezoidal

R-36 Improvements to South of WCS-101			
<p>Flood Reduction Concept: A whole series of improvements could be made to canal segments and structures to enhance the overall conveyance capacity of the R-36 waterway system. The additional stormwater conveyance capacity may induce higher westward flow out of Big Slough at the north boundary of the City. Diverting those higher flows southward to WCS-101 would reduce flow and stages along the more flood prone segments of Myakkahatchee Creek.</p>			
<p>Notes: Enlargement of the R-36 canal reflects preliminary sizing performed by Ardaman & Associates, Inc. during the prior Big Slough WMP project. Improvements to conveyance structures located beneath Tropicair and I-75 were included with the R-36 canal layout for initial screening. Additional work will be performed to evaluate system performance without those culvert improvements.</p>			
Reach ID	Waterway	Structure	Description of Model Revision
RB5695B RR3010 RR3020 RR3025 RR3030 RR3040 RR3050 RR3060 RR3070 RR3080 RR3090 RR3100 RR3110 RR3120 RR3125 RR3130 RR3140 RR3150 RR3220 RR3230 RR3250 RR3270 RR3290 RR3300 RR3310 RR3320 RR3330 RR3340 RR3350 RR3360 RR3370 RR3190 RR3200	R-36		Widen channel to 60ft bottom width trapezoidal
RR3160A			Increase Capacity (from 1 to 2 weir notches)
RR0170A			Increase Capacity (from 1 to 2-60" culverts)
RR0170B			Increase Capacity (from 1 to 2-60" culverts)
RR3160B			Increase Capacity (from 1 to 2 weir notches)
RR3160C		WCS 162	Increase Capacity (from 1 to 2 gates)
RR3210A RR3210B RR3380A RR3380B RR3380C RR3420A RR3420B RR3420C			Increase Capacity (from 1 to 2 bridges)

BYPASS			
Flood Reduction Concept: A new, parallel canal could be constructed from the northern City boundary to Price Boulevard along Tier 1 and Tier 2 lots that have been acquired on the west side of the Myakkahatchee Creek. The additional conveyance may reduce flow rate and thus peak stages along the main channel from start to end of the parallel relief channel.			
Notes: Placement into the model network did not account for overlapping of proposed bypass cross sections with existing cross sections describing the Big Slough/Myakkahatchee Creek conveyance system. Conceptual designs and the model will need to be refined (and overlap removed) if it is decided to continue with the bypass alternative in the preferred plan of improvements.			
Reach ID	Waterway	Structure	Description of Model Revision
RBY0020 RBY0030 RBY0060 RBY0070 RBY0100 RBY0110 RBY0140 RBY0150 RBY0160 RBY0190 RBY0220	Big Slough		New Channel, 60ft bottom width trapezoidal
RBY0010			New Weir, 200ft at 15.75ft, 2ft above bottom
RBY0030X			New Weir, 200ft at 17.67, 5ft above bottom
RBY0040			New Weir, 200ft at 14.72ft, 2ft above bottom
RBY0050			New Weir, 200ft at 14.72ft, 2ft above bottom
RBY0070X			New Weir, 200ft at 17.37ft, 5ft above bottom
RBY0080			New Weir, 200ft at 15.5ft, 2ft above bottom
RBY0090			New Weir, 200ft at 13.9ft, 2ft above bottom
RBY0110X			New Weir, 200ft at 15.14ft, 5ft above bottom
RBY0120			New Weir, 200ft at 11.48, 2ft above bottom
RBY0130			New Weir, 200ft at 11.48, 2ft above bottom
RBY0150X			New Weir, 200ft at 14.13, 5ft above bottom
RBY0160X			New Weir, 200ft at 12.46, 5ft above bottom
RBY0170			New Weir, 200ft at 5.38, 2ft above bottom
RBY0180			New Weir, 200ft at 5.38, 2ft above bottom
RBY0200			New Weir, 200ft at 4.05, 2ft above bottom
RBY0210			New Weir, 200ft at 4.05, 2ft above bottom
RBY0230			New Weir, 200ft at 3.25, 2ft above bottom

Snover Waterway to Cocoplum Waterway			
<p>Flood Reduction Concept: Improvements could be made to existing structures along Snover Waterway and beneath Price Boulevard to increase flow through canals that connect with Cocoplum Waterway. The additional conveyance capacity may induce higher eastward flow out of Big Slough into Snover Waterway. Diverting those higher flows southward to Cocoplum Waterway would reduce flow and stages along the more flood prone segments of Myakkahatchee Creek.</p>			
<p>Notes: Controls set to reflect current operations of other area structures, specifically based on water surface elevation of Myakkahatchee Creek at Tropicair Boulevard. All four (4) Price Boulevard structures were assumed to be replaced. City direction followed that only two (2) of the structures are scheduled to be replaced and future model revisions will reflect that case.</p>			
Reach ID	Waterway	Structure	Description of Model Revision
RE0040A RE0040B RE0040C	Blueridge	DS 119	2 5ft gates added, 10ft of weir removed from riser
RI0030A	Creighton	DS 129	6 5ft gates added, 30ft of weir removed from riser
RI0030B			
RI0040A RI0040B RI0040C			Replaced with RI0040D (removes riser from culverts)
RI0040D			New culverts to replace RI0040A/B/C
RD0030A RD0030B RD0030C	Lagoon	WCS 126	2 5ft gates added, 10ft of weir removed from riser
RS5430A RS5430B RS5430F	Snover	WCS 115	Updated to reflect proposed condition

Miscellaneous Planned Improvements			
Flood Reduction Concept: Canals and structures throughout the area will be reviewed for opportunities to increase conveyance.			
Notes: Revisions to reflect ongoing work at City of North Port to refurbish the existing system. Changes made using conceptual-level design information provided by the City. Como Water Control Structure provides structural connection from the Cocoplum Waterway to a Port Charlotte canal system outfall where there is currently a berm located on the south side of the Cocoplum Waterway.			
Reach ID	Waterway	Structure	Description of Model Revision
RC0900A RC0900D RC0900H RC0900I	Cocoplum	WCS 106	Updated to reflect proposed condition (by others)
RC0600B RC0600C	Como	Como WCS	Disabled, replaced with culvert riser
RC0600D			New gated WCS (4-5' gates, split between two barrels)
RS5430A RS5430B RS5430F	Snover	WCS 115	Updated to reflect proposed condition

Appendix H

Tasks 1.6 and 2.4 Big Slough Flood Reduction Study, Refine and Summarize

Preferred Plan(s) for Improvement (interim status report)

DeLoach Engineering Science, PLLC., October 2017

► **MEMORANDUM**

To: Elizabeth Wong, PE (City of North Port)
From: Dave DeLoach, PE; Trillian Baldassari, PE
Copy: Rod Ghioto, PE
File: 16-00400-00

Subject: Tasks 1.6 and 2.4 Big Slough Flood Reduction Study, Refine and Summarize Preferred Plan(s) for Improvement (interim status report)

October 3, 2017

Development of a Preferred Plan for Improvement

The Big Slough Flood Reduction Study plan for improvement will be comprised of: internal flow diversion and increased conveyance capacity; external flow diversion; offsite storage; and property acquisition. Those plan components were selected by the Project Team based on review of preliminary hydraulic evaluations of alternatives and have been merged into a small number of distinct Candidate Plans. The project team will compare and select one plan from among the Candidates and that Preferred Plan will be finalized and evaluated for hydraulic performance, estimated costs, and flood reduction benefits.

This interim status report introduces eight Candidate Plans, summarizes their hydraulic performance for the mean annual, 10-year, and 100-year 24-hour storm events, provides preliminary cost and flood reduction benefit information, and presents a synopsis of take-aways from the August 8, 2017 team meeting to discuss hydraulic performance and plan development.

Candidate Plans may be applicable to either Task 1 Myakkahatchee Creek at I-75 and Jockey Club areas or Task 2 regional flood reduction objectives, or both. Thus, work performed and information presented in this memorandum address the following elements of the Project Plan (Task 1.6 and Task 2.4).

- Task 1.6 Refine Preferred Plan(s) of Improvement
 - Evaluate Site Conditions and Design/Permitting Constraints of Preferred Plan(s)
 - Refine Preferred Plan(s) to Address Site Conditions and Design/Permitting Constraints
 - Perform Hydraulic Analyses of Refined Plan(s)
 - Perform Cost-Benefit Analysis of Refined Plan(s)
 - Meeting to Review and Discuss Refined Plan(s)
 - Select Recommended Plan (**on-going**)

- Task 2.4 Summarize and Present Preferred Plan(s) for Regional Improvements
 - Screening-Level Hydraulic Model Pre/Post and Result Tabulations
 - Conceptual-Level Drawings and Plan Descriptions
 - Site Conditions and Design Constraints
 - Relevant Permitting Requirements (**on-going**)
 - Opinion of Probable Cost (**on-going**)
 - Planning-Level Report and Mapping (**on-going**)

Plan Components and Candidate Plan Development

The following set of alternatives was considered by the team for initial hydraulic evaluation.

- *Offsite Storage*. Flood reduction would be achieved in part by construction of a fixed water control structure at the north boundary to limit high flows entering the City. Low flows will remain unchanged as a four-foot opening in the upstream face of the structure would extend fully to the existing channel bottom.
- *Internal Flow Diversion and Increased Conveyance Capacity*. Flood reduction would be achieved in part by construction of a parallel relief (bypass) channel alongside Myakkahatchee Creek within Tier 1 lots that have been acquired by the City of North Port, and through widening of the R-36 canal. Wide and Narrow options were considered for each channel improvement concept.
- *External Flow Diversion*. Flood reduction would be achieved in part through higher discharges westward to Deer Prairie Slough. Large increases are considered infeasible as SWFWMD has already restored the slough system and likely will not permit higher inflows to the slough. Therefore, the Preferred Plan will be adjusted to meet pre/post discharge rates and District staff will be asked at an upcoming coordination meeting if those rates can be increased.
- *Additional drainage improvements* may be achieved through upsizing R-36 culverts at Tropicaire, structure replacement during the widening of Price Boulevard, and improvements to the R-580 canal. The effect of Price Boulevard improvements will be localized. Widening of the R-36 and R-580 canals is expected to require additional and perhaps extensive downstream drainage system improvements to eliminate bottlenecks in other flood prone areas of the City.
- *Acquisition* would reduce losses through purchase of flood prone lands and/or structures.

Eight scenarios are presented in this memorandum as Candidate Plans which incorporate various configurations of the “Offsite Storage” and the “Internal Flow Diversion and Increased Conveyance Capacity” concepts described above. While other configurations were evaluated (e.g., offsite storage with flow control set at a lower, 10-year event peak, stage), their performance was not distinctive nor superior to those presented here, and so those scenarios were not advanced as Candidate Plans.

Once a Preferred Plan is selected from among these eight Candidate Plans, other alternative components can again be considered during finalization of the stormwater plan. For example, discussion with District land management staff may allow for adjustments to the offsite inflow control as well as external flow diversions to Deer Prairie Slough. These final plan modifications may have a small (but not insignificant) impact on performance which will be accounted for in final performance and benefit/cost evaluations.

Candidate Plan Descriptions and Performance

A total of eight candidate plans were evaluated. Each candidate plan was comprised of one or more of the following drainage system improvement components, as indicated in the Scenario matrix of Table 1. For example, Scenario 6A is comprised only of a “High Control” to reduce inflows at the northern city limit.

Inflow

- Existing. No hydraulic control of inflow from upstream offsite areas.
- Low Control. 150-foot concrete weir with crest at elevation 24.0 feet for overtopping of high flows. 4-foot wide slot open to existing channel bottom to allow normal low flows, unimpeded.
- High Control. 150-foot concrete weir with crest at elevation 25.5 feet for overtopping of high flows. 4-foot wide slot open to existing channel bottom to allow normal low flows, unimpeded.

R-36

- Existing. No improvements to existing ditch along northwestern and western city boundary.
- Narrow. Widen ditch to maximum extent possible within existing drainage easement/right of way.
- Wide. Widen ditch to 60-foot bottom with 4:1 side slopes, with easement acquisition as-needed.

R-580

- Existing. No improvements to existing ditch along northern city boundary east of Big Slough Canal.
- Narrow. Widen ditch to maximum extent possible within existing drainage easement/right of way.
- Wide. Widen ditch to 60-foot bottom with 4:1 side slopes, with easement acquisition as-needed.

Bypass

- Existing. No bypass. All flow carried within Big Slough Canal/Myakkahatchee Creek and floodplain.
- Narrow. Excavate bypass ditch with 20- to 50-foot bottom 4:1 side slopes for high flow diversion.
- Wide. Excavate bypass ditch with 50-foot bottom 4:1 side slopes for high flow diversion.

Proposed condition simulations were performed for the mean annual, 10-year, and 100-year 24-hour storm events. Flood reduction performance of the eight Candidate Plans (Scenarios 6A through 6H) were compared to the existing condition (Scenario 5). Table 1 presents the Candidate Plans (Scenario matrix) and summarizes flood reduction performance in terms of: area of flood reduction (in acres); length of roadway flood reduction (in miles); and number of flood-impacted parcels reduction (for where the floodplain intersects a portion of a parcel and where the floodplain overlays a parcel’s centroid).

Scenario 6B, comprised of offsite inflow control, a wide bypass, and wide R-36 channel improvements, reduces flooding on more property and roadway than all other Candidate Plans. However, a substantial level of flood reduction is also achieved with scenarios 6D, 6F, and 6H, all of which employ the wide bypass, at lower overall cost and higher BCRs. The wide bypass component provides the majority of flood reduction benefits in each of the four best-performing Candidate Plans, with some added improvement resulting from various configurations of R-36 improvements and offsite inflow control.

Scenario Matrix		5	6A	6B	6C	6D	6E	6F	6G	6H
Inflow	Existing	x					x	x	x	x
	Low Control									
	High Control		x	x	x	x				
R-36	Existing	x	x					x	x	
	Narrow				x	x	x			x
	Wide			x						
R-580	Existing	x	x	x	x	x	x	x		x
	Narrow								x	
	Wide									
Bypass	Existing	x	x				x		x	
	Narrow				x					
	Wide			x		x		x		x

Prel. Estimated Combined Cost	\$	-	\$ 750,000	\$ 32,667,000	\$ 11,714,000	\$ 19,446,000	\$ 7,825,000	\$ 10,871,000	\$ 2,462,000	\$ 18,696,000
Estimated Annualized Cost	\$		\$ 54,345	\$ 2,367,046	\$ 848,795	\$ 1,409,054	\$ 566,998	\$ 787,711	\$ 178,396	\$ 1,354,709

Flood Reduction (acres)	2.33-year	-	22	243	156	213	53	176	24	184
	10-year	-	63	377	204	323	58	212	14	223
	100-year	-	68	450	239	338	106	190	11	184
Road Flood Reduction (miles)	2.33-year	-	0.6	6.7	4.2	6.38485	1.2	5.7	0.7	5.9
	10-year	-	2.9	14.4	8.9	12.969	3.5	9.1	1.1	9.4
	100-year	-	3.5	20.8	9.6	14.055	4.5	9.2	1.6	9.3
Parcels Reduction (touch)	2.33-year	-	22	792	433	726	119	598	7	613
	10-year	-	118	960	515	868	182	554	-33	546
	100-year	-	253	1338	643	958	292	630	34	591
Parcels Reduction (centroid)	2.33-year	-	14	240	144	235	36	225	17	226
	10-year	-	46	408	158	330	26	228	-8	242
	100-year	-	48	399	156	319	47	226	-43	217

Prel. Estimated Annualized Benefit*	\$	113,147	\$ 1,327,153	\$ 734,929	\$ 1,226,504	\$ 191,732	\$ 1,060,727	\$ 66,076	\$ 1,081,500
Est. Benefit/Cost Ratio (BCR)		2.08	0.56	0.87	0.87	0.34	1.35	0.37	0.80

* For initial discussion purposes only. Components used to develop a preliminary estimate of project benefits are subject to further review.

Table 1: Candidate Plan Performance Summary

Preliminary Estimates of Candidate Plan Benefits

Screening-level estimates of project benefits (flood damage reduction) presented in Table 1 were developed to allow initial comparisons of rough Benefit to Cost Ratio (BCR) values across Candidate Plans. Benefits considered cost avoidance for road repair and for residential structure damages through flood reduction across design storms with mean annual, 10-year, and 100-year return periods.

While these estimates are satisfactory for initial comparisons of Candidate Plans, the assumptions made relative to what constitutes project benefits and their per-flood-event values will be discussed further with City and District staff prior to development of a BCR for the final Preferred Plan.

Example Benefit Calculation

Rough calculations were performed to develop preliminary order of magnitude estimates of annualized benefits which can be compared across Candidate Plans to aid in selecting a Preferred Plan.

of events considered: 3, with mean annual, 10-year, and 100-year recurrence

annual probability of occurrence: 2.33-year = 0.429, 10-year = 0.1, and 100-year = 0.01

measurable benefit units:

- reduction in feet of flooded roadway
- reduction in number of parcels intersected by floodplain
- reduction in number of parcels w centroid intersected by floodplain (implies greater damages)

benefit unit values accrued by flood reduction:

- \$62,400 per mile of roadway flood averted (assumes 4 inundation events per roadway repair)
- \$250 per parcel per event averted (parcel intersecting floodplain with minor cost to owner)
- \$6300 per parcel per event averted (parcel centroid intersecting floodplain, 15% res. structures)

The annualized benefit is computed as the product of each “measurable benefit unit” times “benefit unit values” multiplied by “probability of occurrence”, summed across “number of events considered”

Example, for Scenario 6F:

$$\begin{aligned}
 & (6.4 \text{ mi} * \$62,400 + 726 \text{ parcels} * \$250 + 235 \text{ parcels} * \$6,300) * 0.429 \quad [\text{mean annual}] \\
 & + (13.0 \text{ mi} * \$62,400 + 868 \text{ parcels} * \$250 + 330 \text{ parcels} * \$6,300) * 0.1 \quad [10\text{-year}] \\
 & + (14.1 \text{ mi} * \$62,400 + 958 \text{ parcels} * \$250 + 319 \text{ parcels} * \$6,300) * 0.01 \quad [100\text{-year}] \\
 & = \$884,572 + \$310,656 + \$31,276 \\
 & = \$1,226,504
 \end{aligned}$$

Preliminary Estimates of Candidate Plan Costs

Preliminary estimates of probable design and construction costs were developed to allow reasonable comparisons across Candidate Plans. Estimated costs for Scenarios 6A through 6H are presented in Table 1. Also provided are preliminary Equivalent Annualized Costs of construction (no maintenance, etc.) for each Candidate Plan, assuming a 7% annual interest rate and 50-year life of project.

Construction costs were based upon RS Means 2017, Heavy Construction Costs, with a factor of 0.95 applied to adjust Ft. Myers/Sarasota construction costs from national averages. The overriding cost item related to channel widening and/or bypass construction is expected to be for grading and earthwork, which is estimated at \$13.25 per cubic yard of material removed. No accounting was made for land acquisition or easements which would substantially increase costs associated with Scenario 6B only. No accounting was made for erosion control or structural interconnections which will increase costs across all projects fairly uniformly, but are highly dependent on final plan configuration.

Cost calculations were performed to develop preliminary order of magnitude estimates of probable construction costs, which can be compared across Candidate Plans to aid in selecting a Preferred Plan. Once the Preferred Plan is selected and refined, a more rigorous cost calculation will be expanded to cover those items that were not included in the preliminary estimate.

Preliminary Benefit Cost Evaluation

A ratio of annualized benefits to annualized costs was calculated and that BCR assigned to each Candidate Plan for rough comparison to aid in selecting a Preferred Plan. Based on the screening-level estimates of Candidate Plan benefits, Scenarios 6A, 6D, 6F, and 6H appear to be in an acceptable range for consideration. Once a Preferred Plan is selected and refined, a more rigorous annualized benefit calculation will be expanded to cover mean annual, 5-, 10-, 25-, 50-, and 100-year events with selection of measurable benefit units and assignment of benefit unit values coordinated more closely with City staff.

The more rigorous final benefit and cost values for the Preferred Plan will be used to determine a BCR for the proposed flood reduction project, providing a basis for decision-making by administrators and commissioners at the City of North Port as well as to support the City of North Port's application for cooperative funding through the SWFWMD CFI program.

Flood Inundation

Flood inundation areas for each simulation were mapped to depict areas removed from the floodplain. As shown in Figures 1 through 16, flood reduction scenarios 6B, 6D, 6F, and 6H are more effective in reducing flood levels in the watershed, particularly in the I-75 study area, than other Candidate Plans. Candidate Plans may also result in increased flooding in downstream areas. Plan refinements and additional improvements will be developed for the selected Preferred Plan to relieve downstream bottlenecks and accommodate increased flows that result from the wider R-36 or addition of the Bypass.

Team Meeting

A Team Meeting was held on August 9, 2017 to discuss plan refinement (including evaluation of project constraints), hydraulic analyses of the refined plan, preliminary costs, and development of conceptual level drawings. Attendees included: Elizabeth Wong, Chuck Speake, Julie Bellia, Monica Bramble (City of North Port); Jezabel Pagan Garcia (Southwest Florida Water Management District); and David DeLoach, Trillian Baldassari (DeLoach Engineering Science).

The PowerPoint and PDF (Preliminary Draft of Conceptual-Level Drawings) presented at the meeting are attached. The following summarizes notable points raised during the team meeting and important issues that will be addressed as the project moves forward.

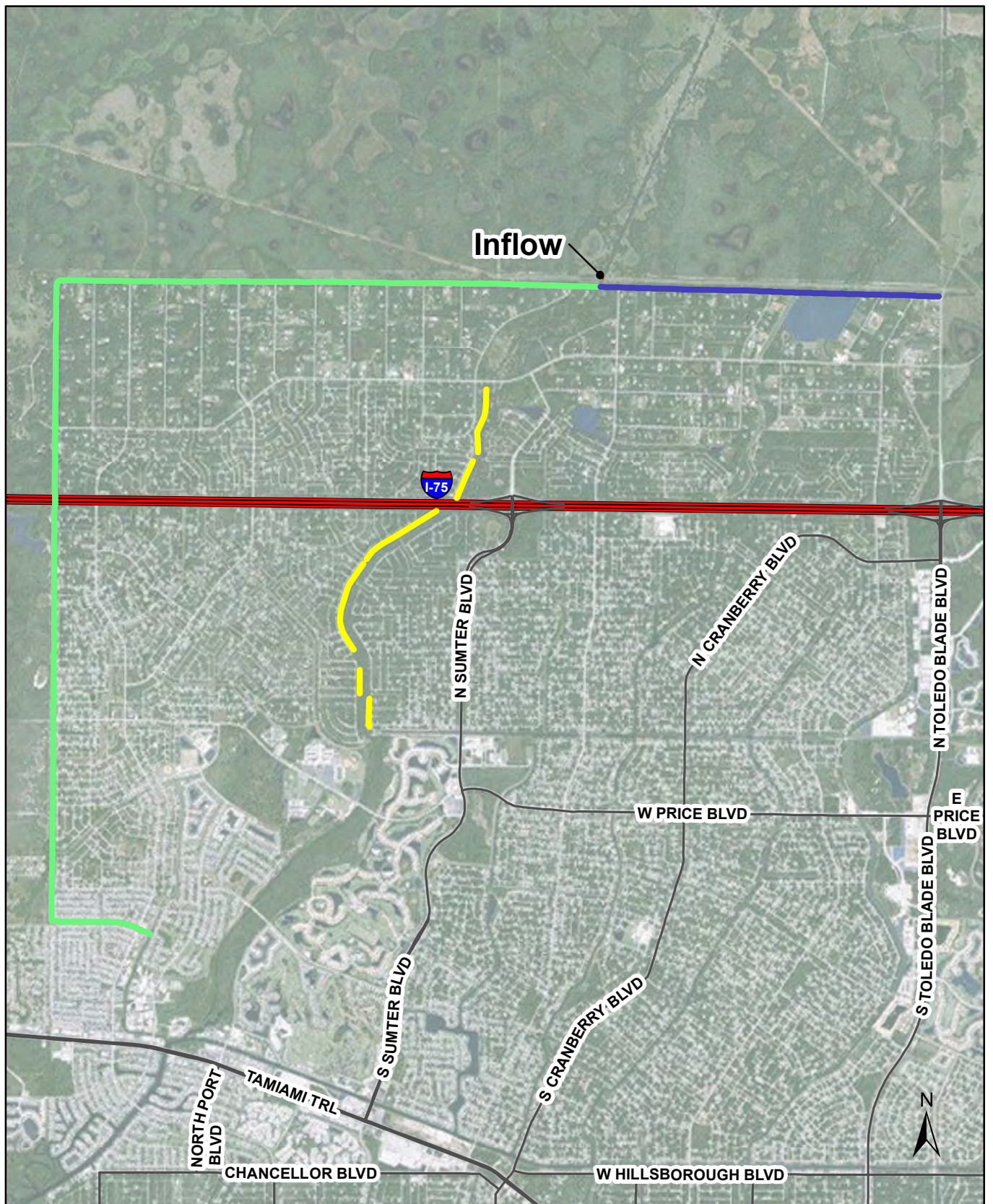
- DES presented conceptual level design drawings for expansion of R-36 (narrow and wide) and the new Bypass Canal (narrow and wide). Included are plan and profile sheets depicting project extents, cross section sheets depicting excavated sections for channel widening and bypass construction, and structure detail sheets depicting the proposed inflow control structure. Drawings will continue to be updated as the Preferred Plan is refined. Elizabeth requested that delivered AutoCAD files be compatible with AutoCAD 2008.
- DES presented a preliminary engineer's opinion of probable cost for expansion of R-36 (narrow and wide), construction of a Bypass Canal (narrow and wide), and construction of a fixed concrete weir to allow normal inflows but restrict high flood flows entering from offsite lands.
- Monica would like to see acreage of floodplain removed as part of the cost/benefit analysis.
- Elizabeth suggested that alternatives be evaluated separately. (*see Scenarios 6A, 6E, and 6F*)
- Big Slough has recently been cleaned from Price Boulevard to Snover Waterway, with plans to continue working northwards. Elizabeth will send photos of pre/post. DES will review roughness assumptions used in the model.
- Discussion to be included in the final report: date LiDAR was flown and reason for not including improvements to R-580 in further plan development.
- City and District staff will coordinate a meeting with the SWFWMD's Land Management Department. Monica would like to receive a documented response regarding sending additional water to Deer Prairie Slough.
- City staff will coordinate a meeting with the City's Parks Department. DES will demonstrate the benefit of the Bypass on Tier 1/Tier 2 Lots for use by the Parks Department.
- DES will provide tabulated benefit (floodplain removed) for each alternative evaluated separately. (*see Scenarios 6A, 6E, and 6F*)

Identification of the Preferred Plan

Based upon the Project Team's review and discussion of preliminary hydraulic evaluation results, a set of alternatives were advanced for development of improvements to achieve flood reduction through internal flow diversion and increased conveyance capacity, external flow diversion, offsite storage, and acquisition. Those concepts were refined and combined into a small number of Candidate Plans for evaluation of hydraulic performance, preliminary cost estimates, and screening-level benefit estimates.

This interim report, meetings, and team discussion provides a basis for evaluation of the Candidate Plans. The Project Team will select from among these Candidate Plans and the Preferred Plan will be finalized and evaluated more rigorously for permissibility, costs, and benefits.

Note: This is an interim report describing a preliminary work product. Some elements of the Candidate Plans are known to result in small, but undesirable increases in water levels in certain areas. From a practical standpoint, it is inefficient to develop Candidate Plans while at the same time eliminating all such increases. For example, scenarios which include upgrades of the Tropicaire R-36 culvert crossing may have an adverse impact on areas between Tropicaire and I-75, depending on the magnitude of discharges to the west (into Deer Prairie Slough) and other elements of the stormwater plan. If a plan is found to be desirable (notwithstanding the increases) then additional improvements may be considered to eliminate increases. The final Preferred Plan will address undesirable increases and incorporate changes to eliminate adverse impacts.



**BMP Location
Waterway**

- Bypass
- R-36
- R-580

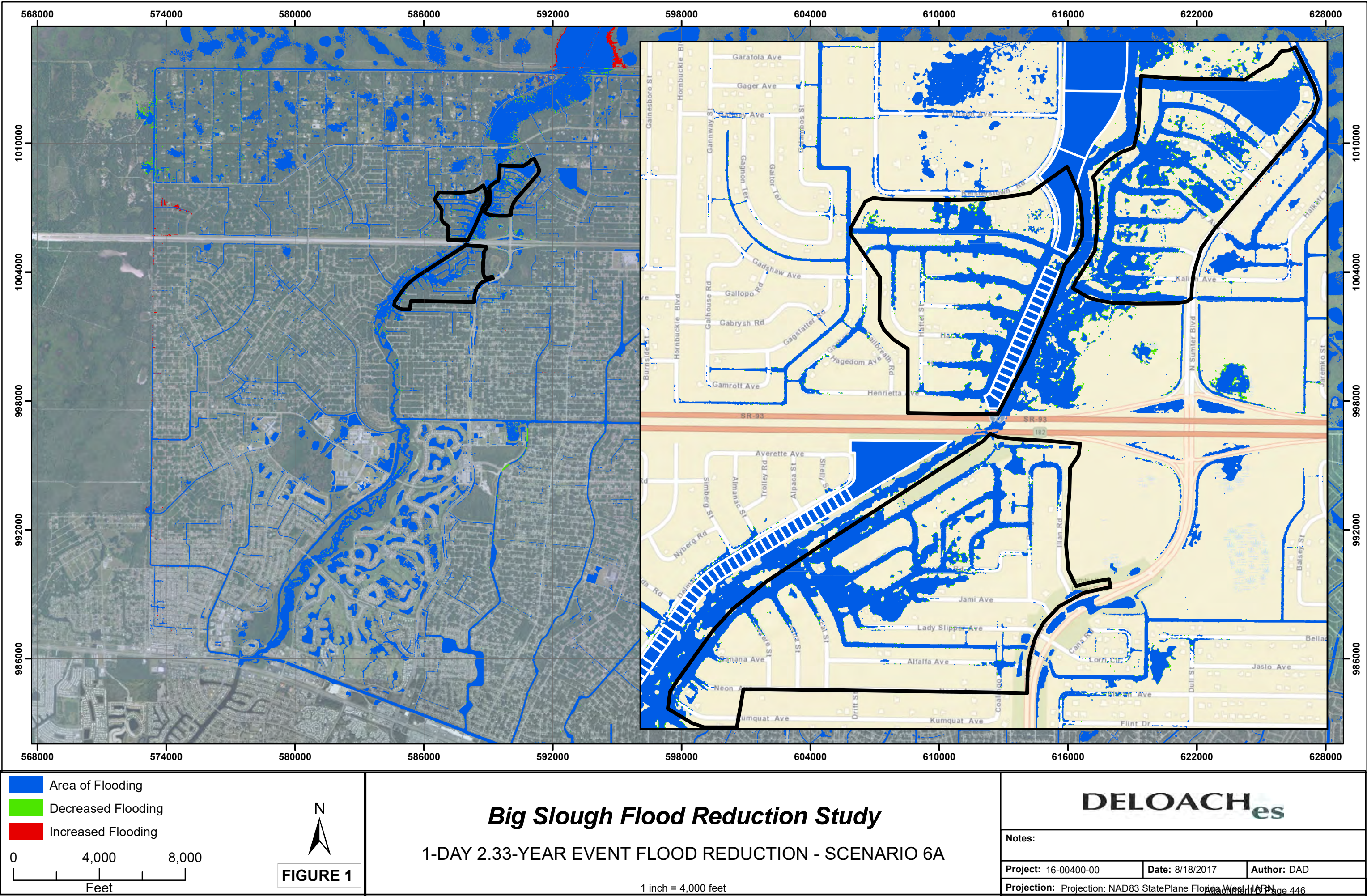
BMP LOCATION MAP

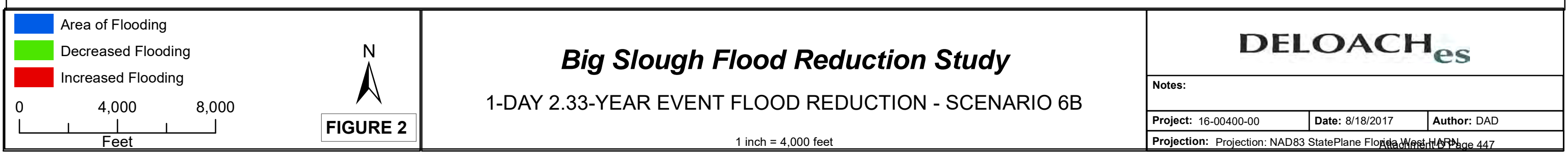
CITY OF NORTH PORT, FL

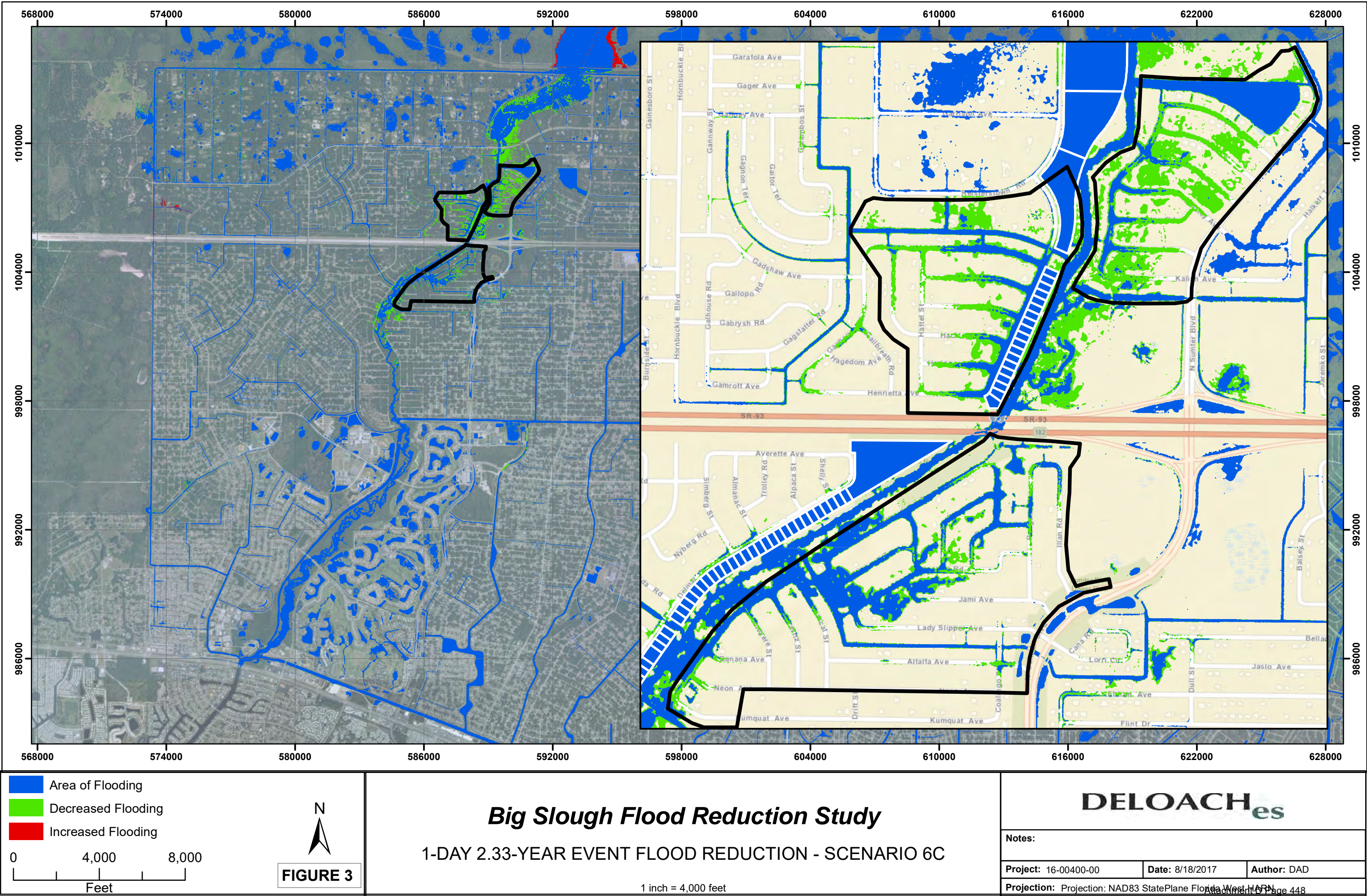
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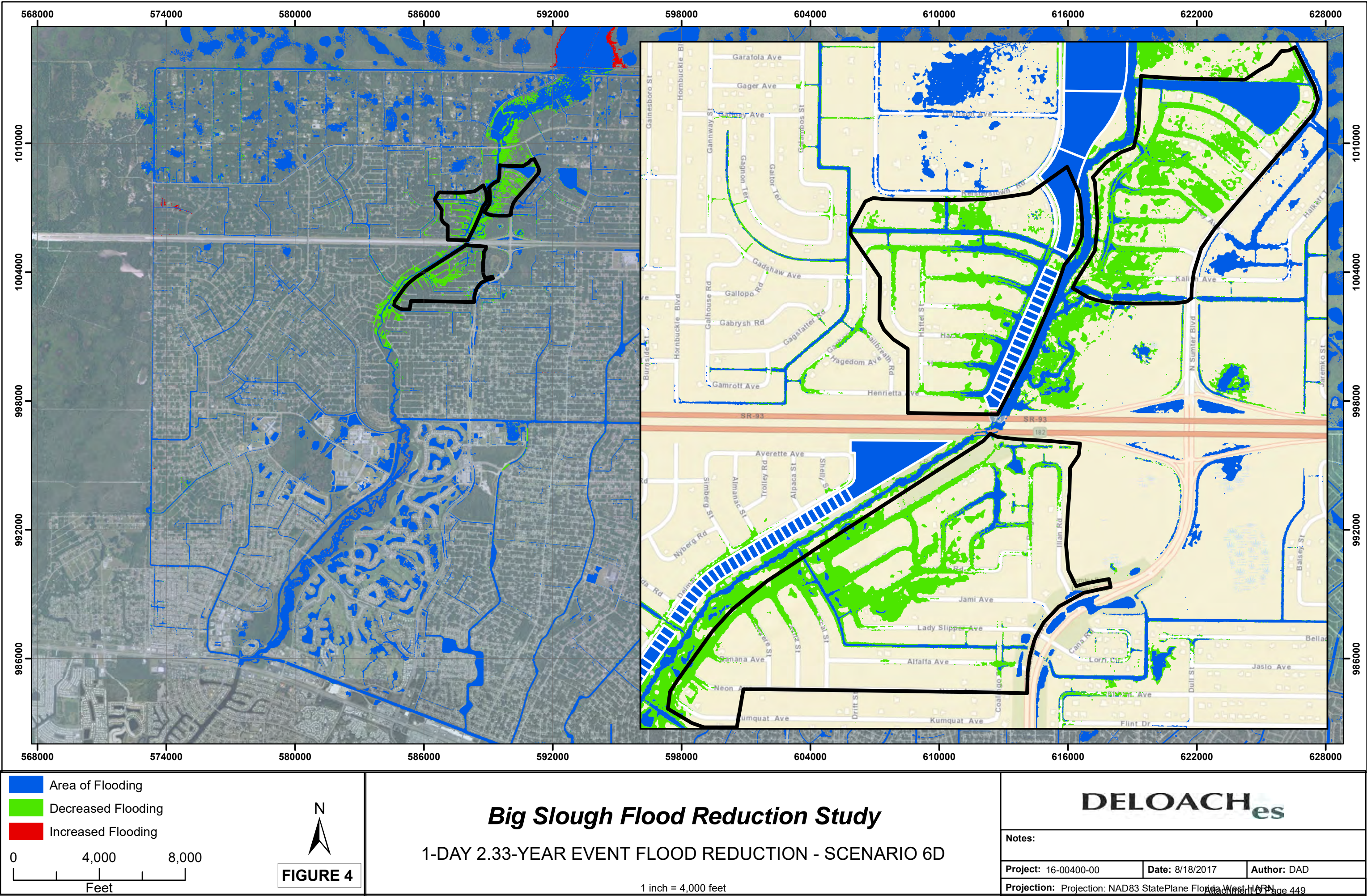
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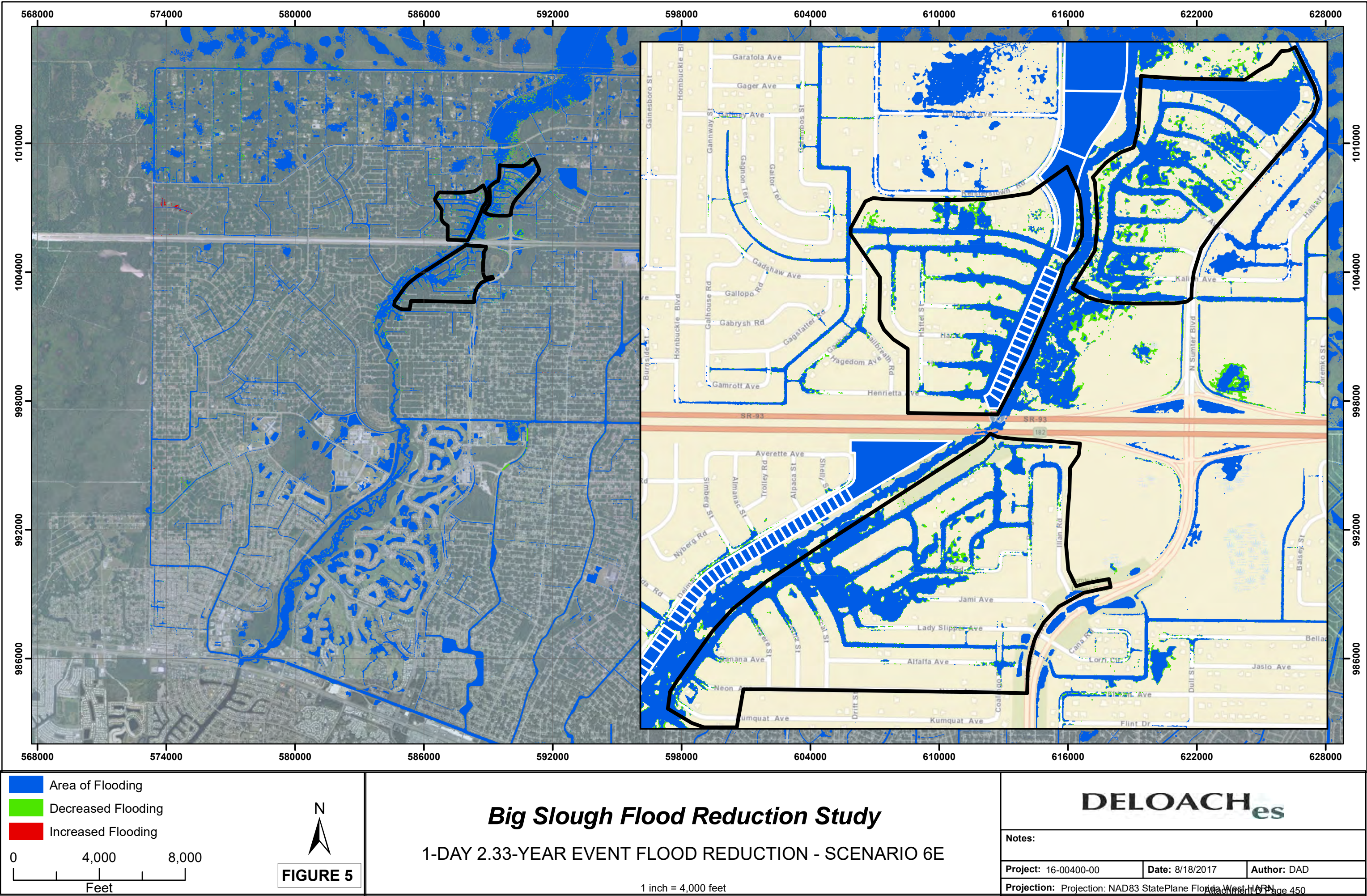


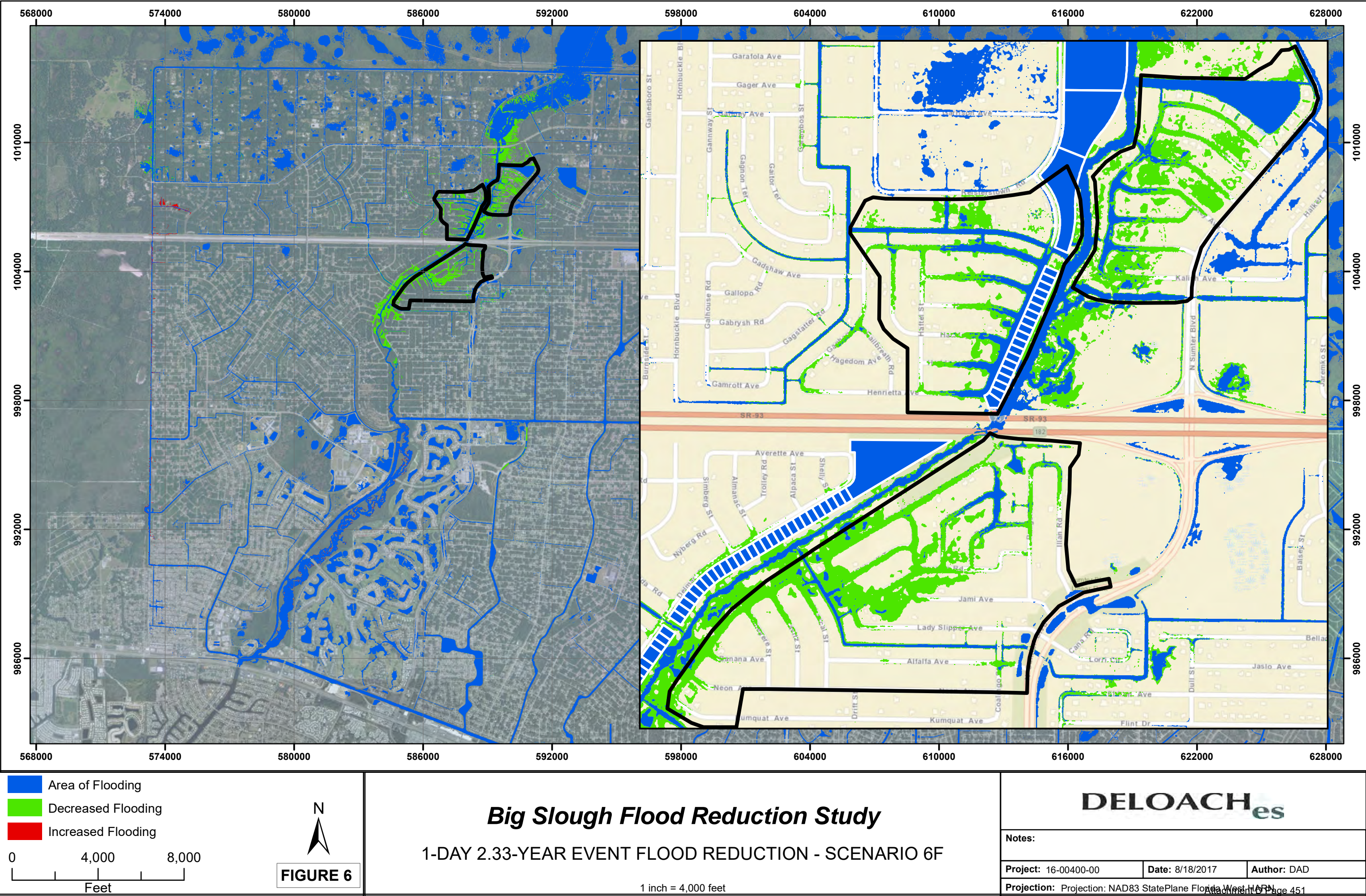




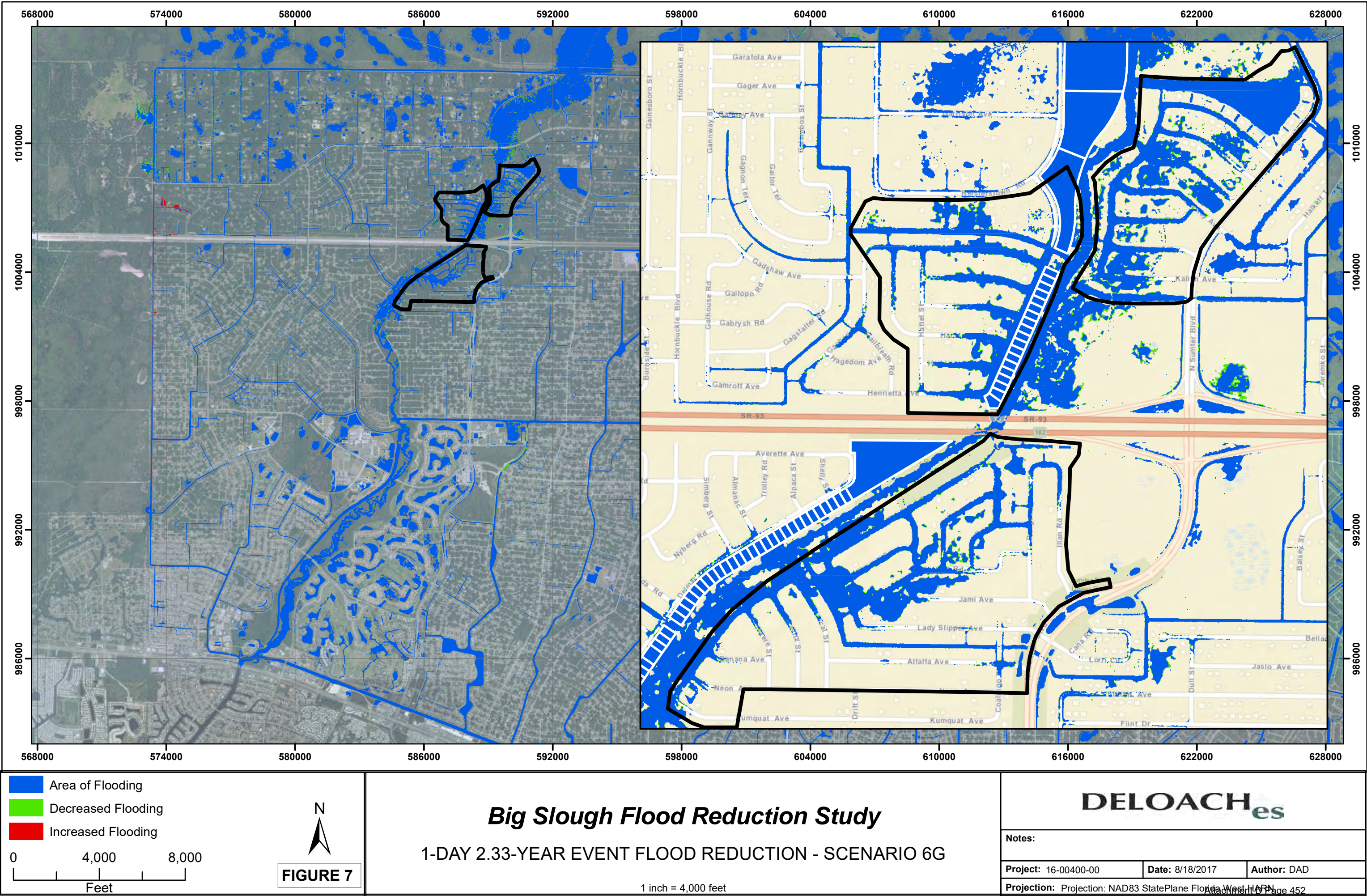


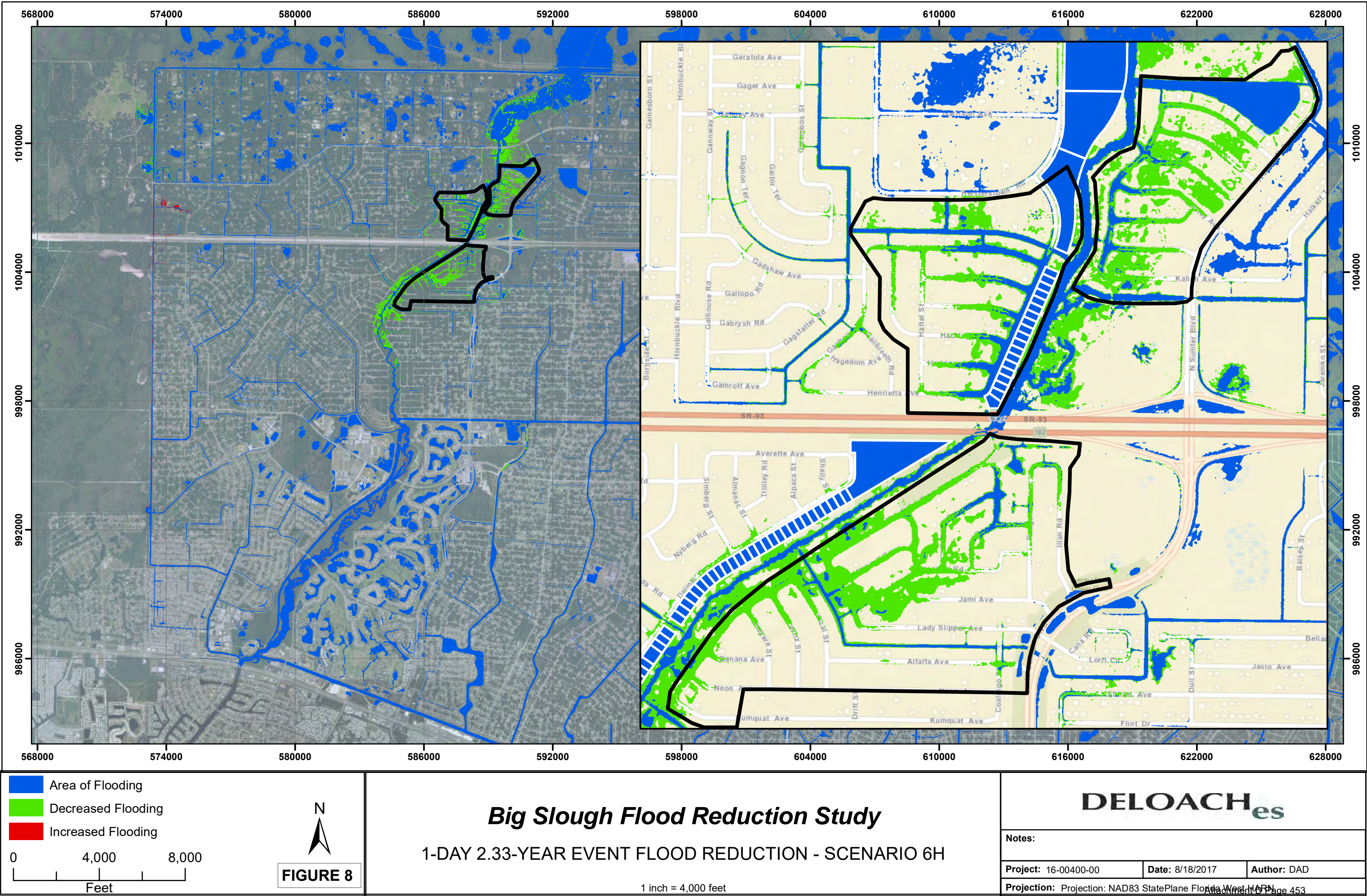
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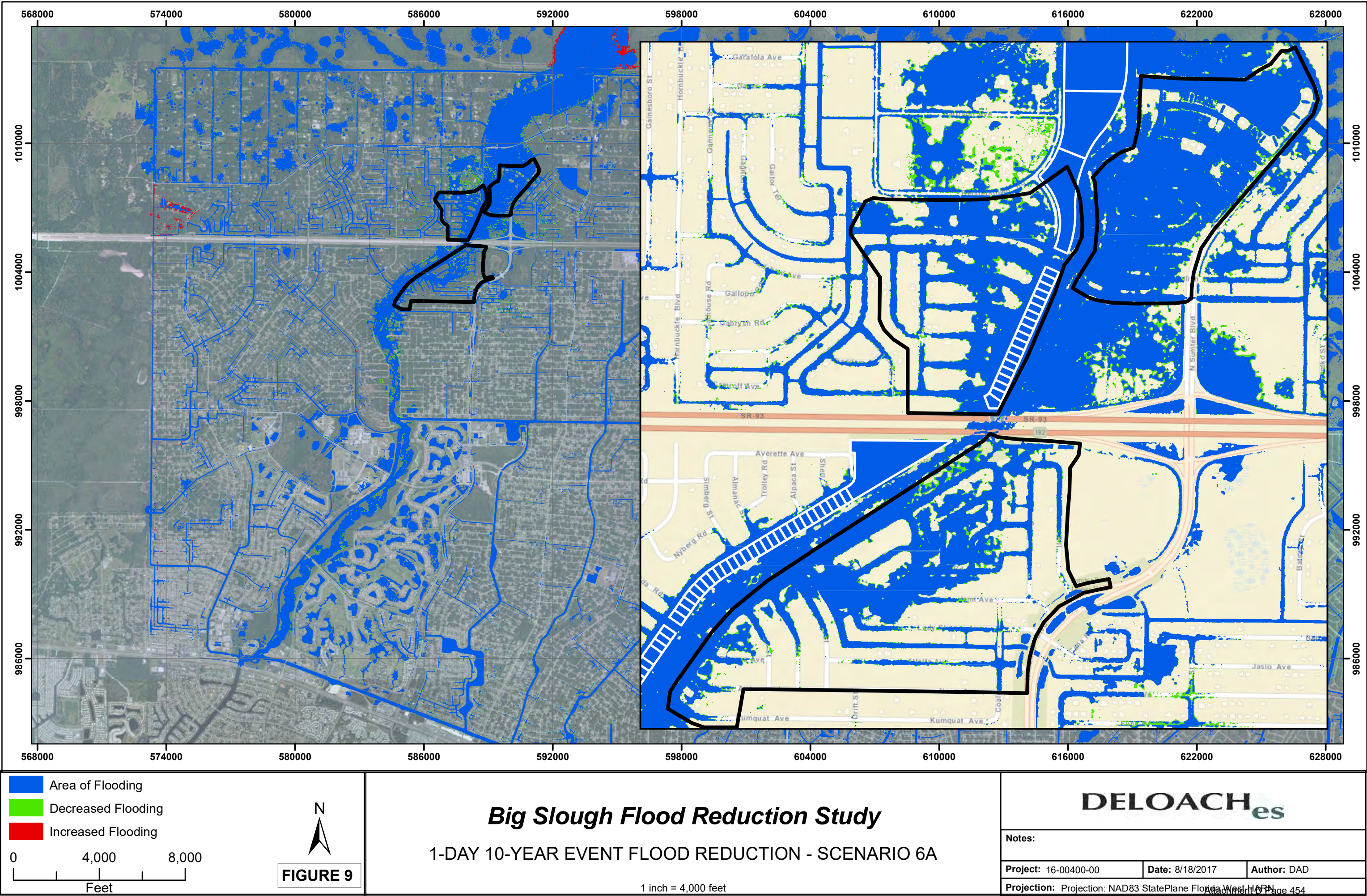


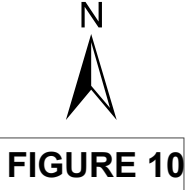
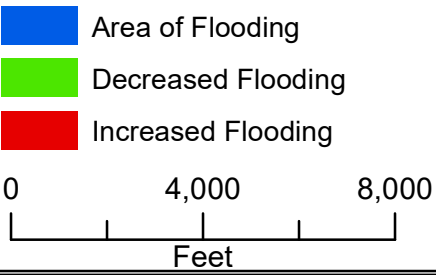
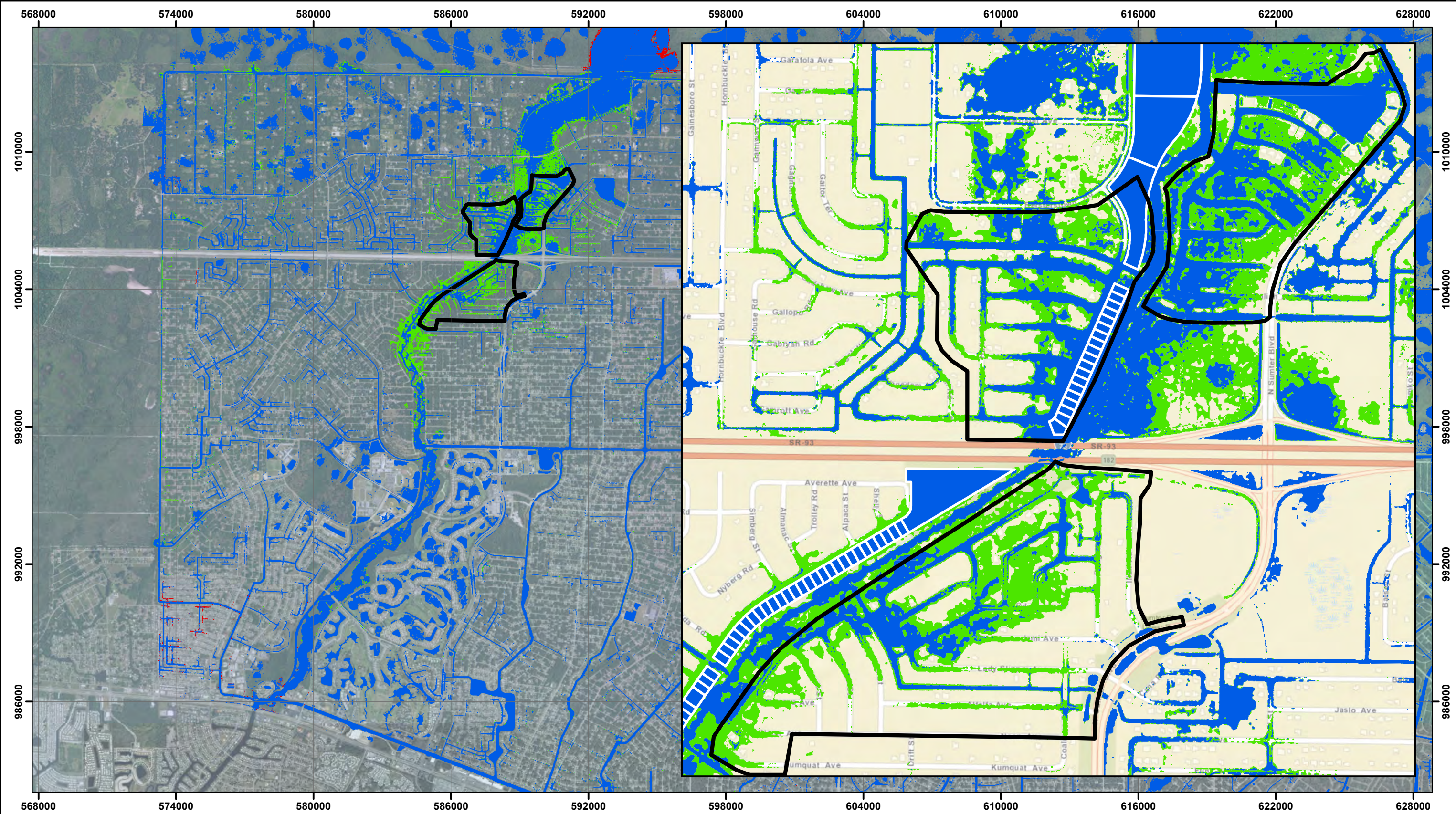
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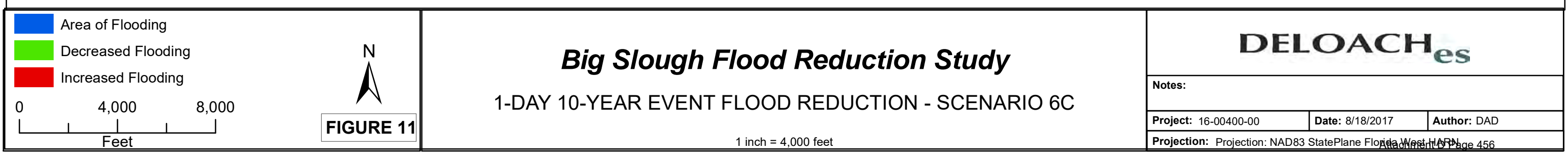


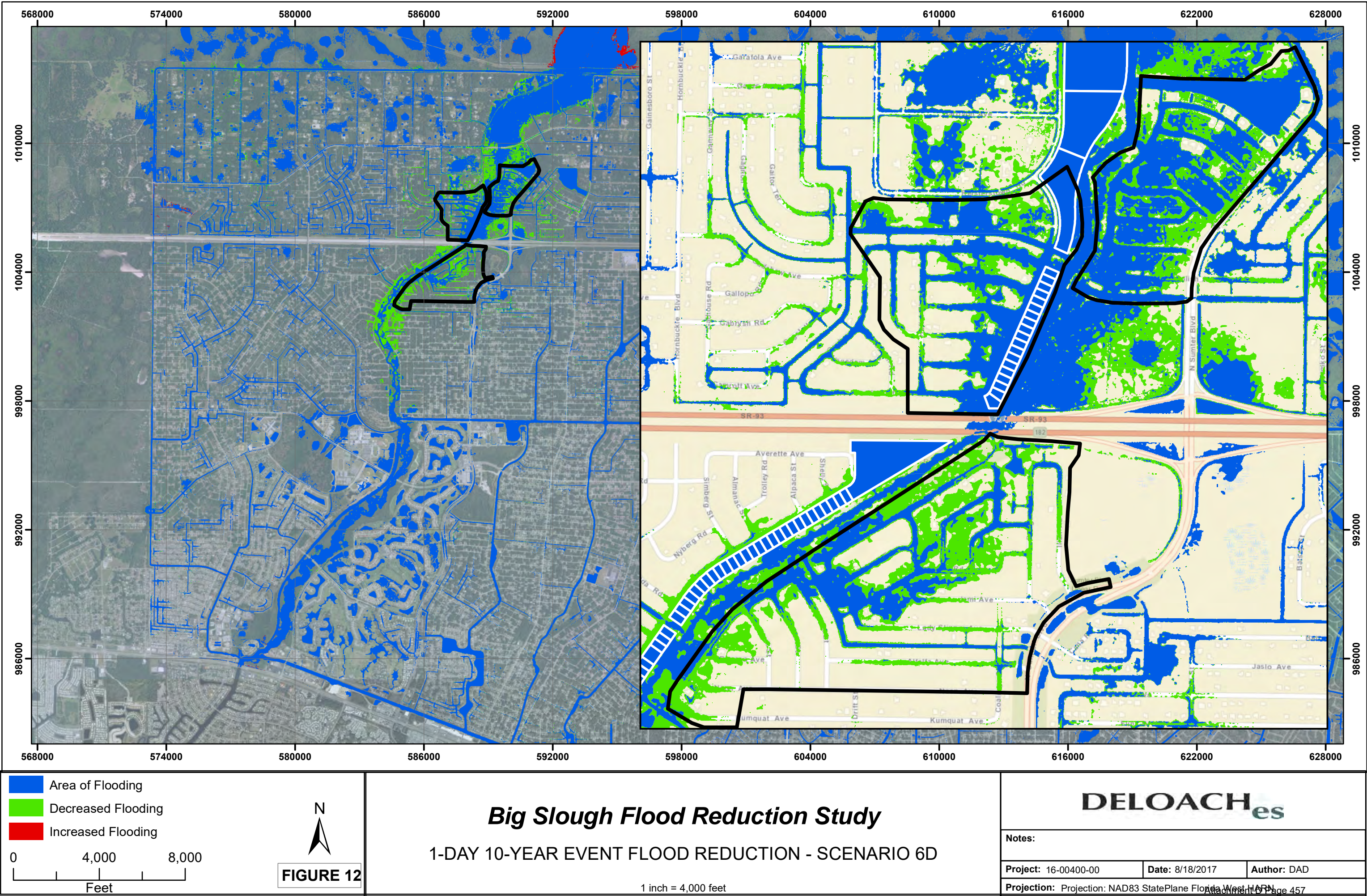
Big Slough Flood Reduction Study
1-DAY 10-YEAR EVENT FLOOD REDUCTION - SCENARIO 6B

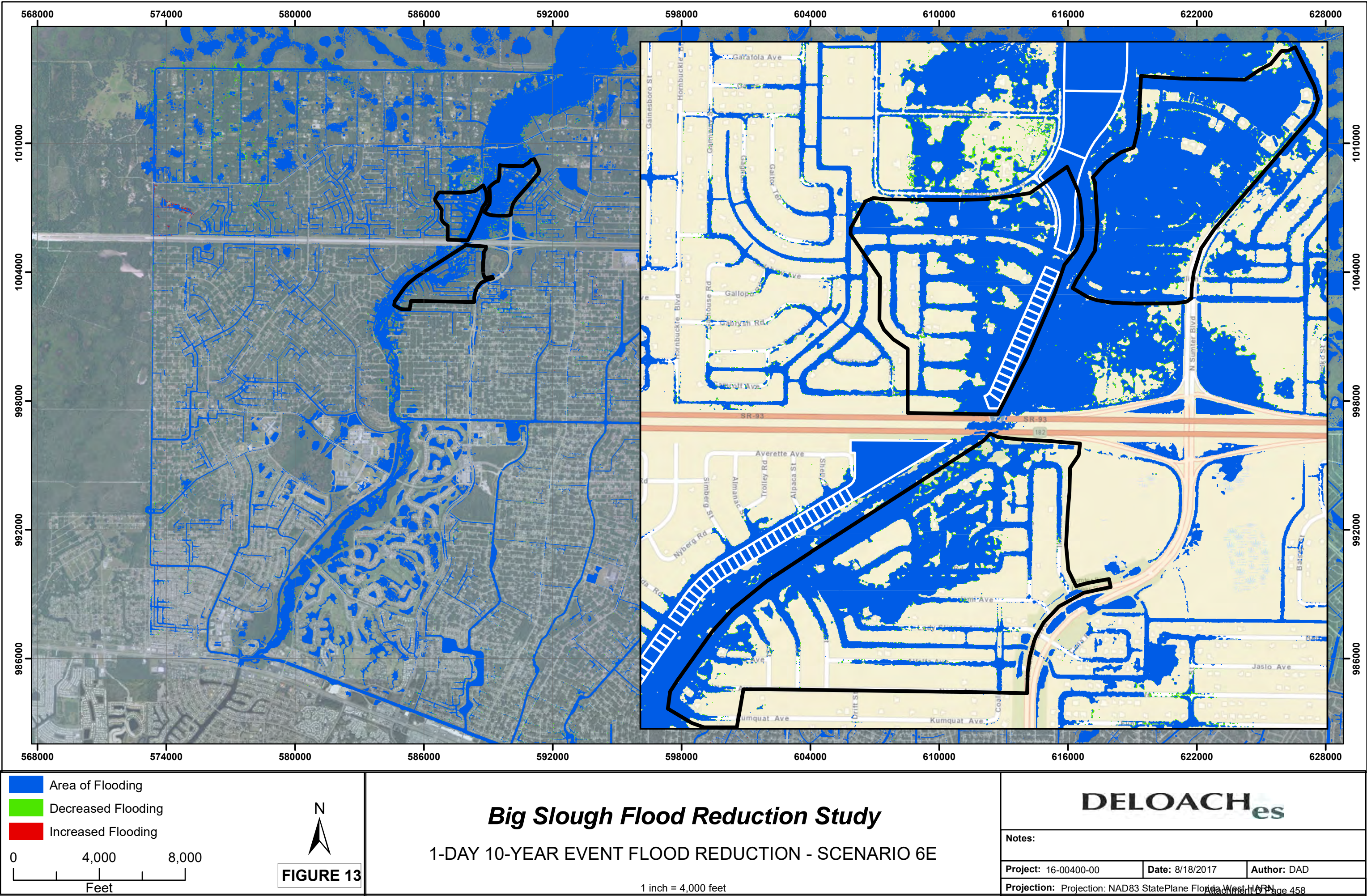
1 inch = 4,000 feet

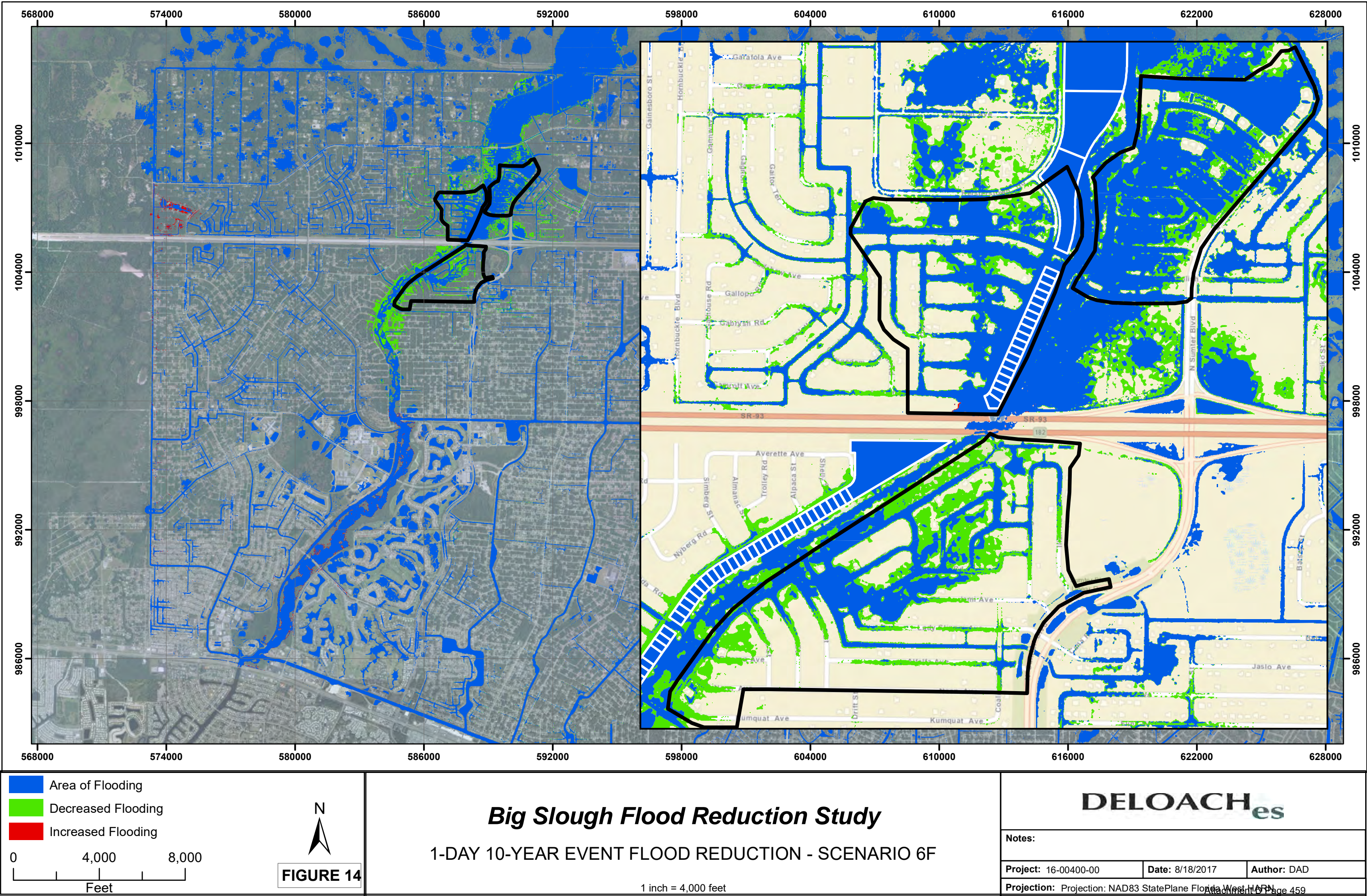


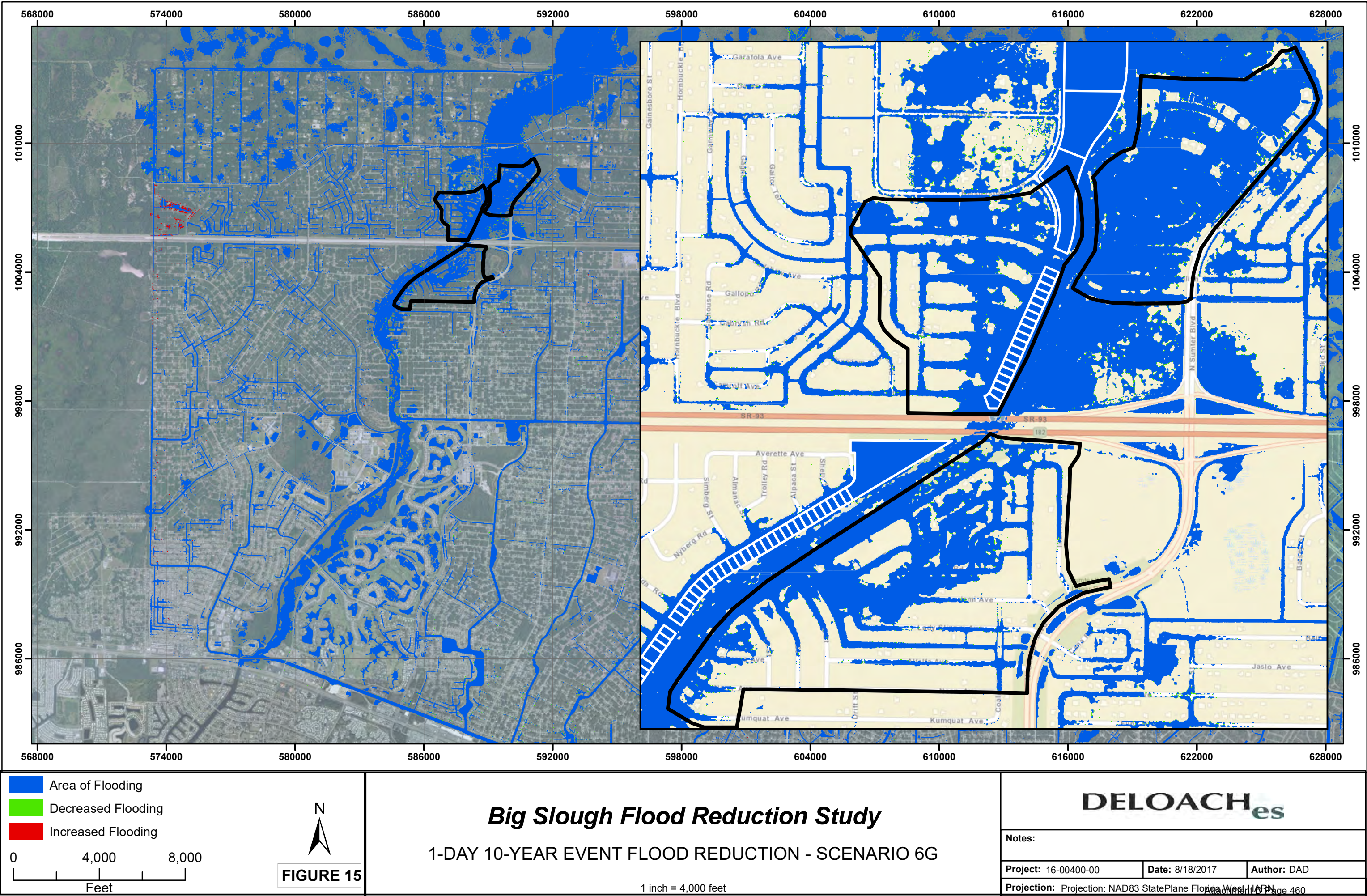
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Projection: Projection: NAD83 StatePlane Florida West NAD83 Attachment D Page 455		

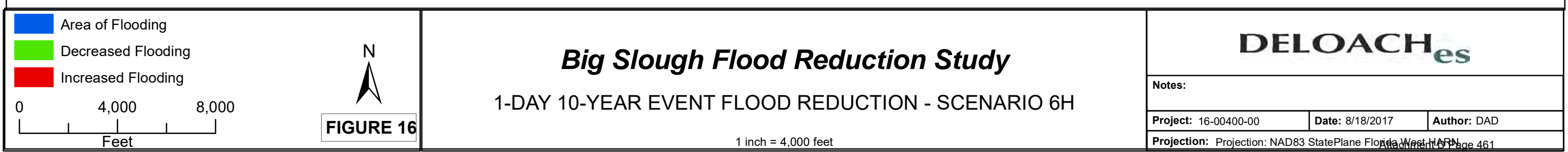












Appendix I

SWFWMD Resource Regulation Division Pre-Application Meeting Notes

City of North Port – Flooding Alternatives PreApp

Southwest Florida Water Management District, November 2018



**SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
RESOURCE REGULATION DIVISION
PRE-APPLICATION MEETING NOTES**

**FILE
NUMBER:

PA 406256**

Date:	11/27/18		
Time:	1:30		
Project Name:	City of North Port - Flooding Alternatives PreApp		
District Engineer:	David Kramer, Steve Lopes, Jezabel Pagan Garcia, Terese Power		
District ES:	Al Gagne		
Attendees:	Elizabeth Wong, Dave Jayroe, Dave Deloach		
County:	Sarasota	Sec/Twp/Rge:	Numerous including
Total Land Acreage:	ROW		3, 4, 9, 16, 17, 20, 21, 29, 30/39/21
		Project Acreage:	100+ acres

Prior On-Site/Off-Site Permit Activity:

- Significant permitting history (ERP, WCP and WUP) within watershed(s).

Project Overview:

- Cooperatively funded project by and between the City of North Port and the SWFWMD to mitigate flooding throughout the City.
- Improvements may include, but may not be limited to:
 - Construction of a parallel storage and conveyance system along Myakkahatchee Creek within I-75 and Jockey Club areas.
 - Attenuation structure located close to northern City boundary that would back flows and maximize flood storage within County and District owned conservation properties.
 - Various culvert and open conveyance upgrades.

Environmental Discussion: (Wetlands On-Site, Wetlands on Adjacent Properties, Delineation, T&E species, Easements, Draw down Issues, Setbacks, Justification, Elimination/Reduction, Permanent/Temporary Impacts, Secondary and Cumulative Impacts, Mitigation Options, SHWL, Upland Habitats, Site Visit, etc.)

- Hydrographic modeling will be required in order to show that the project will not have an adverse effect on wetlands and surface waters.
- Provide the limits of jurisdictional wetlands and surface waters.
- Provide appropriate mitigation using UMAM for impacts, if applicable.
- Demonstrate elimination and reduction of wetland impacts.
- Maintain minimum 15 foot, average 25 foot wetland conservation area setback or address secondary impacts.
- Determine SHWL's at pond locations, wetlands, and OSWs.
- Determine normal pool elevations of wetlands.
- Determine 'pop-off' locations and elevations of wetlands.
- As of October 1, 2017, the District will no longer send a copy of an application that does not qualify for a State Programmatic General Permit (SPGP) to the U.S. Army Corps of Engineers. If a project does not qualify for a SPGP, you will need to apply separately to the Corps using the appropriate federal application form for activities under federal jurisdiction. Please see the Corps' Jacksonville District Regulatory Division Sourcebook for more information about federal permitting. Please call your local Corps office if you have questions about federal permitting. Link: <http://www.saj.usace.army.mil/Missions/Regulatory/Source-Book/>

Site Information Discussion: (SHW Levels, Floodplain, Tailwater Conditions, Adjacent Off-Site Contributing Sources, Receiving Waterbody, etc.)

- Where relevant, document/justify SHWE's at pond locations, wetlands, and OSWs.
- Discussed possible benefits of obtaining input/coordination with FDOT.
- Minimum flows and levels of receiving waters shall not be disrupted.
- Contamination issues need to be resolved with the FDEP. Check FDEP MapDirect layer for possible contamination points within/adjacent to the project area. [FDEP MapDirect Link](#)
- There do appear to be several District data collection sites including, but not limited to, Site ID's 770430, 710465, and 711760 that may be eventually be impacted by proposed construction. Contact the District's

Data Steward at Data.Maps@watermatters.org under the subject line "PRIORITY ERP Data Evaluation" to coordinate relocation of District data collection site.

Water Quantity Discussions: (Basin Description, Storm Event, Pre/Post Volume, Pre/Post Discharge, etc.)

- Big Slough Flood Reduction Study being performed by DeLoach Engineering for City. Local and regional flood alleviation alternatives in phases being investigated.
- A Conceptual ERP may be obtained to establish the baseline existing conditions and to demonstrate that proposed improvements will not cause adverse impacts.
- Conceptual could also evaluate improvements/reductions in flood stage resulting from initial phases of the project that future or later phases could rely on.
- Proposed improvements anticipated to include four possible main features:
 - New weirs or operable gates to impound/attenuate water upstream of I-75. Since this would involve stage increases on District lands, consistency with any Conservation Easements or other easements and approval from SWFWMD Lands Management would be needed.
 - Construction of a new bypass channel. It would need to be demonstrated that surrounding existing groundwater levels would not be adversely lowered (refer to Subsection 3.6, A.H.V.II).
 - Widening of Canal R-36, including associated culvert improvements.
 - Widening of conveyances in Dorothy Avenue area.
- Demonstrate that site will not impede the conveyance of contributing off-site flows.
- Provide documentation to support modeling tailwater conditions. Modeling must extend sufficiently upstream and downstream to assure no adverse stage increases upstream or downstream.
- The Big Slough Watershed Model will be used to demonstrate that proposed improvements will not increase flood stages up- or down-stream of the project area(s) based on Mean Annual, 10yr, 25yr and 100yr 24hr events.
- Please be aware that if there is credible historical evidence of past flooding or the physical capacity of the downstream conveyance or receiving waters indicates that the conditions for issuance will not be met without consideration of storm events of different frequency or duration, applicants shall be required to provide additional analyses using storm events of different duration or frequency than the 25-year 24-hour storm event, or to adjust the volume, rate or timing of discharges. [Section 3.0 Applicant's Handbook Volume II]

Water Quality Discussions: (Type of Treatment, Technical Characteristics, Non-presumptive Alternatives, etc.)

- It is anticipated that the project will not cause or contribute to pollutant loadings; please address with Application.

Sovereign Lands Discussion: (Determining Location, Correct Form of Authorization, Content of Application, Assessment of Fees, Coordination with FDEP)

- The project may be located within state owned sovereign submerged lands (SSSL). Be advised that a title determination will be required from FDEP to verify the presence and/or location of SSSL.
- If use of SSSL is proposed, authorization will be required. Refer to Chapter 18-21, F.A.C. and Chapter 18-20, F.A.C. for guidance on projects that impact SSSL and Aquatic Preserves.

Operation and Maintenance/Legal Information: (Ownership or Perpetual Control, O&M Entity, O&M Instructions, Homeowner Association Documents, Coastal Zone requirements, etc.)

- The permit must be issued to entity that owns or controls the property. City of North Port will be Applicant/permittee/O&M Entity.

Application Type and Fee Required:

For Conceptual ERP:

- Provide/address Sections A, C, and E of the ERP Application.
- Consult the fee schedule for fee.

Other: (Future Pre-Application Meetings, Fast Track, Submittal Date, Construction Start Date, Required District Permits – WUP, WOD, Well Construction, etc.)

- An application for an individual permit to construct or alter a dam, impoundment, reservoir, or appurtenant work, requires that a notice of receipt of the application must be published in a newspaper within the affected area. Provide documentation that such noticing has been accomplished. Note that the published notices of receipt for an ERP can be in accordance with the language provided in Rule 40D-1.603(10), F.A.C.
- The plans and drainage report submitted electronically must include the appropriate information required under Rules 61G15-23.005 and 61G15-23.004 (Digital), F.A.C. The following text is required by the Florida

Board of Professional Engineers (FBPE) to meet this requirement when a digitally created seal is not used and must appear where the signature would normally appear:

ELECTRONIC (Manifest): *[NAME] State of Florida, Professional Engineer, License No. [NUMBER]
This item has been electronically signed and sealed by [NAME] on the date indicated here using a SHA authentication code. Printed copies of this document are not considered signed and sealed and the SHA authentication code must be verified on any electronic copies*

DIGITAL: *[NAME] State of Florida, Professional Engineer, License No. [NUMBER]; This item has been digitally signed and sealed by [NAME] on the date indicated here using a Digital Signature; Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.*

- Provide soil erosion and sediment control measures for use during construction. Refer to ERP Applicant's Handbook Vol. 1 Part IV Erosion and Sediment Control.
- Demonstrate that excavation of any stormwater ponds does not breach an aquitard (see Subsection 2.1.1, A.H.V.II) such that it would allow for lesser quality water to pass, either way, between the two systems. In those geographical areas of the District where there is not an aquitard present, the depth of the pond(s) shall not be excavated to within two (2) feet of the underlying limestone which is part of a drinking water aquifer. [Refer to Subsection 5.4.1(b), A.H.V.II]
- If lowering of SHWE is proposed, then burden is on Applicant to demonstrate no adverse onsite or offsite impacts as per Subsection 3.6, A.H.V.II. Groundwater drawdown 'radius of influence' computations may be required to demonstrate no adverse onsite or offsite impacts. Please note that new roadside swales or deepening of existing roadside swales may result in lowering of SHWE. Proposed ponds with control elevation less than SHWE may result in adverse lowering of onsite or offsite groundwater.

Disclaimer: The District ERP pre-application meeting process is a service made available to the public to assist interested parties in preparing for submittal of a permit application. Information shared at pre-application meetings is superseded by the actual permit application submittal. District permit decisions are based upon information submitted during the application process and Rules in effect at the time the application is complete.

Appendix J

North Port Big Slough Flood Reduction Study, Presentation to the North Port City Commission

DeLoach Engineering Science, PLLC., December 2018

North Port Big Slough Flood Reduction Study



Presentation to the
North Port City Commission

December 6, 2018

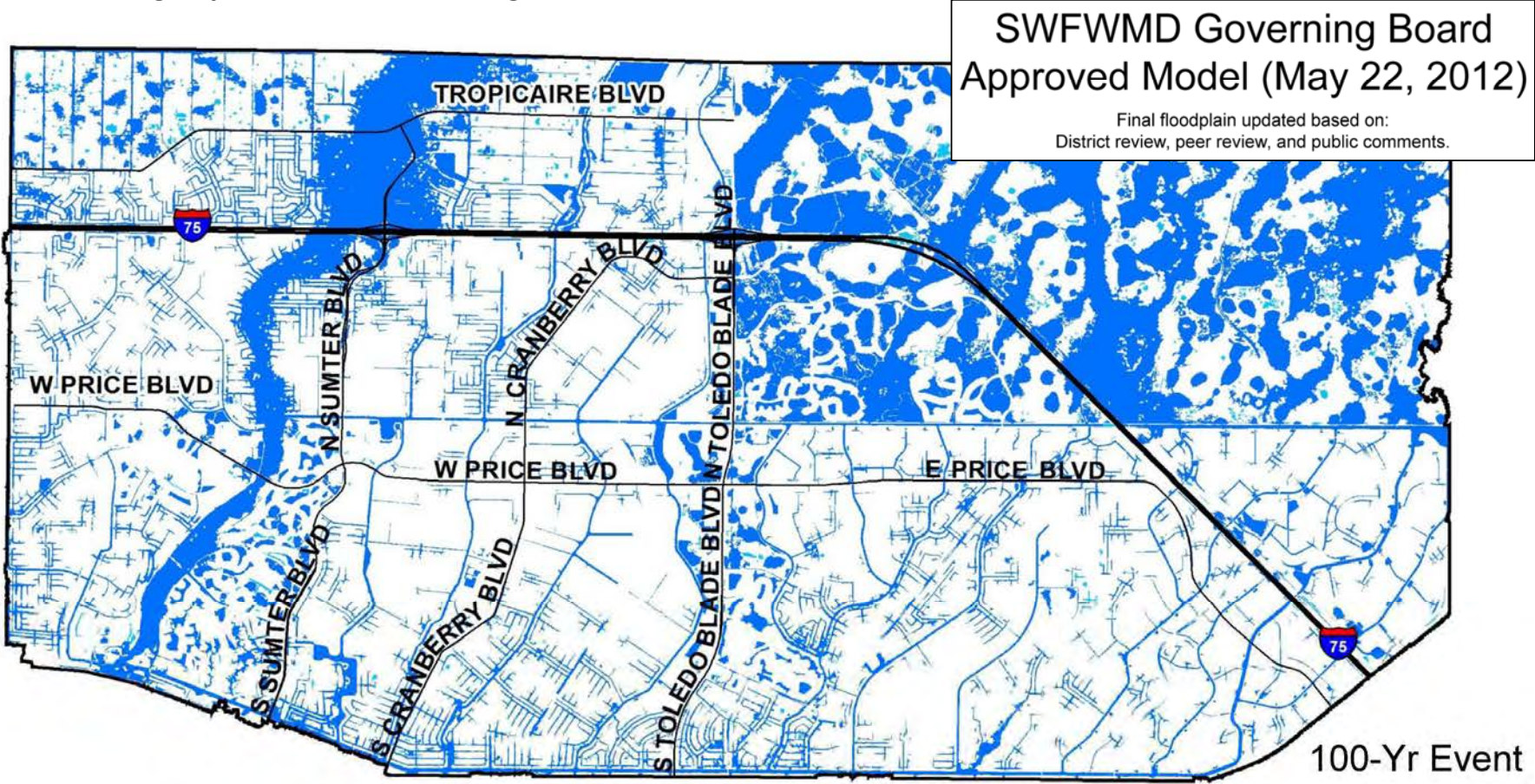
Project Plan – Scope of Work

“Evaluate the feasibility and cost effectiveness of solutions to reduce flooding”

- City of North Port Department of Public Works, Agreement #2016-48
- Cooperatively funded by and between the City of North Port and the SWFWMD
- Part 1 – localized along Myakkahatchee Creek within I-75 and Jockey Club areas
- Part 2 – preliminary regional concepts to mitigate flooding throughout City

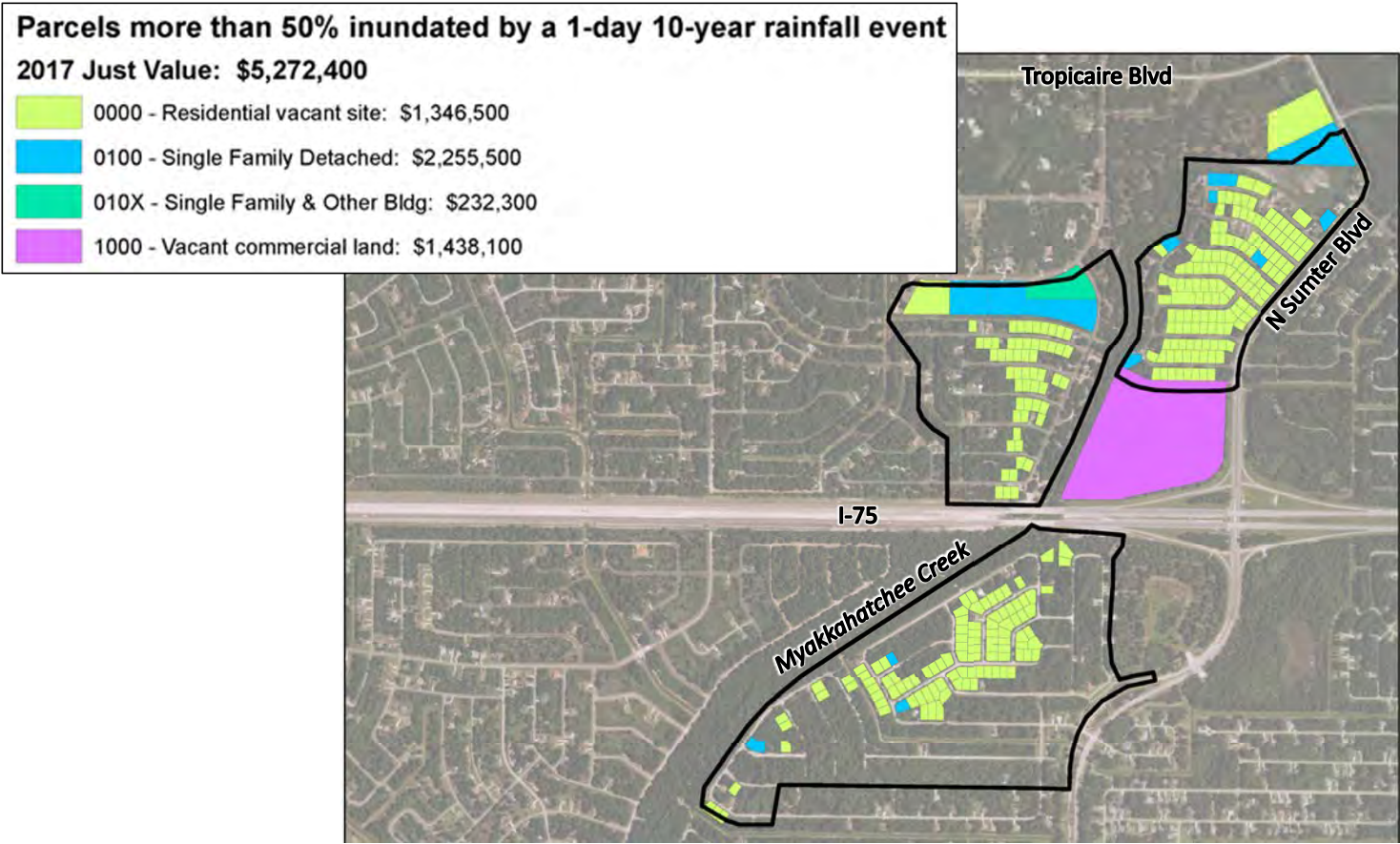
North Port Big Slough Flood Reduction Study

Project Plan – Using City of North Port’s Existing Available Model



North Port Big Slough Flood Reduction Study

Project Plan – Focus on Local Areas of Recurring Flooding, I-75 Area



North Port Big Slough Flood Reduction Study

Project Plan – Focus on Local Areas of Recurring Flooding, Dorothy Avenue Area

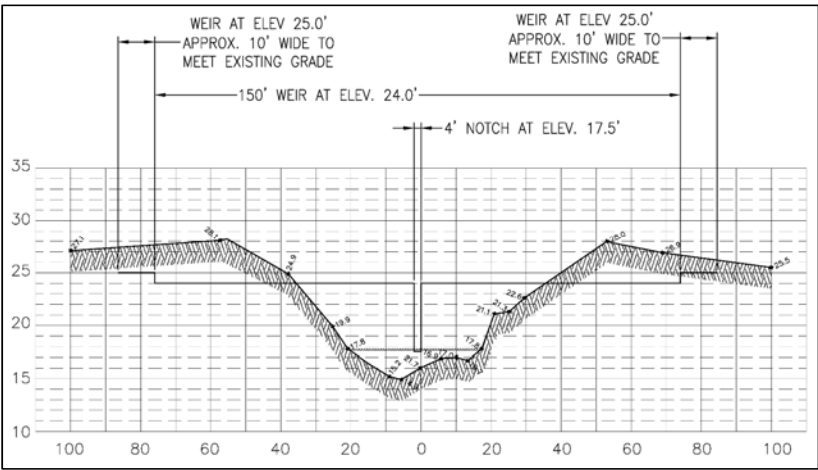
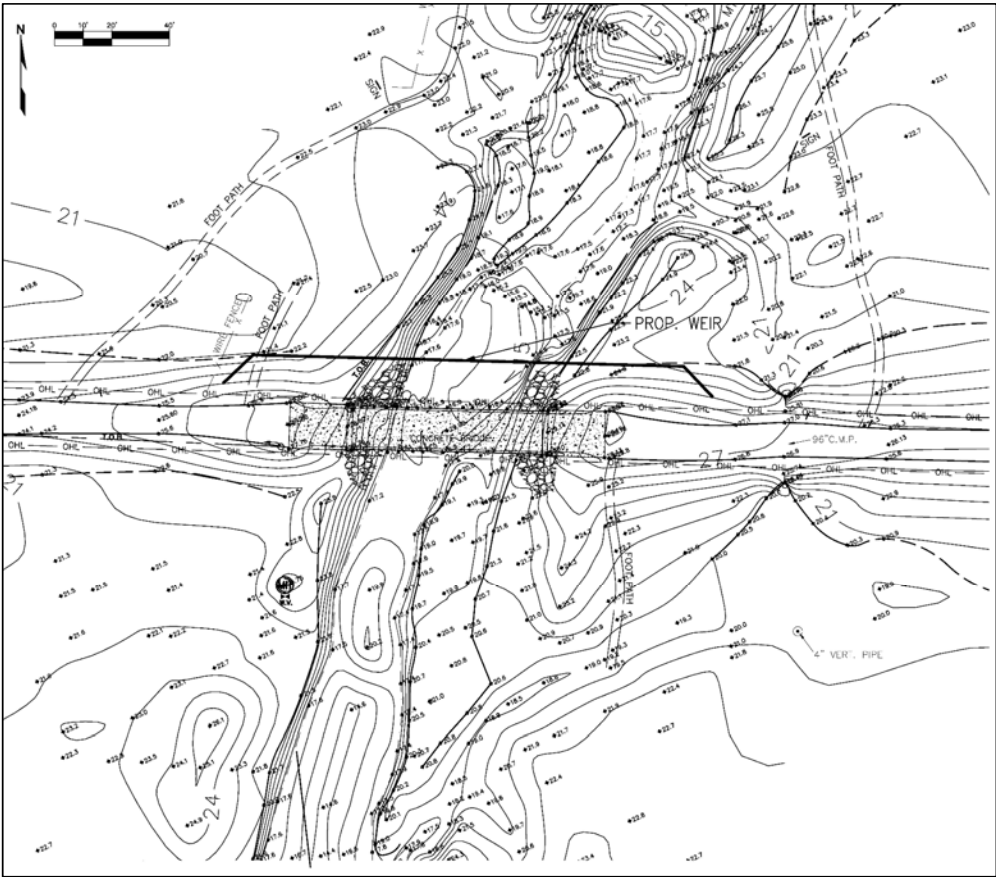


Grobe Street at Herbison Avenue 9/11/17 after Hurricane Irma



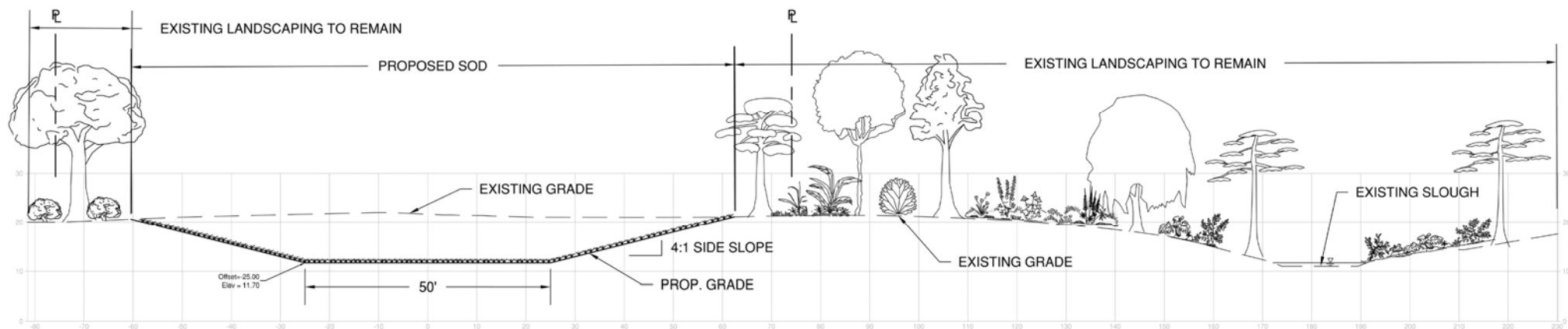
North Port Big Slough Flood Reduction Study

Regional Improvements (e.g., Reduce Offsite Inflows at FPL Easement North of City)



North Port Big Slough Flood Reduction Study

Local/Regional Improvements (e.g., Bypass Construction)

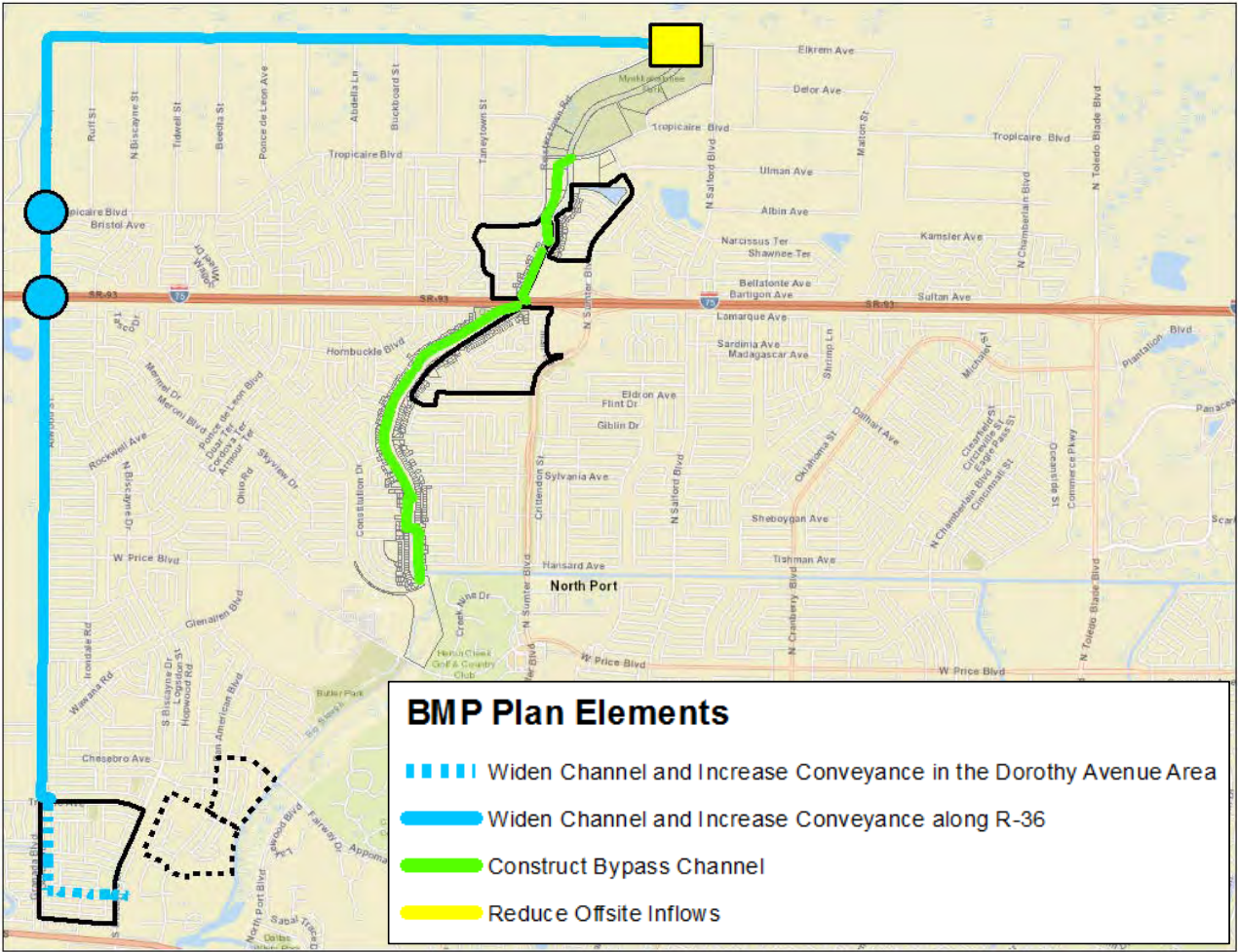


North Port Big Slough Flood Reduction Study

Recommended Plan – Plan Components

Project Components	105B
Existing Condition*	x
Dorothy (Single Box Culvert)	-
Dorothy (Triple Box Culvert)	x
R-36 Improvements	x
Bypass (flowway, n = 0.040)	x
Bypass (wetland, n = 0.150)	-
Reduce Northern Inflows	x
Other Planned Improvements	-

*** Existing Condition model updated from 2012 version**



North Port Big Slough Flood Reduction Study

Recommended Plan – Plan Components and Engineer’s Opinion of Probable Costs

	Existing	Phasing			"Full Plan"		Best BCR	
Project Components	101	102	103	104	105	105B	106	106A
Existing Condition*	x	x	x	x	x	x	x	x
Dorothy (Single Box Culvert)	-	x	x	x	x	-	x	x
Dorothy (Triple Box Culvert)	-	-	-	-	-	x	-	-
R-36 Improvements	-	-	x	x	x	x	-	-
Bypass (flowway, n = 0.040)	-	-	-	x	x	x	x	-
Bypass (wetland, n = 0.150)	-	-	-	-	-	-	-	x
Reduce Northern Inflows	-	-	-	-	x	x	-	-
Other Planned Improvements	-	-	-	-	-	-	-	-

Estimated Combined Cost	\$ -	\$ 1,299,000	\$ 12,156,000	\$ 29,422,000	\$ 31,922,000	\$ 32,771,594	\$ 18,565,000	\$ 22,018,200
Estimated Annualized Cost		\$ 94,125	\$ 880,822	\$ 2,131,914	\$ 2,313,063	\$ 2,374,625	\$ 1,345,217	\$ 1,595,435

Engineer's Estimate of Probable Construction Cost (by Component)

Existing Condition	\$ -
Dorothy (Single Box Culvert)	\$ 1,299,000
Dorothy (Triple Box Culvert)	\$ 2,148,594
R-36 Improvements	\$ 10,857,000
Bypass (flowway, n = 0.040)	\$ 17,266,000
Bypass (wetland, n = 0.150)	\$ 20,719,200
Reduce Northern Inflows	\$ 2,500,000

North Port Big Slough Flood Reduction Study

Recommended Plan – Cost and Benefits

		Existing	Phasing				"Full Plan"		Best BCR	
Project Components		101	102	103	104	105	105B	106	106A	
Existing Condition*		x	x	x	x	x	x	x	x	
Dorothy (Single Box Culvert)		-	x	x	x	x	-	x	x	
Dorothy (Triple Box Culvert)		-	-	-	-	-	x	-	-	
R-36 Improvements		-	-	x	x	x	x	-	-	
Bypass (flowway, n = 0.040)		-	-	-	x	x	x	x	-	
Bypass (wetland, n = 0.150)		-	-	-	-	-	-	-	x	
Reduce Northern Inflows		-	-	-	-	x	x	-	-	
Other Planned Improvements		-	-	-	-	-	-	-	-	
Estimated Combined Cost		\$ -	\$ 1,299,000	\$ 12,156,000	\$ 29,422,000	\$ 31,922,000	\$ 32,771,594	\$ 18,565,000	\$ 22,018,200	
Estimated Annualized Cost			\$ 94,125	\$ 880,822	\$ 2,131,914	\$ 2,313,063	\$ 2,374,625	\$ 1,345,217	\$ 1,595,435	
Road Flood Reduction (miles)	2.33-year	-	0.4	1.2	7.7	7.7	7.8	7.5	7.4	
	5-year	-	0.6	1.9	11.5	12.2	12.9	10.8	9.4	
	10-year	-	0.3	2.7	16.8	18.0	18.3	14.8	11.9	
	25-year	-	0.5	2.8	17.9	20.5	20.7	15.9	12.8	
	50-year	-	0.6	2.5	18.3	20.9	21.1	16.7	13.8	
	100-year	-	0.6	2.6	21.9	24.4	24.5	20.3	17.4	
Parcels Reduction (touch)	2.33-year	-	68	113	807	854	863	811	791	
	5-year	-	84	91	960	1024	1138	968	836	
	10-year	-	49	98	1022	1125	1161	996	891	
	25-year	-	58	90	1002	1138	1161	984	858	
	50-year	-	66	152	1073	1175	1207	1012	865	
	100-year	-	88	167	1170	1313	1313	1133	1000	
Parcels Reduction (centroid)	2.33-year	-	0	39	232	233	234	230	223	
	5-year	-	0	31	402	405	405	398	362	
	10-year	-	0	15	515	538	538	505	427	
	25-year	-	0	16	513	539	542	503	381	
	50-year	-	0	27	510	563	562	480	366	
	100-year	-	5	30	505	556	558	482	372	
Estimated Annualized Benefit			\$ 25,216	\$ 193,186	\$ 1,889,975	\$ 1,960,257	\$ 1,977,742	\$ 1,842,132	\$ 1,636,307	
Est. Benefit/Cost Ratio (BCR)			0.27	0.22	0.89	0.85	0.83	1.37	1.03	

North Port Big Slough Flood Reduction Study

I-75 Area - Scenario 105B, Mean Annual Storm Event Flood Reduction

Project Components	105B
Existing Condition*	x
Dorothy (Single Box Culvert)	-
Dorothy (Triple Box Culvert)	x
R-36 Improvements	x
Bypass (flowway, n = 0.040)	x
Bypass (wetland, n = 0.150)	-
Reduce Northern Inflows	x
Other Planned Improvements	-

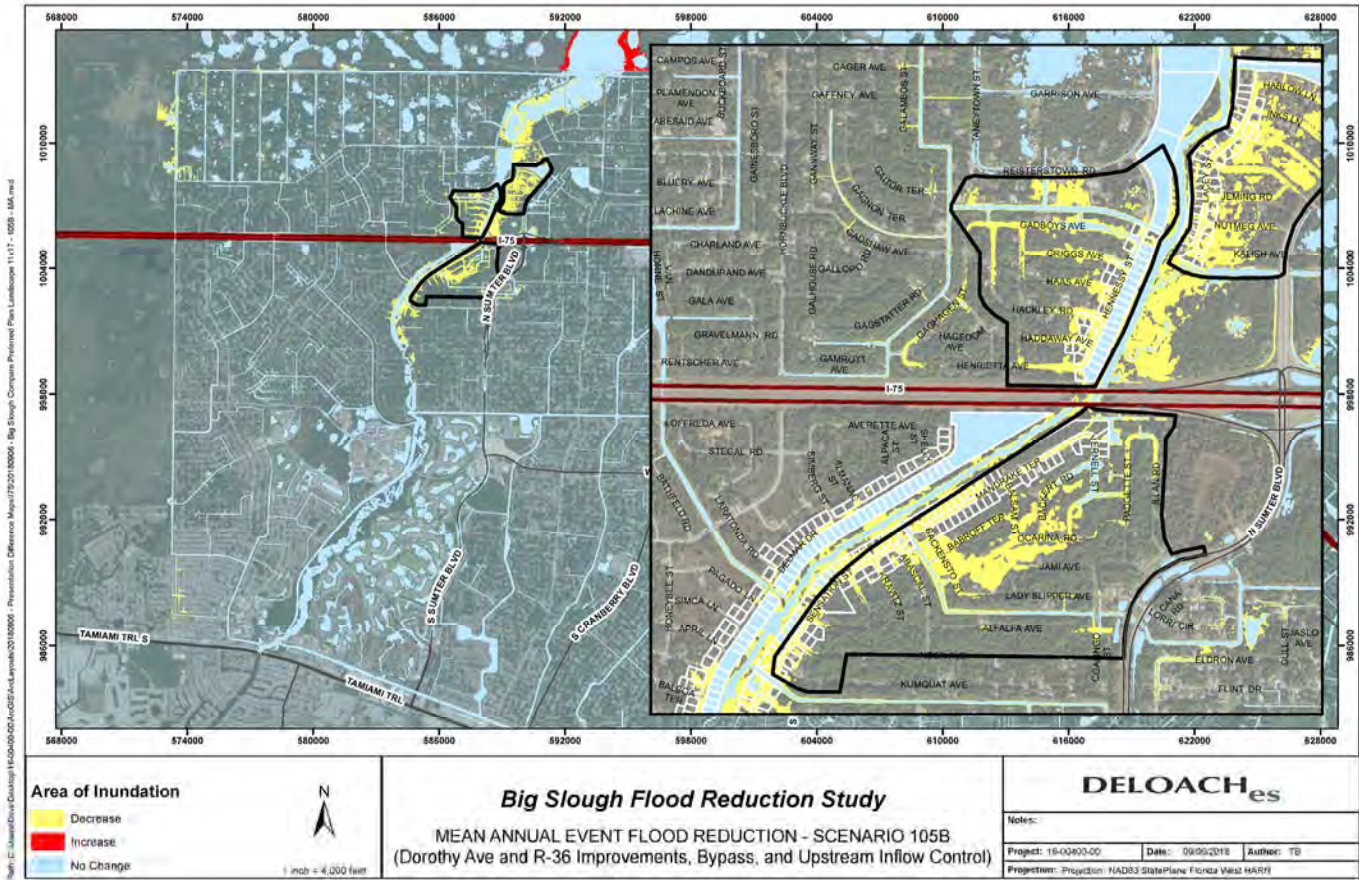
Estimated Combined Cost \$ 32,771,594

Estimated Annualized Cost \$ 2,374,625

Road Flood Reduction (miles)	2.33-year	7.8
	5-year	12.9
	10-year	18.3
	25-year	20.7
	50-year	21.1
Parcels Reduction (touch)	2.33-year	863
	5-year	1138
	10-year	1161
	25-year	1161
	50-year	1207
Parcels Reduction (centroid)	2.33-year	234
	5-year	405
	10-year	538
	25-year	542
	50-year	562

Estimated Annualized Benefit \$ 1,977,742

Est. Benefit/Cost Ratio (BCR) 0.83



North Port Big Slough Flood Reduction Study

Dorothy Avenue Area - Scenario 105B, Mean Annual Storm Event Flood Reduction

Project Components	105B
Existing Condition*	x
Dorothy (Single Box Culvert)	-
Dorothy (Triple Box Culvert)	x
R-36 Improvements	x
Bypass (flowway, n = 0.040)	x
Bypass (wetland, n = 0.150)	-
Reduce Northern Inflows	x
Other Planned Improvements	-

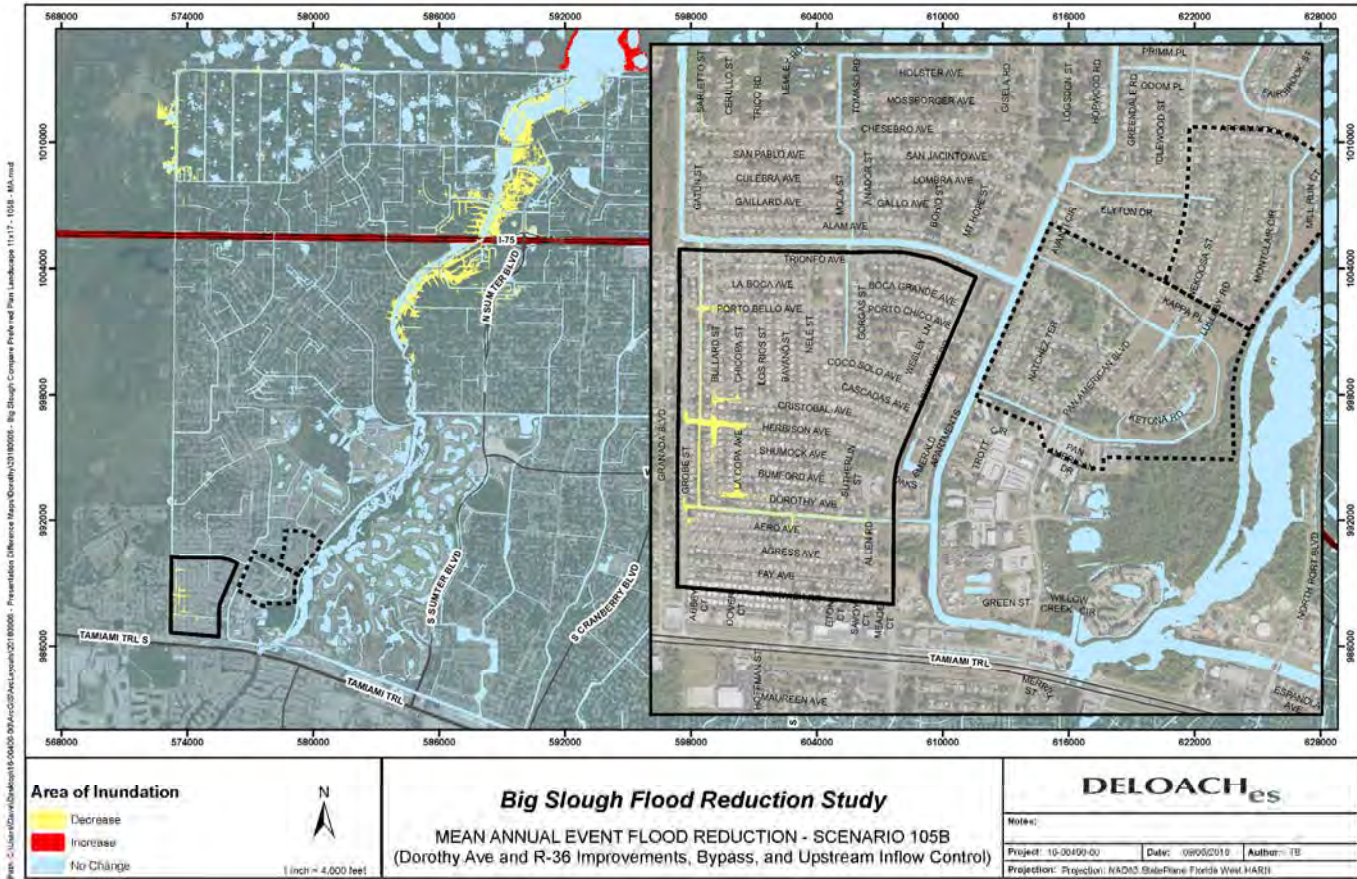
Estimated Combined Cost \$ 32,771,594

Estimated Annualized Cost \$ 2,374,625

Road Flood Reduction (miles)	2.33-year	7.8
	5-year	12.9
	10-year	18.3
	25-year	20.7
	50-year	21.1
Parcels Reduction (touch)	2.33-year	863
	5-year	1138
	10-year	1161
	25-year	1161
	50-year	1207
Parcels Reduction (centroid)	2.33-year	234
	5-year	405
	10-year	538
	25-year	542
	50-year	562

Estimated Annualized Benefit \$ 1,977,742

Est. Benefit/Cost Ratio (BCR) 0.83



North Port Big Slough Flood Reduction Study

I-75 Area - Scenario 105B, 10-Year Storm Event Flood Reduction

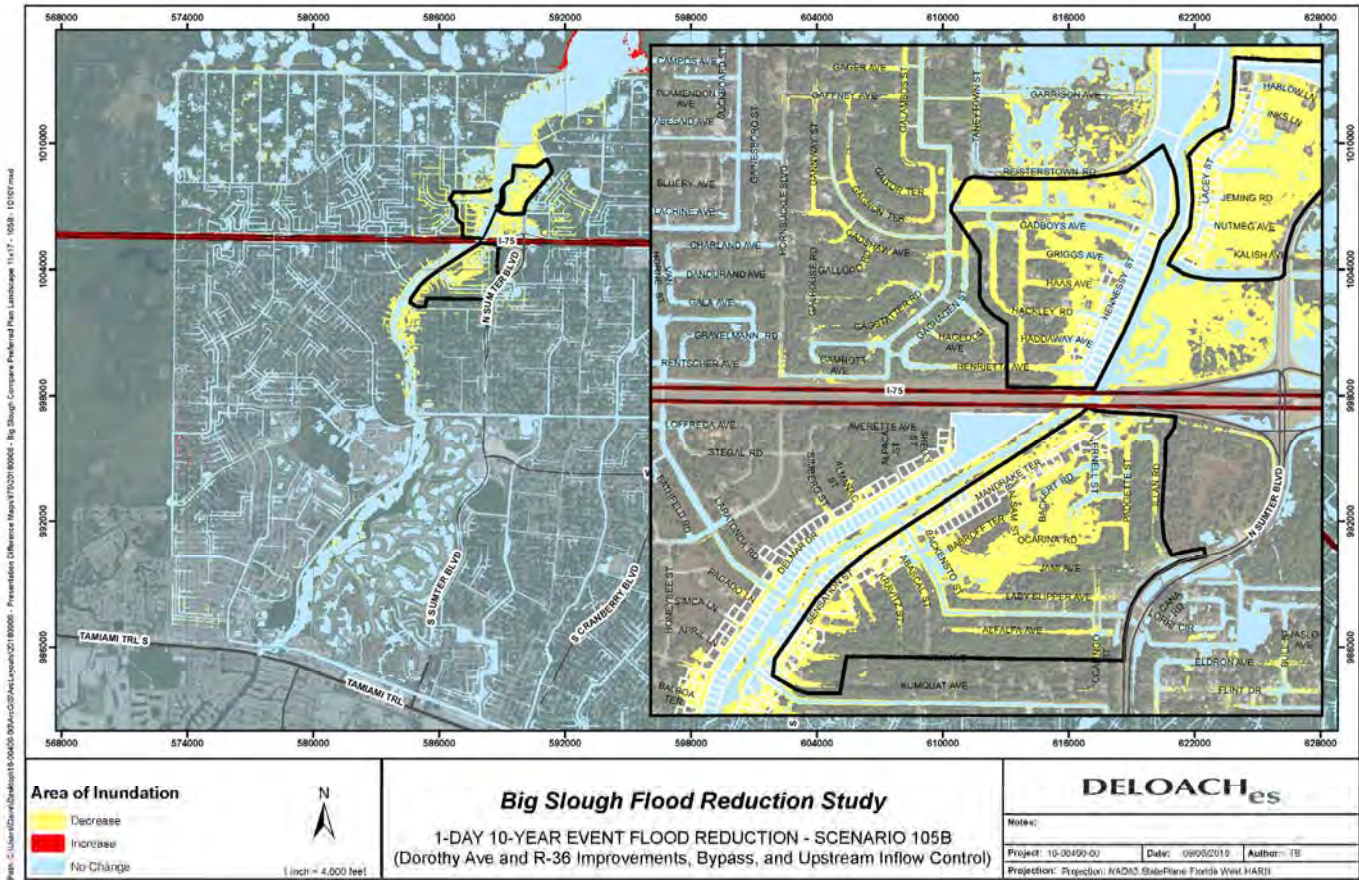
Project Components	105B
Existing Condition*	X
Dorothy (Single Box Culvert)	-
Dorothy (Triple Box Culvert)	X
R-36 Improvements	X
Bypass (flowway, n = 0.040)	X
Bypass (wetland, n = 0.150)	-
Reduce Northern Inflows	X
Other Planned Improvements	-

Estimated Combined Cost \$ 32,771,594

Estimated Annualized Cost \$ 2,374,625

Road Flood Reduction (miles)	2.33-year	7.8
	5-year	12.9
	10-year	18.3
	25-year	20.7
	50-year	21.1
Parcels Reduction (touch)	100-year	24.5
	2.33-year	863
	5-year	1138
	10-year	1161
	25-year	1161
Parcels Reduction (centroid)	50-year	1207
	100-year	1313
	2.33-year	234
	5-year	405
	10-year	538
	25-year	542
	50-year	562
	100-year	558

Estimated Annualized Benefit \$ 1,977,742
Est. Benefit/Cost Ratio (BCR) 0.83



North Port Big Slough Flood Reduction Study

Dorothy Avenue Area - Scenario 105B, 10-Year Storm Event Flood Reduction

Project Components	105B
Existing Condition*	x
Dorothy (Single Box Culvert)	-
Dorothy (Triple Box Culvert)	x
R-36 Improvements	x
Bypass (flowway, n = 0.040)	x
Bypass (wetland, n = 0.150)	-
Reduce Northern Inflows	x
Other Planned Improvements	-

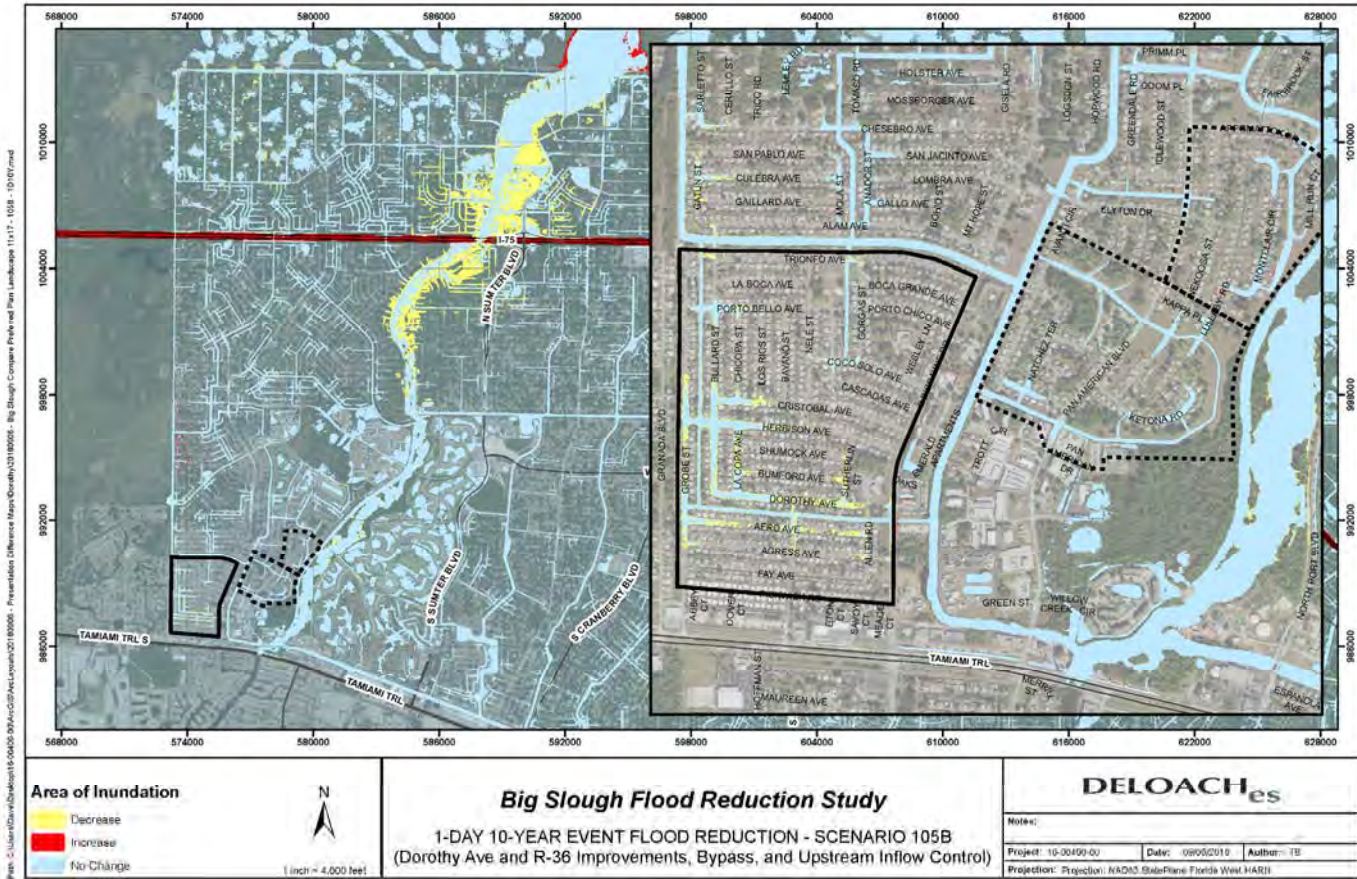
Estimated Combined Cost \$ 32,771,594

Estimated Annualized Cost \$ 2,374,625

Road Flood Reduction (miles)	2.33-year	7.8
	5-year	12.9
	10-year	18.3
	25-year	20.7
	50-year	21.1
Parcels Reduction (touch)	2.33-year	863
	5-year	1138
	10-year	1161
	25-year	1161
	50-year	1207
Parcels Reduction (centroid)	2.33-year	234
	5-year	405
	10-year	538
	25-year	542
	50-year	562

Estimated Annualized Benefit \$ 1,977,742

Est. Benefit/Cost Ratio (BCR) 0.83



North Port Big Slough Flood Reduction Study

I-75 Area - Scenario 105B, 100-Year Storm Event Flood Reduction

Project Components	105B
Existing Condition*	X
Dorothy (Single Box Culvert)	-
Dorothy (Triple Box Culvert)	X
R-36 Improvements	X
Bypass (flowway, n = 0.040)	X
Bypass (wetland, n = 0.150)	-
Reduce Northern Inflows	X
Other Planned Improvements	-

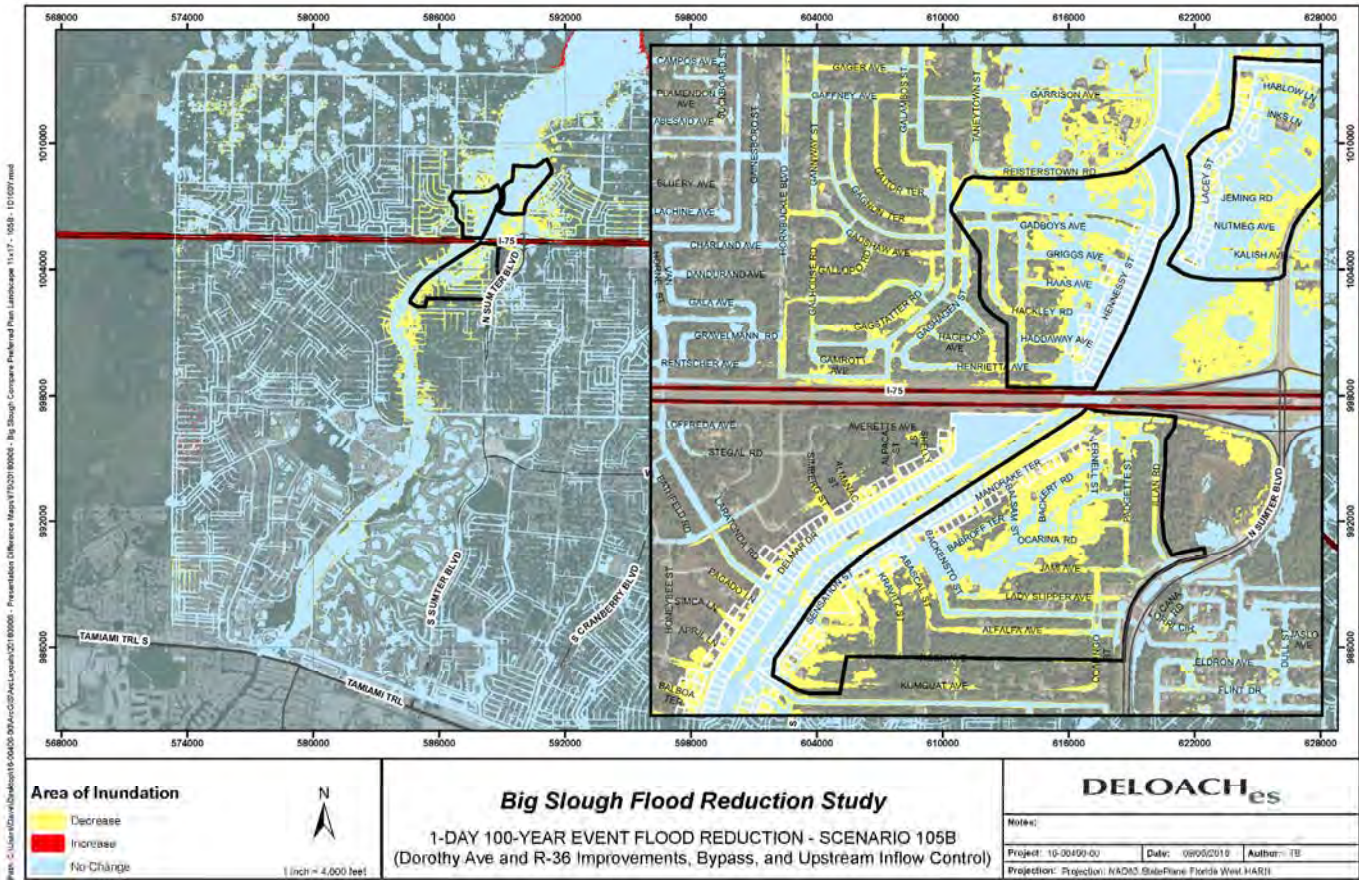
Estimated Combined Cost \$ 32,771,594

Estimated Annualized Cost \$ 2,374,625

Road Flood Reduction (miles)	2.33-year	7.8
	5-year	12.9
	10-year	18.3
	25-year	20.7
	50-year	21.1
Parcels Reduction (touch)	100-year	24.5
	2.33-year	863
	5-year	1138
	10-year	1161
	25-year	1161
Parcels Reduction (centroid)	50-year	1207
	100-year	1313
	2.33-year	234
	5-year	405
	10-year	538
	25-year	542
	50-year	562
	100-year	558

Estimated Annualized Benefit \$ 1,977,742

Est. Benefit/Cost Ratio (BCR) 0.83



North Port Big Slough Flood Reduction Study

Dorothy Avenue Area - Scenario 105B, 100-Year Storm Event Flood Reduction

Project Components	105B
Existing Condition*	x
Dorothy (Single Box Culvert)	-
Dorothy (Triple Box Culvert)	x
R-36 Improvements	x
Bypass (flowway, n = 0.040)	x
Bypass (wetland, n = 0.150)	-
Reduce Northern Inflows	x
Other Planned Improvements	-

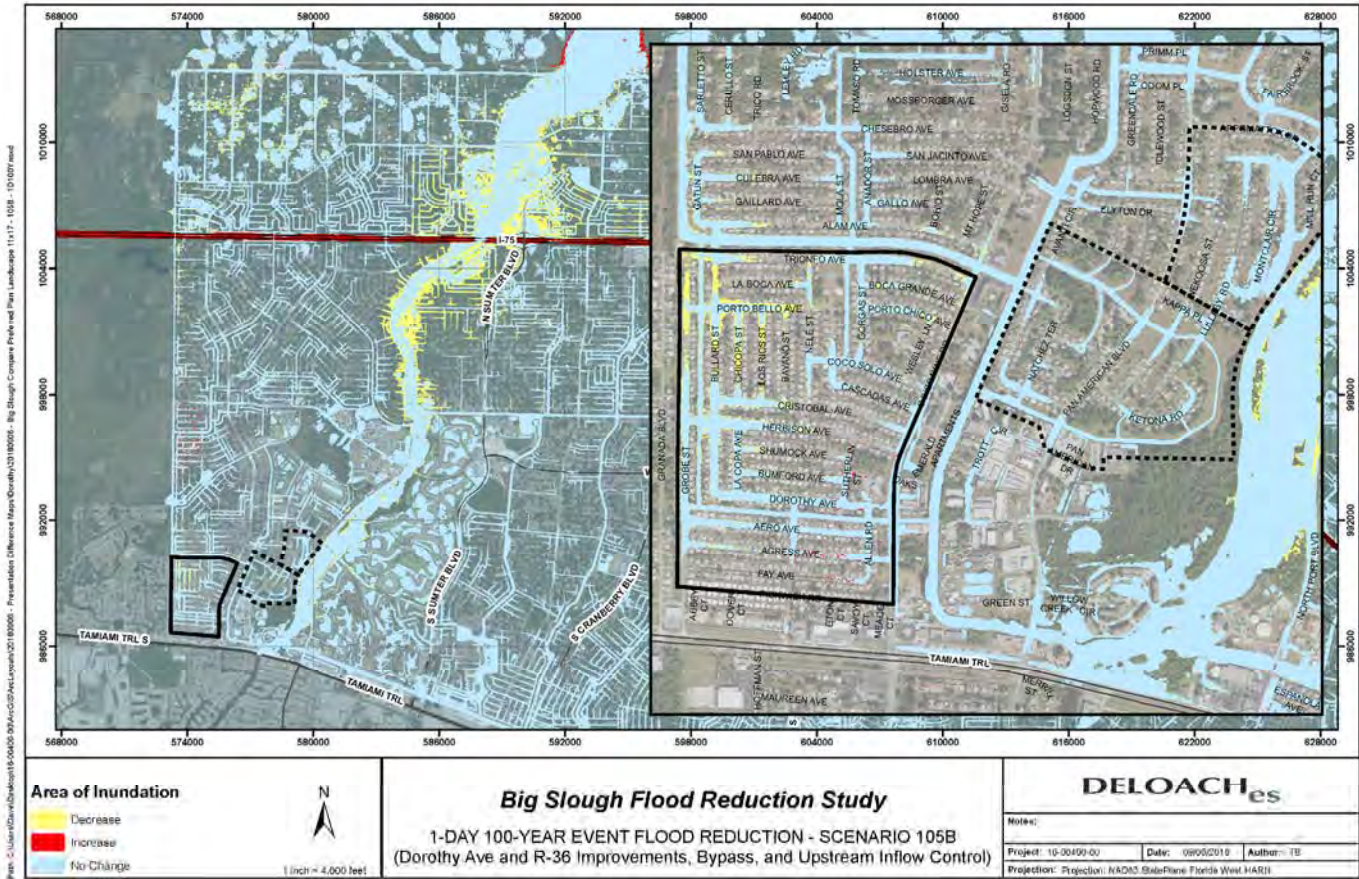
Estimated Combined Cost \$ 32,771,594

Estimated Annualized Cost \$ 2,374,625

Road Flood Reduction (miles)	2.33-year	7.8
	5-year	12.9
	10-year	18.3
	25-year	20.7
	50-year	21.1
Parcels Reduction (touch)	100-year	24.5
	2.33-year	863
	5-year	1138
	10-year	1161
	25-year	1161
Parcels Reduction (centroid)	50-year	1207
	100-year	1313
	2.33-year	234
	5-year	405
	10-year	538
	25-year	542
	50-year	562
	100-year	558

Estimated Annualized Benefit \$ 1,977,742

Est. Benefit/Cost Ratio (BCR) 0.83



North Port Big Slough Flood Reduction Study

North Port Big Slough Stormwater Management Master Plan – Apply for SWERP Conceptual Approval

Project Components	105B
Existing Condition*	-
Dorothy (Single Box Culvert)	-
Dorothy (Triple Box Culvert)	x
R-36 Improvements	x
Bypass (flowway, n = 0.040)	x
Bypass (wetland, n = 0.150)	-
Reduce Northern Inflows	x
Other Planned Improvements	-

Estimated Combined Cost \$ 32,771,594
Estimated Annualized Cost \$ 2,374,625

Road Flood Reduction (miles)	2.33-year	7.8
	5-year	12.9
	10-year	18.3
	25-year	20.7
	50-year	21.1
Parcels Reduction (touch)	100-year	24.5
	2.33-year	863
	5-year	1138
	10-year	1161
	25-year	1161
Parcels Reduction (centroid)	50-year	1207
	100-year	1313
	2.33-year	234
	5-year	405
	10-year	538
	25-year	542
	50-year	562
	100-year	558

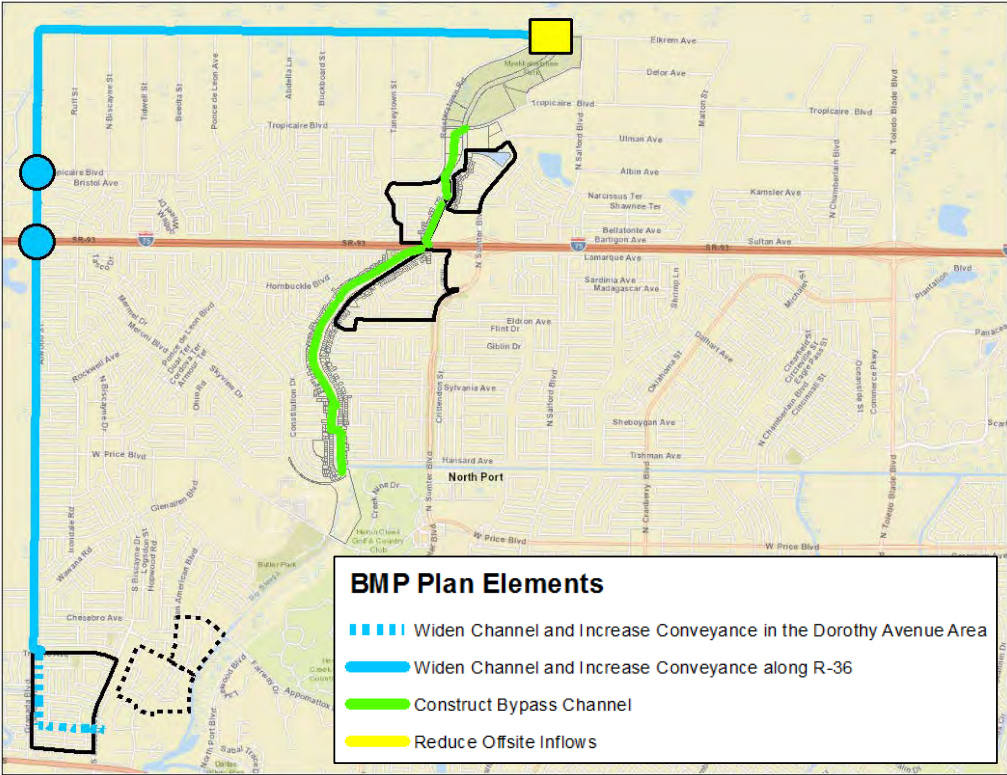
Estimated Annualized Benefit \$ 1,977,742
Est. Benefit/Cost Ratio (BCR) 0.83

Project Components	106
Existing Condition*	x
Dorothy (Single Box Culvert)	x
Dorothy (Triple Box Culvert)	-
R-36 Improvements	-
Bypass (flowway, n = 0.040)	x
Bypass (wetland, n = 0.150)	-
Reduce Northern Inflows	-
Other Planned Improvements	-

Estimated Combined Cost \$ 18,565,000
Estimated Annualized Cost \$ 1,345,217

Road Flood Reduction (miles)	2.33-year	7.5
	5-year	10.8
	10-year	14.8
	25-year	15.9
	50-year	16.7
Parcels Reduction (touch)	100-year	20.3
	2.33-year	811
	5-year	968
	10-year	996
	25-year	984
Parcels Reduction (centroid)	50-year	1012
	100-year	1133
	2.33-year	230
	5-year	398
	10-year	505
	25-year	503
	50-year	480
	100-year	482

Estimated Annualized Benefit \$ 1,842,132
Est. Benefit/Cost Ratio (BCR) 1.37





Floodplain Management Plan

2020-2025

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Contents

INTRODUCTION	5
PURPOSE.....	5
COMMUNITY PROFILE	6
CLIMATE.....	6
POPULATION AND DEMOGRAPHICS	7
HOUSING	7
ECONOMY.....	7
NATIONAL FLOOD INSURANCE PROGRAM (NFIP).....	8
COMMUNITY RATING SYSTEM (CRS).....	8
FLOOD INSURANCE BENEFITS OF CRS PARTICIPATION	9
1. ORGANIZATION	12
PLANNING COMMITTEE	12
COMMISSION APPROVAL OF THE FMP COMMITTEE	13
RECOGNITION OF FLOODPLAIN MANAGEMENT COMMITTEE.....	13
2. PUBLIC INVOLVEMENT	14
3. COORDINATION WITH OTHER AGENCIES.....	16
4. ASSESSMENT OF FLOOD HAZARDS.....	17
COASTAL FLOODING	17
TROPICAL STORM and HURRICANE.....	20
INLAND FLOODING	26
REPETITIVE LOSS AREAS and HISTORICAL CLAIMS	27
FLOODPLAINS	28
LESS FREQUENT FLOOD HAZARDS and OTHER TYPES of HAZARDS	28
Tornado	28
King Tide	29
Lightening.....	29
Coastal Erosion	29
Sea Level Rise	29
Erosion of Structural Elements.....	29
Additional Hazards	29
5. ASSESS THE PROBLEM	30
Life Safety: Warnings and Evacuations.....	30
ARMS System.....	31
Global Positioning System (GPS)	32

800 MHz Trunk Radio System.....	32
Hurricane Evacuation Study	32
Natural and Beneficial Functions within the Floodplain	34
Development, Redevelopment and Population Trends	36
Economic Impact on Future Flooding.....	36
6. FLOODPLAIN PROGRAM GOALS	38
7. REVIEW OF CURENT ACTIVITIES	39
Preventative	39
Engineering Design Criteria Manual	39
Stormwater Environmental Utility	39
Beach and Dune Maintenance	39
Coastal Construction Control Line.....	42
City of Sarasota Regulation of Development in Special Flood Hazard Areas	42
Property Protection.....	43
Natural Resource Protection	44
Beach Nourishment.....	44
Tree Protection Ordinance	44
Emergency Services.....	44
Structural Projects	45
Shoreline Protection Structures	45
Stormwater Infrastructure	45
Public Information Activities	45
Informational Flyers, Articles, and Internet Site	45
Flood Protection Assistance	46
8. REVIEW OF POSSIBLE ACTIVITIES	51
Preventative	51
Property Protection.....	51
Natural Resource Protection	52
Emergency Services.....	52
Structural Projects.....	52
Public Information.....	52
9. ACTION PLAN.....	54
10. ADOPTION, IMPLEMENTATION, EVALUATION and REVISION.....	62
11. REFERENCES	64

CITY OF SARASOTA 2020-2025 FLOODPLAIN MANAGEMENT PLAN

INTRODUCTION

The City of Sarasota is in northwestern Sarasota County, in southwest Florida and is a Gulf Coast community located on the west coast of Florida that encompasses approximately 24 square miles, of which approximately 10 square miles is water. In 1902, the Town of Sarasota came into being. Large land purchases and subsequent investments were followed by rapid development. In 1914, Sarasota was incorporated as a city. The population of the City increased from 8,498 in 1930 to 40,237 in 1970. Although the City experienced a significant loss of population during the recent recession, the population has begun to increase again and was 57,338 from the 2018 Census Factfinder at <https://www.census.gov/quickfacts/fact/table/sarasotacityflorida,US/PST045219>. The City of Sarasota, as do most coastal communities in Florida, experiences a significant increase in population during the winter months.

The City of Sarasota is bounded on the north by Manatee County, the east by Desoto County, the South by Charlotte County, and the west by the Gulf of Mexico.

The generally flat topography of Sarasota County is characterized by pine flatwoods and other upland systems, numerous wetlands, and marshy tributary systems. Elevation ranges from sea level in the west to a maximum of 95 feet referenced to the North American Vertical Datum of 1988 (NAVD) in the northeast portion of the County. The barrier islands are low-lying and generally do not exceed 7 feet NAVD.

PURPOSE

Among all the natural hazards, floods are the costliest and most pervasive hazard in the United States. Property losses from flooding events in the United States have been steadily increasing since the mid 1900s and have now reached billions of dollars per year.

Floodplain management plans form the foundation for a community's long-term strategy to reduce flood losses and break the cycle of flood damage. They create a framework for risk-based decision making to reduce damages to lives, property, and the economy from future floods. Local governments are required to develop a flood mitigation plan as a condition for receiving certain types of non-emergency disaster assistance.

The City of Sarasota has developed this Floodplain Management Plan to provide a comprehensive set of community wide efforts to address flooding and other hazards facing the City of Sarasota.

The goals of the program include, but are not limited to:

- help reduce flood losses

- improve local flood hazard mitigation capability
- increase public and private sector awareness by educating about hazards,
- education on loss reduction measures improve the natural and beneficial function of the floodplain
- protect cultural, economic, and natural resources

The number of claims paid out through the National Flood Insurance Program totaled approximately \$7.5 million since 1978 for the City of Sarasota for 871 claims. (FEMA, 2019). These claims only reflect properties that have had flood insurance policies in-force through the National Flood Insurance Program (NFIP).

The purpose of this plan update is to:

- Guide mitigation efforts to better protect the people and property in the City of Sarasota from the effects of hazard events.
- Ensure the City of Sarasota and participating partners' continued eligibility for certain federal disaster assistance.
- Maintain and earn points for the National Flood Insurance Program's Community Rating System (CRS), which provides for lower flood insurance premiums in CRS communities.
- Meet the requirement of the Federal Emergency Management Agency (FEMA) to assist local communities in the Region to become more disaster resistant through cooperative efforts of the private, public, and non-profit sectors.

COMMUNITY PROFILE

CLIMATE

The climate in Sarasota County is characterized as subtropical, with warm and humid summers, mild winters, and dry springs and falls. Summer daytime temperatures commonly reach to 90 degrees Fahrenheit or more. Average annual precipitation for the county is 53 inches. More than half of the annual rainfall typically falls during the summer months of June through September, mainly a result of convective storms. Winter frontal systems are the source of most of the precipitation during the remaining 8 months.

The sub-tropical weather pattern in this region provides frequent extreme weather events including flooding from tropical depressions and hurricanes. Extreme and severe summer rains can cause flooding in various locations throughout the County. These events may pose a significant threat to life and property. The City of Sarasota can experience flooding due to hurricanes or tropical storms, as well as heavy rainfall that can occur throughout the year in Florida. Hurricane Hermine, a category 1 hurricane, hit Sarasota County in September 2016 with peak winds of 54 mph and 9.38 inches of rainfall. Tropical Storm Colin caused flooding, power outages and beach erosion throughout the County in June 2016. Hurricane Charley, a category 4 hurricane, severely damaged hundreds of buildings, and trees in August 2004. In

June of 1992, Tropical Depression One exceeded the 100-year storm conditions, dropping more than 20 inches of rain in northern Sarasota County where the City of Sarasota is located.

POPULATION AND DEMOGRAPHICS

The State of Florida requires that population estimates, and projections used in the development of the Sarasota City Plan include both “resident” and “seasonal” populations. The full-time resident population is counted in the same manner utilized by the United States Bureau of the Census (the “year-round” permanent population). The seasonal population reflects “part-time” inhabitants who are expected to utilize public facilities and services on a short-term or long-term basis (e.g., tourists and migrant farm workers). Since the City of Sarasota is using several locally generated values (as well as those generated by the Bureau of Economic and Business Research (BEBR)), the methodologies for these numbers are set out following Illustration LU-10.

Illustration LU-10 Summary Table of Population Estimates and Projections

Population	2005	2010	2015	2020	2025	2030
Resident	54,848	57,748	59,930	62,021	63,812	65,334
Seasonal	11,079	11,665	12,106	12,528	12,890	13,197
Resident + Seasonal	65,927	69,413	72,036	74,549	76,703	78,531
Functional	79,904	84,129	87,308	90,353	92,964	95,179

Source: City of Sarasota Neighborhood and Development Services Department, 2005. Resident, Resident + Seasonal, and Functional populations for year 2005 are an estimate using data from the Bureau of Economic and Business Research and populations for years 2010 through 2030 are projections.

HOUSING

There are an estimated 24,416 households in the City of Sarasota (U.S. Census Bureau, 2018). The median value of owner-occupied housing units for the City in 2018 was approximately \$239,600 with 57.5% of the housing units being owner occupied. The median gross rent was \$1,069.

ECONOMY

The economy of the City of Sarasota is largely service-oriented, driven by the tourism and migration of retirees. Approximately half of all City jobs are health care, retail trade, and hospitality related. The City’s population was approximately 56,692 in 2019 not counting the seasonal population that increases with an additional 11,000 tourists. Every year Sarasota’s International Airport welcomes almost 1 million visitors to the City of Sarasota.

Sarasota County’s Office of Financial Management publishes monthly economic reports that contain statistics for the County’s labor force, including the top 10 industries, average wages, and unemployment rates. According to these reports, the average annual wage for Sarasota County was \$47,765 in 2019. In December 2019 Sarasota County unemployment rate was 2.5%.

(Data provided from Sarasota County June 2020 Monthly Economic Report)

NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

The National Flood Insurance Program (NFIP) was approved by Congress in 1968 primarily to make flood insurance available to property owners with buildings located in Special Flood Hazard Areas (SFHA) identified on Flood Insurance Rate Maps (FIRM). To qualify for participation, a community must develop and adopt a regulatory program designed to reduce exposure to flood damage and, at a minimum, that conforms to the basic participating requirement of the NFIP (44CFR, Part 60.3). If conforming, flood insurance is available to anyone that lives in that community. The City of Sarasota fulfills these requirements through the City's Floodplain Management Ordinance and Zoning Codes. The City of Sarasota first adopted its Ordinance, including FEMA's Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRM), in December 1971. The FIS and FIRMs were last revised on November 4, 2016. There are approximately 8,000 NFIP insurance policies currently in force, representing more than \$2 billion of coverage (FEMA 2019).

COMMUNITY RATING SYSTEM (CRS)

FEMA's National Flood Insurance Program (NFIP) administers the CRS. Under the CRS, flood insurance premiums for properties in participating communities are reduced to reflect the flood protection activities that these communities are implementing. The National Flood Insurance Program's (NFIP) CRS was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP standards. Under the CRS, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from community activities that meet the three goals of the CRS:

- Reduce flood losses,
- Facilitate accurate insurance ratings, and
- Promote the awareness of flood insurance

To obtain the necessary credit points to achieve lower CRS class ratings, communities implement a broad range of programs aimed at addressing these three goals of the CRS program. In general, these goals are accomplished through a mix of more stringent regulations, additional property acquisitions and relocations, floodproofing of flood prone buildings, preservation of natural resources such as open space, and other measures that protect natural resources. This program can have a major influence on the design and implementation of flood mitigation activities, so a summary is provided here.

A community receives a CRS classification based on the credit points it receives for activities. It can undertake any mix of activities that reduce flood losses, such as enhanced mapping, regulatory changes, public information programs, flood damage reduction, or flood warning and preparedness programs.

There are 10 CRS classes: class 1 requires the most credit points and gives the largest premium reduction; class 10 receives no premium reduction (see Table 1). A community that does not apply for the CRS or that does not obtain the minimum number of credit points is a class 10 community. The NFIP's Community Rating System (CRS) is a voluntary incentive program

that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements,

Table 1: Community Rating System Premium Reductions

Class	Points	Premium in Floodplain	Reduction Outside Floodplain
1	4500+	45%	10%
2	4,000-4,499	40%	10%
3	3,500-3,999	35%	10%
4	3,000-3,499	30%	10%
5	2,500-2,999	25%	10%
6	2,000-2,499	20%	10%
7	1,500-1,999	15%	5%
8	1,000-1,499	10%	5%
9	500-999	5%	5%
10	0-499	0%	0%

The City of Sarasota has participated in the CRS program since October 1992. By implementing comprehensive floodplain management activities, the City of Sarasota has been rated as a Class 6 community under this program since 2010.

This means that the NFIP insurance for the City of Sarasota property owner is discounted annually by 20% for high risk properties and 10% for medium to low risk policies. This represents a current savings of over \$1.7 million dollars to residents of the City every year.

The Disaster Mitigation Act of 2000 (DMA 2000) amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988. Among its main features, the DMA 2000 authorized the creation of a pre-disaster mitigation program that makes mitigation grants available to states, as well as to local and tribal governments, providing they have a FEMA approved hazard mitigation plan in effect prior to the time of the disaster. In accordance with the DMA 2000, the Sarasota County developed the Local Mitigation Strategy (LMS) that the City is part of. This approved hazard mitigation plan has enabled the County and City to receive Hazard Mitigation Grant Program (HMGP) awards, Flood Mitigation Assistance (FMA) Planning Grants and Pre-Disaster Mitigation awards.

FLOOD INSURANCE BENEFITS OF CRS PARTICIPATION

Table 2 on the following page shows the direct dollar benefit to the City of Sarasota and the City's policy holders for participation in the CRS. The savings per policy are for properties in the FEMA mapped 100-year floodplain ("Special Flood Hazard Area"). The savings are lower for policies outside the mapped floodplain.

The City of Sarasota is currently a Class 6 community with a 20% discount on SFHA policies.

Table 2: City of Sarasota Policy Savings for CRS Participation

	Total Policies	* Policies in SFHA	** X/X-500	*** PRP
NUMBER OF POLICIES	8,098	6,389	332	1,377
TOTAL PREMIUMS	\$7,579,580.00	\$6,745,868.00	\$181,834.00	\$651,878.00
CLASS 9 SAVINGS PER FLOODPLAIN POLICY	\$53.00	\$66.00	\$30.00	\$0.00
CLASS 9 SAVINGS FOR COMMUNITY	\$431,718.00	\$421,616.00	\$10,102.00	\$0.00
CLASS 8 SAVINGS PER FLOODPLAIN POLICY	\$105.00	\$132.00	\$30.00	\$0.00
CLASS 8 SAVINGS FOR COMMUNITY	\$853,341.00	\$843,239.00	\$10,102.00	\$0.00
CLASS 7 SAVINGS PER FLOODPLAIN POLICY	\$157.00	\$198.00	\$30.00	\$0.00
CLASS 7 SAVINGS FOR COMMUNITY	\$1,274,958.00	\$1,264,856.00	\$10,102.00	\$0.00
<u>CLASS 6 SAVINGS PER FLOODPLAIN POLICY</u>	<u>\$211.00</u>	<u>\$264.00</u>	<u>\$61.00</u>	\$0.00
<u>CLASS 6 SAVINGS FOR COMMUNITY</u>	<u>\$1,706,676.00</u>	<u>\$1,686,472.00</u>	<u>\$20,204.00</u>	\$0.00
CLASS 5 SAVINGS PER FLOODPLAIN POLICY	\$263.00	\$330.00	\$61.00	\$0.00
CLASS 5 SAVINGS FOR COMMUNITY	\$2,128,292.00	\$2,108,089.00	\$20,204.00	\$0.00
* SFHA (Zones A, AE, AH, AO, VE) Discount varies depending on class.				
** SFHA (Zones X, X-500) 10% Discount for Classes 1-6: 5% Discount for Classes 7-9.				
*** Preferred Risk Policies not eligible for CRS Premium Discounts.				



1. ORGANIZATION

This Floodplain Management Plan provides a comprehensive overview of best management practices adopted and implemented by the City of Sarasota to improve flood risk reduction and flood protection for its residents, and to support other City and County regulatory, preservation, conservation, social, and economic needs. The City of Sarasota developed and adopted the first Floodplain Management Plan in 2005, prior to 2005 it was dependent on the Sarasota City Plan (1998).

The current plan was and continues to be updated by a committee consisting of Sarasota City staff as well as public stakeholders and residents.

PLANNING COMMITTEE

The City of Sarasota's Floodplain Management Committee is composed of the members of the Public Information Office, Building and Zoning, Engineering, Planning, Sustainability, and Emergency Management Departments within the City. Table 2-1 lists the members and departments. This Committee began its initial review of this Floodplain Management Plan in February 2020 and have conducted a series of meetings in compliance with the National Flood Insurance Program Community Rating System Coordinator's Manual to update our currently approved plan.

Table 2-1 Current Floodplain Management Plan Committee Members

OFFICIAL MEMBERS		REPRESENTING
TODD KERKERING	richard.kerkering@sarasotaFL.gov	EMERGENCY MANAGEMENT
BOB HEGGAN	robert.heggan@sarasotaFL.gov	PUBLIC WORKS
CYNDI CAHILL	cynthia.cahill@sarasotaFL.gov	DEVELOPMENT SERVICES FEMA
DAVID SMITH	david.smith@sarasotaFL.gov	PLANNING
DAN OHRENSTEIN	daniel.ohrenstein@sarasotaFL.gov	ENGINEERING
GRETCHEN SCHNEIDER	gretchen.schneider@sarasotaFL.gov	DEVELOPMENT SERVICES ZONING
JAN THORNBURG	jan.thornburg@sarasotaFL.gov	PUBLIC INFORMATION
STEVIE FREEMAN-MONTES	stevie.freeman-montes@sarasotaFL.gov	SUSTAINABILITY

Key topics during the committee meetings include:

- Plan organization
- Public involvement
- Assessment of flood hazards that affect the City of Sarasota
- Assessment of the problems brought about by the flood hazards
- Floodplain management goals
- Review of possible and in process floodplain management activities
- Development of an action plan
- Plan adoption and update

The Floodplain Management Committee will continue to meet quarterly after the 2020-2025 FMP is approved. Agendas, sign-in sheets, and meeting notes for the subsequent meetings will be provided in the next 5-year update.

COMMISSION APPROVAL OF THE FMP COMMITTEE

The original Committee met four times between January and March of 2005 and was formally recognized by the Sarasota City Commission at its February 22, 2005 public meeting.

RECOGNITION OF FLOODPLAIN MANAGEMENT COMMITTEE

MINUTES OF THE REGULAR SARASOTA CITY COMMISSION MEETING OF FEBRUARY 22, 2005, AT 2:30 P.M.

PRESENT: Mayor Richard F. Martin, presiding, Vice Mayor Mary Anne Servian, Commissioners Fredd "Glossie" Atkins, Danny Bilyeu, and Lou Ann R. Palmer, City Attorney Robert M. Fournier, City Manager Michael A. McNees, and City Auditor and Clerk Billy E. Robinson

ABSENT: None

The meeting was called to order by Mayor Martin at 2:37 p.m.

INVOCATION/PLEDGE OF ALLEGIANCE: City Auditor and Clerk Robinson

1. CITIZENS' INPUT

Ms. Joy McIntosh spoke about worship services being conducted at the Gillespie Park Pavilion.

2. APPROVAL OF MINUTES

Following revisions, Mayor Martin noted Commission consensus to approve the minutes of the February 7, 2005, meeting with corrections. Following discussion, Mayor Martin noted Commission consensus to institute motion minutes immediately. (FTR 2:53)

3. CONSENT AGENDA NO. 1

A motion was made by Commissioner Bilyeu, seconded by Commissioner Atkins, and carried by a 5-0 vote to approve Consent Agenda No. 1, Item Nos. 2 through 9, to:

- 1) Authorize the Mayor and City Auditor and Clerk to execute the Assignment of Lease Agreement between the City of Sarasota and Helen R. Payne Day Nursery to Children First, Inc., for the remainder of the Lease which terminates on March 15, 2018 - Removed for discussion and considered as Minutes Item 7(1) later in the meeting;
- 2) Recognize formation of a Floodplain Management Plan Committee
- 3) Authorize the Mayor and City Auditor and Clerk to execute the First Amendment to the Audit Agreement between the City and Purvis, Gray and Company for a one year renewal to cover the 2005/06 Fiscal Year Audit

The City of Sarasota Community Rating System (CRS) Coordinator attended the Coalition of City Neighborhood Associations (CCNA) to obtain written comments from the public on flood problems and possible solutions, including goals or action strategies to include in the Floodplain Management Plan. The CCNA is comprised of individuals representing the various neighborhood associations throughout the City of Sarasota, including those areas subject to flooding.

The Development Services Department is responsible for the Floodplain Management Plan. The Emergency Management Manager and Floodplain Manager/CRS Coordinator shall be co-chairpersons of the FMP Committee. The Floodplain Manager/CRS Coordinator will coordinate the meetings and will prepare and update the FMP.

2. PUBLIC INVOLVEMENT

The City of Sarasota makes every effort to involve the public throughout development of this plan and other activities relating to flood risk. The City provides for public outreach through public meetings. These meetings are sometimes conducted through neighborhoods or associations.

The City provides for public outreach through public meetings and presentations provided to civic and neighborhood associations as well as establishing informational booths at the local Farmer's Market and County Fair.

Further public involvement is also provided by the City of Sarasota's participation in the Sarasota County Unified Local Mitigation Strategy (LMS) Work Group, the Sarasota County Floodplain Plan Committee, and the Sarasota County Multi-jurisdictional Program for Public Information Committee.

The City of Sarasota's Floodplain Management Committee began meeting and planning in October of 2019 to update our currently approved 2015-2020 Floodplain Management Plan. Committee meetings were planned monthly beginning in January of 2020 and several public meetings were planned for the early summer of 2020. In addition, staff members were able to promote the City's Floodplain Management Plan update process and seek public input by utilizing the local FEMA Risk Map update process and participating in two public outreach events in early March 2020

Due to the COVID-19 Pandemic, all in-person public meetings were cancelled in mid-March of 2020. Committee members continued to discuss the update process by various methods and developed the following to seek further public involvement:

- Created a flood information email address for citizens to provide input to the plan and other flood issues within the City,
- Created a floodplain management survey that was launched thru Survey Monkey May 20, 2020 thru July 1, 2020 in which we received almost 200 responses,
- Created a social media marketing campaign to encourage citizens to participate in the survey and seek input to the floodplain management plan.

The City of Sarasota has also utilized the following platforms to get input from the public on the FMP plan:

- Due to the COVID 19 the committee developed a floodplain management survey for the public in April 2020. The survey was launched thru Survey Monkey from May 20, 2020 thru July 1, 2020. We received almost 200 responses.
- At public outreach events this spring, Open Houses on Preliminary Flood Maps, we discussed the Flood Maps and their impact on the FMP with residents and received questions and comments to be incorporated.

Thru out the year HOA's request presentations on flooding and the City's plan to reduce flooding and proposed projects. The FMP is discussed at these presentations and comments and concerns are reviewed.

3. COORDINATION WITH OTHER AGENCIES

Personnel from the City of Sarasota coordinate monthly at a minimum with other agencies as it relates to floodplain management activities. Within these meetings, discussion and action on current projects, plans, technical data, reviews of existing studies and reports take place. Listed below are some of the coordination activities that take place:

- The City of Sarasota and Sarasota County entered into an Inter-local Agreement for the Consolidation of Storm-water Management in 1998. Meetings are quarterly. Members include staff from the City and County along with discussions with FDOT and SWFWMD as needed.
- The City participates and has adopted The Sarasota County Unified Local Mitigation Strategy (LMS). Work group members include but not limited to; City of North Port, City of Sarasota, City of Venice, Sarasota County, Sarasota Memorial Hospital, and the Town of Longboat Key. This organization conducts quarterly meetings.
- The City of Sarasota participates as a Stakeholder Member of the Sarasota County Floodplain Management Plan Planning Committee. This organizations conducts quarterly meetings.
- The City of Sarasota participates as a Government Member of the Sarasota County Multi-Jurisdictional Program for Public Information Committee. This organizations conducts quarterly meetings
- Florida Division of Emergency Management Region 6. Members include but not limited to; Sarasota County, City of North Port, City of Sarasota, DeSoto County, Charlotte County, Highlands County, Okeechobee County, Glades County, Hendry County, Lee County, City of Cape Coral, and Collier County. This organization conducts quarterly meetings.
- Southwest Florida Regional Planning Council, Local Emergency Planning Committee. Members include but not limited to; Florida National Guard, Florida Department of Health, Collier County Government, Sarasota County Fire Department, Lee County Utilities, Glades County Emergency Management, Mote Marine, Florida Power & Light, Lee Memorial Health System, Charlotte County Sheriff's Office, and Cape Coral Fire Rescue. This organization conducts quarterly meetings.
- Tampa Bay Regional Resiliency Coalition is a group of over 29 local governments that collaborate to strengthen southwest Florida's ability to plan for a changing climate, reduce impacts and secure increased levels of federal funding for resilient infrastructure improvements, adaptation and mitigation programs, to protect communities, property and economies. This organization conducts quarterly meetings.

4. ASSESSMENT OF FLOOD HAZARDS

Flooding results from two major sources in the City of Sarasota. Coastal areas are subject to inundation from surges from the Gulf of Mexico and associated coastal waves. Inland areas become flooded when rainfall accumulates in low, flat areas which have inadequate or poorly maintained drainage systems. Land development activities have significantly increased runoff volumes and have exceeded the capacity of natural or manmade drainage systems. Rainfall occurs primarily due to thunderstorm activity in the summer months, with additional rainfall occurring with the passage of hurricanes.

This section describes the known flood hazards within the City of Sarasota, their history of occurrence, and areas that are likely to be impacted by those hazards. The City of Sarasota coastal community characterized by low, flat topography and a high-water table. These characteristics make the City highly susceptible to the effects of flood damage caused by hurricanes, tropical storms, and heavy rain.

To reduce the risk of damage due to flooding for new developments, the City implements regulations that exceeds the minimum requirements of the NFIP. One of the ways that they accomplish this is, in addition to the SFHA, the City also regulates activities in the CFHA. The City along with Sarasota County continues to update the FEMA Flood Insurance Rate Maps (FIRM) with improved risk information based on newer and better data. During 2017 and 2018, the County submitted three MT-2 requests for physical map revisions to FEMA. These include updated flood risk data for Little Sarasota Bay, Phillippi Creek, and Dona Bay/Roberts Bay and Lemon Bay.

Flooding can be attributed to several types of natural hazards that may occur in this region, including coastal flooding, inland flooding due to frequent and heavy rains, tropical storms, and hurricanes. By nature of its location along the coast of the Gulf of Mexico, the City is continuously at risk of coastal flooding in conjunction with tropical storms, hurricanes, and heavy rain. High tide conditions increase the effects of storm surge and inland flooding due to high tailwater conditions.

This section summarizes the flood hazards that affect The City of Sarasota. The City of Sarasota is a StormReady community. Therefore, for many of these natural hazards, City staff coordinates with the National Weather Service to receive warnings regarding the source of flooding, warning times and expected depth of flooding. The County also maintains gages that provide additional information including rainfall amount, flow/velocities, and depth.

The City of Sarasota Post-Disaster Redevelopment Plan is included in the Comp Plan.

COASTAL FLOODING

The City of Sarasota coastline stretches 37 miles along the Gulf of Mexico, making the City extremely vulnerable to coastal flooding. Coastal flooding is usually the result of a severe weather system such as an ashore by the wind, known as a storm surge, is the main cause of coastal flooding as well as low-lying barrier islands and canals subject to tidal surge. The damaging effects to structures in the beach areas are caused by a combination of higher levels of storm surge, winds, waves, rains, erosion, and battering by debris. Sea walls, jetties, and beach areas are affected by coastal flooding, and losses can occur over short or long periods.

Historically, the City has experienced several damaging coastal floods caused by wind-driven water associated with high tide. Significant occurrences of coastal flooding in the past include:

October 1921: An unnamed tropical storm originated in the western Caribbean Sea and made landfall in Florida north of Tarpon Springs. Flooding conditions were prolonged due to the slow forward movement of the storm. A combination of high tides (above 7 feet) with wave action resulted in heavy damage in Sarasota County and City of Sarasota.

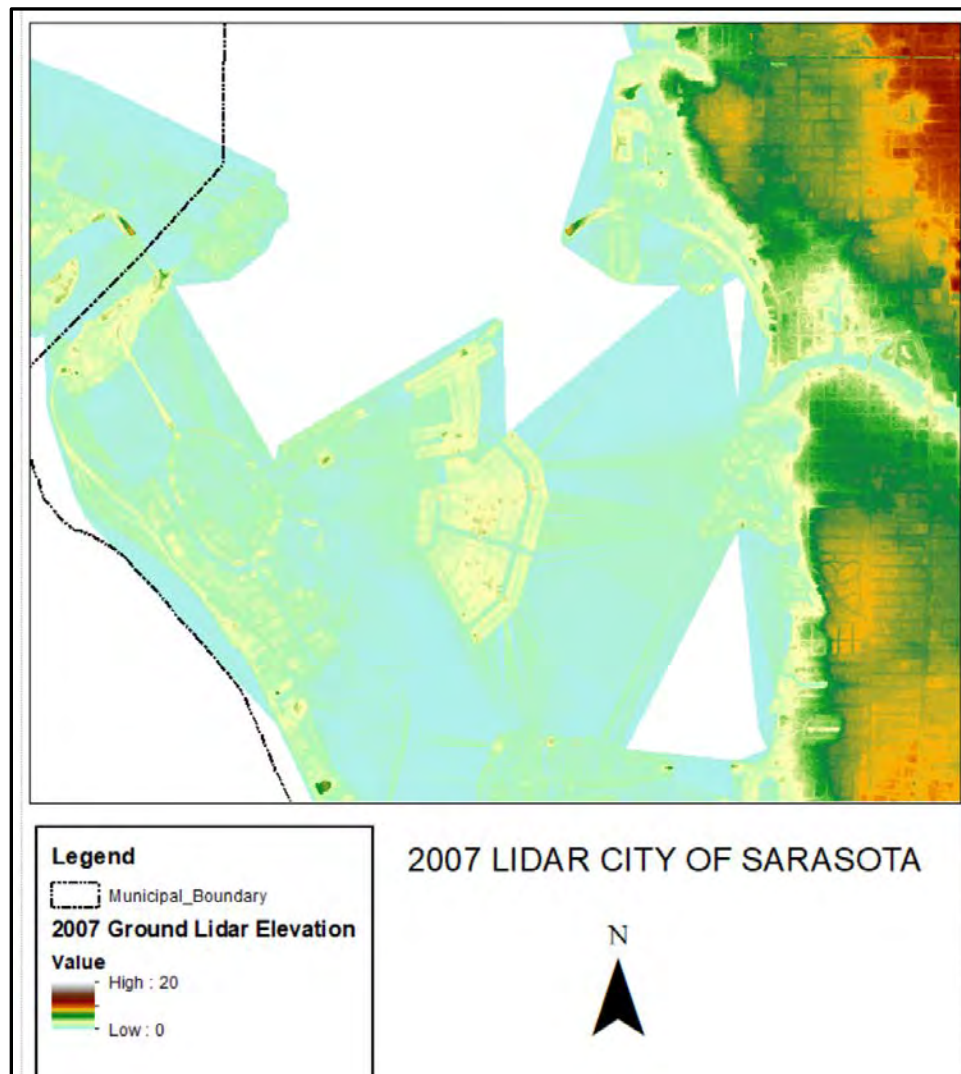
June 1972: Hurricane Agnes originated on the northeastern tip of the Yucatan Peninsula and traveled westward. Although the center of the storm passed approximately 150 miles west of the Florida peninsula, it produced high tides of 3 feet above normal and precipitation of 5 inches in Sarasota County. The high tides caused damage to many homes, seawalls, revetments, and roads along the Sarasota coastline. In addition, wave action produced considerable erosion along the City and Sarasota County coast.

June 1982: Subtropical Storm One hit the Sarasota area with 60 mile-per-hour winds and 6 inches of rain with little warning. The storm and abnormally high tides caused considerable structural flood damage to properties.

Tropical storms and hurricanes can produce coastal flooding, although they are not the only conditions under which such flooding occurs. The probability of coastal flooding in the City of Sarasota is relatively high. This probability increases if the storm strikes the coastline during a high tide.

Residences along the City of Sarasota coast and barrier islands are highly vulnerable to coastal flooding due to storm surge and/or high tide. The most vulnerable locations to storm surge are the barrier islands and areas along the coast. This often occurs because these areas are closest to the coast or are located along inland waterways and low-elevation areas.

CITY OF SARASOTA LIDAR, BARRIER ISLANDS



Flood events that have affected the City of Sarasota and Sarasota County include, but are not limited to the following:

September 1962: Exceptionally heavy rains covered the Florida west coast area, including 5,000 square miles over six counties. The highest amount of precipitation reported in a 24-hour period was 14.5 inches measured at the Manasota Tower. Over 1,000 residences were flooded, many to depths of 3 feet or more. Automobiles, streets, and bridges were severely damaged. Numerous roads were underwater for several hours, and many were impassable. The greatest damages occurred in the residential area of Sarasota, which comprises much of the 57-square-mile drainage area of Phillippi Creek. In addition to urban areas, approximately 60,000 acres of ranch land sustained damages. Floods at Phillippi Creek and US Hwy 41 measured 6 feet in depth. Sarasota County suffered significant damages in the Phillippi Creek Basin, in addition to one death. An estimated 10,000 to 15,000 people were directly impacted.

June 1992: Tropical Depression One exceeded the 100-year storm conditions, dropping more than 20 inches of rain in northern Sarasota County. An estimated 3,000 structures countywide were flooded during this intense storm.

July 1995: Tropical Storm Dean dropped more than 11 inches of rain within a 15-hour period, resulting in structural flooding throughout the area.

October 1996: Heavy rainfall of 4 to 6 inches associated with rain bands from Tropical Storm Josephine caused flooding of several homes and streets.

November 1997: In less than 14 hours, more than 10 inches of rain fell in the Phillippi Creek Basin, located in the southern portion of the City of Sarasota, flooding about 190 structures. The rain fell on already saturated soils, causing runoff to flow shortly after the storm began, with water levels rising quickly in the County's Main A Canal.

Tropical storms and hurricanes can often produce inland flooding, although they are not the only conditions under which such flooding occurs. Other historical occurrences of inland flooding in Sarasota County and the City of Sarasota are described later in this section.

Storm events can be described as the amount of precipitation that occurs over a given duration (e.g., 10 inches of rain over a 24-hour period). Typically, the probability of these storm events is categorized as follows, consistent with United States Geological Survey (USGS) and FEMA terminology:

- 100-year flood (1 percent chance per year)
- 50-year flood (2 percent chance per year)
- 25-year flood (4 percent chance per year)
- 10-year flood (10 percent chance per year)

These categories indicate a probability of occurrence (a 100-year flood has a 1-percent chance of occurrence in any given year). The smaller the chance of occurrence is, the more devastating the flood potential may be. Each of the flood categories is associated with a specific amount of rainfall over a given duration for a specific region. For Sarasota County region, the 10-year flood is characterized as receiving 7 inches of rain within a 24-hour period, while the 100-year flood is associated with 10 inches of rain within a 24-hour period.

TROPICAL STORM and HURRICANE

Tropical storms and hurricanes are large cyclonic storms with counterclockwise winds of 39 mph or greater. If the conditions are right, with warm ocean water and favorable high-altitude winds, the system could develop winds more than 155 miles per hour, with catastrophic results if it makes landfall in populated areas. The following are descriptions of the three general levels of development for tropical cyclones:

- Tropical depression: The formative stages of a tropical cyclone in which the maximum sustained surface wind is 38 mph or less.
- Tropical storm: A warm core tropical cyclone in which the maximum sustained surface wind ranges from 39–73 mph.

- **Hurricane:** A warm core tropical cyclone in which the maximum sustained surface wind is 74 mph or greater.

Hurricanes are categorized according to the Saffir-Simpson Hurricane Wind Scale (Table 3-2), which is based on estimates of potential property damage. Hurricanes rated Category 3 and higher are considered major hurricanes because of their potential for significant damage and loss of life. While less devastating, Category 1 and 2 hurricanes are still dangerous, and they, too, require preventative measures.

Table 3-2 Saffir-Simpson Hurricane Wind Scale

Category	Sustained Winds	Potential Damage
Tropical Storm	39 – 73 mph	Some
1	74 – 95 mph	Some
2	96 – 110 mph	Extensive
3	111 – 130 mph	Devastating
4	131 – 155 mph	Catastrophic
5	156 mph or higher	Catastrophic

NOAA describes the damage potential for each category as follows:

- **Category 1:** Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding, and gutters. Large branches of trees will snap, and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
- **Category 2:** Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
- **Category 3:** Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
- **Category 4:** Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted, and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
- **Category 5:** Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

Although hurricanes are categorized according to sustained wind speeds, they are often accompanied by heavy rains and storm surge that can cause flooding throughout Sarasota County and City of Sarasota. NOAA's projections for increased sea level rise over the coming decades indicates increased flooding when heavy rains and storm surges interact with rising water levels. The interconnection of sea level rise and heavy precipitation events will continue to be an important component for mitigation efforts. In addition, fallen trees and debris can obstruct water flow, contributing to flood damage to structures.

Hurricanes cause the most severe flooding problems in the City and it should be noted that most hurricanes occur in the latter portion of the rainy season. Thus, rain associated with hurricanes commonly falls when conditions are most critical for runoff. A representative sample of some damaging storm activity demonstrates the level of coastal flood hazard experienced in the City of Sarasota:

October 24, 1921: Flooding conditions were prolonged due to the slow forward movement of the storm. A combination of high tides (above 7 feet) with wave action resulted in heavy damage along the coastline in Sarasota County. Total loss in the City of Sarasota was estimated at \$200,000.

September 19, 1926: Flooding in the Sarasota area caused damage estimated at \$1 million. In addition, wave action resulted in considerable erosion along the coast in Sarasota County and the City of Sarasota.

September 10, 1960: Hurricane Donna resulted in tidal heights of approximately 3 feet above normal in Sarasota. Pre-storm rainfall of nearly 10 inches saturated the ground. That combined with rainfall of 5 to 7 inches during the storm caused extensive flood damage.

October 19, 1968: Un-named Storm - Tides of up to 5 feet above normal resulted in considerable flood damage.

June 18, 1972: Although the eye of Hurricane Agnes passed approximately 150 miles west of the south Florida peninsula, it produced high tides of 3a feet above normal and five inches of rainfall. High tides caused damage to many homes, seawalls, revetments, and roads along the coastline.

June 18, 1982: A subtropical storm, commonly known as the "No Name Storm", hit the Sarasota area with 60 mph winds and 6 inches of rain with little or no warning from weather forecasters. The storm and abnormally high tides caused considerable structural flood damage to properties.

September 2, 1985: Hurricane Elena hovered over the west coast of Florida for 6 days. Aug 28 – Sept 4, 1985 and brought rainfall of more than 11 inches, requiring the evacuation of 37,000 people. Building on the effects of Elena, Tropical Storm Juan caused serious structural damage to shoreline areas of the City of Sarasota and Sarasota County. Elena required the evacuation of 37,000 persons, of which about 6,500 stayed in shelters

October 28, 1985: Hurricane Juan caused 25 to 35-foot swells in the Gulf of Mexico, and subsequent coastal flooding.

October 16, 1987: Hurricane Floyd brought heavy rains and strong winds, resulting in flooding.

November 20, 1988: Tropical Storm Keith brought rain and strong winds, creating tidal surges 4 feet above normal.

June 23, 1992: This storm exceeded the 100-year storm both in terms of duration and intensity, dropping more than 20 inches of rain in northern Sarasota County. An estimated 3,000 structures were flooded during this intense storm.

June 23, 1993: June 23-26, 1993. Rain exceeded the 100-year, 24-hour storm event with 11.82 inches of rain falling in a 24-hour period.

July 18, 1995: This greater than 100-year storm dropped more than 11 inches of rain within a 15-hour period, resulting in structural flooding.

November 1, 1997: In less than 14 hours, more than 10 inches of rain fell in the Phillippi Creek Basin, located in the southern portion of the City, flooding about 190 structures. This rain fell on already saturated soil, causing runoff to flow shortly after the storm began, with water levels rising quickly in Sarasota County's Main A Canal.

September 14, 2001: Gabrielle, a tropical storm which approached Category 1 hurricane status, made landfall near Venice, Florida to the south of Sarasota. Several inches of rain fell on the area, which resulted in some structural flooding.

August 13, 2004: Hurricane Charley, which developed into a Category 4 storm, was forecast to remain just offshore of the west coast of Florida and make landfall near the mouth of Tampa Bay. However, the storm took an easterly turn and made landfall in the Punta Gorda area, about 50 miles south of Sarasota. It then proceeded northeast through Arcadia, Lake Wales, and Orlando before exiting the state between Daytona and Jacksonville. Because of the relatively compact size of the storm and the fact that it was fast moving, there was little impact on the City of Sarasota in the form of wind or rainfall.

September 5, 2004: Hurricane Frances was a very slow-moving Category 2 storm, with a diameter approximately the size of the state of Texas, which impacted virtually the entire state of Florida. The eye of the storm made landfall near Stuart, and then moved across the state in a northwest direction and went back into the Gulf of Mexico near New Port Richey. The eye stayed to the northeast of Sarasota, but several inches of rainfall fell in Sarasota during the storm, which resulted in some flooding of structures.

September 16, 2004: Hurricane Ivan, a strong Category 4 storm, made landfall near Gulf Shores, Alabama. The storm remained west of Sarasota, out in the Gulf of Mexico far enough so that the only impact was beach erosion and damage to some docks because of changing tides.

September 26, 2004: Hurricane Jeanne made landfall on the east coast of Florida near Stuart. The storm then moved northwest, but the eye remained to the northeast of Sarasota. During the storm, up to 8 inches of rainfall resulted in the flooding of some structures. The storm remained on a northerly track and moved into Georgia.

October 24, 2005: Hurricane Wilma made landfall in Florida near Cape Romano and moved across the peninsula in less than 5 hours. The location of the landfall was far enough south of the City of Sarasota that winds and rain were minimal.

June 2, 2007: Tropical Storm Barry made landfall near Tampa, dropping a few inches of rain, and creating high surf conditions along the west coast of Florida, including Sarasota.

August 19, 2008: Tropical Storm Fay made landfall in Florida south of Naples near Cape Romano and moved to the northeast, with rainfall amounts more than 20 inches reported on Florida's east coast near Melbourne. Because of the path of the storm, there was a minimal impact in Sarasota.

June 23-26, 2012: Tropical Storm Debby developed from a trough of low pressure in the central Gulf of Mexico and made landfall near Steinhatchee, Florida. Initial predictions anticipated the storm to move towards Louisiana or Texas, but the storm moved in the opposite direction. Upwards to 10 inches of rain fell within the City of Sarasota flooding many secondary roads and the Lido Beach parking lot was impacted by flooding from the shifting of the highwater mark due to surf and tide conditions. Overall, Sarasota County suffered almost \$2 million in beach erosion damage which included Lido Key.

January 18, 2016: EF2 Tornado touched down in Siesta Key in Sarasota County with winds estimated to have reached 70 mph, according to the NWS. 111 to 135 mph. 300 business throughout the county were damaged

June 2016: Tropical Storm Colin stayed far offshore as it passed Sarasota, delivering intermittently heavy rainfall, and causing erosion along the coast.

September 1, 2016: Hurricane Hermine caused storm surges and erosion along the coast.

September 10, 2017: Hurricane Irma entered Florida as a Category 4 hurricane. By the time it made it to the Sarasota area, it was still a Category 1 hurricane that brought substantial winds, flooding, downed power, and debris.

A hurricane vulnerability zone is based on storm intensity. Generally, storm intensities are more severe immediately adjacent to large bodies of water such as the Gulf of Mexico and Sarasota Bay. The hurricane vulnerability zone is defined as those areas requiring evacuation in the event of a Category 3 storm event. Storm events are classified by storm categories numbered 1 through 5, with Category 1 storms having the least potential for destruction and Category 5 storms having the greatest potential for destruction.

On average, The Tampa Bay Region, which includes Sarasota County, sustains a hurricane every 4.5 years based on the National Hurricane Center's (NHC) historical assessment of tropical storms and hurricanes. Table 3-3 and Table 3-4 describe the frequency of occurrences of tropical storms and hurricanes in the Tampa Bay Region, which includes Sarasota County.

Table 3-3 NHC Hurricane or Tropical Storms Return Intervals for the Tampa Bay Region

Number of Years	135
Number of Hurricanes and Tropical Storms	100
Mean Number of Occurrences per Year	0.74
Mean Recurrence Interval	1.35 Years

Table 3-4 NHC Hurricane Return Intervals for the Tampa Bay Region

Number of Years	135
Number of Hurricanes	30
Mean Number of Occurrences per Year	0.22
Mean Recurrence Interval	4.5 Years

Every year the state of Florida is at risk of being impacted by tropical storms and hurricanes. Figure 3-6 illustrates the historical tropical storm and hurricane tracks for Florida from 1842 to 2019. Figure 3-7 illustrates the tropical storm and hurricane tracks since 1950 for the Sarasota area. Based on events recorded by the NOAA, 37 of these tracks were within 75 nautical miles of Sarasota County since 1950.

Fig. 3-6 Historical Tropical Storm and Hurricane Tracks in Florida from 1842-2019

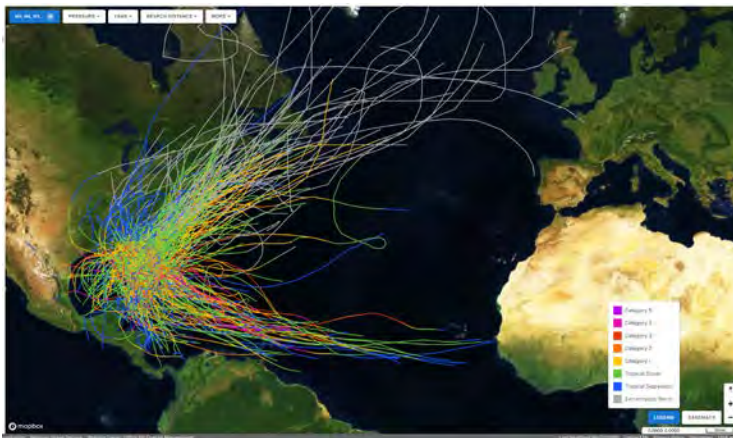


Fig. 3-7 Historical Tropical Storm and Hurricane Tracks in Sarasota County from 1842-2019 (within 75 nautical mile radius)



Due to its geographic location in the subtropics, adjacent to the Gulf of Mexico, the entire County is vulnerable to damage caused by tropical storm and hurricane-force winds and related flooding. Vulnerability to hurricane related flooding is dependent upon the severity of storm surge, a general rise in sea level caused by the low pressure and strong winds around a hurricane's eye, and the amount of rain carried by the hurricane. Storm surge is influenced by the hurricane's velocity and can rise 20 feet or more above normal sea level to cause massive flooding and destruction along shorelines in its path. During tropical storms and hurricanes, flooding due to heavy rainfall may extend over widespread areas of the County including the City of Sarasota.

INLAND FLOODING

Flooding has been the most frequently occurring natural hazard in the City of Sarasota, including inland flooding due to heavy rains, whether or not the rains are associated with tropical storms or hurricanes. Areas within the City are subject to flood depths that range from less than a foot up to 10 feet. Prolonged periods of rainfall have shown increased potential for causing damage to property and requiring residents to evacuate due to flooding. This problem can become more severe if the heavy rainfall occurs at the same time as a high tide, which prevents much of the rainwater from flowing through the drainage systems into the bays or Gulf of Mexico.

Sarasota County has experienced several damaging floods in recent history. Since 1950, 62 flood events have been recorded in Sarasota County by the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information. The types of events recorded include coastal flood, flash flood, flood, heavy rain, hurricane, storm surge/tide, tropical depression, and tropical storm

The most vulnerable are structures are built before the City of Sarasota entered the NFIP in 1971 called pre-FIRM structures. The City of Sarasota has approximately 8,000 of these structures built prior to flood mapping or regulations.

REPETITIVE LOSS AREAS and HISTORICAL CLAIMS

The NFIP has paid over \$6.9 million in claims in the City of Sarasota. Of these paid losses, approximately \$6.3 million were for pre-FIRM structures, representing 534 claims while post-FIRM structures accounted for 47 claims totaling approximately \$467 thousand, illustrating the importance of maintaining accurate flood risk information and the benefits of the City of Sarasota floodplain management practices and regulations. Table 3-5 and Table 3-6 describe the policy and claim statistics for the City of Sarasota.

Table 3-5 PRE-FIRM Built before 7/31/1971

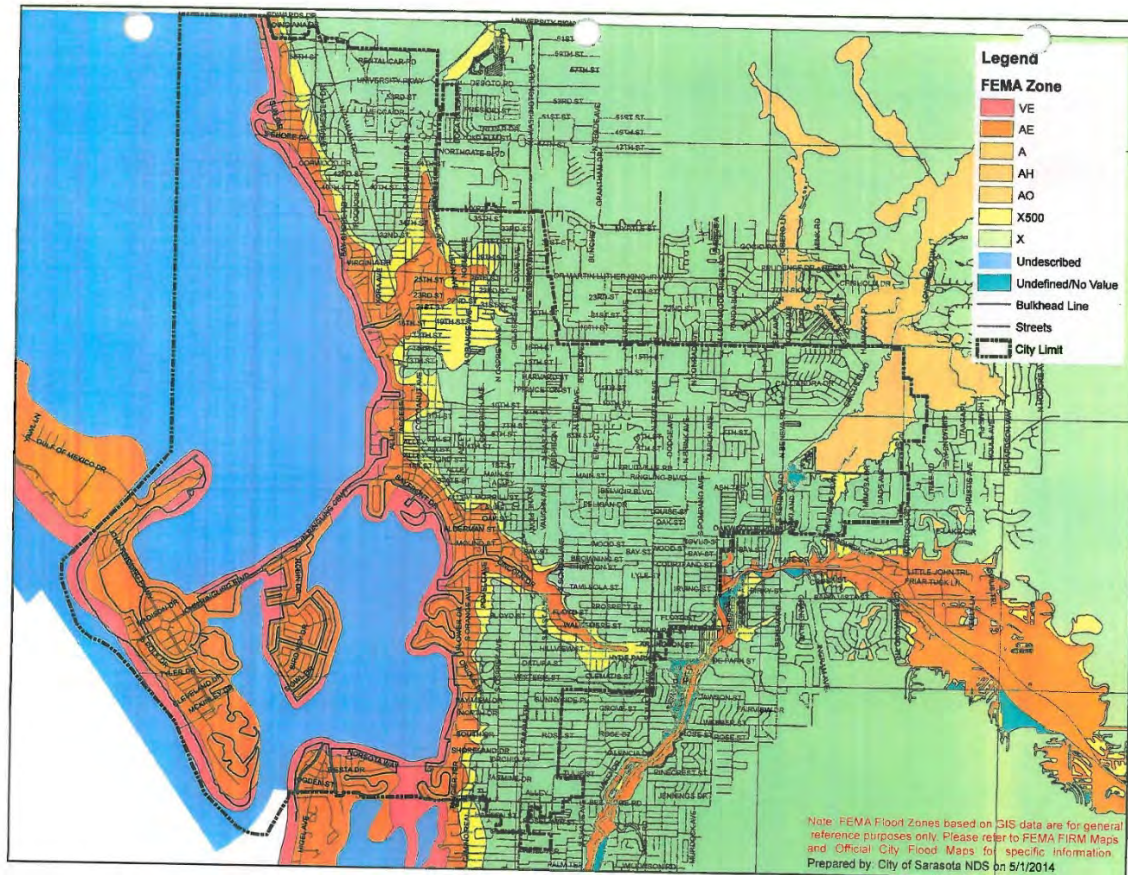
ZONE	POLICIES	NUMBER OF CLOSED PAID LOSSES	AMOUNT OF PAID LOSSES
A 01-30.AE	2,977	311	\$ 2,871,456.23
A	3	20	\$ 409,909.74
AO	0	0	\$ 0
AH	6	1	\$ 36,705.92
V 01-30, VE	151	52	\$ 751,131.24
B, C, X	825	29	\$ 123,073.50
STANDARD	79	59	\$ 560,274.09
PREFERRED	746	62	\$ 1,558,830.64
TOTALS	3,962	534	\$ 6,311,381.36
<i>FEMA as of 8/31/2019</i>			

Table 3-6 POST FIRM Built on or after 7/31/1971

ZONE	POLICIES	NUMBER OF CLOSED PAID LOSSES	AMOUNT OF PAID LOSSES
A 01-30.AE	3,160	7	\$ 27,695.14
A	0	2	\$ 27,940.97
AH	46	12	\$ 109,571.29
V 01-30, VE	44	1	\$ 1,635.26
D ZONE	0	2	\$ 13,487.60
B, C, X	884	23	\$ 286,551.02
STANDARD	253	20	\$ 201,365.75
PREFERRED	631	3	\$ 85,185.26
TOTALS	4,134	47	\$ 466,881.28
<i>FEMA as of 8/31/2019</i>			

FLOODPLAINS

The City's floodplains are identified on the map below and are defined by the "A" and "V" zones of the flood insurance rate maps of the Federal Emergency Management Agency (FEMA). "A" zone are areas subject to the 100-year flood hazard and "V" zones are subject to the 100-year flood hazard and associated wave action. The areas within the floodplains are largely developed and include residential, commercial, and recreational and community uses.



LESS FREQUENT FLOOD HAZARDS and OTHER TYPES of HAZARDS

This Section describes other, less frequent, hazards that may affect the City of Sarasota, including but not limited to:

Tornado

Tornados can destroy buildings, flip cars, and create deadly flying debris. They are violently rotating columns of air that extend from a thunderstorm to the ground.

- Can happen anytime and anywhere
- Bring intense winds, over 200 MPH
- Can occur with high wind and or rain events
- Warning time is minimal
- Look like funnels and sound like freight trains

King Tide

King Tides refer to the extreme high tides that occur when the moon is aligned with the earth and sun, and when it is closest to the earth in its orbit.

- King tides are the highest tides.
- They are naturally occurring, predictable events
- The king tides occur when the Earth, Moon and Sun are aligned at perigee and perihelion, resulting in the largest tidal range seen over the course of a year.

Lightening

- There is no safe place outside when thunderstorms are in the area.
- If you hear thunder, lightning is close enough to strike you.
- Just Remember, When Thunder Roars, Go Indoors.
- Florida has had the most reported lightning deaths in the U.S. since 2011

Coastal Erosion

- High winds, which can cause significant wave action and result in substantial erosion

Sea Level Rise

- The City of Sarasota uses NOAA's 2017 sea level rise projections, calibrated for the rate of change observed at the St. Petersburg tidal gauge.
- The Sarasota region has experienced 8 inches of sea level rise since 1944, when official federal records began for the Tampa Bay area.
- It is projected the Sarasota region will experience 1 – 1.5 feet of sea level rise by 2050.
- Sea level rise is a unique from other hazards as it is a slow moving even that is known to be occurring yet exact increases depend on complicated global variables.

Erosion of Structural Elements

- Failure can take several forms, including a collapse of or breach in the structure
- Prolonged periods of rainfall and flooding, which cause most failures.
- Inadequate spillway capacity, resulting in excess overtopping of the embankment.
- Internal erosion caused by embankment or foundation leakage or piping.
- Improper maintenance, including failure to remove trees, repair internal seepage problems, or maintain gates, valves, and other operational components.
- Improper design or use of improper construction materials.
- High winds, which can cause significant wave action and result in substantial erosion

Additional Hazards

Listed in the Sarasota County Unified Local Mitigation Strategy (LMS) that the City of Sarasota is a participant.

5. ASSESS THE PROBLEM

Many things can contribute to flooding, including hurricanes, tropical storms, sea level rise, and large rainfall events. A historical look at such storm events was discussed earlier in this document. There are more than 4,000 structures located in the floodplains within the City of Sarasota. It is estimated that more than 90 percent are residential (some are condominiums or apartments with multiple dwelling units in a single structure), with the remaining 5 to 10 percent being commercial or industrial. Some structures are subject to repeat flooding. The most current Repetitive Loss List data issued to the City of Sarasota by the Federal Emergency Management Agency is dated fall, 2018, which lists repetitive loss properties in the City based on losses from January 1, 1978. There are 73 properties located within the incorporated boundaries of the City of Sarasota. Repetitive loss properties are discussed in the Sarasota County Unified Local Mitigation Strategy (LMS), and a map of all repetitive loss properties in Sarasota County, including the City of Sarasota, can be found in Appendix G of the LMS. Nearly all the repetitive loss properties are residential structures.

Life Safety: Warnings and Evacuations

Hurricane vulnerability and the resulting flooding is a fact of life for local governments in coastal locations. Therefore, hurricane evacuation planning is both a necessity and major concern. Much of the City lies within the storm surge category areas used to define evacuation during storm events. The ability to safely evacuate during a natural disaster depends on strong disaster preparedness planning and requires the cooperation of all affected citizens.

In 2014, the City of Sarasota created its own Emergency Management Division within the Police Department which is responsible for developing and administering all-hazards preparedness planning through the City's Comprehensive Emergency Management Plan (CEMP). The City's Emergency Manager works closely with the Sarasota County Department of Emergency Management which is responsible for developing and administering hurricane preparedness planning for the entire Sarasota County area through the County's Comprehensive Emergency Management Plan (CEMP). These plans establish uniform policy that jurisdictions use to create specific procedures and guidelines during floods and other similar emergencies. The City of Sarasota coordinates its hurricane, flooding, and other emergency efforts with the Sarasota County Department of Emergency Management through our Emergency Operations Center to their Emergency Operations Center.

Prior to the arrival of a storm, the Public Safety Group determines which areas are to be evacuated. The Sarasota County Sheriff's Office is responsible for coordinating the evacuation of Sarasota County, with assistance from the City of Sarasota and its various departments, to execute the notification of citizens in the areas to be evacuated and the establishment and monitoring of evacuation routes. Sarasota County Emergency Management also supports the Sarasota County Sheriff and affected municipalities with resource requests and to make sure the public is informed.

The City of Sarasota maintains three Tactical First-In Teams whose primary mission is to clear routes to critical infrastructure within the City. These teams are assembled in advance of a storm (before wind speed reaches 45 mph) and is activated by City's Emergency Manager from the Emergency Operations Center. These teams are self-supporting and have the communications assets available to redeploy based on the current threat situation. Teams are

composed of members from the City of Sarasota Police Department, City of Sarasota Public Works Department, Verizon, Florida Power and Light (FPL), Sarasota County School Board Transportation, and Sarasota County Fire and Rescue. These teams conduct an annual drill.

Sarasota County partners with all municipalities to develop and maintain a “Local Mitigation Strategy” (LMS). The program’s purpose is to encourage local jurisdictions to minimize risks and costs associated with natural disasters by planning and pursuing preventive measures such as strengthening existing vulnerable structures, elevating vulnerable structures, modifying building codes as appropriate, implementing public awareness programs, and preparing emergency response plans. The program is coordinated through the Sarasota County Emergency Management Department. Sarasota County has a FEMA approved LMS as January 2016 and adopted by Resolution by Sarasota County and all municipalities, including the City of Sarasota.

The City of Sarasota and Sarasota County continue to partner and collaborate in order to add and maintain in technological systems that have increased the effectiveness in alerting the public throughout both of our jurisdictions to potential emergency situations and predicting where storm-related flooding is anticipated.

Emergency Alert System (EAS)

EAS is a national public warning system that requires broadcasters, cable television systems, wireless cable systems, satellite digital audio radio service (SDARS) providers, and direct broadcast satellite (DBS) providers to provide communications capability to the President to address the American public during a national emergency. The system may also be used by state and local authorities to deliver important emergency information, such as weather information targeted to specific areas. The City of Sarasota submits an event appropriate message through Sarasota County to the State Watch Office or National Weather Service to be disseminated via EAS.

Alert Sarasota County

In May of 2020, the City of Sarasota, Sarasota County, and the other municipalities within the county entered into a partnership with the Florida Division of Emergency Management for the creation of Alert Sarasota County an emergency telephone calling system hosted by Everbridge. This notification system is a geographical information system (GIS) based high-speed telephone communication service for emergency notifications. Telephone numbers are matched electronically to the associated addresses and the pre-recorded message with information about the incident and instructions for action to be taken is delivered to all phone numbers in the selected area. This system can also call a cell phone and/or deliver text messages, emails, or push information via the mobile app notification based upon user preference.

ARMS System

In August of 1998, Sarasota County’s Emergency Management Department completed installation of a virtual rain gauge. Linked to a satellite system, the virtual rain gauge provides a precise picture of how much rain will fall in a specific area. This system has been connected with four existing flood monitors on the Myakka River and the Sarasota County Drainage

Operation's network of 30± gauges that includes river flood gauges and salt-water tide gauges to give the Emergency Management Department the early warning capability to reduce losses caused by storm-related riverine flooding. The data is accessible via the Internet at <http://sarasota.wateratlas.usf.edu/datamapper/>.

Wireless Emergency Alerts (WEA)

WEA is a public safety system that allows customers who own certain wireless phone models and other enabled mobile devices to receive geographically targeted, text-like messages alerting them of imminent threats to safety in their area. The City of Sarasota submits an event appropriate message through Sarasota County to the State Watch Office or National Weather Service to be disseminated via WEA.

Door-to-Door

Based upon the particular weather hazard and unfolding situation, the Emergency Manager may direct the Police Department's Patrol Division to conduct a door-to-door/mobile public address to disseminate the warning information. The City is divided into 10 patrol zones and each Officer will proceed north to south and west to east direction within their patrol zone relaying the designated message to the citizens. Additional Officers from the Police Department's Emergency Response Team may be dispatched to the more vulnerable areas as needed. If additional resources are needed, the Emergency Manager may direct the Public Works Solid Waste Division to assist based upon their pickup day collection routes.

Global Positioning System (GPS)

A community Base Station receiver for the GPS is used by many Sarasota County agencies. This system develops data collection, conducts real time surveying, and vehicle location or Emergency Operations and Transit Operations.

800 MHz Trunk Radio System.

This county-wide interoperable radio communications system has expanded to over 4,000 units since its implementation in 1996. There are just over 1,000 mobile and 3,000 portable units in service. The ability for interagency communication, such as communication between school buses, sheriff patrol cars, City police cars, City public works vehicles, City utilities division vehicles, and emergency vehicles, greatly enhances public health and safety, especially during an emergency.

Hurricane Evacuation Study

The Southwest Florida Regional Planning Council, of which the City is a member, updated the *Hurricane Evacuation Study* as part of a statewide evacuation study, in 2010. The study includes evacuation information such as shelter listings, evacuation routes, and clearance times. It provides an updated Sea, Lake and Overland Surges from Hurricane (SLOSH) Model, produced in conjunction with the Atlantic Oceanic Meteorological Laboratory. The SLOSH Model includes inundation maps showing hurricane surge limits for Sarasota County, including the City of Sarasota, increasing the City and County's ability to warn residents in

high-risk areas. On September 14, 2020, the initial kick-off meeting was held by the Southwest Florida Regional Planning Council to update this plan.

Public Health

A flood can devastate residential homes, commercial property, environmentally sensitive lands, and other public infrastructure. However, during the flood and its aftermath, there are also threats to the community's health and safety. Although most attention is normally paid to the risk of physical property damage during and after a flood event, citizens must take precautions to lower the associated health risks. Health risks can be found in many forms, and are not limited to:

- Unsafe food
- Contaminated drinking and washing water
- Poor sanitation
- Domestic and wild animals
- Mosquito borne diseases
- Mold and mildew
- Carbon monoxide poisoning
- Structure electrical and natural gas
- Mental stress and fatigue

Restoring flooded properties is an overwhelming task, and everyone should be cognizant of the potential health risk and associated hazards. Residents should seek assistance from professional sources or their public safety officials.

Critical Facilities and Infrastructure

Critical facilities are defined as those structures from which essential services and functions for victim survival, continuation of public safety actions, and disaster recovery are performed. The City of Sarasota's Emergency Manager maintains an up-to-date contact list for all critical facilities within the jurisdiction. There are no special warnings or early notification requirements for these facilities for a non-tropical weather event. If the situation is a tropical event, all special warnings or early notifications of facilities will be coordinated by the following table:

Facility Jurisdiction	Coordination Entity
City of Sarasota	Logistics Section Facilities Unit
Sarasota County	Sarasota County Public Works Facilities Department (note- County Constitutional Officers facilities are owned and operated by Sarasota County Government)
Sarasota Schools	The School Board assigns a liaison officer to the Sarasota County Emergency Operations Center.
Sarasota Memorial Hospital	Sarasota Memorial Hospital is a public hospital jurisdiction which assigns a

	liaison officer to the Sarasota County Emergency Operations Center
Non-Government Schools	The School Board liaison officer will coordinate with all private schools
Florida Power & Light	Florida Power & Light assigns a representative to Sarasota County Emergency Management to staff Emergency Support Function 12, “Energy” to coordinate all activities
Non-Government Medical Facilities	The Sarasota County Health Department Staffs’ Emergency Support Function 8, “Health and Medical Services” and coordinates all activities

Community Economy and Major Employers

The City of Sarasota is an internationally recognized destination known for its arts and cultural excellence, exceptional healthcare facilities, premier educational institutions, diverse recreational opportunities, and the vibrancy of its downtown. Sarasota’s economy is driven by education, arts, tourism, and financial services. Major Private Employers include Publix, Pines of Sarasota, Ringling College of Art and Design, Sarasota Family YMCA, and Mote Marine Laboratory & Aquarium. Major Public Employers include Sarasota County Government, School Board of Sarasota County, Sarasota Memorial Hospital, City of Sarasota, and the John and Mable Ringling Museum.

Natural and Beneficial Functions within the Floodplain

Wetlands

A wetland is defined in 373.019(27), Florida Statutes as “areas that are inundated or saturated by surface or groundwater at a frequency and a duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils. Unlike Sarasota County and some other areas of the state, the City is essentially urbanized and developed. Therefore, wetlands are not as abundant in the City. However, it is important that the City protect wetlands and the natural function of wetlands through coordination with the private sector, other units of government and the Sarasota Bay National Estuary Program (SBNEP).

Beach and Dune Systems

The City’s beaches protect upland infrastructure and buildings and provide critical habitat for many species including sea turtles and birds. In addition to being a significant natural resource, the beaches are also an important recreational facility for residents and tourists, which is essential to the area’s economy. The beach runs the entire three (3) miles of Lido Key with a dune system along most of this length. There are over 500 parking spaces within walking distance of Lido Beach. A need for additional parking has not been identified. The Gulf side of Lido Key has experienced severe erosion at various times, in which portions of

the beach did not exceed 10-feet in width, and the City works with the Army Corps of Engineers and Florida Department of Environmental Protection to protect the beach. In 2015, the City completed a 1.8-mile stabilization project for Lido Beach which replaced sand that was lost due to Tropical Storm Debby in 2012. The Post-Tropical Storm Debby Lido Beach Re-nourishment Project added 197,000 cubic yards along the 1.8 miles of Lido Beach from the Lido pool to Ted Sperling Park. The project added approximately 85 feet width of beachfront along the affected areas. If it had not been corrected, it would have had a significant negative impact on the economy of the City and Sarasota County. To mend damage from subsequent storm events, in July 2020 the City began construction on the Lido Beach Hurricane and Shoreline and Damage Reduction Project. The project should be completed May 2021 to add 710,000 cubic yards of sand to the beach. Future re-nourishment will occur every 3 to 5 years depending on the extent and urgency of the re-nourishment needed.

Beaches are dynamic systems that constantly shift in response to wave action, tides, and winds. Dune systems buffer upland property and provide support to numerous plant and animal species. Development along beach systems and inlets interrupt the natural movement of the sand. Shoreline hardening structures may protect the beach areas on which they were built, but beach areas near these structures generally experience scouring of beachfronts. For this reason, the City and the State regulate shoreline hardening.

Beaches also provide habitat for sea turtles with nesting season running from May through October on the Gulf coast. Sea turtles are protected by both the Federal Endangered Species Act and the Florida Marine Protection Act. It is illegal to touch or disturb nesting sea turtles, hatchlings, or their nests.

Lido Key is the only active beach/dune system within the City limits. According to the 1984 Southwest Florida Ecological Characterization Atlas, U.S. Department of the Interior, the northern half of Lido Key experiences erosion at the rate of one foot per year and is known to be unstable. The southern half of Lido Key generally experiences build-up but also encounters severe erosion at times. This data is based on the regression of the mean highwater line expressed in feet/year and was calculated by periodically reviewing shorelines using aerial photography or U.S. Army Corps of Engineers high-water-shoreline-change charts. The measurements are of limited use, however, because they can indicate considerable regression while no net sand loss occurred.

Mangroves

Mangroves occur along extensive portions of the shoreline of Sarasota Bay. Two species with specialized root systems grow in the intertidal environment, and two more species grow near the shore at higher elevations. Well-established mangrove forests can protect shorelines during episodes of erosion, and buffer uplands from storm surges. They filter upland pollutants, and in doing so serve as valuable nutrient stores and sources. The Florida Department of Environmental Protection issues permits for trimming or removing mangroves.

The protection of mangroves shall comply with the Mangrove Trimming and Preservation Act, Sections 403.9321 through 403.9333, Florida Statutes.

Tree Protection

In 1989, the City adopted a Tree Protection Ordinance providing protection for trees of four and one-half inches in diameter or larger, palms with greater than 8 feet of clear trunk and all species of mangroves. A permit is required for removal of these trees. Removal is allowed only when a tree creates a safety hazard, utility problem, prevents reasonable access, is dead or diseased, or prevents the reasonable development of property. In addition, the regulations provide protection for trees during construction.

Development, Redevelopment and Population Trends

The City of Sarasota is essentially built-out, meaning there are no large vacant tracts of land such as those found in Sarasota County outside of the City. Therefore, the City population is not expected to grow rapidly because of new development. During the past 15 years, a great amount of redevelopment has occurred in the central core of the City's downtown. Large condominium buildings have replaced older and, in most cases, smaller structures. This redevelopment has increased the downtown's population and this trend is expected to continue in the future. Additionally, increases in the City population could result from annexation of areas of unincorporated Sarasota County. It should be noted that any annexed lands are likely to already be developed; therefore the population increase resulting from annexation will not be from new development, but rather a "transfer" of the status of the people as residents of unincorporated Sarasota County to residents within the limits of the City of Sarasota.

Much of the development that has been occurring in the City in recent years and is projected to occur in the future, consists of the razing of existing buildings and the construction of new ones. This has been particularly true with waterfront properties and those located near the water, such as on Bird Key, Lido Key, and elsewhere along Sarasota Bay and the Gulf of Mexico in "A" and "V" flood zones. Many homes have been purchased for the purpose of being razed and a new home being built. Many of the homes being demolished were built prior to any requirement to elevate structures or meet any flood prevention regulations. The new homes being constructed have to meet all flood development regulations such as the first finished floor being elevated to a certain level, requiring hydrostatic flow-through openings in walls, breakaway walls if located in a "V" flood zone, and locating equipment such as water heaters, air handlers, etc. above the design flood elevation. Being constructed to meet all these standards should result in less flood damage to these structures as compared to the ones they replaced. In addition to meeting requirements to develop in an "A" or "V" flood zone, new homes and other buildings being constructed also must comply with the latest building code requirements regarding elevation, wind, and hurricanes.

Economic Impact on Future Flooding

The amount of economic impact by flooding and its duration depends on the severity of the storm event. A storm event with heavy rain and little wind may only result in flooding in a limited area of the City and would have relatively little long-term economic impact. Conversely, torrential rains, along with high winds and storm surge associated with a Category 4 or 5 hurricane could result in citywide damage and mid to short-term financial impacts. Based on the assumption of a catastrophic storm, property tax revenue would decline severely in the year following such a storm. The return of property tax revenues to pre-storm

levels would depend on how quickly structures are rebuilt. The City reserve funds would need to be drawn upon to pay for damages to City property, rent temporary office space, and replace lost revenues. Franchise and Excise fees from electric, natural gas and communication fees would drop until such time as the damaged areas are rebuilt and these services restored. However, at the same time the subsequent receipt of disaster assistance, clean-up and recovery activity, and the production of replacement capital will serve to act as a counterweight to some losses. Also, the City's loss of property is insured and payments to reimburse the City will be forthcoming. Building permit revenues, which are not included in the General Fund, would soar in the months following such a storm as insurance claims are settled and property owners begin the process of rebuilding structures. The sales tax revenue generated from purchases of supplies and replacement goods (e.g. lumber, plumbing fixtures, furniture, appliances, electronics) may offset in part the loss of sales tax revenue from a drop in tourism and visitors to the City due to the storm. Another economic factor to consider is the fact that studies have shown the employment in Florida drops between 1% - 1.5% in response to hurricanes as well as residents leaving the City temporarily.

6. FLOODPLAIN PROGRAM GOALS

- Increase public awareness of known flood hazard areas, availability of flood insurance, and flood protection methods.
- Increase publicly owned natural areas within flood prone areas.
- Provide adequate warning to residents of storm events, impending floods, and other natural disasters.
- Protect environmentally sensitive lands from development.
- Eliminate or reduce stormwater system levels of service deficiencies in the 12 drainage basins located in the City.
- Prevent increased water runoff from new development, which could result in increased flood flows.

7. REVIEW OF CURENT ACTIVITIES

Preventative

Engineering Design Criteria Manual

The City's "Engineering Design Criteria Manual" addresses stormwater attenuation requirements for all new subdivisions and other multi-family developments within the City limits. Attenuation is a design principle whereby additional stormwater run-off created by development is controlled so that it does not increase the probability of flooding either upstream or downstream property owners. Adequate retention areas and controls are engineered so that the rate of discharge into the receiving body is not increased. Run-off reduction enhances the ability of precipitation that falls on land surfaces to be absorbed by the soil (infiltration), thus recharging the groundwater supplies. All information to be based on the datum used by the effective Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) received from FEMA at time of submittal.

Stormwater Environmental Utility

In 1989 the City and Sarasota County Government entered into an interlocal agreement creating a "Stormwater Environmental Utility" to comply with the National Pollutant Discharge Elimination System (NPDES) regulations for the management of municipal stormwater. Sarasota County as the lead agency and the City as a co-permittee for this endeavor received one of the first such permits issued. The Utility's responsibilities include administration, basin planning, operations, maintenance, repair, and capital improvements to the stormwater system.

Beach and Dune Maintenance

In January 1990, the City Commission authorized the preparation of the Lido Beach Long-Range Beach Management and Erosion Control Plan. As part of that plan, an analysis was made of the littoral processes affecting the key. This included researching and summarizing the range of wind and wave conditions and the effects of the seven major extra tropical storms, which had affected the area since the 1920's. A sediment budget (inventory of sand gains and losses) was developed to examine sources of sand, and transport rates and directions. Littoral drift rates (the rate at which sand moves along the coast) along Lido Key were estimated by studying the rates that sand builds up at Sarasota County inlets and passes. Various authors based on shoaling/dredging records at the passes have inferred net rates of 28,000 to 50,000 cubic yards per year. This data was used to calibrate a computer model for calculation of sediment transport, which was then used in subsequent analyses. The effects of wave transformation by the ebb shoals of the passes were also considered and the model results were compared with historical shoreline changes identified from previous surveys. The final sediment budget confirmed the existence of a "nodal point" around the public beach in the center of Lido Key. The significance of this is that sand transport patterns indicate erosional losses in both directions (north and south) from the public beach. According to the City Engineer, in 2015 the southern portion of Lido accretes sand while the north portion remains stable.

The Lido Beach Long-Range Beach Management and Erosion Control Plan, completed in January of 1991, recommended an initial beach re-nourishment of 350,000 cubic yards with subsequent re-nourishments of 200,000 cubic yards approximately every four years, all placed along approximately one mile of publicly accessible beach on central Lido Key. The initial beach fill width of approximately 155-feet (with a gradual taper extending over the southern 1400 feet) resulted in a 75-foot design beach width to be maintained for a 50-year period. This work was to be in addition to and alternating with the fill placed by the U.S. Army Corps of Engineers (USACE) via their New Pass channel maintenance project every four years. This alternating and periodic re-nourishment process is necessary because of the designed, sacrificial loss of sand, due to natural effects. The City Commission approved the Plan, after several public hearings and great support from the citizens. The City Commission authorized the multitude of necessary studies for the design of the initial project in August of 1991. The City applied for a State grant for construction of the Long-Range Plan's initial fill through the Florida Beach Erosion Control Program for fiscal year 1997-98. The 1997 State Legislature recommended funding of the project to the Governor in the amount of 15 percent. The project was constructed in April 1998.

New Pass at the north end of Lido Key was dredged in 1982 and 1990-91 and the spoil used in a beach re-nourishment project along Lido Key and Longboat Key. The U.S. Army Corps of Engineers dredged new Pass in the summer of 1997 and approximately 160,000 cubic yards of spoil was deposited on Lido Key along the beach from John Ringling Boulevard, southward. Another 160,000 cubic yards of spoil was placed on Longboat Key, north of the channel. Dredge disposal sites are discussed below.

The southern third of Lido Key experienced severe erosion during the first half of 1998 and the September 1998 storms. Condominium owners and resort owners became well organized and requested help from the City of Sarasota. On March 2, 1998, the City Commission approved an Agreement for Engineering Services with Coastal Planning and Engineering, Inc. (CPE) to accomplish the engineering and permitting, including the sand search. A sand source was identified by CPE about eight miles offshore, directly west of Lido Beach.

To protect the shoreline and back dunes on Lido Beach, Sarasota County has constructed wooden dune crossovers to the beaches to allow the back dunes a chance to develop a vegetative cover. A dune cross over is essentially a footbridge so pedestrians will not walk on and damage dune vegetation. Natural forces destroyed several dune crossovers in the last few years. They have been or will be replaced with "at-grade" access points and the new dune will be revegetated.

As they did for the 1998 Lido Beach Restoration Project, the Florida Department of Environmental Protection (FDEP) required the establishment of an "Erosion Control Line" (ECL) for this project. The City Commission approved the ECL on 4 December 2000 and the document was recorded with the County Clerk on 17 January 2001. Drawings showing the exact location of the adopted ECL are in our office for public review.

During March and April of 2001, Weeks Marine placed approximately 360,000 cubic yards of sand on the southern half of Lido Beach, a distance of 1.3 miles. The sand source was about 8 miles west of Lido Beach, under 35 feet of water. The total cost of this project was \$4.18 million.

The USACE had New Pass dredged again in 2003. Goodloe Marine, Inc. started dredging New Pass and placing some sand on Lido Beach on December 15, 2002. At the recommendation of City Engineer and CPE, on April 15, 2002, the City Commission approved the plan to place the “white” sand on the entire southern two-thirds of the island, as a two-foot thick layer, approximately one hundred feet wide. Goodloe completed the Lido Beach portion on February 1, 2003, placing approximately 125,000 cubic yards and continued dredging New Pass and placing the other half on Longboat Key’s beach. The New Pass maintenance program currently reached its cap for federal funding.

On December 22, 2004, the Chief of Engineers of the USACE signed the “Feasibility Study for Hurricane and Storm Damage Reduction for Lido Key” culminating the 3-year study by the USACE. The following steps in order of needed action were completed:

1. Office of Management and Budget (OMB) clears Feasibility Study and submits to Congress.
2. Congress authorizes increased project cost via the next Water Resources Development Act (WRDA) bill.
3. Authorization to proceed under authority of Section 206 approved by Assistant Secretary of the Army.
4. USACE prepares, City executes and USACE executes Project Cooperation Agreement (PCA).
5. Congress authorizes construction financing.

In addition to the long-range Lido Beach project, the “FEMA” project was completed in early 2009. The agreement for the design of Lido Beach for the next 50 years was approved by the City Commission in August of 2006 and is presently underway by the USACOE.

In January 2005, Sarasota County awarded a contract to a coastal engineering firm to prepare inlet management studies for both New Pass and Big Sarasota Pass.

In June 2012, Tropical Storm Debby produced severe erosion on Lido Beach. Receiving funding from the FEMA, FDEP, and the Tourist Development Tax, in 2015 the Post-Tropical Storm Debby Lido Beach Re-nourishment project added 197,000 cubic yards of sand from New Pass to Lido Beach. CB&I (formerly CPE) was hired as the coastal engineering consultant, and Orion Marine Group was hired as the contractor. The total cost of the project was approximately \$3.6 million.

In July 2020, the City began construction on the Lido Beach Hurricane and Shoreline Damage Reduction project. The project will re-nourish Lido Beach with 710,000 cubic yards of sand carried from the Gulf of Mexico and recycle it back onto the beach. Subsequent to the beach re-nourishment, the project will also construct new beach groins to absorb wave action and slow natural beach erosion. The project is expected to be completed by May 2021. This re-nourishment will be the first project completed under the long-term agreement with the U.S. Army Corps of Engineers. Future re-nourishments will occur about once every 5 years or as needed depending on the severity of erosion and threat to nearby infrastructure.

The City continues to receive grant funds from Sarasota County's Tourist Development Tax fund and from the Florida Department of Environmental Protection's Beach Erosion Control Program.

Coastal Construction Control Line

The State of Florida addresses coastal development in Chapter 161.053, Florida Statutes, which is administered by the Florida Department of Environmental Protection (FDEP), Rule 62B-33, Florida Administration Code. The statute establishes a Coastal Construction Control Line (CCCL) defined as that portion of the beach-dune system which is subject to severe fluctuations based on the 100-year storm surge, storm waves, or other predictable weather conditions. Development seaward of the line is subject to FDEP review to ensure that coastal construction minimizes the adverse impacts to beach-dune systems and adjacent property and is designed to meet hurricane resistance building standards. Chapter 162.053, F.S., also establishes the 30-year erosion projection line, which is the projected location of the seasonal highwater line on subject property 30 years following submittal of an application for a permit. No major structures are eligible to receive a permit seaward of the 30-year erosion projection line except single-family dwellings meeting specific site requirements.

In 1989 the Florida Department of Environmental Protection relocated the Coastal Construction Control line (CCCL) further inland in Sarasota County in response to general erosion trends. Development seaward of the CCCL is required to meet more stringent construction standards to help protect development in highly dynamic areas.

Development in the coastal area is generally subject to more stringent regulation than other areas in order to minimize the risk to life and property if a disaster were to occur. The City is bound by regulation at the federal, state, and local levels that provide mitigation measures for coastal development.

City of Sarasota Regulation of Development in Special Flood Hazard Areas

Within the City of Sarasota, development in the coastal areas as well as all Special Flood Hazard Areas, is regulated by the Florida Building Code (FBC), Chapter 16, the Florida Building Code Residential (FBCR) Chapter 3, and the American Society of Civil Engineers–ASCE-24-Standard as referenced by the Florida Building Code (FBC) and the Florida Building Code Residential (FBCR).

In addition, the City of Sarasota has a Floodplain Management Ordinance 16-5188 adopted September 19, 2016 that amended Ordinance 15-1520 adopted May 4, 2015 which has procedures and criteria for development in Special Flood Hazard Areas. These areas are defined on the flood insurance rate maps of Federal Emergency Management Agency and include all V and A zones of these maps.

The purpose of these regulations is to minimize public and private losses due to flood conditions in the Special Flood Hazard Areas. Below are some examples of how the regulations in the aforementioned documents help to minimize flood losses:

- Restrict or prohibit uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities.
- Require that uses vulnerable to floods, including facilities which serve such uses, be protected against potential flood damage at the time of initial construction.

- Control the alteration of natural floodplains, stream channels and natural protective barriers which are involved in the accommodation of floodwaters.
- Control filling, grading, dredging and other development which may increase erosion or flood damage.
- Prevent or regulate the construction of flood barriers which will unnaturally divert Floodwaters, or which may increase flood hazards to other lands.

Regulation of Moderate to Low Risk Areas (Zone X Shaded and Unshaded)

Section VI-105 of the Zoning Code establishes minimum building finished floor elevation requirements. For most buildings, the minimum finished floor Elevation must be 24 inches above the average elevation of the crown of the road.

Sec. VI-105. - Establishment of minimum building finished floor elevations.

For buildings, including manufactured homes and mobile homes, with a front yard setback of ten feet or more:

- (1)The minimum finished floor elevation for the first floor shall be as provided in subsection a. below, or the highest elevation produced by any of the measurements provided for under subsections b., c. or d. below, as determined by the city engineer.
 - a. A minimum of 24 inches above the average elevation of the crown of a dedicated public street abutting a front yard, as established by the city engineer;
 - b. A minimum of 24 inches or more above the average elevation of the crowns of two or more dedicated public streets that determine the drainage pattern of the area, as established by the city engineer;
 - c. A minimum of 24 inches or more above the crown of a street that has not been dedicated as a public street where the elevation of the street has been approved by the city engineer for drainage purposes; or
 - d. Not less than five feet above mean sea level for the location of the proposed construction, as determined by reference to the datum established by the United States Coast and Geodetic Survey.

Property Protection

Sarasota County acts as the local sponsor on behalf of the repetitive flood loss property owners in the Flood Mitigation Assistance grant program. City of Sarasota property owners are eligible to participate in this program. This mitigation program is offered by the Federal Emergency Management Agency (FEMA) and administered by the Florida Division of Emergency Management (FDEM). The program provides grant reimbursements up to 75 percent of the approved project cost for flood proofing projects including building elevation, relocation, acquisition, dry flood proofing, and minor localized flood control structural projects and minor beach nourishment activities. Sarasota County has participated in this grant application program since it was first offered in 1997.

Development Services Department provides property owners with flood insurance information, Flood Insurance Rate Map (FIRM) information, and information on flood proofing. These activities are discussed below under “Public Information Activities.”

Natural Resource Protection

Beach Nourishment

Beach nourishment along the City’s beaches is discussed earlier in this document under “Beach and Dune Maintenance” in the “Preventative” section of current activities.

Tree Protection Ordinance

As discussed earlier in this document, well-established mangrove forests can protect shorelines from occasional episodes of erosion, and buffer uplands from storm surges.

To protect mangroves and other trees, in 1989 the City adopted a Tree Protection Ordinance NO. 16-5173 amended in 2016 providing protection for trees of four and one-half inches in diameter or larger, palms with greater than 8 feet of clear trunk and all species of mangroves. A permit is required for removal of these trees. Removal is allowed only when a tree meets certain criteria. In addition, the regulations provide protection for trees during construction.

The protection of mangroves shall comply with the Mangrove Trimming and Preservation Act, Sections 403.9321 through 403.93333, Florida Statutes.

Emergency Services

Prior to May 2014, the City of Sarasota relied upon Sarasota County Emergency Management to coordinate much of their disaster preparedness, response, and recovery activities through planning documents such as the Hurricane Evacuation Study 2010 and the County’s Comprehensive Emergency Management Plan. The County’s plans were reviewed amongst the various City Department Directors in order for them to plan their respective department’s roles in a County-wide disaster event.

In May 2014, the City of Sarasota created an Emergency Manager position within the Sarasota Police Department to focus on the direct needs of the City and to coordinate activities prior to, during, and after a disaster with Sarasota County. While the position continues to expand, the primary duties of the position are:

- Serves as the City’s Incident Commander during a “State of Emergency”.
- Serves as Chair of the Floodplain Management Committee.
- Serves on the Sarasota County Local Mitigation Strategy Work Group.
- Responsible for all emergency related planning activities.
- Responsible for all emergency management training activities.
- Maintains the City’s Emergency Operation Center.

- Coordinates emergency response and recovery activities with surrounding jurisdictions and agencies.

The creation of this position enables the City to respond to the needs of our residents more effectively and efficiently during a disaster and the damage that may follow.

Structural Projects

Shoreline Protection Structures

There are approximately 40 miles of coastal shorelines within the corporate boundaries of the City of Sarasota. Of these 40 miles, approximately 8 miles are in a natural state and 32 miles have been altered by some type of man-made structure. The City regulates shoreline hardening through the Zoning Code.

Stormwater Infrastructure

In 1998 the City of Sarasota and Sarasota County entered an interlocal agreement whereby all stormwater management services are consolidated under the control of Sarasota County. Current, future, and maintenance needs are identified in various master plan studies, such as replacement of aging pipes, upgrades to under capacity systems, and provide outfall to landlocked basins. Additional, up-to-date information on water quality and stormwater master plans can be found at the following website: <http://www.sarasota.wateratlas.usf.edu/>.

Public Information Activities

Informational Flyers, Articles, and Internet Site

The City of Sarasota provides information to the public about flooding. Annually, an informational flyer is included in water utility bills which discuss flood hazard areas, flood warnings, flood safety, flood insurance, property protection measures, floodplain development permit requirements, and other helpful information.

Information flyers concerning preparedness, response, and recovering from flooding events and evacuation information may be found in the following locations, Sarasota Police Department Headquarters, City Hall, and the Utility Bill Pay Center. Additional information is also available in the Building Department regarding development requirements in the various flood zones, and the regulations concerning the remodeling or improvement of structures which do not meet the minimum finished floor requirements because they were built prior to such regulations.

The City of Sarasota maintains a web site accessible via the Internet. A link for flood information and safety is available on the City of Sarasota home page at www.SarasotaFL.gov. Links are also provided to connect visitors to other web sites which provide flood information.

Flood Insurance Rate Maps

The FEMA Flood Insurance Rate Maps (FIRM) are available in the Development Services Department. The boundaries of the flood zones on these maps have been placed on the quarter-section maps of the City, enabling property owners, residents, developers, and insurance agents to determine what flood zone a specific property is located in. They can view the maps in person or, as many insurance agents do, call, and ask Zoning Department staff for the information.

The City of Sarasota participated with the Southwest Florida Water Management District (SWFWMD), Sarasota County, and other jurisdictions in Sarasota County in the updating of the Flood Insurance Rate Maps from paper to digital. Effective November 4, 2016 the FIRM maps are digital based on the NAVD 1988 datum.

Jurisdictions within Sarasota County also utilize the Local Mitigation Strategy Work Group to address, assist, and collaborate with one another on regulations and the flood map updates.

Flood Protection Assistance

The City of Sarasota Development Services Department provides information on required minimum floor elevations, data on historical flooding in the City, and other information relating to flood threats in the City. They can also provide the names of licensed and registered contractors, and information as to the appeal process should someone be dissatisfied with a contractor's performance. The Building Division staff are available to make site visits to advise of appropriate flood protection measures for both new and existing buildings and can lend assistance in reviewing retrofitting plans for existing structures.

The following Sarasota City Plan Action Strategies pertain to one or more of the six previous activity categories:

The following action strategies are from the Utilities Chapter of the Sarasota City Plan:

- 1.7 **Stormwater Drainage:** The City shall require development to provide facilities for stormwater drainage in accordance with the Engineering Design Criteria Manual and in accordance with the requirements of Florida Administrative Code, Chapter 62-25.
- 1.8 **Stormwater Drainage Level-of-Service:** The stormwater drainage system shall provide adequate capacity to maintain level-of-service C (Street and Yard Flooding only) using a 25-year/24-hour design storm.
- 1.9 **Sarasota County Storm Water Fee Proceeds:** Proceeds from the Sarasota County Storm Water Utility fees shall be used for maintenance, planning, elimination of structure flooding, and the reduction of pollutants carried by stormwater runoff into Sarasota Bay.
- 1.10 **Drainage System Improvements:** The City shall work with the Sarasota County Stormwater Environmental Utility or develop and fund its own stormwater utility to:

- Complete Basin Master Plans,
 - Evaluate the recommended improvement to the drainage System to correct existing deficiencies as identified in each Basin Master Plan, and
 - As the funds are available will consider implementing the improvements.
- 1.11 **Development:** Development shall be subject to the availability of adequate levels of service for potable water, sanitary sewer, solid waste, and drainage, pursuant to the relevant action strategies of the Capital Improvements Chapter. The design and function of utility infrastructure shall be in compliance with the requirements of the City's Engineering Design Criteria Manual (EDCM).
- 2.2 **Environmental Protection from Stormwater Runoff:** The quality and quantity of storm water runoff shall be regulated in accordance with:
- Chapter 17-25 Florida Administrative Code;
 - Environmental Resource Permitting of Surface Water Management Systems, administered by the Southwest Florida Water Management District, (Chapters 40D-4, 40D-40, 40D-45, and 40D-400 Florida Administrative Code);
 - National Pollutant Discharge Elimination Permit No. FLS000004; and
 - The City's Engineering Design Criteria Manual (EDCM), Chapter 29.5, Ordinance 89-3278, to protect the quality of receiving water bodies. The EDCM will continue to require that any new development not be allowed to shed storm water at a higher rate onto adjacent right-of-way or property than was discharged from the site in its prior existing state.
- 2.6 **Permeable Surfaces:** The Engineering Department shall explore the use of permeable surfaces as an alternative to impervious pavement surfaces to minimize runoff.
- 3.3 **Stormwater Management:** The City will explore alternatives to balance redevelopment efforts and site-specific stormwater management requirements.
- 3.4 **Regional Stormwater Management:** In recognition of the desires to improve watershed management while promoting continued urban development and redevelopment, the City shall investigate the feasibility of utilizing aggregate and/or regional stormwater management facilities.

The following action strategies are from the Environmental Protection and Coastal Islands Chapter of the Sarasota City Plan:

1.3 **Specific Natural Resource Protection Initiatives - Water**

In addition to regulations listed in this action strategy, the City will continue to support and comply with all applicable county, state, and federal laws to protect water.

Stormwater Runoff: The quality and quantity of storm water runoff shall continue to be regulated in accordance with the ECDM to protect the quality of receiving water bodies by emulating natural hydrologic conditions.

- 1.4 **Specific Natural Resource Protection Initiatives – Wetlands:** The City will continue to support and comply with applicable regulations which protect wetlands. The applicable regulations shall include, but not be limited to, the most recently adopted and applicable documents, as may be amended, listed in Action Strategy 1.1 of this Environmental Protection Plan; Chapter 373, Florida Statutes; and Chapters 62-4, 62-40, 62-302, 62-340, and 62-342, Florida Administrative Code.
- 3.6 **Impervious Surface Area:** The City shall continue to explore reducing the amount of existing impervious surface in the Sarasota Bay watershed and seek alternatives for reducing impervious surface area in future development.
- 3.8 **Impervious Surface on Coastal Islands:** The City shall further evaluate the reduction of impervious surfaces for sites located on the coastal islands. Impervious surfaces shall be minimized to the maximum extent feasible, especially for parking surfaces.
- 4.1 **Development and Evacuation:** The City shall ensure that future development within the Coastal High Hazard Area does not occur in amounts, types, or locations that would cause total evacuation time to exceed those established by the City's Emergency Operations Plan that is: they shall not exceed more than 16 hours.
- 4.2 **Storm Damage Minimization:** The potential for storm damage shall be minimized through compliance with applicable Land Development Regulations. In general, these regulations should ensure that proposed changes will not endanger the stability of the beach-dune system; will not accelerate erosion; and will be consistent with the Florida Department of Environmental Protection regulations.
- 4.3 **Federal Emergency Management Act (FEMA):** The City will continue to participate in the Federal Emergency Management Act Community Rating Systems (CRS) Program, which involves meeting higher than minimum FEMA standards. The CRS program includes but is not limited to:
 - the City's adopted flood plain management program which deals with strategies to lessen flooding and respond to emergencies; and
 - annual reports to the CRS Program on the City's progress, and effects of any storms.
- 4.5 **Emergency Operations Plan:** The City shall employ the hazard mitigation annex of The Emergency Operations Plan, for purpose of coordinating all preparedness, response, recover and mitigation activities which includes, but is not limited to:
 - assigning responsibilities and establishing procedures for governmental agencies, volunteer agencies, and individuals, in preparing for and executing evacuation of designated areas of Sarasota;

- relocation of coastal residents, residents of mobile home parks, and residents of low-lying areas subject to flooding; and
 - providing maximum warning time possible to residents of those areas which are deemed to be in danger.
- 4.6 **Coastal Property Acquisition:** The City will consider measures, including the acquisition of coastal property subject to frequent damage during natural disasters, to future disasters.
- 4.7 **Post-Disaster Redevelopment Plan:** Immediately following each major disaster, the City shall evaluate the Damage Assessment Team and Damage Survey Team reports (as required by the Peacetime Emergency Plan) and develop a specific post-disaster redevelopment plan in coordination with the Sarasota County Department of Emergency Management. The intent of the post-disaster redevelopment plan will be to repair damaged infrastructure needed for health and safety; to coordinate long term recovery operations to City infrastructure and public structures; and aid the City's economy to return to pre-disaster competitive status. The plan will include funding and staffing estimates, set priorities for post-disaster efforts, and develop criteria for deciding the order of importance in which the elements of the City's economy are to be aided.
- 4.8 **Public Fund Expenditures in Coastal High Hazard Area:** Prior to locating new public facilities or public infrastructure in the coastal high hazard area (CHHA), alternative locations outside of the CHHA shall be explored and evaluated. The expenditure of public funds on infrastructure in the CHHA shall be limited to:
- New public facilities and public infrastructure which cannot feasibly be located outside of the CHHA;
 - Restoration, maintenance, enhancement, relocation, mitigation, or replacement of;
 - ◊ Natural resources;
 - ◊ Passive recreation facilities;
 - ◊ Facilities and uses which further the land uses on the Future Land Use Map;
 - ◊ Facilities necessary to ensure the health, safety, and welfare of the public or sustain the financial integrity of the City. Examples of such facilities include, but are not limited to: Police stations, fire stations, medical facilities, bridges, roads, public rest rooms, performing arts centers, and auditoriums.
- 4.10 **Minimizing the Risks of Natural Disasters:** The City will coordinate with Sarasota County in the development of a Local Mitigation Strategy (LMS) as outlined by the Florida Department of Community Affairs, for the purpose of minimizing the risks of natural disasters. The LMS will include an assessment of vulnerabilities to natural disasters and mitigate initiatives to minimize risks. Mitigation initiatives include:
- Acquisition of hazard prone/repetitive loss property and conversion to open space,
 - Retrofitting existing buildings and facilities,
 - Elevation of flood prone/repetitive loss structures,
 - Vegetative management and soil stabilization,

- Infrastructure protection measures,
 - Stormwater management,
 - Minor structural flood control projects,
 - Post-disaster code enforcement activities,
 - Education, and
 - Dissemination of grant opportunities.
- 4.11 **Re-nourishment of the City's Beaches:** The City shall continue its program of periodic beach re-nourishment to protect upland property and to support the economic benefits of tourism. The City shall pursue grants and other funding sources to assist in the re-nourishment of the City's beaches for the protection of public and private property.
- 4.12 **Passive Recreation:** The City encourages that recreational activities on and adjacent to beaches minimize impacts to natural resources and the environment.
- 4.13 **Coastal Construction Control Line:** The City shall not issue permits for structures seaward of the Coastal Construction Control Line (CCCL) that do not have the appropriate permit(s) issued by the Florida Department of Environmental Protection unless the structure is exempt from the requirements of Chapter 62B-33, Florida Administrative Code. Construction activities seaward of the CCCL shall be consistent with Chapter 161, Florida Statutes.
- 5.1 **Evacuation:** The City shall cooperate with Sarasota County through the Emergency Operations Plan to:
- ensure orderly evacuation of the designated coastal high hazard areas, flood prone areas, and mobile homes in the event of a natural disaster consistent with evacuation orders issued by the County;
 - reduce evacuation times in conjunction with the Sarasota County comprehensive plan;
 - increase the amount of shelter space available; and
 - periodically review the Emergency Operations Plan.
- 5.2 **Law Enforcement After Storm Events:** After passage of a storm event, the City's Police Department shall provide enough law enforcement patrols to safeguard property in evacuated locations.

8. REVIEW OF POSSIBLE ACTIVITIES

Preventative

The Floodplain Management Plan (FMP) Committee discussed the use of permeable surfaces as an alternative to impervious pavement surfaces to minimize runoff. There continues to be inquiries from the development community and property owners about using materials for parking, sidewalks, and other similar uses that allow water to percolate down through them into the ground, unlike traditional concrete and asphalt surfaces. One of the concerns about permeable surfaces is the durability. However, the Committee decided that the possible use of permeable surfaces is worth investigating and Action Plan item #1 and #15 was created to determine if permeable surfaces are feasible. It was determined that these should be reviewed on a project-by-project basis when proposed by the developer and/or City Staff.

One of the concerns of residents and property owners is the coverage of zoning lots with impervious surfaces area such as sidewalks, decks, and patios. On April 29, 2002, the City Commission adopted updates to the City's Zoning Code, which included maximum impervious surface coverage requirements in Residential Single-Family zone districts. The requirements apply to single-family zone districts throughout the City and limit the amount of impervious surface coverage allowed.

The FMP Committee discussed the City's participation in the Community Rating System (CRS), and the current regulations administered by the City that minimize flood and storm damage. It was felt that the existing regulations have served the City well and that no additional regulations were necessary at this time. Action Plan items #4 and #5 provide for the continued enforcement of applicable regulations to minimize flood and storm damage, and continued participation in the CRS program.

Development in the Coastal High Hazard Area (CHHA) was discussed, and the location of public facilities or public infrastructure in the CHHA. The Committee established Action Plan item #8 to coincide with the Action Strategy in the Sarasota City Plan to consider alternative locations outside of the CHHA for such facilities, but not require that they be. The FMP Committee realized that in some cases the most appropriate or strategic place for a facility is in the CHHA. An example would be a fire station located to provide an acceptable response time.

Property Protection

The FMP Committee discussed the acquisition, relocation, and retrofitting of structures in the floodplain, those structures which have been subject to repeated flooding. Sarasota County has a CRS Coordinator whose position is partially funded by property owners in the City of Sarasota. The County CRS Coordinator pursues grants for flood mitigation assistance, including retrofitting, relocation, and acquisition. Rather than duplicating pursuit of grants with City of Sarasota staff, it was determined by the FMP Committee that City staff should determine potential candidate structures for such grants in conjunction with the Sarasota County CRS Coordinator. The Sarasota County CRS Coordinator could then include such structures in any eligible grant applications Action Plan item #9 addresses this approach to reducing flood damage to structures.

Natural Resource Protection

The City's Bobby Jones Master Plan includes natural habitat restoration and land conservation in perpetuity. This includes restoring land to its natural conditions, a conservation easement and will also provide stormwater retention functions that will reduce flooding in the surrounding areas.

Emergency Services

The FMP Committee felt that existing City's Emergency Management Program adequately address measures taken during a flood to minimize its impact. Action Plan item #6 specifies what will occur following a disaster should one occur.

Structural Projects

Providing stormwater facilities on each individual site can consume a sizeable portion of a small development site, such as those found in the downtown area, and make it difficult to meet other regulations such as parking. If provided for in a development agreement, several properties can share a stormwater management facility, although this is rare. New zone districts, and new development regulations for these zone districts, were created for the downtown area, which will change the way these properties are developed, including how water run-off from a site will be designed. The rezoning of the downtown area affecting some 2000 properties was effective in the fall of 2005. The FMP discussed this issue and created Action Plan item #3 to see if such aggregate facilities are feasible.

The Basin Master Plan studies were discussed and that work on these studies should continue as part of the ongoing work program, resulting in Action Plan item #2.

Beach re-nourishment projects and their cost were discussed by the FMP Committee, and it was determined that the Development Services Department and Engineering Division should consider which grants or funding sources, if any, should be applied for to assist with such projects. Action Plan item #7 addresses pursuit of such grants and funding sources.

Public Information

The FMP Committee considered public information activities to advise property owners, potential property owners, and builders about flood hazards and ways to protect people and property from such hazards. The FMP Committee thought that the City should continue to send out an informational brochure on flooding to all property owners in the water utility bills each year, not just those located in the floodplains. While there was discussion on the possibility of just mailing to those located in the floodplains, it was determined that it was better to educate as many residents and property owners as possible about flood hazards and prevention. Action Plan item #10 was created to ensure that this informational brochure will be mailed annually.

Accuracy of information on flooding, flood hazards, warnings, flood insurance property protection measures, and flood protection assistance was also discussed. Residents, property owners, and members of the development community appear to take advantage of such information as there are many inquiries to the City, particularly the Building and Zoning Department on such topics. It was determined by the FMP Committee that keeping this

information up-to-date and accurate was very important, and relatively inexpensive to do. Action Plan item #11 was prepared to make sure this information is accurate and timely.

Since flooding and flood related issues transcend the boundaries of the city limits, it is important that the City of Sarasota participate with surrounding jurisdictions in flood prevention and public outreach activities. The Sarasota County Unified Local Mitigation Strategy (LMS) Work Group, of which the City of Sarasota is a member, meets and one of the issues they discuss is flooding and public outreach. As such, Action Plan item #12 was created to ensure continued participation with these groups.

There is was a Map Modernization project underway to update the Flood Insurance Rate Map's (FIRM's) for Sarasota County and all municipalities in the County, that included the City of Sarasota. This Map Modernization effort was to modernize the FIRM's into a digital product and update the flood hazard information to reflect the best possible data, and converting from the National Geodetic Vertical Datum 1929 (NGVD 29) to the North American Vertical Datum 1988 (NAVD 88). The Map Modernization project was completed in 2016. On November 4, 2016 the City of Sarasota, County of Sarasota and all the municipalities received and adopted by ordinances the current effective, digital Flood Insurance Rate Maps (FIRM) and Flood Insurance Study (FIS) in the North American Vertical Datum 1988 (NAVD 1988).

Action Plan item #13 and #14 was created by the committee regarding this project.

On December 31, 2019, the County and the Municipalities, including the City of Sarasota received the preliminary Risk Maps for updated Flood Insurance Rate Maps (FIRM) and Flood Insurance Study (FIS) in the North American Vertical Datum 1988 (NAVD 1988). The Risk Map Study included analysis of approximately 93 miles of shoreline in Sarasota County. Detailed analysis includes wave heights, run-up, erosion, and overtopping analysis. Primary Frontal Dunes (PFD) and Limit of Moderate Wave Action (LIMWA) have been identified along the coastal areas.

Action Plan item #14 was created by the committee regarding this project.

9. ACTION PLAN

1. The Development Services Department and Engineering Division shall continue to evaluate the use of permeable surfaces as an alternative to impervious pavement surfaces to minimize runoff.

Action: On a project-by-project basis, when proposed by developers or property owners, the Development Services Department shall evaluate the feasibility of permeable surfaces to minimize runoff.

Budget: Staff time (Operating funds)

Staff Update Comment: The current edition of the City of Sarasota Engineering Design Criteria Manual (EDCM) as adopted on March 18, 2002, provides allowance for use of “permeable” materials for parking areas, sidewalks, and similar uses through the run-off factors in the drainage calculations, and staff will encourage developers and property owners to utilize “permeable materials” where appropriate.

2. The City shall work with the Sarasota County Stormwater Environmental Utility to complete Basin Master Plans, evaluate the recommended improvements to the drainage system to correct existing deficiencies as identified in each Basin Master Plan, and as the funds are available will consider implementing the improvements.

Action: As an ongoing part of the work program, the Public Works Department and Development Services Department shall work with the Sarasota County Stormwater Environmental Utility to make drainage system improvements. This shall include drainage system maintenance, planning, elimination of structure flooding, and the reduction of pollutants carried by stormwater runoff into Sarasota Bay.

Budget: Staff time (operating funds and revenues from the Sarasota County Stormwater Utility assessments.)

Staff Update Comment: A liaison from the City of Sarasota works with Sarasota County to review drainage master plans and incorporate City comments and concerns into the design of these plans. The City and Sarasota County have signed an interlocal agreement dated July 28, 1998 that establishes a Joint Stormwater Environmental Utility, that is under the control of Sarasota County.

In January 2018, the Sarasota City Commission unanimously adopted the Climate Vulnerability Assessment and Adaptation Plan. Part of this plan identified stormwater vulnerabilities within future sea level rise and flooding scenarios and identified adaptation strategies. One goal of this plan is to integrate climate projections into Capital Improvement Projects and focus on and incorporate SLR and additional model inputs to address future storm

surge and extreme (inland) precipitation events. The City worked with Sarasota County stormwater in the identification of vulnerabilities and in relaying the outcomes of the assessment. The City of Sarasota Public Works Department is coordinating with Sarasota County with regards to a study of the drainage entering the Gulf Stream retention basins, they are also coordinating and tracking Sarasota County in their video inspection and cleaning of underground stormwater conveyance systems.

3. The City shall investigate the feasibility of utilizing aggregate and/or regional stormwater management facilities to reduce the resultant land consumption on individual sites, while improving the overall system efficiency.

Action: On a project-by-project basis, the Development Services Department shall determine the feasibility of aggregate and/or regional stormwater management facilities.

Budget: Staff time (Operating funds)

Staff Update Comment: The Engineering Design Criteria Manual (EDCM), as adopted on March 18, 2002, does not restrict developments from using shared storm drainage attenuation facilities, provided that proper legal agreements designating authority and responsibility are recorded, and that all required permits from local and/or state authorities have been approved.

The City passed resolution 19R-2793 March 25, 2019 requesting the Governor to reinstate the adoption process for the statewide stormwater treatment rule and is supporting state legislation that would assure that state water quality standards were being mitigated with respect to nitrogen and phosphorus nutrient pollutant loads.

4. The potential for storm damage and flooding shall be minimized through compliance with applicable Land Development Regulations.

Action: As part of its ongoing review of applications for building permits and development approvals, the City shall ensure that such proposals comply with all applicable Land Development Regulations including but not limited to the Florida Building Code, Coastal Construction Code, Sarasota Zoning, and the Engineering Design Criteria Manual.

Budget; Staff time (Operating funds)

Staff Update Comment: All appropriate City departments have been enforcing all regulations applicable to prevent or reduce flood damage. On June 28, 2002, the Zoning Code was revised to limit impervious surface area to 60, 70, or 75 percent of lot area (depending on zone district) in single-family residential zone districts. On November 2, 2009, the City Commission adopted Ordinance 09-4888 which revised the Zoning Code and created an Impervious Surface Overlay District (ISOD). The ISOD limits impervious coverage of parcels to 70 percent on the barrier islands and that portion of Siesta Key within the City unless the base zone already limits coverage to less than 70 percent.

5. The City will continue to participate in the Community Rating System (CRS) Program.

Action: Annually the CRS Coordinator will report to the CRS Program on the City's procedures to employ strategies to lessen flooding and respond to emergencies.

Budget: Staff time (Operating funds)

Staff Update Comment: The City of Sarasota Development Services Department and Emergency Management provide information as required to continue participating in the Community Rating System (CRS) Program.

The City's sustainability program has worked with emergency management to coordinate on sea level rise and flood risk education to meet and enhance CRS requirements. This includes installing an educational sign and in-water marker that indicates sea level rise projections and flooding levels associated with various storm surge at Nora Patterson Park. The City has also completed a climate vulnerability assessment and adaptation plan which looks at strategies for city infrastructure that would lessen flooding associated with future climate projections.

City staff actively educates community stakeholders on sea level rise and flood risk and participates in local networks to communicate risks in a unified manner throughout the region.

6. The City shall develop a specific post-disaster redevelopment plan and coordinate with Sarasota County and other surrounding jurisdictions as appropriate.

Action: The City will develop a Post-Disaster Redevelopment Plan specific to the needs of the City. The plan will include funding and staffing estimates, set priorities for post-disaster redevelopment efforts, and develop criteria for deciding the order of importance in which the elements of the City's economy are to be aided.

Budget: Staff time (Operating funds)

Staff Update Comment: Post-disaster redevelopment is addressed in the Sarasota City Plan Environmental Protection and Coastal Islands chapter. Current policy is to allow the redevelopment to occur at the same density that existed prior to the event if all current federal, state, and local regulations are met.

For post-disaster identification efforts, the Development Services, Utilities, and Public Works Departments have personnel trained and equipped to evaluate damage following a storm, flood, or other disaster as part of a county-wide damage assessment program. Training and exercises are conducted on an annual basis.

As part of the upcoming process to update City's Emergency Operations Plan, the Recovery Section will be evaluated and addressed to meet the concerns of short-term and long-term recovery needs as well as the structure needed to facilitate the community's redevelopment needs.

Additionally, the City participates as a member of the Sarasota County Local Mitigation Task Force that evaluates critical facilities and other projects of importance prior to an event for disaster mitigation projects.

The City hired a consultant to conduct a detailed feasibility assessment to understand the challenges and opportunities of using solar panels plus battery backup for a post-disaster community shelter. This assessment provided a comparison to diesel generator backup power and is being assessed for potential funding and implementation.

7. The City shall pursue grants and other funding sources to assist in the re-nourishment of the City's beaches for the protection of public and private property. (The deadline dates vary from year-to-year)

Action: As part of its annual work program, the Development Services Department shall consider which grants or other funding sources, if any, should be applied for to assist in beach re-nourishment projects.

Budget: Staff time (Operating funds)

Staff Update Comment:

The City and the USACOE are joint applicants for a permit from the FDEP to enact a regular maintenance program for Lido Key Beach, which will include obtaining sand from Big Pass. The first event will include removing 1,199,000 CY. Subsequent events are anticipated to occur on a 5-year nourishment interval to replace the advanced nourishment, which is estimated to be 325,000 CY per event.

The City is utilizing funding from the TDT, a State grant from FDEP, FEMA, and the CRA to conduct an emergency beach re-nourishment project for Lido Beach with about 185,000 cubic yards of sand from New Pass. The project began in November 2019 and is expected to be completed Spring 2019. This project is a partnership between the City, Sarasota County, and FEMA. The total cost is \$3.9 million, with the City's cost being approximately \$600,000.

8. Prior to locating new public facilities or public infrastructure in the coastal high hazard area (CHHA), alternative locations outside of the CHHA shall be explored and evaluated.

Action: Review of proposed development approvals to locate public facilities or infrastructure in the CHHA shall include consideration of alternative locations outside of the CHHA.

Budget: Staff time (Operating funds)

Staff Update Comment: Staff reviews any proposals for public facilities to be in the Coastal High Hazard Area (CHHA) to determine if it is possible to locate the facility outside of the CHHA. When it is not possible to do so, staff ensures that the facility is constructed in compliance with all regulations for development in such areas so that potential flooding or storm damage is minimal. Additionally, the City completed a climate vulnerability assessment and adaptation planning process in 2018. This effort will apply scientific projections related to extreme heat days, precipitation patterns and inland flooding, sea level rise, and storm surge, and assess how projections may impact public infrastructure and municipal services. Public vulnerabilities will be identified and prioritized, and adaptation strategies created. New public facilities and infrastructures will likely consider locations identified as not vulnerable, as well as locations outside of the CHHA.

In May 2017, the City adopted new policies in the comprehensive plan providing for

- *Protection through engineered mitigation techniques designed to decrease vulnerability of facilities;*
- *Accommodation by altering the design of facilities through measures such as elevation or stormwater improvements to allow facilities to stay intact;*
- *Managed relocation of existing facilities to lower risk locations; or*
- *Avoidance of future development in high risk areas unless the location is necessary to provide for the health, safety, and welfare of the general public.*

9. The City will consider measures, including the acquisition of coastal property subject to frequent damage during natural disasters, to reduce the exposure of life and property to future disasters.

Action: Annually, the Development Services Department will review the list of repetitive loss properties, and in conjunction with the Sarasota County CRS Coordinator, determine which properties may be eligible candidates for the Flood Mitigation Assistance grant program.

Budget: Staff time (Operating funds). Funding of acquisition of property would come from the Flood Mitigation Assistance grant program.

Staff Update Comment: The costs involved do not make acquisition of properties by the City of Sarasota a viable method of reducing repetitive loss properties. However, the City of Sarasota sends a mailing to owners of repetitive loss properties advising them they may be eligible to apply, jointly with Sarasota County on their behalf, for financial assistance through FEMA's Flood Mitigation Assistance Program (FMAP), which is administered by the State of Florida Department of Community Affairs. The City of Sarasota entered into an agreement with Sarasota County several years ago to administer stormwater drainage. A portion of the stormwater drainage fees paid by City residents goes toward funding the Sarasota County CRS Coordinator's position, who applies for Flood Mitigation Assistance on behalf of City residents. This provides some economies of scale in the preparation and submission of grant applications. Sarasota County Stormwater is entering into an agreement with Weiler Engineering Corporation to conduct a Repetitive Loss Area Analysis for properties within the City of Sarasota. Repetitive loss properties are defined by FEMA as "properties for which two or more National Flood Insurance Program losses of at least \$1,000 each have been paid within any 10-year rolling period since 1978.

May 2019 the Sarasota County Stormwater removed the properties of the City of Sarasota from the repetitive Loss Area Analysis. The City of Sarasota is actively looking into applying for grant opportunities.

The City of Sarasota Public Works Department recently completed an inventory of shoreline protection measures in 33 City property locations and assessed the conditions of the armoring devices. The City of Sarasota will utilize this report in prioritizing areas of need and developing remediation strategies for each.

Current Projects:

- ***Bayfront Park Marina (Marina Jack) Seawall Restoration Project***
- ***Shoreline Stabilization Program – Immediate actions for Brewer Avenue at Hudson Bayou, Alameda Avenue at Whitaker Bayou and 40th Street & Sarasota Bay***
- ***Terrace Gardens Drainage Project***

Completed Projects:

- ***O’Leary’s Shoreline Stabilization Project Phase 1 which included the installation of 250 LF of conventional seawall. This was completed weeks before Hurricane Irma struck, and the surge caused minimal damage to the shoreline***
 - ***O’Leary’s Shoreline Stabilization Project Phase 2 which included the installation of 235 LF Living Seawall comprised of Eco-Rap modules designed to reduce the impact of wave energy as well as provide habitat for a variety of marine life***
 - ***10th Nutrient Separating Baffle Box.***
 - ***Boulevard of the Arts Hybrid shoreline project which included the removal of a failing seawall and replacement with a sloped rip rap design with native plants. This project was funded by the DEP Coastal Resilience program.***
 - ***North Palm Avenue Drainage and Streetscape Project.***
10. The Community Rating System Coordinator/Emergency Manager will distribute an informational brochure on flooding to all property owners in the City each year. It will include information on the following topics: flood hazard areas, warnings, flood insurance, property protection measures, and flood protection assistance.
- Action: This brochure will be mailed annually in the first half of the calendar year, as an enclosure with water utility bills.
- Budget: Staff time (Operating funds)
Postage (Operating funds)

Staff Update Comment: Completed for 2019. The information brochure was mailed with water bills in June of 2016. 2017 2018 2019

11. The Community Rating System Coordinator/Emergency Manager will update information available to the public on the following topics: flood hazard areas, warnings, flood insurance, property protection measures, and flood protection assistance.
- Action: By September 1st of each year, the Community Rating System Coordinator shall review the public information available at City Hall, Police Station, Utility Billing Center, Sarasota County Public Library, and online on the City’s web page via the Internet. The information will be updated, as necessary.
- Budget: Staff time (Operating funds)
Materials (Operating funds)

Staff Update Comment: Completed for 2016, 2017, 2018, 2019. Information is updated on an ongoing basis by the Community Rating System Coordinator and the Emergency Manager, as necessary.

12. The City shall be a participating member in the Sarasota County Unified Local Mitigation Strategy (LMS) Work Group.

Action: As part of the ongoing work program, the Community Rating System Coordinator, Emergency Manager and appropriate staff from the City as necessary shall attend LMS Work Group meetings that are held throughout the year and assist as may be required with public outreach activities, reports, and other activities undertaken by the two groups regarding flooding.

Budget: Staff time (Operating funds)
Materials (Operating funds)

Staff Update Comment: Completed for 2016, 2017, 2018, 2019. City staff attends meetings of the Sarasota County Unified Local Mitigation Strategy (LMS) Work Group which are held several times throughout the year.

13. The Flood Insurance Rate Maps (FIRM's) **The Letter of Final determination (LFD) for the Sarasota County, Florida Flood Insurance Study Update was approved and issued May 4, 2016. The new Flood Maps became effective on November 4, 2016.** These maps are in a digital format and updated using the latest topographical data and the North American Vertical Datum 1988 (NAVD 1988).

Action: **No action required**

Budget: Staff time (Operating Funds)
Materials (Operating Funds)

Staff Update Comment: Completed November 4, 2016. The Letter of Final determination (LFD) for the Sarasota County, Florida Flood Insurance Study Update was approved and issued May 4, 2016. The new Flood Maps became effective on November 4, 2016.

14. The Flood Insurance Rate Maps (FIRM's) for the coastal risk and tidal influenced flood risk areas shall be updated in the Federal Program titled "Risk Mapping". The Risk Mapping update will include the unincorporated areas of Sarasota County and the City of Sarasota. These maps shall be in a digital format and be updated using 2007 LIDAR with elevations reported in the North American Vertical Datum 1988 (NAVD 1988). **Preliminary FIRM's were released on 12/31/2019 and received by the City.**

Action: The Development Services Department, is working in conjunction with Sarasota County, FEMA, and other applicable agencies, will meet the federal requirements for public outreach which will include a community and public 90 day appeal and comment period and review by FEMA, followed by adoption to complete the Risk Mapping project.

Budget: Staff time (Operating Funds)
Materials (Operating Funds)

Staff Update Comment: City staff attend meetings and works with Sarasota County, FEMA, and other jurisdictions as necessary on this project.

Preliminary Flood Insurance Rate Maps (FIRM) were received on December 31, 2019. The City is working with FEMA, State, other Agencies, County and Jurisdictions on public roll-out of information.

15. The **Development Services Department and Engineering Division** shall continue to evaluate the use of permeable **material** as an alternative to impervious pavement surfaces to minimize runoff.

Action: On a project-by-project basis, City Departments shall evaluate the feasibility of permeable **material** to minimize runoff.

Budget: Staff time (Operating Funds)
Project Funding

Staff Update Comment: City Departments continue to evaluate on a project-by-project basis. The North Palm Drainage Project currently underway incorporates the use of permeable pavers to reduce runoff and the flooding of storefronts in that area.

16. **This project has been removed.** On July 18, 2012 Sarasota County stated the project will not go forward due to cost effectiveness, and the Hudson Bayou Basin assessments would be refunded. City staff continues to work with Sarasota County to address issues in the Pelican Drive outfall area. The County has removed this from their CIP list, but there is a downstream project which may alleviate flooding.

Staff Update Comment: On July 18, 2012 Sarasota County stated the project will not go forward due to cost effectiveness, and the Hudson Bayou Basin assessments would be refunded. County Public Utilities staff stated in August of 2014, the Hudson Bayou Basin assessments credits will be completed and reflected on the November 2014 property tax notices. City staff continues to work with Sarasota County to address issues in the Pelican Drive outfall area. The County has removed this from their CIP list, but there is a downstream project which may alleviate flooding

10. ADOPTION, IMPLEMENTATION, EVALUATION and REVISION

Once the plan has been approved by the FMP committee it will be presented to the City Commissioner's for approval. After receiving approval, the FMP will be sent to CRS for approval and CRS credit.

Implementation of the City's Plan will be administered by the Development Services Department with the assistance of the City's Emergency Manager. The department(s) listed in the Action Plan shall be responsible for overseeing implementation of the Action Plan.

The Plan will be evaluated annually by the Floodplain Management Plan Committee. Any Committee recommendations for adoption, deletions or other changes will be included in an annual report to the City Commission annually prior to October 1st.

The report will be prepared by the CRS Coordinator and the Committee. It will provide an overview of the plan and progress accomplished during the previous 12 months towards implementing the Action Plan. Any items not achieved will be specifically addressed in the annual report, and if appropriate, alternative recommendations for action provided. Any recommended amendments to the Plan will be presented to the City Commission for adoption. The annual report will be available to the public and released to the media.

This FMP serves as an appendix to Sarasota County's LMS, which is a state-approved multijurisdictional, multi-hazard plan.

The FMP committee will meet quarterly each year to evaluate progress of the projects as described in Sections 7 and 8 and make updates to the plan where necessary. Potential revisions may include updates to GIS information and statistics, addition of new City staff and public stakeholders to the committee, and development of new projects and/or revisions to existing projects.

To implement and update the FMP:

1. The City's CRS Specialist will review the FMP to evaluate what sections and data require update for that year.
2. The CRS Specialist will be responsible for coordinating with the contact person for each project to get its status.
3. After the status information is gathered, the CRS Specialist prepares a summary of required changes to the FMP and project updates for review by the FMP Committee.
4. The FMP Committee will conduct a meeting (noticed and open to the public) to review the progress and recommend additional changes to the FMP.
5. The CRS Specialist assigns the revision items to members of the committee or other designated County support staff.
6. The FMP Committee will conduct a meeting (noticed and open to the public) to review the draft document.

7. The updated plan will be posted on the City's website and flood-related outreach activities will present and educate the public about the revised FMP.

An annual evaluation report will be submitted with the City's annual CRS recertification to indicate progress of the plan implementation.

The FMP plan itself will be updated at least every five years.

11. REFERENCES

- Sarasota County Floodplain Management Plan.....June 2018
- City of Venice Floodplain Management Plan.....Aug 2019
- City of North Port Floodplain Management PlanNov 2015
- Sarasota County Unified Local Mitigation StrategyJan 2016
- Wikipedia City of Sarasotahttps://en.wikipedia.org/wiki/Sarasota,_Florida
- Community Rating System Coordinator’s Manual, FEMA,2007
- Example Plans, FEMA/Community Rating System,2006
- Getting Started Building Support for Mitigation Planning, FEMA, FEMA-386-1, 2002
- Local Multi-Hazard Mitigation Planning Guidance, FEMA,2008
- fema.gov <https://www.fema.gov/>
- ready.gov <https://www.ready.gov/>
- noaa.gov <https://www.noaa.gov/>
- Sarasota City Plan.....2008
- Future Land Use Chapter, Updated July 20, 2017 (May 1, 2017 Adoption)...2017
- City of Sarasota Climate Vulnerability Assessment and Adaptation PlanJan 2018

Prepared by: Engineering and City Clerk's Office

RESOLUTION NO. 2020-26

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF VENICE, SARASOTA COUNTY, FLORIDA, TO ADOPT THE UPDATED SARASOTA COUNTY LOCAL MITIGATION STRATEGY WORK GROUP CITY OF VENICE PROJECT LIST AND THE 5-YEAR UPDATE OF THE CITY OF VENICE FLOODPLAIN MANAGEMENT PLAN WHICH TOGETHER WITH THE SARASOTA COUNTY UNIFIED LOCAL MITIGATION STRATEGY 2016 SHALL SERVE AS THE FORMAL GUIDES FOR THE CITY OF VENICE'S FLOODPLAIN MANAGEMENT AND HAZARD MITIGATION ACTIVITIES IN ACCORDANCE WITH THE NATIONAL FLOOD INSURANCE PROGRAM FOR COMMUNITY RATING SYSTEM AND 42 U.S.C . §5165, 44. C.F.R. §201.6, PART 1 OF CHAPTER 252, FLORIDA STATUTES, AND FLORIDA ADMINISTRATIVE CODE CHAPTER 27P-22; SUPERSEDING RESOLUTION NO. 2019-10; AND PROVIDING AN EFFECTIVE DATE

WHEREAS, the City of Venice is subject to natural and man-made hazards including hurricanes, tornadoes, floods, fires and chemical releases which may cause damage to life, property, natural resources and the local economy; and

WHEREAS, initiatives identified on the Local Mitigation Strategy Project List are given more consideration by state-managed funding programs such as the Hazard Mitigation Grant program, Emergency Management Preparedness Assistance Trust Fund, Communities Trust, Community Development Block Grant, Coastal Partnerships Initiative, and HOME; and

WHEREAS, the Floodplain Management Plan serves as the guide for floodplain management activities for the City of Venice as required of all communities participating in the National Flood Insurance Program and seeking project funding from the Flood Mitigation Assistance Program; and

WHEREAS, the Local Mitigation Strategy, which incorporates the Floodplain Management Plan, serves as the flood mitigation plan required of all communities participating in the National Flood Insurance Program and seeking project funding from the Flood Mitigation Assistance Program; and

WHEREAS, the Local Mitigation Strategy can serve as the Post-Disaster Redevelopment Plan as required of all coastal counties in Florida; and

WHEREAS, the Sarasota County Multi-jurisdictional Program for Public Information Plan (PPI) was developed by the PPI Committee comprised of a cross-section of employees and community stakeholder members from Sarasota County Government, the City of Venice, the City of Sarasota, the City of North Port, the Town of Longboat Key, the Sarasota Bay Estuary Program, and a cross-section of stakeholders including Mote Marine representation, realtors, insurance agents, mortgage lenders, and private citizens, and is open for participation to any

and all interested parties, and is chaired by the Sarasota County Stormwater Department Director, or his designee; and

WHEREAS, the PPI was adopted by the Board of County Commissioners on January 29, 2019 and by the Venice City Council on August 27, 2019, as a representation of the City of Venice and Sarasota County's commitment to reduce vulnerability and risks from flooding, to inform the public of the hazards of flood, serving as a policy guide as resources are committed toward reducing the effects of flooding, and as a guide to increase public safety through outreach; and

WHEREAS, the 5-Year Update of the City of Venice Floodplain Management Plan formally incorporates the PPI within the document presented for adoption; and

WHEREAS, the Floodplain Management Plan and Local Mitigation Strategy are designed to be a process-oriented document with review and revision policies that allow the Local Mitigation Strategy to be changed to meet new or changing conditions including hazard-event frequency, perceived local needs and funding opportunities; and

WHEREAS, the 5-Year Update of the Floodplain Management Plan has been completed to meet the requirements of the Community Rating Systems program; and

WHEREAS, the City of Venice Community Ratings System Floodplain Management Plan Committee has received public input and has updated the City of Venice portion of the Sarasota County Local Mitigation Strategy Work Group Project List and the 5-Year Update to the Floodplain Management Plan.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF VENICE, FLORIDA, as follows:

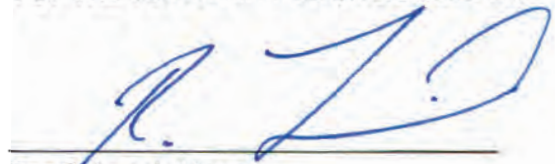
SECTION 1. The Whereas clauses above are ratified and confirmed as true and correct.

SECTION 2. The Venice City Council hereby adopts the updated Sarasota County Local Mitigation Strategy Work Group City of Venice Project List and City of Venice Floodplain Management Plan, which are attached hereto and incorporated herein as Exhibits A and B, respectively, which together with the Sarasota County Unified Local Mitigation Strategy 2016 shall serve as the formal guides for City of Venice floodplain management and hazard mitigation activities.

SECTION 3. This resolution shall supersede Resolution No. 2019-10.

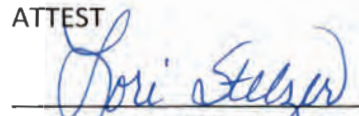
SECTION 4. This resolution shall take effect immediately upon adoption.

APPROVED AND ADOPTED AT A REGULAR MEETING OF THE VENICE CITY COUNCIL HELD ON
THE 14TH DAY OF JULY 2020.



Ron Feinsod, Mayor

ATTEST



Lori Stelzer, MMC, City Clerk

I, **LORI STELZER**, MMC, City Clerk of the City of Venice, Florida, a municipal corporation in Sarasota County, Florida, do hereby certify that the foregoing is a full and complete, true and correct copy of a Resolution duly adopted by the City Council of said City at a meeting thereof duly convened and held on the 14th day of July, 2020, a quorum being present.

WITNESS my hand and the official seal of said City this 14th day of July 2020.



Lori Stelzer, MMC, City Clerk

(S E A L)

Approved as to form:



Kelly Fernandez, City Attorney

Priority Note 1	Name of Project	Description of Project	Hazard Mitigated Note 2	Hazard Mitigation Strategy Note 3	Mitigation Goals Achieved Note 4	Funding Source	Jurisdiction Project Benefit Note 5	Jurisdiction Project Owner	Jurisdiction Project #	Agency Responsible for Implementation	Estimated Cost	Project New Note 6	Project Status Completed Note 6	Project Status In Progress Note 6	Project Status Deleted Note 6	Project Status Deferred Note 6	If Deferred, Why? Note 6	Timeframe for Project Completion	Mitigate New or Existing (N/E)
High	Public Outreach	Public outreach programs for all jurisdictions	ALL	ALL	3	N/A	ALL	ALL	N/A	LMS Work Group	\$10K			✓				Continuous	E
High	Police Dept. Relocate and EOC construction	Reconstruct PD facility to include City Command EOC	2, 7, 8, 9,11, 12, 15	2	5	Bond	ALL	V	1V	Police	\$16M			✓				2020	E
Medium	Relocate Fire Station #2	Construct new fire station outside flood zone	2, 7, 8, 9,11, 12, 15	2	5	N/A	ALL	V	3V	Fire	\$5M					✓	Funding		E
Medium	Directional signs for island evacuation	Acquire four signs for three bridges and roadways	2, 7, 8, 9,11, 12, 15	5	4	N/A	3,4	V	6V	Public Works	\$60K					✓	Funding		E
High	Fire Station #51 and City Hall generator	Emergency operations for city communications	2, 7, 8, 9,11, 12, 15	2	5	N/A	3,4	V	7V	City Hall	\$1.175M			✓				Under construction	E
High	Radio upgrade for the city department	Provide optimum radio communications	2, 7, 8, 9,11, 12, 15	5	5	NA	ALL	V	21V	Utilities, Police, PW	\$490K					✓	Funding		E
Low	Second House Program	Partner coastal with inland residents during emergencies	2, 7, 8, 9,11, 12, 15	5	1	N/A	3	V	23V	City Hall	\$10K					✓	Funding		E
Low	Relocate water plant elevated tank	Upgrade support system to prevent against flood and wind	2,7,9,12	2	5	N/A	ALL	V	26V	Utilities	\$725K					✓	Funding		E
Low	Upgrade Chuck Reiter elevated tank	Upgrade support system to prevent against flood and wind	2,7,9,11, 12,15	2	5	N/A	ALL	V	27V	Utilities	\$76K					✓	Funding		E
Low	Modify Pinebrook booster station	Waterproof and upgrade communication system	2, 7, 8, 9,11, 12, 15	2	5	N/A	ALL	V	28V	Utilities	\$100K					✓	Funding		E
Low	Coastal Area Redevelopment Study	Post disaster study	2, 7, 8, 9,11, 12, 15	5	2	N/A	ALL	V	29V	Dev. Service	\$50K					✓	Funding		E
Low	Coastal Compliance Program	Public education for retrofit and construction activities	2, 7, 8, 9,11, 12, 15	5	3	N/A	3	V	30V	Building	\$30K					✓	Funding		E
Medium	Coastal Land Acquisition Program	Purchase properties and preserve for open space	2,7,9,11	1	4	N/A	3	V	36V	Engineering	\$425K					✓	Funding		E
High	Relocate RO Water Plant	Construct facility out of the flood zone	2,7,9,11	2	5	N/A	ALL	V	42V	Utilities	\$40M					✓	Funding		E
High	Ajax property 2.0-3.0MGD booster station	Provide service to east side of town, construct interconnect with county	2,7,9,11, 12,15	2	5	SRF/ Revenue	3	V	44V	Utilities	\$10M							2022	N
Low	Venice Evacuation Study	Study to address the need for hurricane shelters in city	2,7,8,9,11, 12,14,15	5	1	N/A	ALL	V	50V	Planning	\$50K					✓	Funding		N
High	Fire Station 1 Replacement	Upgrade facility to meet current storm criteria	2,7,9,11, 12,15	3	5	N/A	ALL	V	55V	Fire	\$5M			✓				2022	E
High	Relocate PW to PD after new PD complete	Harden Structure and retrofit for PW Admin.	2, 7, 8, 9, 11,12, 15	2	5	N/A	3	V	57V	Public Works	\$750K			✓			Funding	2021	E
Low	Hurricane Tolerant Handbook	Update the 1994 hurricane study	9	5	3	N/A	ALL	V	61V	Planning	\$15K					✓	Funding		E
High	New Solid Waste and Recycling Complex	Relocate facility east and construct to hurricane codes	2,7,8,9,11, 12,15	2	5	N/A	ALL	V	62V	Public Works	\$3M					✓	Funding		E
High	Purchase Portable Generators for Lift Station	Provide emergency back up power outage	2,7,8,9,11, 12,15	5	1	Utilities revenue	ALL	V	64V	Utilities	\$450K					✓	Funding		E
Medium	Hurricane Louvers for Water Plant	Secure building for hurricanes	9,15	2	5	N/A	ALL	V	65V	Utilities	\$32K					✓	Funding		E
High	City Hall Reroof	Roof not built to code and condition is deteriorating	2,7,9,11, 12,15	2	5	N/A	ALL	V	66V	Public Works	\$600K		✓						E
Medium	2nd sanitary force main under Intracoastal	Add a secondary force main to add to secondary redundancy	2, 7, 9	5	5	N/A	3	V	69V	Utilities	\$1M			✓				2022	E
High	2nd sanitary force main under I-75	Add a secondary force main to add to secondary redundancy	2, 7, 9	5	5	Utilities revenue	3	V	70V	Utilities	\$3.5M			✓				2021	E
High	Reinforce Airport Hangars	Reinforce existing airport to meet hurricane standards	2, 7, 9, 11,12,15	2	2, 5	Airport / Grants	3	V	75V	Airport	\$1M								N
High	Construct New T-Hangars	Construct new T-Hangars meeting hurricane standards	2, 7, 9, 11,12,15	5	2	Airport / Grants	3	V	76V	Airport	\$1.5M								N

Priority Note 1	Name of Project	Description of Project	Hazard Mitigated Note 2	Hazard Mitigation Strategy Note 3	Mitigation Goals Achieved Note 4	Funding Source	Jurisdiction Project Benefit Note 5	Jurisdiction Project Owner	Jurisdiction Project #	Agency Responsible for Implementation	Estimated Cost	Project New Note 6	Project Status Completed Note 6	Project Status In Progress Note 6	Project Status Deleted Note 6	Project Status Deferred Note 6	If Deferred, Why? Note 6	Timeframe for Project Completion	Mitigate New or Existing (N/E)
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High	City Hall Reroof	Roof not built to code and condition is deteriorating	2,7,9,11, 12,15	2	5	N/A	ALL	V	66V	Public Works	\$600K		✓						E
Medium	2nd sanitary force main under Intracoastal	Add a secondary force main to add to secondary redundancy	2, 7, 9	5	5	N/A	3	V	69V	Utilities	\$1M			✓				2022	E
High	2nd sanitary force main under I-75	Add a secondary force main to add to secondary redundancy	2, 7, 9	5	5	Utilities revenue	3	V	70V	Utilities	\$3.5M			✓				2021	E
High	Reinforce Airport Hangars	Reinforce existing airport to meet hurricane standards	2, 7, 9, 11,12,15	2	2, 5	Airport / Grants	3	V	75V	Airport	\$1M								N
High	Construct New T-Hangars	Construct new T-Hangars meeting hurricane standards	2, 7, 9, 11,12,15	5	2	Airport / Grants	3	V	76V	Airport	\$1.5M								N

The Sarasota County Local Mitigation Strategy (LMS) Work Group City of Venice Project List

Priority Note 1	Name of Project	Description of Project	Hazard Mitigated Note 2	Hazard Mitigation Strategy Note 3	Mitigation Goals Achieved Note 4	Funding Source	Jurisdiction Project Benefit Note 5	Jurisdiction Project Owner	Jurisdiction Project #	Agency Responsible for Implementation	Estimated Cost	Project New Note 6	Project Status Completed Note 6	Project Status In Progress Note 6	Project Status Deleted Note 6	Project Status Deferred Note 6	If Deferred, Why? Note 6	Timeframe for Project Completion	Mitigate New or Existing (N/E)
Low	Relocate Airport Maintenance Facility	Relocate existing Airport Maint. Facility to meet hurricane stds.	2, 7, 9, 11,12,15	5	2	Airport / Grants	3	V	78V	Airport	\$650K								N
High	Airport Avenue Drainage Project	Upgrade existing drainage facilities to mitigate flood in evacuation route	2,7,9,11	6	2	Airport / Grants	3	V	79V	Airport	\$700K					✓	Funding		N
Medium	Live Oak Dr. Stormwater Improvements	Upsize existing stormwater pipes to reduce flooding	2,7,9,11	6	2	SRF	3	V	80V	Stormwater	\$600K			✓				Under construction	E
High	Nokomis Ave. South Stormwater	Upsize existing stormwater pipes to reduce flooding	2,7,9,11	6	2	CIP	3	V	81V	Stormwater	\$1.1M		✓						E
Medium	Outfall 9 Improvement	Study the drainage basin and increase the infiltration pond size	2,7,9,11	6	2	CIP/ Grants	3	V	82V	Stormwater	\$500K					✓	Funding		E
Medium	Golf Dr. Stormwater Improvements	Upsize existing stormwater pipes to reduce flooding	2,7,9,11	6	2	CIP/ Grants	3	V	83V	Stormwater	\$750K					✓	Funding		E
Medium	Beach Erosion Hot Spot Alternatives	Alternate erosion evaluation and construction	1,2,7,9	5	5	Grants	3	V	86V	Engineering	\$4M					✓	Funding		N
LOW	Mobile Command Unit	Design and Purchase a Mobile Command Unit for use during special events and emergencies.	2, 7, 8, 9,11, 12, 15	2	5	N/A	ALL	V	87V	Police	\$500K					✓	Funding		N
Medium	Valencia Rd. Stormwater Improvements	Upsize existing stormwater pipes to reduce flooding	2,7,9,12	6	2	CIP/ Grants	3	V	88V	Stormwater	\$850K					✓	Funding		E
Medium	Circle Drive Drainage Improvement	Upsize existing stormwater pipes to reduce flooding	2,7,9,11	6	2	CIP/ Grants	3	V	89V	Stormwater	\$400K					✓	Funding		E
Medium	Church St. Drainage Improvement	Upsize existing stormwater pipes to reduce flooding	2,7,9,11	6	2	CIP/ Grants	3	V	90V	Stormwater	\$400K					✓	Funding		E
Medium	Parkdale & Parkside Dr. Drainage Improvement	Upsize existing stormwater pipes to reduce flooding	2,7,9,11	6	2	CIP/ Grants	3	V	91V	Stormwater	\$750K					✓	Funding		E
Medium	Venice Fire Station 3 EOC	Provide Equipment for Venice EOC at Fire Station 3 to allow for Emergency Management Operations	2,7,8,9,11, 12,14,15	5	5	N/A	ALL	V	92V	Fire	\$250,000					✓	Funding		E
High	Lightning and Surge Protection	Provide Lightning and Surge Protection to provide protection to City Technology and infrastructure.	2,7,8,9,11, 12,14,15	5	5	N/A	3,4	V	93V	Fire	\$105,000					✓	Funding		E
Medium	Construct 8E production well	Enhance system reliability	2,7,9	5	1,4	CIP	ALL	V	94V	Utilities	\$1.5M			✓				2021	N
High	Water Plant Generator	Purchase new generator for water plant for backup power	2,7,8,9,11, 12,15	2	1	CIP	All	V	95V	Utilities	\$1M			✓				2021	E
High	Fire Station #2 Hardening	Harden Facility for Storm Protection	2,7,8,9,11, 12,14,15	5	5	N/A	ALL	V	96V	Fire	\$250,000					✓	Funding		E

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High	Airport Avenue Drainage Project	Upgrade existing drainage facilities to mitigate flood in evacuation route	2,7,9,11	6	2	Airport / Grants	3	V	79V	Airport	\$700K					✓	Funding		N
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LOW	Mobile Command Unit	Design and Purchase a Mobile Command Unit for use during special events and emergencies.	2, 7, 8, 9, 11, 12, 15	2	5	N/A	ALL	V	87V	Police	\$500K					✓	Funding		N
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Medium	Construct 8E production well	Enhance system reliability	2,7,9	5	1,4	CIP	ALL	V	94V	Utilities	\$1.5M			✓				2021	N
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High	Fire Station #2 Hardening	Harden Facility for Storm Protection	2,7,8,9,11, 12,14,15	5	5	N/A	ALL	V	96V	Fire	\$250,000					✓	Funding		E



City of Venice
Floodplain Management Plan
Including Program for Public Information (PPI) and
Coverage Improvement Plan (CIP)

5-year update June 2020

Prepared by:
City of Venice
Engineering/Stormwater Department
401 W Venice Ave
Venice, FL
941-486-2626

Presented for Adoption by Venice City Council

July 14, 2020

Table of Contents

Section 1 Introduction.....	5
Purpose.....	5
Community Profile.....	6
National Flood Insurance Program.....	8
Community Rating System.....	9
Section 2 Plan Organization and Development.....	6
Planning Committee Members.....	7
Public Involvement.....	13
Coordination.....	13
Section 3 Assessment of Flood Hazards.....	16
Flooding.....	17
Coastal Flooding.....	18
Inland Flooding.....	18
Tropical Storm/Hurricane.....	22
Historical Claims and Repetitive Loss Areas.....	24
Vulnerable Properties.....	26
Hazard History.....	27
Section 4 Less Frequent Flood Hazards and Other Types of Hazards.....	32
Dam Failure.....	32
Coastal Erosion.....	32
Storm Surge.....	34
Other Hazards	34
Section 5 Future Flooding.....	37
Climate Change and Sea Level Rise.....	37
Future Development in the Watershed.....	38
City Ordinance to Flood Hazards and Development.....	40
Future Conditions Model.....	41
Past Studies.....	41
Section 6 Assessment of Impact Due to Hazards.....	43
Life Safety.....	43
Public Health.....	45
Critical Facilities and Infrastructure.....	46
Economy.....	47
Residential and Commercial Buildings.....	47
Section 7 Natural Floodplain Functions.....	49
Beneficial Resources and Functions of Natural Floodplains.....	49
Protecting our Natural Floodplains.....	50
Section 8 Floodplain Management Plan Goals and Activities.....	54
Goals.....	54
Review of Possible Floodplain Management Activities.....	54
Coordination with Other Plans and Groups.....	61
Section 9 Floodplain Management Action Plan.....	65
Coordination with Other Initiatives.....	67
Post Disaster Mitigation.....	67

Section 10 Plan Adoption, Implementation, Evaluation and Revision.....	69
Section 11 Resources.....	71

Table of Contents: Figures

Figure 1 City of Venice Flood Zone (see Appendix C for larger map).....	16
Figure 2 Watersheds with Venice Jurisdictional Boundary.....	21
Figure 3 Venice Myakka River Park.....	49

Table of Contents: Tables

Table 1 Land Use by Acres and Percentage.....	8
Table 2 Saffir-Simpson Scale.....	22
Table 3 Pre-FIRM Structures with NFIP Coverage.....	24
Table 4 Post-FIRM Structures with NFIP Coverage	24
Table 5 NFIP Insured Policies and Cost of Paid Losses.....	25
Table 6 Flood History of Venice 1921 – Present Day.....	27
Table 7 Summary of Hazards, Probability and Potential Impact.....	44
Table 8 Name, Address and Natural Function for Parks.....	50
Table 9 Target Groups for Public Outreach and Messages.....	60
Table 10 FMP Action Plan.....	65

Table of Contents: Appendix

Appendix A CRS Committee Planning Document.....	72
Appendix B CRS Committee Documentation.....	81
Appendix C City Maps.....	103
Appendix D LMS Project List, Multijurisdictional PPI Annual Update and Report.....	107
Appendix E PPI, Schedule and Outreach Templates.....	301
Appendix F Flood Response Plan.....	348
Appendix G Flood Insurance Analysis and Coverage Improvement Plan.....	359

Section 1- Introduction

Purpose

Floods are the costliest and most pervasive hazard in the United States. Property loss due to floods has been on the rise over the last 100 years. According to FEMA a structure in the high-risk area has a 25% chance of flooding in a 30-year mortgage. The National Weather Service noted 29 separate billion-dollar flood events and estimated that the average event cost of each event was 4.35 billion dollars in direct flood damage to property between 1985 and 2018. The chart did not include inland flood damage caused by tropical cyclones in the flood statistics.

The City of Venice has a unique geography in that a substantial portion of the city's boundary is surrounded by water. The City has almost 4 linear miles of coastline along the Gulf of Mexico, unobstructed by barrier islands. The City also has 2 linear miles of bay shores that are part of a major estuary, and approximately 4 miles of ICW. These waterways include the Gulf of Mexico, Venice Inlet, Curry Creek, Myakka River, Hatchet Creek, Roberts Bay, and the West Coast ICW. These water bodies improve the community by providing an enhanced environment consisting of shorelines, estuaries and woodlands, which allow habitation for wildlife. The water bodies also provide the community with a multitude of water and beach related activities including fishing, swimming, boating, shell and shark tooth hunting, and sunset watching.

Rapid growth of the city and the resultant reduction in vacant land available for development, coupled with a less than average rainfall for several years, have encouraged people to settle in flood hazard areas. As development has spread within and around the city, large amounts of land have been covered with an impermeable surface such as parking lots, roofs, driveways, streets. A greater number of teardowns and rebuilds have elevated structures within the floodplain, however, they have also tended towards bigger homes with maximum allowed lot coverage. Not only have these manmade structures covered previously absorbent surfaces, they have also removed much of the existing vegetation. This vegetation normally acts to slow the rate of runoff and to allow a greater portion of rainfall to be absorbed into the ground.

The initial stormwater system for the City of Venice was installed in 1926, when the Brotherhood of Locomotive Engineers began its intensive development of the City following designs by architect and city planner, John Nolen. As part of the development, main drainage canals were constructed in the existing sloughs, and the outlet to Curry Creek was improved.

The sub-tropical climate provides frequent extreme weather events like hurricanes and tropical depressions, Venice also receives frequent summer rains. These events contribute to causes of flooding in the area and can become a significant threat to life and property.

In order to plan for flooding events, the city of Venice developed a floodplain management plan (FMP). The FMP is designed with following objectives:

- Organize community resources to reduce or eliminate flood risk to people and property
- Implementing strategies before a flood event to reduce the disaster's impact, which can save lives and property after an event
- Give guidance in developing pre and post mitigation plans
- Identify priority projects and programs for funding
- Increase the likelihood of State and Federal funding for pre and post hazard mitigation projects

Venice's FMP is an appendix to Sarasota County's Local Mitigation Strategy (LMS), a state-approved, multijurisdictional, multi-hazard plan. The FMP offers structure in line with the Floodplain Management Planning activity of the Community Rating System (CRS)

Community Profile

Geographic Profile

The City of Venice occupies approximately 16.7 square miles (land) of southern Sarasota, in Southwest Florida, between Tampa and Fort Myers. It is bordered on the west by the Gulf of Mexico and a portion to the East borders the Myakka River.

The City of Venice is divided into five major drainage basins which are defined as the Hatchett Creek, Curry Creek, Shakett Creek, Myakka River and Island of Venice stormwater basins. The Hatchett Creek drains into the southern portion of the mainland area discharging into the Intracoastal Waterway (ICW), just south of Roberts Bay. The mainland's northern section is drained via the Curry Creek basin using the Blackburn Canal and Curry Creek to discharge into Dona Bay. The eastern portion of the City drains into Shakett Creek and the Myakka River. The Island of Venice basin drains into the ICW and the Gulf of Mexico.

Topography

The topography in the area is generally flat and low, with elevations ranging from sea level to 20 feet. The average elevation of the island is 11.9 feet North American Vertical Datum (NAVD), while the mainland averages 13.9 feet NAVD.

Climate

The City is situated in a subtropical climate and, as such, experiences distinct wet and dry seasons. The wet season extends from June through September and is warm and humid. During this period the City receives approximately two-thirds of its annual 50-inch rainfall thanks to

frequent storms. The winter is mild, fall and spring tend to be dry. Summer daytime temperatures often reach 90°F or higher

Population and Demographics

The City of Venice was incorporated in 1927, after expansion of the railroads, and has experienced a steady growth rate since 1930; the largest occurring between 1950 and 1960 when the population grew from 727 to 3,444 people. The latest statistics from the U.S. Census Bureau estimate the 2019 population of the City at 23,376. However, as with most coastal communities in Florida, the City experiences an increase in population during the winter months, with the most recent estimates being approximately 5,046-part time residents. Compared to other cities, Venice has a high percentage of older, primarily retired residents, with a median age of 67 years.

Housing

Most of the housing units in Venice are Single-Family homes and in recent years there has also been a call to allow for more lot coverage on residential Single-Family homes, types RSF-1 and RSF-2, to 35%. The additional lot coverage impacts have the potential to increase runoff from the lots for properties that are not required to obtain either a Southwest Florida Water Management District Permit (SWFWMD) or provide pre-development versus post-development runoff calculations.

Economy and Tax Base

Most residents in the Venice are retired. The residents who are employed tend to work primarily in the service sector, the medical industry, or government to service tourism and the migration of retirees.

According to the U.S. Census Bureau, the cost of living index in Venice, as of July 2016, is 101.5 (U.S. average is 100). Per Capita income is \$42,375 (US Census Bureau). The Unemployment Rate is 3.3 percent (2017 City of Venice CAFR, Statistical Schedule 13). (2018 Schedule 13 shows unemployment rate is 2.9%) According to the Sarasota County Property Appraiser's office, the 2017 Average Market Value is \$276,854 for single family Residential parcels, and \$276,341 for Residential Condominium Parcels in the County. The Taxable Value by Municipality is \$3,817,208,295 (Adopted FY2020 Budget Book – page 22 shows 2019 Taxable Value as \$4,056,212,039) for the City of Venice.

The City collects ad valorem taxes through a millage rate. In fiscal year 2020, the General Fund operating millage was 3.7000, estimated property taxes were \$14,999,850. Total General Fund Budget was \$33,775,690. and Total Budget All Funds were \$129,420,226. The City sets aside enough reserve funds to support operating costs for up to 3 months.

Land use patterns

Based on current figures obtained from the City of Venice COMP Plan 2017-2027 (City of Venice, Florida, Inventory of Existing Land Uses), the city's land use patterns are shown in table 1 below.

Table 1:

Type of land use by acres and percentage of the city. The data is from 2018.

<i>Existing Land Use Category</i>	<i>Acres</i>	<i>% of total</i>
<i>Agricultural</i>	2456	0.8
<i>Airport</i>	440	0.0
<i>Office</i>	56	0.9
<i>Commercial</i>	159	1.6
<i>Golf Courses</i>	805	0.1
<i>Government</i>	107	0.3
<i>Industrial</i>	882	1.7
<i>Institutional</i>	137	0.5
<i>Mobile Home</i>	74	9.8
<i>Miscellaneous</i>	120	1.7
<i>Multi-Family Residences</i>	129	1.5
<i>Single-Family Residences</i>	3685	75.2
<i>Submerged / Partially Submerged</i>	0	0.0
<i>Utilities / Infrastructure</i>	183	0.3
<i>Vacant / Open Space</i>	557	5.3
<i>ROW / Roadway / Drainage</i>	147	0.4
<i>Total Land</i>	9937	100

National Flood Insurance Program

The National Flood Insurance Program (NFIP) was approved by Congress in 1968 to make flood insurance available to property owners with buildings located in the high-risk area also known as the Special Flood Hazard Area (SFHA). The SFHA is identified by Flood Insurance Rate Maps (FIRMs). To qualify for participation, a community develops and adopts a regulatory program designed to reduce exposure to flood damage. The minimum requirements for participation in the NFIP can be found in 44CFR, Part 60.3. If the community complies with the minimum requirements, then residents of that community are eligible for flood insurance. The City of Venice has participated in the NFIP since 1974 and have received Flood Insurance Rate Maps (FIRMs) and Flood Insurance Study's ever since. The most recent map and study update was November 4th, 2016. Preliminary maps have been released for the next map update. They are currently going through the process of being made official. There are currently 5,950 policies in force representing almost \$1.5 billion of coverage.

Community Rating System

The Community Rating System is a voluntary incentive program of the NFIP. The program is intended to recognize and encourage a community's floodplain management activities that go above and beyond the minimum requirements set by the NFIP. The City of Venice has participated in CRS since 1991. Venice is currently a Class 6 as of 2005. A Class 6 allows our residents to be eligible for discounts on their flood insurance, 20% in high risk areas and 10% in low risk areas. This represents a current savings of \$627,592 to Venice residents every year.

Section 2 - Plan Organization and Development

The CRS Committee was created to address specific target audiences in order to more effectively evaluate the current outreach activities for effectiveness and to recommend areas of improvement to be incorporated into the plan documents. The Building Official serves as the Floodplain Administrator for the city. However, floodplain management duties have been delegated to the City Engineer and the Stormwater Engineering Research Analyst as they relate to flood zone determinations, review and approval of elevation certificates, flood insurance coverage evaluation and public outreach activities. The committee includes both city staff and public stakeholders. CRS Committee members are appointed by the City Engineer with the intent to provide a broad spectrum of experience and perspective.

During August and September 2014, the CRS Committee met 7 times prior to adoption of the plans and conducted additional review of the plan documents through e-mail distribution. All meetings were publicly posted and open to the public. In addition, the creation and meeting information was provided to the local media and was published for the general public. The plans were presented to City Council at a public meeting with an opportunity for public comment during the meeting proceedings. The plans were published prior to the City Council meeting in the Agenda Packet to give an opportunity for additional public input prior to the formal adoption or update of the plans. Documentation of the CRS Committee activities during this time, including the adopting ordinance is included in Attachments A.

In order to improve the effectiveness of floodplain management, outreach efforts, and the number of flood insured properties, City Council approved and adopted Resolution No. 2014-27 on August 12, 2014 to create a Joint Floodplain Management Plan (FMP), Program for Public Information Plan (PPI) and Coverage Improvement Plan (CIP). The Committee is referred to as the CRS Committee in the remainder of this document. A planning document was prepared to organize the activities and goals for the CRS Committee and is attached in Appendix A. The planning document was distributed to City Council, discussed during the adoption process, and referred to for guidance during committee meetings. A public meeting was held on November 20, 2014 for draft review prior to the adoption. All minutes, agendas and attendance sheets for the CRS committee can be found in Appendix B.

The Committee currently meets four times a year to update the plan. Key topics in the meetings include:

- Plan Organization
- Public Involvement

- Assessment of flood hazards that affect the City of Venice
- Assessment of the problems brought about by flood hazards
- Floodplain Management goals
- Review of possible floodplain management activities
- Development of an action plan
- Effectiveness of existing programs and recommended updates
- Plan Annual Update and Adoption plus the 5-Year Update that was completed this year.

During this year, the CRS Committee actively provided input and review of the 5-year FMP update. To make the document more user friendly, inviting and clear to the public, the general overall format was upgraded to be more consistent with Sarasota County Floodplain Management Plan. Many outreach brochures and documents were updated to appeal to a larger audience and also to provide social media distribution in addition to the more traditional mailings, e-mails, newsletters and brochures. Memes were created and graphics were updated. The CRS Committee was presented with the updated outreach materials for review and input with the goal to make the program more effective and increase awareness. To obtain additional public input, social media and an on-line survey were used to get input from the public. The full plan was posted in ADA compatible format to give the public additional formats for review and to provide input. These changes include the conversion to an ADA compatible document, the reformatting of the document to flow easier and provide clarity to readers and our new more effective PPI materials. The CRS Committee also reviewed the projects listed on the Venice LMS and CIP.

Planning Committee Members

The following members are currently serving on the CRS Committee:

City CRS Committee Members:

- Floodplain Management Office – Kathleen Weeden, PE, CFM, City Engineer and Stormwater Utility Director, and floodplain communication
- Planning & Zoning – Roger Clark, AICP, Planning Manager, Responsible for management of the City's Planning & Zoning Division of Development Services.
- Building Division – Frank Conorozzo, PX, BN, CBO, Plans Examiner
Mr. Conorozzo is responsible for reviewing plans for building permits to verify that the proposed construction is consistent with the FBC, FEMA and city code requirements.

Public Sector Committee Members:

Flood Insurance

Mary Elizabeth Petty, AAA Insurance, Insurance Agent

Ms. Petty, Insurance Agent, has 30 years of experience and is an award-winning agent for Auto Club Group Insurance Agency. Sarasota Magazine named her one of the top Home/Auto Insurance Professionals for the past seven years. Active in the community, she services on the Board of Directors for the Center of Hope of South County, Yellow Brick Road of Florida and the Venice Area Chamber of Commerce Board Member.

Real Estate and Flood Insurance

John Meyers, Berkshire Hathaway, Real Estate

Mr. Meyers is a Realtor with Berkshire Hathaway in the City of Venice and has 14 years prior experience as an Allstate Insurance agent and 10 years prior experience as a Realtor with Remax in Indiana. He has been a resident of Venice since 2013 and is becoming more acquainted with flood hazards, flood zones, and the need to carry at least minimum flood insurance.

Financial Lending Institute

Currently Vacant, we are in the process of filling this position.

Building Industry

Robert Yoho, The Damex Corporation

Mr. Yoho is a state certified building contractor and Mold remediator. He also holds certificates in water damage restoration, lead renovation, repair and painting. He is a member of the American Indoor Air Quality (AIAQ) Council and has been an OSHA "Train the Trainer" since 2010. Robert has been a resident of SWFL since 1975.

Building Industry

Mark Hawkins, Hawks Nest Construction, Inc.

Mr. Hawkins is a state certified building contractor who complete remodels and new construction within the city. Mr. Hawkins is active in local building associations.

Commercial/Business Industry

Currently Vacant, we are in the process of filling this position.

City Staff Liaisons:

- Lorraine Anderson, Communication and Marketing Officer
Ms. Anderson has delegated the day to day communication planning and outreach to Ms. Weeden for floodplain management activities. Ms. Anderson will also issue any formal press releases that are issued for the CRS program.
- Kathryn Harring, CFM, Stormwater Engineering Research Analyst, CRS Coordinator
Ms. Harring is a Certified Floodplain Manager. She completes committee related activities such as drafting the plans and revisions, incorporating committee and public recommendations in the plan documents, preparing agendas, meeting minutes and outreach material preparation and distribution.

County Staff Liaison:

- Donna Bailey, CFM CRS Coordinator
Ms. Bailey increases our committee's coordination with Sarasota County on the issues discussed at the meetings

Public Involvement

Members of the public and press are invited to attend and provide input at all meetings. The public is further informed through articles published in the local newspapers, through interviews, and attendance at the meetings. The City Clerk's office posts the Notice of Meeting, Agendas and Minutes of each meeting on the city website and on the City Hall bulletin board. The FMP is also presented annually to the City Council for an adoption of any recent updates where the public has the opportunity to comment as well. For the 5-year update there was a separate public meeting scheduled for public comment on March 26th 2020 at the community center, however, due to COVID-19, in person meeting were stopped. To make sure the public had sufficient formal presentation at the City Council public meeting, social media blasts and e-mail blasts were sent out notifying the public where the full ADA compatible version was located on the website for review. The public was also informed that the FMP was being updated during FEMA hosted meeting to discuss flood map updates. Council. At the FEMA hosted meeting, City CFMs were available to answer flood related questions and assisting with map update impacts to property owners.

Public Information Activities

The city has developed other methods to inform the public about the FMP. These activities include:

- A webpage that provides information about the plan to the public and encourages input. The City Clerk's office posts the Notice of Meeting, Agendas and Minutes of each meeting on the city website.
- A survey is available online and occasionally advertised via our newsletter and social media. This survey includes questions about recent flooding history in the area and insurance information. Printed copies are also made available.
- Sarasota County hosts outreach workshops near Venice. These workshops are advertised through our city newsletter and social media.

Coordination

Other communities in the region face very similar flooding issues as the city and have developed their own plans to address the problem. Many of these plans are reviewed by the City of Venice in the course of developing the FMP. The city maintains regular contact with other communities to discuss floodplain management activities as well as ideas and strategies to implement the FMP more effectively.

Review of Existing Studies and Information

Plans and data that were reviewed include but are not limited to:

- City of Venice Comprehensive Plan
- City of Venice Repetitive Loss Area Analysis
- Watershed Management Plans
- City of Venice Capital Improvement Program
- Sarasota County Local Mitigation Strategy
- FEMA Flood Insurance Study and DFIRM
- Sarasota County Floodplain Management Plan
- City of Venice Comprehensive Emergency Management Plan

Coordination with Other Agencies and Organizations

County LMS meetings

The Federal Disaster Mitigation Act of 2000 (DMA2000) requires all local agencies in the country to adopt a federally approved Multi-Hazard Mitigation Plan in order to receive post-disaster funds. The City of Venice complies with this requirement through our multi-Hazard, Multi-Jurisdictional, LMS Plan with Sarasota County, and the cities of Sarasota, Northport, and the Town of Longboat Key. The LMS meetings are held quarterly to discuss updates to the LMS plan. Grant application availability for municipalities in Sarasota are also discussed.

The Venice portion of the LMS Action Plan is attached as Appendix D. It is extracted from the LMS Strategy for 2019-2020, and publicly available online

County Floodplain Management Plan (FMP) meetings

The County FMP meetings are held quarterly. Different aspects of floodplain management are discussed to share ideas and strategies for implementing the FMP. The City of Venice participates in these meetings and we update our FMP to incorporate improvements to our program that are discussed in the meeting.

County-wide Program for Public Information (PPI) Meetings

To improve the effectiveness of the PPI program, the City of Venice joined the County-wide PPI Committee. The Multi-Jurisdictional Program for Public Information (County-wide PPI) was reviewed by our CRS committee before it was adopted by the City of Venice City Council August 27th 2019. It has been incorporated into the City's Floodplain Management and PPI program by resolution. From this point forward, the City will continue to complete the local City PPI activities included in Appendix E of this document in addition to the programs provided by the County-wide PPI to increase public information provided. The County-wide PPI was adopted by Resolution by BOCC on January 29, 2019 as an annex to the Unified Multi-Jurisdictional Local Mitigation Strategy (LMS). This LMS also includes the City of Venice adopted FMP as an annex

along with the City's updated LMS Project List. The LMS and County-wide PPI includes of all the municipalities in Sarasota County including: The City of Venice, City of North Port, City of Sarasota, the Town of Longboat Key and unincorporated Sarasota County. The location of the Multi-Jurisdictional PPI is included in Appendix D.

Pinellas Community Rating System (CRS) Working Group

The CRS working group meetings consist of representatives from municipalities in Pinellas County and Sarasota County. Different aspects of floodplain management are discussed to share ideas and strategies for implementing the FMP. The meetings are held quarterly at the Tampa Bay Regional Planning Council.

This section describes the known flood hazards within the City of Venice, their history of occurrence, and areas that are likely to be impacted by those hazards. Venice is a small coastal community characterized by low, flat topography and a high water table. These characteristics make the County highly susceptible to the effects of flood damage caused by hurricanes, tropical storms, and heavy rain. Since 1978, the NFIP has paid \$2 billion in closed paid losses in Venice. Figure 1 illustrates Federal Emergency Management Agency (FEMA) Special Flood Hazard Areas (SFHA) within the City.

The City of Venice Flood Zones. See Appendix C Figure 1 for a larger version.



The population in Venice is projected to increase within the next 25 years. This will be accompanied by an increase in new developments and homes, placing more stressors for flooding in terms of increased runoff and location of structures in at-risk areas. To reduce the risk of damage due to flooding for these new developments, the city implements regulations that exceeds the minimum requirements of the NFIP. Venice continues to update the FEMA Flood Insurance Rate Maps (FIRM) with improved risk information based on newer and better data

Flooding can be attributed to several types of natural hazards that may occur in this region, including coastal flooding, inland flooding due to frequent and heavy rains, tropical storms, and hurricanes. By nature of its location along the coast of the Gulf of Mexico, Venice is continuously at risk of coastal flooding in conjunction with tropical storms, hurricanes, and heavy rain. High tide conditions increase the effects of storm surge and inland flooding due to high tail water conditions. Outside of coastal areas, the Myakka River are prone to storm surge, high tail water conditions and westerly winds.

The Venice staff coordinates with the National Weather Service to receive warnings regarding the source of flooding, warning times and expected depth of flooding. The County also maintains gages that provide additional information including rainfall amount, flow/velocities and depth.

In 2015 the City coordinated with Sarasota County on the preparation of a Sarasota County Post Disaster Redevelopment Plan. As part of the planning process the City held meetings with representatives from outside agencies, including the Red Cross, SWFWMD, FDEP, Florida Fish and Wildlife (FWC) and the Charlotte Harbor National Estuary Program. The representatives provided input and support to the City's long-term comprehensive plan goals and objectives. The plan identifies policies, operational strategies, and roles and responsibilities for implementation that will guide decisions that affect long-term recovery and redevelopment of the community after a disaster.

Flooding

The City experiences seasonal flooding as does most of Florida. According to the Sarasota County Department of Emergency Management all of Sarasota County and its municipalities are considered to be flood prone. Some areas are more likely to flood than others especially areas near the coast, adjacent to bays, inlets, creeks, rivers, or portions of the Intracoastal Waterway (ICW). The island is also more likely to flood due to proximity to storm surge in the Gulf and Roberts Bay. The circumstances for flooding occurring on the island area of the City are substantially different than those to mainland areas, due to lower finished floor elevations, older infrastructure (storm pipes) and greater impervious ratio. Increased impervious areas

have also greatly increased the possibility of flooding throughout the city. There are two types of flooding discussed below, coastal and inland.

Coastal Flooding

The City of Venice coastline stretches about 4 miles along the Gulf of Mexico, making the city extremely vulnerable to coastal flooding. Coastal flooding is usually the result of a severe weather system such as a severe thunderstorm, hurricane, or tropical storm with high winds and intense rainfall. Water driven ashore by the wind, known as a storm surge, is the main cause of coastal flooding as well as low-lying canals subject to tidal surge. The damaging effects to structures on the beach areas are caused by a combination of higher levels of storm surge, winds, waves, rains, erosion, and battering by debris. Sea walls, jetties, and beach areas are affected by coastal flooding, and losses can occur over short or long periods.

Historically, the city has experienced a number of damaging coastal floods caused by wind-driven water associated with high tide. For a full list of previous flood events see Table 6 at the end of this section

Tropical storms and hurricanes can produce coastal flooding, although they are not the only conditions under which such flooding occurs. Other historical occurrences of coastal flooding in Venice are described later in this section.

The probability of coastal flooding in the city is relatively high. This probability increases if the storm strikes the coastline during a high tide.

Residences along the Venice coast are highly vulnerable to coastal flooding due to storm surge and/or high tide. The most vulnerable locations to storm surge are the area of the city near Donna Bay, along creeks, rivers, and ditches, and the area southwest of the airport according to the SLOSH model and the evacuation levels. This often occurs because these areas are closest to the coast.

Inland Flooding

Flooding has been the most frequently occurring natural hazard in the city of Venice, including inland flooding due to heavy rains, whether or not the rains are associated with tropical storms or hurricanes. Prolonged periods of rainfall have shown increased potential for causing damage to property and requiring residents to evacuate due to flooding. This problem can become more severe if the heavy rainfall occurs at the same time as a high tide, which prevents much of the rainwater from flowing through the drainage systems into the bays or Gulf of Mexico.

Tropical storms and hurricanes can often produce inland flooding, although they are not the only conditions under which such flooding occurs. Most of the riverine flooding, within the Hatchett Creek, Curry Creek and Myakka River basins, appears to be along the major drainage ditches and the surrounding low-lying areas.

Flooding from Hatchett Creek generally occurs from the East Gate subdivision to the West. Flooding in this area has resulted from Hatchett Creek overflowing its banks. Road flooding has occurred on East Venice Avenue between the intersections of Grove Street and Warfield Avenue, and on Grove Street in the Housing Authority. The impact to the Housing Authority property has been reduced due to tearing down of the existing structures, and replacement with elevated structures and floodplain modeling to verify floodplain compensation impacts are addressed. Warning time is sometimes limited by the quick development of afternoon rain events.

Road and low-lying areas along Curry Creek are known to have past flood problems. The areas include Bay Indies Mobile Home Park, Roberts Bay Estates, and Mobile City estates. Residents generally have enough warning time to evacuate.

Storm events can be described as the amount of precipitation that occurs over a given duration (e.g., 10 inches of rain over a 24-hour period). Typically, the probability of these storm events are categorized as follows, consistent with United States Geological Survey (USGS) and FEMA terminology:

- 100-year storm = 1% chance of a flood every year
- 50-year storm = 2% chance of a flood every year
- 25-year storm = 4% chance of a flood every year
- 10-year storm = 10% chance of a flood every year

These categories indicate a probability of occurrence (a 100-year flood has a 1-percent chance of occurrence in any given year). The smaller the chance of occurrence is, the more devastating the flood potential may be. Each of the flood categories is associated with a specific amount of rainfall over a given duration for a specific region. For Venice, the 25-year flood is characterized as receiving 8 inches of rain within a 24-hour period, while the 100-year flood is associated with 10 inches of rain within a 24-hour period.

A high probability of flooding and continued development throughout the City make the entire City vulnerable to inland flooding. Most vulnerable are structures built before the county entered the NFIP in 1974 called pre-FIRM structures. Sarasota County has developed and maintained a comprehensive Watershed Management Plan for all watersheds within the County. These plans include stormwater models developed to describe the flooding potential for areas within the City. The plans were developed in coordination with the Southwest Florida Water Management District (SWFWMD), which oversees the management of the region's water resources and includes flood protection and issuing of permits to ensure that new

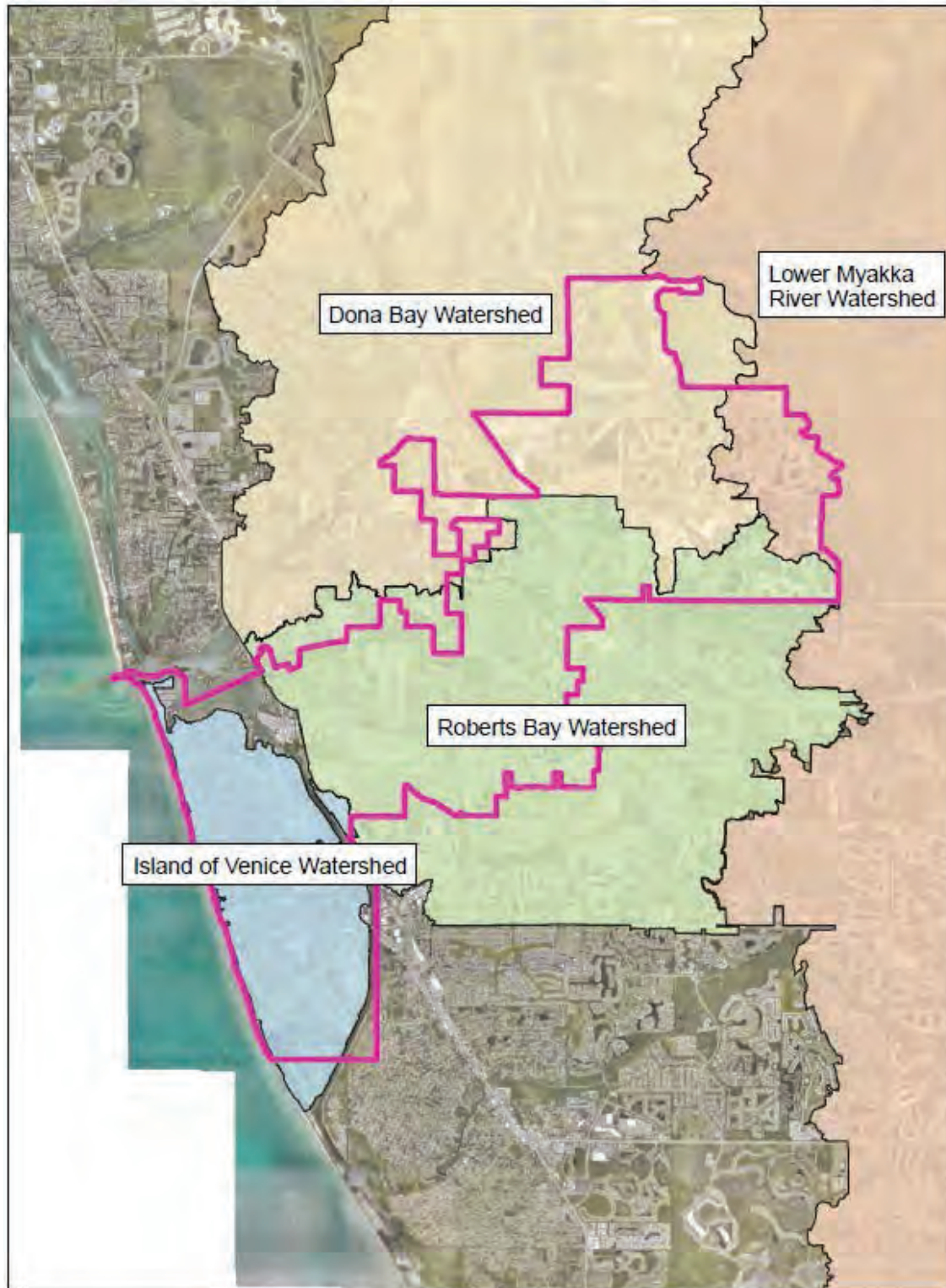
developments do not cause flooding. The results of these plans help to identify those areas that are vulnerable to flooding from small storms or less frequent, larger storms. The following descriptions highlight the watersheds and the drainage systems that they contain that are within City of Venice limits.

- **Dona and Roberts Bay Watershed:** Cow Pen Slough, Fox Creek, Curry Creek, Dona/Roberts Bay Coastal, Hatchett Creek, and Island of Venice.
- **Myakka River Watershed:** Big Slough Canal, Curry Creek, Deer Prairie Creek, East Cocoplum Waterway, Harris Camp, Howard Creek, Lake Myakka, Lower Myakka River, Maple Creek, Mossy Island Slough, Mud Lake Slough, North Cocoplum Waterway, Oglegy Creek, Owen Creek, South Cocoplum Waterway, Tatum Sawgrass Swamp, Tippecanoe Bay, West Cocoplum Waterway, Wildcat Slough, and Wingate Creek.
- **Gulf of Mexico Watershed:** Coastal areas of the city of Venice.

The City also performs an annual evaluation of repetitive losses within its jurisdiction. Repetitive loss areas are described further in Section 5 of this report. The combination of the City's stormwater models, historical records, and repetitive loss area evaluations help identify those areas within the City that are susceptible to flooding. The City also maintains data describing locations that have flooded in the past.

FEMA has recently issued new preliminary flood maps. The city received them at the beginning of 2020. Venice has since reviewed our panels internally and co-hosted 3 different meetings with FEMA and the other local jurisdictions. The weeks leading up to the meetings Venice sent social media messages out about the events. The city is hosting one more flood map update meeting for the public in soon once the preliminary maps go through the federal registrar and an article is published in the local papers a 90-day appeal and comment session will begin. The process to update these maps should take 18-24 months according to FEMA, however, FEMA has placed the adoption process on hold during COVID-19. Once.

Figure 2:
Watersheds within the Venice jurisdictional boundary



Tropical Storm/Hurricane

Tropical storms and hurricanes are large cyclonic storms with counterclockwise winds of 39 mph or greater. If the conditions are right, with warm ocean water and favorable high-altitude winds, the system could develop winds in excess of 155 miles per hour, with catastrophic results if it makes landfall in populated areas. The following are descriptions of the three general levels of development for hurricanes:

- Tropical depression: The formative stages of a tropical cyclone in which the maximum sustained surface wind is 38 mph or less.
- Tropical storm: A warm core tropical cyclone in which the maximum sustained surface wind ranges from 39–73 mph.
- Hurricane: A warm core tropical cyclone in which the maximum sustained surface wind is 74 mph or greater.

Hurricanes season in Florida is June 1st through November 30th. Hurricanes are measured by the Saffir-Simpson Scale see the table below. Hurricanes in Category 3 or higher are considered major hurricanes because they have the potential to be devastating or catastrophic. A category 3 hurricane would cause flooding of the most heavily populated portions of the City. A category 4 or 5 hurricane would cause flooding almost to the I-75 corridor. Category 1 and 2 are still dangerous and require preventative measures.

Table 2:

Saffir-Simpson Scale categorizes hurricanes by their wind speed and estimates their damage potential.

Category	Wind Speed (mph)	Damage
1	74-95	Some
2	96-110	Extensive
3	111-129	Devastating
4	130-156	Catastrophic
5	157+	Catastrophic

NOAA describes the damage potential for each category as follows:

- **Category 1:** Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding, and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
- **Category 2:** Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will

be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.

- **Category 3:** Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
- **Category 4:** Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
- **Category 5:** Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

Although hurricanes are categorized according to sustained wind speeds, they are often accompanied by heavy rains and storm surge that can cause flooding throughout Venice. In addition, fallen trees and debris can obstruct water flow, contributing to flood damage to structures.

Due to its geographic location in the subtropics, adjacent to the Gulf of Mexico, the entire City is vulnerable to damage caused by tropical storm and hurricane-force winds and related flooding. Vulnerability to hurricane related flooding is dependent upon the severity of storm surge, a general rise in sea level caused by the low pressure and strong winds around a hurricane's eye, and the amount of rain carried by the hurricane. Storm surge is influenced by the hurricane's velocity, and can rise 20 feet or more above normal sea level to cause massive flooding and destruction along shorelines in its path. During tropical storms and hurricanes, flooding due to heavy rainfall may extend over widespread areas of the City. Thankfully hurricanes also take time to develop and provide enough warning for an evacuation and/or preparation of residents and visitors.

Venice's most common hazard is hurricanes, several tropical storms and hurricanes have occurred recently, for a list see Table 6 at the end of this section.

Historical Claims and Repetitive Loss Areas

The NFIP has paid \$2,272,549.18 in closed paid losses in the City of Venice. Of these paid losses approximately \$2,209,000 were for Pre-FIRM structures, representing 211 claims while post-FIRM structures accounted for 11 claims totaling almost \$61,590. This shows the importance of maintaining accurate flood risk information and the benefits of Venice's floodplain management practices and regulations Tables 3 and 4 describe claim statistics for the City of Venice.

Table 3:

Pre-FIRM structures with NFIP coverage separated by flood zones. Includes Policies in Force, Premium, Insurance in Force, Dollar Amount of Paid Losses, and Adjustment Expense

Zone	Policies in Force	Premium	Insurance in Force	# of Closed Paid Losses	# of Closed Paid Losses	Adjustment Expense
AE and A1-30	2,114	\$1,840,631	\$363,683,200	108	\$1,395,371.73	\$67,992.75
Unnumbered A	0	\$0	\$0	2	\$60,081.59	\$2,475.20
VE and V1-30	5	\$6,793	\$330,200	54	\$316,232.57	\$15,905.00
B, C and X	1,003	\$406,912	\$261,461,700	47	\$437,450.55	\$25,175.05
Standard X	409	\$142,050	\$80,658,700	38	\$193,760.91	\$10,390.00
Preferred X	594	\$264,862	180,803,000	9	\$243,689.64	\$14,785.05
Total	3,122	\$2,254,336	\$625,475,100	211	\$2,209,136.44	\$111,548.00

Table 4:

Post-FIRM structures with NFIP coverage separated by flood zones. Includes Policies in Force, Premium, Insurance in Force, Dollar Amount of Paid Losses, and Adjustment Expense

Zone	Policies in Force	Premium	Insurance in Force	# of Closed Paid Losses	\$ of Closed Paid Losses	Adjustment Expense
AE and A1-30	931	\$553,199	\$191,926,400	4	\$15,777.61	\$1,995.00
Unnumbered A	0	\$0	\$0	0	\$0.00	\$0.00
VE and V1-30	1	\$580	\$64,900	0	\$0.00	\$0.00
B, C and X	1,896	\$803,395	\$586,831,500	7	\$45,810.98	\$5,525.00
Standard X	167	\$103,586	\$39,934,500	2	\$11,212.87	\$850.00
Preferred X	1,729	\$699,809	\$546,897,000	5	\$34,598.11	\$4,675.00
Total	2,828	\$1,357,174	\$778,822,800	11	\$61,588.59	\$7,520.00

The City maintains insurance on all of its facilities including flood insurance for facilities that are at risk of flooding.

As described in table 3 and 4 there are almost 3,100 policies in the SFHA. There are many more insurable structures in the high risk areas, however, insurance is not carried on many of them. The reason insurance coverage is low is because many of the homes are paid in cash so there is no mortgage.

Structures in the community are at risk of flooding even if they are not in the SFHA. 20% of all paid losses have been outside the SFHA. Most of the flood insurance policies in the city are for single family homes (2,523 policies) Most of the claims come from this group as well representing approximately \$1,123,434.02 in paid losses.

Table 5:

NFIP insured policies and cost of paid losses separated by occupancy type

Occupancy Type	Number of Policies	Cost of Closed Paid Losses
Single Family	2,523	\$1,123,434.02
2-4 Family	384	\$510,970.40
All Other Residential	2,893	\$501,509.63
Non Residential	186	\$136,635.13
Total	5,950	\$3,373,549.18

The City of Venice performed a repetitive loss analysis using the most recent repetitive loss properties data from FEMA. The city has identified 7 areas at an increased risk of flooding based on historical claims data, topographic information, FEMA flood zones, historical flooding complaints, and other information. The goal is to reduce the number of repetitive loss properties in the city. There are 169 insurable structures in these repetitive loss areas. Most of these structures are on the island and seem to be due to storm surge. The condos that were affected seemed to only be affected on the first floor. One is located inland due to low elevation and inadequate drainage

A property is considered repetitive loss when an NFIP-insured structure has had at least two paid flood losses of more than \$1,000 each in any 10-year period since 1978. There are currently 16 repetitive loss structures in the city. A Severe Repetitive Loss structure is a residential property that is covered under an NFIP flood insurance policy and (a) has at least four NFIP claim payments (including building and contents) over \$5,000 each, and the cumulative amount of such claims payments exceeds \$20,000; or (b) at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building. For both (a) and (b) above, at least two of the referenced claims must have occurred within any 10-year period, and must be more than 10 days apart. Venice has 11 severe repetitive loss structures with only one located inland.

The City of Venice is a Class 6 community in the Community Rating System Program and is required to have a Floodplain Management Plan or area analyses for its repetitive loss areas.

Stormwater division and the CRS Coordinator adhere to the data pertaining to SRLs and RLPs as protected under the Federal Privacy Act of 1974.

Venice mapped the Repetitive Loss Properties and evaluated nearby properties with the same potential for flooding. The repetitive loss areas include the properties on the repetitive loss list and all nearby properties that may experience similar flooding conditions. The repetitive loss areas were delineated based on compilation of the following data:

- Repetitive loss properties and data (e.g., number of losses and associated cost).
- LiDAR (elevation data, land slope).
- Conveyance system components (e.g., location and size of stormwater pipes, ditches, storage basins, work requests).
- Floodplains (e.g., WMP studies and FIRMs).
- Storm surge areas.
- Streetview.
- Historical flooding complaints.

The city continually evaluates the repetitive loss areas, with the most recent evaluation and major update conducted in 2017. The update consisted of a desktop evaluation of existing and potential new repetitive loss areas, and a field investigation of the properties. The RLAA memo describes the analysis process for evaluating the historical claims data and repetitive loss areas.

See Attachment C for a full RLAA map

Vulnerable Properties

All properties within the city are considered vulnerable to flooding, however, certain sections of the city represent a higher risk due to location, type of use, or topography. Areas adjacent to the coastline or other water bodies such as Roberts Bay, the Intracoastal Waterway, Hatchett Creek, Curry Creek, Myakka River or Blackburn Canal are considered to be more vulnerable to the risks of storm surge and riverine flooding. Areas of low topography may experience ponding or localized flooding during rain events.

The Hatchett Creek Master Basin Plan identified 2 commercial buildings as vulnerable structures. The Curry Creek Master Basin Plan identified 1 residential property and 1 multi-family property as vulnerable structures. Approximately 50 to 60 residential properties were identified as vulnerable structures in the Island of Venice master Basin Plan, of which 33 are included in the repetitive loss area. Chapter 98 in the Venice City Code of Ordinance regulates development activities.

The potential dollar loss of vulnerable structures is estimated at \$200,000 for the Hatchett Creek basin, \$300,000 for the Curry Creek basin, and between \$15 and \$20 million for the

Island of Venice basin. Reviews of the flood insurance claims show that the properties most affected by flooding are Coastal areas near Roberts Bay and the Gulf of Mexico.

Road and low-lying areas along Curry Creek are known to have past flood problems. The areas include Bay Indies Mobile Home Park, Roberts Bay Estates, and Mobile City estates. As redevelopment occurs, the new construction and substantial improvements are required to comply with the city floodplain ordinance and construct above the 100-year floodplain elevations. The Southwest Florida Water Management District (SWFWMD) also requires that floodplain compensation calculations be completed to reduce any off-site floodplain impacts.

Flooding from Hatchett Creek generally occurs from the East Gate subdivision to the West and adjacent to the Myakka River in the northeaster section of the City. Historical aerials from the 1940's and 1950's show that Hatchett Creek was rerouted to allow for residential development. As a result, homes were built on EauGaille and Myakka sands which are very deep, very poorly drained, slowly permeable soils. Soils in East Gate are poorly drained and have a seasonal high-water table at 6 to 18 inches, for 1 to 3 months of the year, and within 40 inches for 2 to 6 months of the year. Properties that have been developed adjacent to the Myakka River have been designed based on a flood study performed by Kimley Horn Engineering Consultants, and the region has been designed to account for modeled flood stages. Residential structures and the community center in this area have been elevated above the required flood elevation and an extensive drainage system has been constructed to meet the 100-year flood stage conditions.

Twenty-two (22) structures in the SFHA were demolished between October 2016 and January 2020. Four (4) structures were mobile homes, fourteen (14) of the structures were single family residences. These structures were replaced by the property owners with compliant structures sufficiently elevated to meet the minimum FFE and reduce potential flood losses.

Hazard History

The City's most common hazards are hurricanes, tropical storms, beach erosion, tornadoes, storm surge and flooding. The City has experienced numerous events over the years that have caused flooding, from minimal street flooding to significant flooding of roadways, making them impassable, and impacting structures. The primary events are listed in table 2, Flood History:

Table 6:

Flood History of Venice 1921-present day

DATE	Event Name	Description
10/24/1921	A storm that originated in the western Caribbean Sea.	This storm produced high tides (approximately 7 feet). Wave action resulted in heavy damage throughout Sarasota County.
9/19/1926	An un-named hurricane.	This was a 10-year storm in which 8 inches of rain fell in a 24-hour period, resulting in flood damage of more than \$1 million.
6/26/1943		7.48 inches of rain fell in a 24-hour period
6/23/1945		10.80 inches of rain fell in a 24-hour period.
9/10/1960	Hurricane Donna	Resulted in flooding throughout the county. Tides ran more than 3 feet above normal, rains totaled between 5 to 7 inches and pre-storm rainfall of almost 10 inches contributed to flooding.
9/21/1962		7.37 inches of rain fell in a 24-hour period. Total storm rainfall over the 3-day period was 13.83 inches. The storm caused flood damage to multiple houses in Sarasota County.
10/21/1968	An un-named storm.	Considerable flood damage
6/18/1972	Hurricane Agnes	Caused flood damage due to high tides and 5 inches of rain.
6/18/1982	The "No Name Storm"	6 inches of rain and 60 mph winds in Sarasota County with little warning. The storm created high tides and caused structural flood damages.
8/28/1985	Hurricane Elena	Hurricane Elena hovered over the west coast of Florida for 6 days. Aug 28 – Sept 4, 1985 and brought rainfall of more than 11 inches, requiring the evacuation of 37,000 people.
10/28/1985	Hurricane Juan	Hurricane Juan caused 25 to 35 foot swells in the Gulf of Mexico, and subsequent coastal flooding.
10/16/1987	Hurricane Floyd	Hurricane Floyd brought heavy rains and string winds, resulting in flooding.
11/20/1988	Tropical Storm Keith	Tropical Storm Keith brought rain and strong winds, creating tidal surges 4 feet above normal
6/23/1992		11 to 23 inches of rain fell within a 15-hour period, causing minor flood damage.
6/23/1993		June 23-26, 1993. Rain exceeded the 100-year, 24-hour storm event with 11.82 inches of rain falling in a 24-hour period.
7/18/1995		Approximately 9 inches of rain fell within a 15-hour period causing minor flood damage.

DATE	Event Name	Description
9/7/1995		Rainfall of approximately 2 to 3 inches in 1-hour. Caused localized flooding and approximately \$5,000 worth of property damage (NOAA National Climatic Data Center).
11/1/1997	El Niño event.	Caused 10 to 12 inches of rain to fall within a 24-hour period, causing flooding throughout Sarasota County. Nov/ Dec 1997
8/12/2000		Rainfall of 4 to 6 inches over a 6-hour period caused localized flooding of low roads.
9/15/2001	Tropical Storm Gabrielle.	Gabrielle reached tropical storm strength mid-day on Sept 13th, while located about 175 nautical miles SW of Venice. Gabrielle's center made landfall near Venice about 1200 UTC on Sept 14th. The storm strengthened to about 69 MPH just before landfall. Caused storm surge and localized street flooding.
5/1/2003		Rain events - May 2003 caused a lift station to fail and water /sewer damage to a local church that sits along Hatchett Creek.
9/5/2003	Tropical Storm Henri	Caused flooding that created flooding problems in the East Gate area and intermittently closed sections of Venice Avenue.
8/13/2004	Hurricane Charley	A Category 4 storm struck Punta Gorda. Due to the compact nature of the storm and the quick course change, the rain and wind impacts to the City of Venice were minimal.
9/5/2004	Hurricane Frances	A very large, slow moving Category 2 storm. Although the eye did not impact the City directly, several inches of rainfall caused some flooding and wind impacts within the County
9/19/2004	Hurricane Ivan	A strong Category 4 storm made landfall near Gulf Shores, Alabama. Although the storm remained west of Venice, beach erosion was experienced here.
9/26/2004	Hurricane Jeanne	Caused flooding impacts although the landfall was on the East coast of Florida, near Stuart.
10/24/2005	Hurricane Wilma	Hurricane Wilma made landfall in Florida near Cape Romano and moved across the peninsular in less than 5- hours. The location of the landfall was far enough south of Venice that winds and rain were minimal.
11/7/2006		Afternoon rains on November 7, 2006: Afternoon rains caused roadway and structure flooding along East Venice Avenue.

DATE	Event Name	Description
6/2/2007	Tropical Storm Barry	Tropical Storm Barry made landfall near Tampa, dropping a few inches of rain and creating high surf conditions along the west coast of Florida, including Venice.
3/27/2008	A rain event.	Caused flooding along East Venice Avenue.
8/19/2008	Tropical Storm Fay	Tropical Storm Fay made landfall in Florida, south of Naples, and moved northeast with rainfall amounts in excess of 20 inches on the east coast. Because of the path of the storm, there was minimal impact on Venice.
5/1/2009		Rain events during the month. May 2009 caused localized flooding of structures and roadway along East Venice Avenue, between U.S. 41 By-pass and Warfield Avenue.
6/1/2012	Tropical Storm Debbie	June 2012. Caused downed trees and flooding. No evacuation notice issued. 1 home destroyed, 35 homes damaged. No injuries or fatalities. No Critical facilities impacted. Beach Road was the only road closure.
8/1/2012	Tropical Storm Isaac	Flooding at Flamingo Ditch. Beach erosion. August, 2012
9/1/2013	A heavy rainfall event	Caused flooding, 2 beach outfall ponds to be overtopped, and beach erosion. Sept, 2013
9/27/2014	A heavy rainfall event	The Myakka River at Myakka State Park reached 8.75 feet on Monday. Sept 27-29, 2014. Sunday reading of 8.5 feet. Its flood stage is 7 feet. The only place closed in the city because of flooding was Venice Myakka River Park, which is at the east end of Laurel Road in North Venice. There were no official road closures in the city of Venice.
8/5/2015	Myakka River Flooding Event	Myakka River continues to stage above action level of 6.5ft. There were no road closures in the City of Venice.
1/18/2016	EF2 Tornado	An EF2 tornado touched down in Siesta Key in Sarasota County with winds estimated to have reached 70 mph, according to the NWS. 111 to 135 mph. 300 business throughout the county were damaged.
6/6/2016	Tropical Storm Colin	Tropical Storm Colin made landfall near Deckle Beach in Taylor County, moving at 20mph. Venice was impacted by rain, strong winds, and an unusually high tide, creating tidal surges 3 feet above normal and localized flooding.
8/31/2016	Tropical Storm Hermine	Tropical Storm Hermine (later Hurricane Hermine) caused flooding within the City in the vicinity of Flamingo Ditch, Tarpon Center and S. Jetty Park.
7/31/2017	TS Emily	Tropical Storm Emily swept through Florida after a whirlwind landfall on July 31, 2017, featuring heavy rain and some local wind damage.

DATE	Event Name	Description
8/4/2017	Myakka River Flooding Event	The Myakka River rose to the point that all walkways were under water with no safe access to the floating dock. Sarasota County Parks & Rec closed the park and sent out media notices.
8/25/2017	Low pressure system	Approximately 20 inches fell over a period of 5 days, resulting in flooding in various areas of the City.
9/10/2017	Hurricane Irma	Hurricane Irma made a second landfall as a category 2 over Marco Island and continued to weaken into a category 1. Irma caused a lot of downed vegetation and it cut out power for many days and damaged the water main. The water was turned off for a period of time due to a loss of pressure and a boil notice was put in effect.
8/28/2018	Myakka River Flooding Event	Sarasota County Parks and Recreation has closed Venice Myakka River Park, at 7501 Laurel Road E, due to flooding.
8/29/2018	Heavy rain event	Flood Warning was issued by VPD for the following areas due to localized flooding, US Bypass 41 and E Venice Ave, the base of all 3 bridges, Capri Isles Blvd, and Barcelona and Madrid
10/2/2018	Myakka River Flooding Event	Sarasota County Parks and Recreation has closed Venice Myakka River Park, at 7501 Laurel Road E, due to flooding.
8/13/2019-8/16/2019	14 County-wide Flood Watch	14 different counties including Sarasota were placed under flood watch due to heavy rains, saturated soils and multiple rivers including Myakka at or above flood stage.
8/15/2019-9/4/2019	Myakka River Flooding Event	Sarasota County Parks and Recreation has closed Venice Myakka River Park, at 7501 Laurel Road E, due to flooding. Put in GIS once end date is known
10/19/2019	TS Nestor	Localized flooding 1 mile from Caspersen Beach.
06/01/2020	Tornado Event	Tornado during a heavy rain event caused structural damage to the dugout and goal posts at Wellfield Park and the roof of the E. Venice Publix.
06/02/2020	Heavy rain event	Approximately 4" of rain within one hour caused localized flooding in many areas within the city including Madrid St., N. Park Blvd, Harbor Dr. S, Turin Ave., Granada St., business on US 41 N and other locations. Flooding was also observed in the North Pier Parking area as the outfall pipe was unable to be opened due to active Marine Turtle nest immediately adjacent to the outfall pipe.

Section 4 - Less Frequent Flood Hazards and Other Types of Hazards

This section discusses other hazards that affect the City of Venice less frequently than the hazards discussed in Section 3

Dam Failure:

The City lies just outside a Myakka reservoir dam inundation zone. If the dam were to breach, sections of the mainland part of the City could potentially see flooding. It is expected that the extent of the flooding would be minimal, although the flooding could be greater if combined with a severe weather event. The depth of flooding, velocities, and warning time would vary with each event. Venice has never yet been subjected to a dam breach.

Coastal Erosion:

Coastal erosion is the wearing away of land and the removal of beach or dune sediments by wave action, tidal currents, wave currents, drainage, or high winds. Waves generated by coastal storms or hurricanes cause coastal erosion, which may take the form of long-term losses of sediment and rocks, or merely the temporary redistribution of coastal sediments. Erosion in one location may result in accretion nearby. Beach erosion is most common in the summer but can occur during winter cold fronts

The beaches and inland waterways of Venice will continue to shift and change over time, presenting an identifiable hazard. Whether or not coastal erosion takes place over a long period of time or by a single incident, coastal erosion is a continued hazard.

The City of Venice has about 4 miles of Gulf beach shoreline. As land values have increased, redevelopment of the finite number of privately owned, previously developed coastal properties has become common. Observed trends include the teardown and reconstruction of single-family residences with larger structures and, often, additional ancillary features such as pools, garages, docks, and patios. These trends have placed new demands and threats on coastal resources, which are being managed with regulatory and public educational programs. These trends can also have a positive result: for example, redevelopment results in modernized structures that comply with improved building codes, better enabling the structures to withstand the adverse effects of hurricanes and coastal erosion. These improvements will enhance public health, safety, and general welfare and will reduce the need for Bay and Gulf-front coastal armoring.

All coastal structures as well as the critical facilities that support these structures could be impacted by coastal erosion. The State Enhanced Hazard Mitigation Plan (2013) references specific areas of coastal erosion and has identified critical areas as defined by the Florida Department of Environmental Protection. Erosion is “critical” if there is a threat to or loss of

one of four specific interests – upland development, recreation, wildlife habitat, or important cultural resources.

Beach renourishment also affects coastal erosion. Venice Beach is renourished on a regular basis in order to establish a fixed dune and stabilized beach system to provide flood protection to the coastal community during storm surge events. The most recent beach nourishment was completed in 2015. Additionally, the existing stormwater beach outfalls are regularly evaluated to look for opportunity to improve the function of the drainage system and to verify proper operation of the existing facilities. This project is being performed in partnership with the Army Corp of Engineers and the FDEP as funding partners. The next renourishment event is scheduled to be completed in 2025. The wide beach created by renourishment is important in reducing the damage caused by hurricanes and tropical storms. The vegetated dunes also help prevent some erosion.

The City mitigates the effects of erosion within coastal hazard areas by regulating construction on sand dunes through the following ordinances: Sec 98-43, Site Improvements, Utilities and Limitations; Sec 86-260, Waterfront and Coastal Area standards; Sec 98-35, Site Plans and Construction Documents; and Sec 98-47, Other Development. These regulations permit construction or alteration on or around sand dunes only when approved by the Florida Department of Environmental Protection, and only if the engineering analysis demonstrates that the proposed alteration will not affect the potential for flood damage, is consistent with the local beach dune morphology, and the vertical clearance is maintained between the top of the sand dune and the lowest horizontal structural member of the building. The City maps the Erosion Control Line (ECL), Coastal Construction Control Line (CCCL) and General Permit Line (GPL) established along our entire coast line. The ECL is used during state permitting, along with the CCCL and GPL, to minimize construction in coastal erosion high hazard areas. Information regarding all three lines is also given as part of every flood zone determination. Ultimately, these maps will be available to the general public via the City's website.

The City maps the Coastal Erosion Areas, as established by FDEP in 2014. The City also maps the Historical Shoreline using data from the shoreline change analysis for the USGS National Assessment Project. The data has shorelines from 1883, 1942, 1977 and 1998. Erosion areas and historical shoreline change are considered to be crucial elements in studying the vulnerability of the shoreline. This data is updated as new information becomes available. A map of the historical erosion for the city of Venice is included as Appendix C, Fig 2.

Storm Surge

Storm surge occurs when a storm's winds push sea water toward the shore. The advancing surge combines with normal tides to create a hurricane storm tide, raising the average water level 15 feet or more. Storm surge can be hugely destructive. Sand dunes can be washed out, buildings near the coast can be toppled, and the surge can push flooding miles inland through rivers and back bays. Storm surge occurs along the coastline, the City's westward boundary, the Gulf of Mexico. Depth of flooding depends on the strength of the tropical storm or hurricane. Hurricane and tropical storm watches are issued several days in advance, allowing residents, visitors, and commercial property owners plenty of time to prepare.

Other Hazards:

The City of Venice has adopted the Sarasota County Local Mitigation Strategy (LMS) that embraces an all-hazards approach to mitigation. The LMS has a comprehensive plan to reduce or eliminate risks associated with both natural and man-made hazards. The plan considers the hazards impact to life and safety of residence, properties, critical facilities, and the economy. It also considers ways to reduce or eliminate these impacts, it provides a guideline for implementing these programs and projects in the community. A committee develops and updates this plan. The members consist of all the municipalities in Sarasota County and public stakeholders.

The LMS discusses the hazards that were in section 3 of this FMP as well as other, less frequent hazards that occasionally occur in the area. These hazards include:

Hail Storms:

Hail is a form of precipitation that occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into balls of ice. Hail can damage aircraft, homes, and cars, and can be deadly to livestock and people. Hail is usually pea-sized to marble-sized, but big thunderstorms can produce larger hail. Hailstorms usually accompany thunderstorms, which are common occurrences in Venice, however, instances of hailstorms are low. According to NOAA, Sarasota County and its jurisdictions have experienced 42 hailstorm events during the period from January 1, 1950 to November 1, 2016. The probability of hailstorm occurrence is low since the freezing level – the elevation at which freezing temperatures occur – in a Florida thunderstorm is so high that hailstones typically melt before they reach the ground.

Lightning:

Lightning is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a "bolt" when the buildup of charges becomes strong enough. This flash of light usually occurs within clouds or between clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000° Fahrenheit. Florida is the most

lightning-prone area in the United States, with about 90 thunderstorm days per year. Because of this, Florida experiences more lightning deaths than any other state. In fact, in Florida lightning kills more people than do all other weather hazards combined. In the Florida Peninsula, thunderstorm season generally has two periods. Historically, the most dangerous months for lightning strikes are June, July, and August. According to FSU Emergency Management an average of 10 people in Florida are killed by lightning and 40 people are seriously injured every year.

Freeze:

A freeze is weather marked by temperatures at or below the freezing point (0° Celsius or 32° Fahrenheit) for a significant period. Freezing temperatures can damage agricultural crops and burst water pipes in homes and buildings. Frost, often associated with freezes, can increase damaging effects. Frost is a layer of ice crystals that is produced by the deposit of water from the air onto a surface that is at or below freezing. The damage that can result from a freeze is typically associated with the agriculture industry, and does not often affect persons, structures, or associated property directly. During extended periods of low temperatures, individuals can suffer hypothermia and frostbite. Venice is most susceptible to freeze events from December through February. Freeze warnings for Venice occur every few years, but severe freezes have occurred statewide. In 1985 and 1989, the freeze was so severe that it wiped out entire groves across the state, killing both mature and young citrus trees. These freezes caused a significant economic impact on the citrus industry.

Tornado:

Tornadoes are cyclonic windstorms that usually accompany thunderstorms and hurricanes. While relatively short-lived in duration, tornadoes are intensely focused, making them one of the most destructive natural hazards. The weather conditions that tend to generate this phenomenon are unseasonably warm and humid earth surface air, cold air at the middle atmospheric levels, and strong upper-level jet stream winds. Waterspouts are weak tornadoes that form over warm water and occasionally move inland to become tornadoes. Florida has two tornado seasons. The summer tornado season runs from June to September and has the highest frequencies of occurrences, with usual intensities of EF0 or EF1 on the Enhanced Fujita Scale. The spring tornado season runs from February to April and is characterized by fewer, but more powerful tornadoes on the Enhanced Fujita Scale.

Florida has the second highest record of tornadoes in the United States, although Venice does not have a high incidence of tornado activity. In 1982 a tornado killed 1 person and injured several others just east of the city limits. A wind event occurred on April 8, 2008, when a wind burst caused damage to a restaurant on East Venice Avenue and damage to 15 nearby mobile homes. An EF2 tornado touched down in Siesta Key on Jan 18th, 2016 with winds estimated to

have reached 70mph. An EF1 tornado touched down in Venice on June 4, 2020, causing damages.

Land Subsidence/ Sinkholes:

Land subsidence is the lowering of a portion of the earth's crust and can occur naturally or through human activity. Natural subsidence may occur when limestone, which is easily carved by underground water, collapses, leaving sinkholes on the surface, or due to earthquakes along fault lines. Human activities such as mining or the extraction of oil, gas, or water may also lead to land subsidence. Sinkholes are a common feature of Florida's landscape due to land subsidence.

Sinkholes are only one of many kinds of karst landforms, which include caves, disappearing streams, springs, and underground drainage systems, all of which occur in Florida. Sinkholes form in karst terrain principally from the collapse of surface sediments into underground cavities in the limestone bedrock. Slightly acidic groundwater slowly dissolves cavities and caves in the limestone over a period of many years. When a cavity enlarges to the point that its ceiling can no longer support the weight of overlying sediments, the earth collapses into the cavity, forming a sinkhole. Sinkhole probability in Venice is considered by the Florida Geologic Survey to be uncommon, but deep collapse types and small subsidence sinkholes are possible. Since July 1981, Venice has only had one sinkhole with less than 10 feet in diameter and centered on a single property, according to USF.

Wildfires:

A wildfire is an intense fire that is usually in an uninhabited or sparsely habited area. There have been wildfires in the area in the past, 75% of the county is vulnerable to wildfires. The Venice fire department works closely with fire suppression agencies on fire mitigation and controlled burns.

Section 5 - Future Flooding

Climate Change and Sea Level Rise

Over the last century the global sea level has been rising, and has increased its rate in the last few decades. There are 2 major causes of sea level rise, thermal expansion and melting land-based ice. Thermal expansion is a physical property of all molecules, when the temperature rises molecules get more excited and expand while still in a liquid state. Glaciers and Ice Sheets are also melting due to rising temperatures and the albedo effect. As they melt the water makes its way to the oceans causing the rise in water levels.

As sea levels rise, low lying coastal areas become increasingly prone to coastal and inland flooding, especially during spring high tide and during seaward storms, strong offshore winds or other factors that contribute to storm surge.

Storm surge and wave heights during a hurricane are predicted to increase as the sea level rises. Hurricanes are also predicted to have a greater damage impact on coastal areas. Sea level rise will also reduce the effectiveness of the stormwater system because they are currently mostly gravity-feed. This will lead to an increase in sunny day flooding and more flooding in low-lying areas during rain events.

Sea level rise will also exacerbate coastal flooding, beaches may erode differently and potentially shift the beach profile. Dunes may become lower in elevation or completely erode.

According to NOAA, the pace of global sea level rise almost doubled from 1.7 mm/year throughout most of the 20th century to 3.2 mm/year since 1993. The USACE developed the Sea Level Change Curve Calculator to provide guidance in evaluating future coastal projects with respect to changes in sea level.

Sea Level rise makes coastal communities more vulnerable to flooding and may flood them more frequently. Areas that do not currently experience flooding might flood in the future. Consequently, the risk of flood damage to coastal infrastructure is likely to increase in parallel with sea level rise (U.S. Global Change Research Program, 2009). Infrastructure such as beach facilities, roads, bridges, residential properties, and other structures that must be located at or near the water line are very likely to be at gradually increased risk of damage from flooding, hydrodynamic pressure from storm surge, and wave impact because of sea level rise. Sea level rise will stress infrastructure physically, since salinity changes may affect the structural integrity and/or functionality of physical materials that compose the features of roads, ports, airports, and rail systems. Even roads farther inland may be threatened because road drainage systems become less effective as sea levels rise. Even if coastal and riverside properties themselves are elevated enough not to flood, the roads and infrastructure leading to them could be inundated on a regular basis in the future.

Future Development in the Watershed

Rapid growth of the City and the resultant reduction of vacant land available for development, coupled with less than average rainfall for several years, have encouraged people to settle in flood hazard areas. As development and redevelopment have spread around the City, large amounts of land have been covered with impermeable surface such as parking lots, roofs, driveways and streets. A greater number of teardowns and rebuilds have elevated structures within the floodplain, however, they also have tended towards bigger homes with maximum allowed lot coverage. Not only have these manmade structures covered previously absorbent surfaces, they have also removed much of the existing vegetation. The additional lot coverage impacts have the potential to increase runoff from the lots for properties that are not required to obtain either SWFWMD permits or provide pre-development versus post-development runoff calculations. These properties that are not required to meet SWFWMD are required to submit signed and sealed drainage plans to the city building department as part of the review process. Recent annexations are also developing. Residential and commercial development will continue in these area within the next 5-10 years. As the development plans are submitted, they will be carefully reviewed for negative impacts on the watershed, natural resources and natural floodplain.

The City of Venice is characterized by several land use categories shown on the Future Land Use Map which reflects the projected growth of Venice through time. By law, all land use regulations and capital improvements must be consistent with the Future Land Use Map. Most of the city is zoned as mixed use residential and low density residential. There is some commercial areas and pocket parks around the city and some higher density zoning near the coast but does not approach the percentage of land covered by mixed use residential and low density residential.

Changes in future development will influence the peak discharge of floods by modifying how rainfall is stored on and/or run off the land into tributaries. As mentioned later in section 7 the floodplains have numerous beneficial functions that decrease as the area is developed. There is more and faster runoff than natural areas due to lack of permeable areas. Dense networks of ditches and culverts in cities reduce the distance that runoff must travel overland or through subsurface flow paths to reach streams and rivers. As the City continues to grow, the stormwater system will be expanded to meet the demands. The system functions successfully in most areas, however some localized flooding still occurs. Flooding issues are being addressed through implementation of the stormwater master plan, administered by the Stormwater Management Division.

Venice's stormwater management division is a part of the Engineering department. A stormwater management plan was created and adopted in 1995 to better manage stormwater runoff. The Stormwater Management Plan is currently being updated and the city is performing

a stormwater utility study. All stormwater controls in the city are required to be designed for a 25-year storm.

More homes and lives may be more at risk of flooding as the city becomes larger and more developed, especially areas in the Special Flood Hazard Areas (SFHA). For urbanized areas, in order to prevent and reduce loss due to flooding, the City has taken proactive steps to identifying risk and developing projects to prevent or reduce damages in the future. Other areas of the SFHA and other areas prone to flooding are preserved for their natural beneficial functions.

The goal of the redevelopment projects is to revitalize the areas and improve the quality of life for residents. In addition to requiring new buildings to meet the current building standards (for hurricane, fire, wind, etc.). All redevelopment in the SFHA in the city is required to comply with the current floodplain management regulations, as though it were new construction, if the renovations to the property meet or exceed 50% of the market value of the original structure. This includes elevating the home one foot above the base flood elevation. New construction and substantial improvement require submittal of an Elevation Certificate while under construction and at finished constructed. The ECs are reviewed by a Certified Floodplain Manager (CFM) prior to approval of certificate of occupancy (CO). If construction is in a velocity zone, the applicants' certification of construction must be signed and sealed by a Florida licensed engineer and submitted to the city. If the structure is elevated with an enclosure below the base flood elevation, a statement of non-conversion must be provided by the property owner prior to final CO.

The City Coordinates Floodplain Management efforts with the Southwest Florida Regional Planning District and the committees responsible for creating the City of Venice Comprehensive Emergency Management Plan (CEMP), the City of Venice Evaluation and Appraisal Report, the Stormwater Management Plan, and the Sarasota County Unified Local Mitigation Strategy (LMS). These were all used as resources for this Floodplain Management Plan.

A comprehensive evaluation of the stormwater management system is underway. Through this assessment, in conjunction with the adoption of the D-FIRMS, the city intends to expand the capital improvement program with a priority of more effective stormwater system operation and flood reduction. Currently, funding is allocated from the Stormwater Enterprise Fund to respond to on-going system maintenance needs.

Outside Funding sources

The FEMA Hazard Mitigation Grant Program (HMGP) provides grants to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery

from a disaster. The HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Using HMGP funds, the Venice Community Center was hardened to meet hurricane standards and upgraded for use as a special needs shelter. The Venice Community Center generator project was completed in 2013 as an HMGP project. Hurricane shutters were installed on City Hall as a past HMGP project, and the Venice Avenue Drainage project, which provided upsizing of the stormwater system and additional storage during rain events, was completed to protect an important evacuation route and to protect adjacent properties from flooding impacts. Funding was provided through FEMA HMGP grants and the FDEP. The Westgate Drainage project was completed using an HMGP grant. To improve emergency and post-disaster recovery responses, the City has obtained an HMGP Grant in 2019 to install an emergency generator for City Hall and Fire Station #1. Fire Station #1 is being reconstructed to meet current building code standards and to allow emergency responders to remain on the island during storm events for expedited emergency response.

In addition to regularly meeting with the Countywide CRS Committee, the City periodically discusses mitigation strategies with Sarasota County, the SWFWMD and FEMA. Additionally, the City occasionally receives mitigation funding through grants or Capital Improvement Programs (CIPs) from these same agencies. Maps or other information are also prepared by these other agencies and available for use by the city.

City Ordinances Relating to Flood Hazards and Development

In 1984, the City of Venice adopted the Flood Damage Prevention Ordinance. This ordinance establishes the minimum standards and requirements for land management, building standards, and control measures in order to minimize flood damage to public and private property. The ordinance was updated significantly in 2006, with all revisions reviewed by the Florida Department of Emergency Management (FDEM). Minor updates were completed in 2010.

Ordinances 2006-34 and 2012-18 were adopted in 2006 and 2012, respectively, to include stormwater management and flood related requirements as part of Chapter 86 Division 2, Subdivision Design Standards. Section 86-232 requires proper disposal of surface water, maintenance of natural watercourses, and preservation of historic drainage patterns from adjacent properties. In addition, Section 86-233 applies the standard that no net encroachment into the floodplain, up to that encompassed by the 100-year event, which will adversely affect conveyance, storage, water quality or adjacent lands will be allowed. Any required compensatory storage shall be equivalently provided between the seasonal high water elevation and the 100-year flood level to allow storage function during lesser flood events. Section 86-233(n) further defines that the post-development run-off shall not exceed the pre-development runoff for a 25-year, 24-hour storm event including the requirement for drainage calculations to support compliance. Section 86-233(n) further requires that the proposed

development runoff may not impact areas of existing flooding or ponding nor negatively impact adjacent property. Section 86-233(n) also includes inspection requirements for private facilities with stormwater systems to ensure proper functionality of these systems in accordance to their original designs. Any sites that are neglected or not in compliance are reported to SWFWMD and brought to the City's code enforcement board for enforcement. Though not in Chapter 86, Section 90-104 of City Code is still relevant to the flood protection aspect of subdivision design. This section requires the finished floor elevation of all structures be built a minimum of 15 inches above the crown of the adjacent road.

In 2013, Ordinance 2013-27 amended Chapter 98-Floods, in its entirety. Chapter 98 encompasses all things flood related and is cross referenced with associated chapters dealing with the environment (chapter 34), stormwater management (chapter 74), and buildings and building regulations (chapter 90). The Florida Building Codes adoption have been adopted in Section 90-20 of the city Code of Ordinances. In addition, Section 98-48 was updated to incorporate all the flood related elements specifically into the city Code of Ordinances by Ordinance 2013-27. Chapter 98 has subsequently been amended by Ordinance 2017-11, dated 6/13/2017. This ordinance reduces the time period of Cumulative costs for Substantial Improvement from ten (10) years to one (1) year. All revisions have been reviewed by Florida Department of Emergency Management (FDEM) to verify that the local flood ordinance complies with state and federal requirements.

Future Conditions Model

The City of Venice uses the SLOSH model to determine where sea level rise will affect in the future. The Comprehensive plan even mentions development or redevelopment in an area at high risk for sea level rise will need to incorporate building design specifications, engineering solutions, site development techniques, and management practices that may reduce risk and losses due to flooding.

Other available studies regarding climate change and sea level rise are periodically evaluated with assistance from the Florida Floodplain Managers Association, through publications and information provided at the annual conference.

The City of Venice is in the process of receiving new flood maps from FEMA. The preliminary maps were sent to the city on December 31, 2019. They are currently under review and in the process to become the effective maps. This map update was not a total revision of the entire county, it focused on new coastal models and flood prediction in the areas closer to the coast. These new maps should include a coastal A zone where applicable.

Past Studies

In order to prepare for future conditions, it helps to look to past studies as well as future studies.

A series of basin plan studies were conducted in 2002. These studies were used to evaluate flooding in areas other than the RL areas, and listed structures below the finished flood elevation. Past council meetings, public workshops and newspaper articles were also analyzed in preparation of this plan. Riverine basin studies were conducted by SWFWMD, funded by FEMA, and adopted by Sarasota County, in 2009, and the City of Venice, in 2010.

A study of portions of the Myakka River basin was completed by SWFWMD and, in December 2014, FEMA posted digital copies of the proposed preliminary Flood Insurance Rate Map and Flood Insurance Study report for Sarasota County. These maps and studies have been adopted by the City of Venice, and became effective on November 4th, 2016.

Section 6 - Assessment of Impact Due to Hazards

Coastal and inland flooding, tropical storms, and hurricanes are among the costliest hazards for the City of Venice. Coastal and inland flooding often occur simultaneously as tropical storms or hurricanes can bring heavy rain, affecting both coastal and inland communities.

Major flooding in the City would have a significant impact on the population, causing threats to property, the economy, and potentially human life. In addition, floodwaters could cause wastewater treatment facilities to shut down, contaminate local water supplies, and disrupt utilities. Floodwaters could also submerge portions of US-41 and other east-west highways. The loss of these transportation networks would hinder evacuation and relief efforts, making it difficult to provide emergency response services. Furthermore, impact to non-elevated structures could cause a temporary disruption to critical facilities such as hospitals, schools, and shelters.

The three major hazards produced by a hurricane are storm surge, high winds, and rainfall. Storm surge typically poses the greatest threat to life and property located within surge-prone areas. The more intense the hurricane, and the more perpendicular its track is in relation to the coastline, the higher the potential storm surge and resulting destruction. Also impacting the height of storm surge is the depth of the water along a threatened coastline. Because of the high shoaling factor – shallow water and gradually sloping Gulf bottom – off the central west coast of Florida, Venice receives higher surges than those indicated in the generalized Saffir/Simpson Hurricane Scale.

High winds can render segments of the population particularly vulnerable to a passing hurricane. Throughout Venice, mobile and manufactured homes will be unable to withstand hurricane-force winds. High winds also impact the timing of an evacuation order, since winds hit the coastline several hours before the eye of the storm makes landfall. All evacuation activities must be completed prior to the arrival of sustained gale-force winds (40 mph with significantly higher gusts). Venice has a large senior population which adds special requirements during evacuations and recovery.

This section describes the impact to life, safety, health, critical facilities and infrastructure, economy and buildings within the City of Venice from these flood hazards.

Life Safety

In Florida, common hazards to life safety include coastal and inland flooding, tropical storms, hurricanes, and lightning. Deep, fast flowing, or rapidly rising floodwaters can cause physical injury and loss of life. A mere 6 inches of moving water can sweep a person away. The risk for drowning and physical injury increases when floodwaters carry debris. Floodwaters can also hide other hazards for wading pedestrians, such as manhole openings where the covers have

been lifted by flood flow. Vehicles, too, can be moved by 6 inches of flowing water. Roads can be washed away. Downed power lines or other energized systems in the water can cause electrocution. In addition, stresses to gas lines can lead to a natural gas leak, further putting lives at risk. Flooding from rainfall itself will not usually warrant an emergency evacuation of many residents and visitors.

Storm surge associated with tropical storms or hurricanes poses the greatest threat to life. A Category 3 hurricane has the potential to create a 26ft surge. Surges can be especially dangerous because water levels can rise quickly and flood large areas. This leaves no time to take action and poses a significant threat of drowning. During the peak of a storm surge, it is unlikely that emergency responders will be able to respond to a call for help. Therefore, it is very important for residents and visitors to heed early warnings from officials. A tropical storm or hurricane can leave thousands of homes and businesses without power. Power outages can also result in injuries or death from fires. Storm surge inundation describes the water height above sea level. In Venice, storm surge inundation is explained through heights known as hurricane evacuation zones. The heights range from ground level up to a height of 32 feet. The evacuation zones are classified with letters A through D, with A being lower than D.

Flooding is one of the most devastating natural disasters in the world. Having a warning system and evacuation plan will reduce injuries and loss of life. A specific evacuation procedure, including zones, routes, shelters, and means of communication helps reduce confusion for Venice residents and visitors, and provide a smooth evacuation out of high-risk areas. The City of Venice uses the CodeRED Notification System to notify residents, businesses and property owners in cases of emergencies such as tropical storms, hurricanes and other major flooding issues.

Table 7:
Summary of some hazards to Venice and the probability of occurring and potential impact to the city

Hazard	Probability of Occurrence	Potential Impact
Coastal Flooding	Low to Moderate	Major coastal flooding as result of storm surge and/or high tide in the County can pose a threat to human life.
Inland Flooding	Low to Moderate	Floodwaters have the potential to cause drowning. The risk for drowning and physical injury is increased if floodwater is carrying debris. Floodwaters can also hide other hazards for wading pedestrians, such as manhole openings where the covers have been lifted by flood flow.
Tropical Storm/ Hurricane	Low to Moderate	Storm surge or flooding from tropical storms and hurricanes can be extremely dangerous, since water levels can rise quickly and flood large areas,

Hazard	Probability of Occurrence	Potential Impact
		potentially causing drowning. Additional dangers include flying debris, falling trees, and electrocution from downed power lines.
Dam Failure	Low	Potential impact of dam failure is low
Coastal Erosion	High	Coastal erosion accompanying tropical storms or hurricanes has a higher potential to cause injury or drowning.

In the event of a community emergency, Sarasota County has 20 emergency shelters for residents and visitors available as a last resort. As of the 2018 hurricane season all shelters are pet friendly. Sarasota County provides a shelter program for those residents requiring special medically related care. Special needs shelters will be available for persons requiring more skilled medical care than available in a public shelter but not requiring an acute care facility such as a hospital.

Public Health

Flooding is very dangerous to public health. Floodwaters tend to be contaminated with many different pollutants including sewage, human and animal feces, pesticides, insecticides, fertilizer, simple household chemicals, oil, asbestos, rusty building materials and more. They can spread in floodwaters and adhere to building materials causing extensive damage and expensive repair. Floods also bring out a lot of animals that can bite like alligators, ants, snakes and more, and they aren't always easy to spot. If the floodwater sits for too long it can provide a breeding ground for mosquitoes. Homes that experienced flooding likely have mold and mildew growing in them, which can cause or trigger upper respiratory issues and or allergic reactions in humans. Mold grows within only 24-48 hours of exposure to floodwaters, rainwater or leaking pipes or roofs.

Tropical storm or hurricanes can compromise the safety of water supplies and the integrity of sewage disposal. This can cause foodborne and waterborne diseases; power outages increase this risk from lack of refrigeration. Medical care can also be disrupted as a result of the storm. Restoring medical care for individuals who were injured in the storm or whose care for chronic conditions lapsed when they were cut off from services is a public health priority.

Floods also take a toll on mental health. Exposure to extreme disaster events, including loss or injury of loved ones, home damage, or home destruction can pose a long-term psychological impact on victims. Vulnerable populations such as seniors, the disabled, or those with long-term illnesses are less able than others to cope with floods.

Critical Facilities and Infrastructure

Critical Facilities provide essential services and functions to a community during and after a disaster. Types of facilities include hospitals, fire stations, police stations, emergency operation centers, hurricane shelters and similar facilities. All of the hazards mentioned in the previous sections have the potential to affect critical facilities, the most common hazards are floods, and high winds associated with tropical storms, hurricanes, and heavy rains. Flooding can cause these facilities become inaccessible, thus posing a threat to the delivery of vital services like police and utilities.

Secondary hazards can be created by power outages, road closures, downed trees and power transmission lines, responder communications issues, school closure, evacuation shelters required, phone service outages, water distribution issues and public transportation closures. Floodwaters may submerge portions of major roads and bridges like US-41. The loss of transportation networks will affect evacuation and relief efforts and hinder emergency services. In addition, floodwaters could cause wastewater treatment facilities to shut down, contaminate local water supplies, and disrupt utilities. Flooding of electricity substations can result in a loss of power supply over the affected area. Communications and access can be severed in hard-hit areas and compromise the process of assessing and prioritizing needs for aid.

The Sarasota County Department of Emergency Management maintains a Critical Facilities Inventory (CFI) for the County. Critical facilities in Venice include, but are not limited to: City Hall, fire stations, a police station, water production plant and water storage tanks, distribution / collection center and wastewater plants, sewer lift stations, an airport, a hospital, urgent care facilities and data center. For security purposes, inventory and specifics about each critical facility are available on a secure county database. During a flood event risks to critical facilities, such as assisted living facilities and hospitals, would include communication and evacuation issues caused by phone or power outages and road closures.

Based on historical events, floodwaters in Venice typically range from one to two feet. Impacts to non-elevated structures historically have caused temporary disruptions to critical facilities. There are a few of these facilities located in the SFHA. The City is currently reviewing the flood insurance policies for all City owned buildings to ensure all structures are properly insured. The federal government can withdraw the community's access to federal insurance for both public and private structures if a local government belonging to the National Flood Insurance Program (NFIP) allows development in the floodplain without proper evaluation and construction techniques. Assistance is given to states and localities during a declared major disaster or emergency along with insurance claims. In the event of undeclared disasters or emergencies, the local government is required to cover 100 percent of the costs incurred from the event. The City sets aside enough reserve funds to support operating costs for up to 3 months but major

disasters have the potential to quickly deplete this source and negatively affect the City's economy for many months.

Economy

Flooding is the costliest natural hazard in the United States. The closure of roads and public transportation services can prevent employees from getting to work and employers from providing goods and services. The closure of businesses can affect the economy due to loss of revenue, fixed costs, replacement costs, and other expenses. Many small businesses may never fully recover from a major flood.

Many visitors come to Venice to enjoy the beaches. Businesses along the coast cater to local residents and tourists year-round. These areas are vulnerable to many hazards, including coastal erosion, storm surge, heavy rains, and high winds from tropical storms and hurricanes. The economy of the coastal community would be significantly impacted due to loss of business in a disaster. In addition, long-term erosion and sea level rise represent significant economic risk given their potential impacts. The impacts can be minimized through proper planning and flood mitigation projects identified in the Comprehensive and Emergency Plans.

Residential and Commercial Buildings

Flooding and wind damage from tropical storms, hurricanes, and heavy rain can cause major losses to residential and commercial buildings. Flooding, in particular, can cause severe damage to property. Floodwaters can cause structural damages as well as damage to wood furniture, upholstery, electronics, household appliances, and plumbing equipment. Floodwaters can increase the risk of mold, which is expensive to remediate.

Throughout Venice, mobile and manufactured homes will be unable to withstand hurricane-force winds. Strong winds can send debris, signs, roofing material, and items left outside flying, which causes damage to residential and commercial structures. Water can also breach through windows and doors, resulting in mold and mildew.

Significant wave action along the coastal areas can result in structure failure, as well as damage to utilities, enclosures, and accessory structures. Buildings with first-floor elevation lower than the design elevation minimum could sustain more damage from wave action, debris impact, and floodwaters.

Average individual property flood claims for the city of Venice are over \$10,000 for the period 1978-2016. Flood losses from a major event can potentially reach millions of dollars for Venice. Tropical storms and hurricanes can exponentially increase that amount depending on the severity of the storm.

A review of the damaged buildings and historical claims indicate that there are areas that have potential to improve flood insurance coverage. A large portion of our residents do not have

flood insurance because they tend to pay without a federally backed mortgage. The city performed an analysis on where there are NFIP policies and where there are fewer to determine where to target education for coverage improvement.

Section 7 - Natural Floodplain Functions

Floodplains are low areas of land adjacent to rivers, lakes, marshes and oceans that periodically experience flooding during high water events. Floodplains left intact, perform many natural functions including providing flood and erosion control, recharging our aquifers, improving surface water quality and protecting ecologically sensitive areas. They support diverse populations of flora and fauna, providing outdoor areas to educate residents on the importance of protecting this valuable natural resource. In addition, they provide recreation and economic benefits to the community. Approximately 13% of the City is categorized as a wetland, water body or drainage right of way.

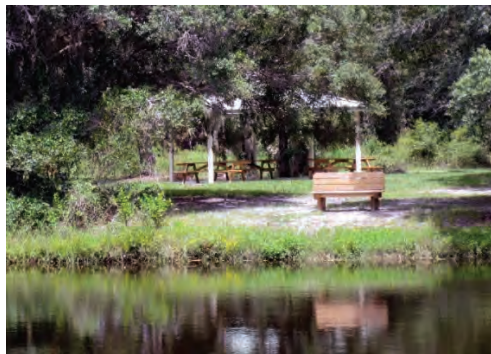
Federal, state, county and local regulations provide combined protection of the natural floodplain function. Army Corp of Engineers, Fish and Wildlife Commissions, FDEP, and SWFWMD all regulate development within wetland and natural waterways. Some local regulations include, Chapter 98 of city code limits development within the floodway and Section 86-233 requires that lots and street be designed to maximize the preservation of natural features, trees, tree masses, unusual rock formations, watercourses and sites which have historical significance. The City Comprehensive Plan also preserves open space. It states that the city will maintain a minimum of 7 acres of open space in the form of a park or preserve per 1,000 acres of functional space.

Beneficial Resources and Functions of Natural Floodplains

Natural Flood Storage and Erosion Control

Floodplains (like Venice Myakka River Park Shown below) provide areas for the river, rainwater or storm surge to spread out when flooding starts and temporarily store the floodwaters. This reduces the peak flood stages. The storage area also reduces the peak velocity of the floodwaters therefore decreasing the erosion rate of the water. Natural floodplains in urban and suburban areas can store water and reduce the runoff carried overland that would usually flood the street or neighborhood.

Figure 3: Venice Myakka River Park



Due to the mostly flat topography in Venice, flood attenuation is an important function of the floodplain. Attenuation is particularly important in low lying areas that may experience flooding with small storms. One acre of floodplain that is flooded by 1 foot of water can hold 330,000 gallons of water. Vegetated floodplains (like areas with mangroves) are especially useful because plants can hinder water movement and slow the flow rate before it can reach the main water body be it a river, bay or the gulf. Slower velocity also means more erosion protection and stability to channel banks or beach dunes. Mangroves are also protected by the FDEP.

Water Quality and Aquifer Recharge:

Natural floodplains also improve water quality and can help recharge the aquifer. Water quality is improved by reducing the amount of contaminants including unnatural levels of pollutants, nutrients and other chemicals from reaching the main water bodies. This happens by allowing the water to flow across the land and vegetation and allowing sediments and other debris to sink and settle within the floodplain. The slower velocity of the water also allows more time for the water to seep into the ground and replenish the aquifer. As it makes its way to the aquifer through the soil natural purification of the water can take place.

Fish and Wildlife Habitat

Natural Floodplains support a wide variety of plants and animals. While different habitats vary in vegetation from aquatic grasses to forests all floodplains have a wet and dry period. The length of time between dry and wet may also vary amongst the different habitats. Floodplains and associated wetlands provide food and shelter for terrestrial, avian, and aquatic life. Wetlands tend to have more biodiversity than uplands and are home to endangered species like the Sandhill crane and sea turtles' eggs. The City works diligently with the FWC, Mote Marine, and other agencies and non-profit organizations to protect the endangered species, while maintaining a level of service to our residents and visitors through education and code enforcement.

Recreation

Most of the natural floodplains and surrounding natural areas of Venice provide many recreational opportunities including hiking, bicycling, fishing, boating and wildlife viewing. Several commercial and game fish utilize these areas as hatcheries. Preserving these natural resources is critical for the fishing industry's economy.

Economic benefit

Not only does the fishing industry bring money into the area, but so does the ecotourism. Venice is well known for its natural beauty, bringing people from around the world to visit, especially for our beaches. Natural floodplains also have an economic value in the reduction of flood and storm damage to infrastructure.

Protecting our Natural Floodplains

Poor planning and management of development in the flood plain can degrade water quality, cause habitat loss, property value loss, erosion, and an increase in frequency and duration of future floods. The city's Comprehensive Plan provides strategies to address the protection of natural floodplains.

Venice implements these measures in many ways including but not limited to: water quality management, policies intended to protect environmentally sensitive lands, and regulations that protect wetlands. These regulations can be found in Subpart B Chapter 86 of the City Code of Ordinances.

The City of Venice has an inventory of wetlands and parks that provide natural functions and benefits. The National Wetland Inventory (NWI) is created by Fish and Wildlife Service. This describes all of the wetlands in the city. A link to the mapper is available on our website. The City maintains the inventory for our parks with the objective of managing and preserving these natural resources and their beneficial functions to the community. The table below shows the natural function of each park in the city.

Table 8:

**Shows the Name, Address, and Natural Functions Asset of each park in the City of Venice.
There are 34 parks in the City.**

Number	Park Name	Address	Natural Functions Asset
1	Brohard Park	Harbor Dr S. Venice, 34285	Beaches, Dunes
2	Centennial Park	200 W Venice Ave Venice, 34285	Uplands
3	Chauncy Howard Park	601 The Esplanade N. Venice 34285	Beaches, Dunes
4	Chuck Reiter Park	250 Fort St Venice, 34285	Uplands
5	City Hall Park	401 W Venice Ave Venice, 34285	Uplands
6	Dr. Fred Albee Park	245 St. Augustine Ave Venice 34285	Uplands
7	East Blalock Park	300 S. Nokomis Ave Venice, 34285	Uplands
8	East Gate Park	1221 Poplar Dr. Venice, 34285	Uplands

Number	Park Name	Address	Natural Functions Asset
9	Fountain Park	Ponce De Leon Ave and Miami Ave Venice, 34285	Uplands
10	Graser Park	740 Barcelona Ave Venice, 34285	Uplands
11	Hecksher Park	450 W. Venice Ave Venice, 34285	Uplands
12	Heritage Park	727 W. Venice Ave Venice, 34285	Uplands
13	Higel Marine Park	1330 Tarpon Center Dr., Venice, 34285	Estuarine and Marine
14	Humphris Park	2000 Tarpon Center Dr., Venice, 34285	Estuarine and Marine
15	John Nolen Park	425 Palmetto Court Venice, 34285	Uplands
16	Legacy Park	395 E. Venice Ave Venice, 34285	Uplands, Riverine, Freshwater Emergent Wetland
17	Marina Park and Boat Ramp	301 E. Venice Ave Venice, 34285	Riverine, Estuarine and Marine
18	Maxine Barritt Park	1800 S. Harbor Dr. Venice, 34285	Freshwater pond, Estuarine and Marine
19	Michael Biel Park	100 W. Tampa Ave Venice, 34285	Uplands
20	Mundy Park	830 Groveland Ave Venice, 34285	Uplands
21	Patriots Park	800 Venetia Bay Blvd Venice, 34285	Freshwater Emergent Wetland, Riverine, Pond, Upland
22	Paw Park	1850 S. Harbor Dr. Venice, 34285	Beaches, Dunes
23	Pinebrook Park	1251 Pinebrook Rd Venice, 34285	Freshwater Emergent Wetland, Freshwater Forested Shrub, Riverine
24	Ponce De Leon Park	Ponce De Leon and Pedro Streets Venice, 34285	Uplands

Number	Park Name	Address	Natural Functions Asset
25	Prentiss French Park	500 Manatee Court Venice, 34285	Uplands
26	Ruscelletto Park	115 U.S. 41 Bypass N. Venice, 34285	Pond, Riverine, Upland
27	Service Club Park	1190 S. Harbor Dr. Venice 34285	Beaches, Dunes
28	Venetian Trail	301 E. Venice Ave Venice, 34285	Riverine, Estuarine
29	Venezia Park	450 Nassau St Venice, 34285	Uplands
30	Venice Beach	101 The Esplanade Venice, 34285	Beaches, Dunes
31	Venice Fishing Pier	1600 S. Harbor Dr. Venice, 34285	Beaches, Dunes
32	Venice Myakka River Park	7501 E. Laurel Rd Venice 34275	Riverine, Freshwater Pond, Freshwater Forested Shrub, Part of the Myakka River Protection Zone
33	Wellfield Park	1251 Pinebrook Rd Venice, 34285	Uplands
34	West Blalock Park	401 Pensacola Rd Venice, 34285	Uplands

Section 8 - Floodplain Management Plan Goals and Activities

Goals

The goals of the City of Venice's Floodplain Management Plan are to:

1. Minimize the loss of life and property due to flood hazards.
2. Protect public health and safety.
3. Improve identification of high flood risk areas.
4. Increase public awareness of risks associated with flooding.
5. Improve the City's emergency response to flood hazards.

These goals include developing activities to address the flood-related hazards through preventative measures, property protection, natural resource protection, emergency services, structural projects, and public information activities.

Review of Possible Floodplain Management Activities

Venice has identified a variety of activities to achieve the goals of the floodplain management plan. Depending on available resources, Venice will develop a prioritized action plan to implement these activities. The types of activities implemented are included in the sections below.

Preventative Activities

The most beneficial and cost-effective approach to reduce damage due to flood is to prevent or reduce the risk before the event happens by identifying and mitigating issues before the flood. Many of the preventative activities are administered by the building, planning and zoning and engineering department's review processes. The city uses the SFHA and detailed watershed models, and regulatory standards that exceed the minimum NFIP criteria. Venice's codes and ordinances are evaluated to address flood risk and ensure that building codes meet NFIP requirements or higher. Flood zone determinations are completed by a Certified Floodplain Manager. Permits received by the City are reviewed by building official who are also Certified Floodplain Manager. These permits are also reviewed by City engineers using the City's most up-to-date stormwater model for the area of interest and required to have a Stormwater Site Drainage Plan certified by a professional engineer. These regulations and measures, in conjunction with the requirement of new developments to be consistent with the City's Future Land Use Map, help the City ensure that developments do not exacerbate existing flood issues or lead to problems related to future conditions.

Coastal areas are regulated by the Coastal Barrier Resources act, the Coastal Construction Control Line, Erosion Control Line, and building codes that apply to V zones and coastal A flood

zones. Extensive review of all building permits proposed seaward of the CCCL or ECL line is conducted by FDEP Beaches & Coastal Systems to verify compliance with the stringent state administrative code. (City permit require and approved CCCL permit or exemption prior to approving building permits for properties located seaward of the CCCL.)

All sites are required by the City to provide a yearly site inspection report verifying that privately owned stormwater management systems are operating as originally designed, and receiving appropriate maintenance. Any sites that are neglected or not in compliance are reported to SWFWMD and brought to the City's code enforcement board for enforcement. All construction must conform to the latest adopted Floodplain Ordinance, Engineering Design Standards, Subdivision Regulations, Zoning, and all other applicable city codes. These regulations include setback requirements, special infrastructure design, and prohibited uses. Further evaluation from SWFWMD related to floodplain compensation natural system impacts and post-development stormwater regulating increase the effectiveness of the City codes. The USACE further reviews impact to protected wetlands, and the FWC and FDEP review impacts to protected species.

Additionally, Venice will continue to implement preventative measures that will reduce the risk of flood damage to life and property through activities such as:

- Conducting activities consistent with the City's Comprehensive Plan.
- Periodic evaluation and maintenance of major drainage systems.
- Proper planning and zoning to reduce flood risks.
- Preservation of open space through acquisition and zoning ordinances.
- Regulating building and development in the floodplain, especially for new or substantially improved construction
- Velocity zone certificates, non-conversion agreements and elevation certificates are required on specific new or substantially improved construction.
- Enforcing post-development volume and rate requirements to reduce adverse impact downstream.

Property Protection

Property protection activities help reduce the risk of damage to structures and land property through activities such as:

- Acquiring high-risk land, particularly if the lands also represent environmentally sensitive lands or natural systems that can be preserved.
- Elevating structures.

- Retrofitting.
- Maintaining proper flood insurance on structures.

The City requires that all buildings and structures in flood hazard areas not designated as Coastal A Zones shall have the lowest floors elevated to or above the design flood elevation. In areas of shallow flooding, buildings and structures shall have the lowest floor (including basement) elevated at least as high above the highest adjacent grade as the depth number specified in feet on the FIRM, or at least two feet (48 inches) if a depth number is not specified.

In the event of a hurricane with plenty of warning residents are encouraged to protect their property from wind and flood damage. Sandbag stations are made available when applicable.

The City of Venice staff provide outreach to educate residents about ways to protect their property and financial assistance available. The city offers this information through personal contact with current homeowners or potential buyers. Residents can contact the city for a property consultation or site visit to evaluate drainage and retrofitting options. A flyer is mailed out twice annually with the utility bill advertising these services and encouraging flood insurance. The information is also available via the city website and the City newsletter. Residents in repetitive loss areas are notified in a separate mailing as well as the utility bill mailing about their options for flood insurance, retrofitting, mitigation and flood preparation.

Natural Resource Protection

As mentioned in a previous section natural floodplains provide the city with many benefits including: storage for surface runoff, recharging our aquifers, improving water quality, support a biologically diverse population, and may other functions. Protecting this resource is essential for a successful floodplain management plan. Activities to protect natural resources include:

- Adopting and implementing floodplain management policies that reduce impact to natural systems.
- Preserving natural areas.
- Restoring natural areas.
- Protecting wetlands.
- Preventing pollution of natural systems.
- Improving water quality.
- Preventing erosion and sedimentation in water ways.

Venice also protects natural resources through acquisition of land as well as implementing capital improvement projects aimed at improving the water quality and protecting the water resources within the City. Examples of recent natural resource protection activities include:

- In 2009 the City acquired a 10-acre abandoned cement plant property along Hatchett Creek near the ICW. This property was reclaimed as open space and is now Legacy Park. Concrete debris and invasive species were removed to allow restoration of the natural state including wetland restoration. The site had several structures with finished floors below the required minimum elevation within the SFHA that were vulnerable to flooding. These structures were demolished and the area converted to open space, or replaced with compliant public restrooms, picnic pavilions, a multi-use trail, playground, and parking amenities, to allow this area to function as a public recreation area.
- The Venice Avenue Drainage project was completed in 2010. As part of this project, the City acquired a 1.43-acre site with an existing commercial structure with a finished floor below the required minimum elevation. The structure was demolished and a pond was created to increase stormwater storage and improve water quality prior to discharge to Hatchett Creek. This site is now a pocket park with a sidewalk for residents to walk and bike around a stormwater pond that is home to numerous water birds and other wildlife. The community park has a shaded picnic area, benches and limited parking spaces, and is now better known as Ruscelletto Park.
- The larger combined Venice Avenue Drainage Project increased the capacity of the stormwater system to remove routine flooding within the critical evacuation route, and address the issue of street flooding that routinely threatened the commercial businesses along the corridor. This project was funded by SWFWMD and FEMA through a HMGP. Additional CIPs to protect vulnerable structures and evacuation routes have been included in the LMS project list, and the City will continue to look for funding opportunities to complete these high priority mitigation projects.
- Venice Beach is re-nourished on a regular basis in order to establish a fixed dune and stabilized beach system to provide flood protection to the coastal community during storm surge events. The most recent beach renourishment was completed in 2015. Additionally, the existing stormwater beach outfalls are regularly evaluated to look for opportunity to improve the function of the drainage system and to verify proper operation of the existing facilities. This project is being performed in partnership with the Army Corp of Engineers and the FDEP as funding partners. The next re-nourishment event is scheduled to be completed in 2024-2025.
- Hatchett Creek Restoration: This natural waterway had become seriously clogged with silt and invasive vegetation. In order to restore the effective function of this waterway and to restore the creek's natural function, the silt, exotic and overgrown vegetation and debris were removed. Native vegetation was planted to reestablish the natural ecosystem and secure the shoreline.

- Impacts to wetlands are reviewed as part of the construction plan process implemented by the Engineering department. The process ensures proper mitigation and evaluates natural floodplain function impacts. In addition, tree permits through Sarasota County Natural Resources are required prior to removing existing trees, and wetland impacts are evaluated by SWFWMD with mitigation required. The City also participates in the Charlotte Harbor National Estuary Program to restore and protect natural estuary systems in the region.
- In August of 2018 a wooden structure was removed from Flamingo Ditch. The removal of the structure restored a more natural flow through the channel instead of the restricting structure. The new channel is also draining easier and has reduced flooding in nearby areas after heavy rains. Native dune vegetation was also planted to reduce erosion.

Emergency Services

The Sarasota County Emergency Management Department coordinates warning and response activities with other municipalities within the County during a large scale event like a hurricane. They administer hurricane preparedness planning through the Comprehensive Emergency Management Plan, which establishes procedures for coordination with the other municipalities. Certain members from Venice go to the Emergency Operations Center (EOC) during an emergency. The EOC has access to on-line meteorological services, is equipped with an emergency satellite communication system, and can deliver television feed to area communities.

The City is a partner in a statewide mutual aid agreement for catastrophic disaster response and recovery. If mutual aid is deemed necessary, the city attorney will review and present specific requests to City Council. Mutual aid can also include cooperation from federal entities.

Depending on the seriousness of the emergency for localized events, the City of Venice incident commander may choose an alternate local site for the emergency operations center (EOC) from a number of mobile or fixed locations.

Emergency Services activities conducted by the Venice Police Department, Fire Department and the Sarasota County Emergency Management include:

- Developing a flood response plan
- Establishing and monitoring evacuation routes
- Notification and orderly evacuation of citizens and visitors from affected zones
- Performing annual readiness training and drills

- Monitoring the early warning system via ARMS coastal and riverine gauges

The city of Venice uses the CodeRED Notification System - an ultra-high-speed telephone communication service - for emergency notifications. This system allows us to send critical communications to all or targeted areas within the city limits in case of a situation that requires immediate action. This system is capable of dialing the entire city within minutes. It delivers a recorded message from Venice describing the situation and any instructions for immediate or future action. Venice also can communicate internally and with other agencies via an 800 MHz Truck Radio System. All directors are able to communicate via city cell phone as long as the towers are still standing

The Southwest Florida Regional Planning Council completed a Hurricane Evacuation Study in 2010. It includes information such as shelter listings, evacuation routes, and clearance times. The Study also included updated Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model. The SLOSH model includes mapping that shows hurricane surge limits for all county residents. The study can be found at http://www.swfrpc.org/evac_study.html.

Structural Projects

The One-Cent Voted Sales Tax, approved by city voters, funds many major structure projects. Additionally, stormwater projects are funded through the Stormwater Enterprise Fund and often supplemented with different grant programs such as FEMA HMGP, SWFWMD and State grants. The available funds are dispersed to prioritized and ranked projects in the city annual budget approved by the City Council. Projects placed on the LMS project list are reviewed and ranked by the LMS Work Group. Such projects in the program include:

- Structural Projects: There are no structural projects currently in progress.
- Other Improvements: A comprehensive evaluation of the stormwater management system is underway. Through this assessment, in conjunction with the adoption of the D-FIRMS, the city intends to expand the capital improvement program with a priority of more effective stormwater system operation and flood reduction. Currently, funding is allocated from the Stormwater Enterprise Fund to respond to on-going system maintenance needs.

Public Information

Public information activities advise residents, property owners, potential property owners, and visitors about the hazards, ways to protect people and property from the hazards, and the beneficial functions of natural floodplains. The City of Venice implements these activities using a variety of mediums, including digital, audio/visual, and printed media. All digital media was recently made ADA accessible including social media and web documents available on the city website. Activities identify target audiences and deliver specific messages about the risks that affect them.

Table 9:

Target groups for our public outreach and what messages they receive

#	Target Group	Topic #	Message #
1	Repetitive Loss area	All	All
2	Homeowners Associations	All	All
3	Realtors	All	All
4	Insurance Agents	2-10	All
5	Spanish Speaking population	2, 5	All
6	Condo Residents	All	All

Public information activities include:

- Flyers / door hangers
- Real estate disclosure programs
- Map information
- Mailings
- Social media
- City Newsletter
- City website
- News media
- Public outreach events, including advertising the county's library workshops
- Technical assistance
- Hurricane Expo

The City of Venice currently implements the above types of activities that aim to protect the life, safety, health and property of its residents. The Venice website was recently updated to be more comprehensive of all of our outreach goals and ADA compatible. Our social media presence has also been updated with memes to convey a variety of messages. They are more engaging and attention grabbing for viewers on various social media platforms than only text. Our Stormwater Engineering Research Analyst also authored an article in the Gondolier's 2019 Hurricane Guide.

Venice recently joined the multi-jurisdictional Program for Public Information. This group includes members from Sarasota County, the city of Sarasota, the city of North Port, the town of Longboat Key and the city of Venice as well as members of the public representing realtors, insurance agents, lenders, and developers. The group organizes their messages so the community as a whole hears the same message from each jurisdiction.

The City reviews possible floodplain management activities on a regular basis through periodic evaluations of this Floodplain Management Plan, the City's Comprehensive Plan, and other initiatives related to flood protection and preservation of natural systems. The review process begins with evaluating existing projects and initiatives. It is important to know what the City is currently doing for

floodplain management in order to effectively plan for future projects. This can indicate areas or goals that are lacking that this committee should address. The review includes evaluating whether the projects meet the specific goals of the FMP and if they can be updated, for example, to be more efficient or provide consistent messaging of floodplain management topics. It describes existing activities that were reviewed that aim to reduce the risk associated with flooding in Venice. Overall, the city of Venice implements activities that cover all of the major activity types and goals set forth in this FMP. Many of the activities are ongoing or were recently completed. However, some of the activities should be periodically revisited or updated, and there will be opportunities to improve a study, streamline the information about flood risk, or better protect the health, safety and property of the Venice residents.

Activities to monitor and consider for future update include:

1. Local Mitigation Strategy – The LMS and this FMP should be monitored for consistency in flood topics, goals and activities.
2. Codes & Ordinances – The codes and ordinances need to be periodically reviewed for changes in building codes, NFIP and CRS requirements.
3. Drainage Maintenance – There may be opportunities here to streamline or integrate requirements for NPDES and CRS. This can also be potentially improved through better GIS integration.
4. Flood Warning and Response Plan – This plan should be updated based on lessons learned from flooding events.

In addition to the projects identified above to evaluate and monitor, the CRS committee also reviewed other possible floodplain management activities that can be implemented.

Coordination with other Plans and Groups

Coordination with the Comprehensive Plan

The comprehensive plan has an Emergency Management Element which includes the following policies that are directly relevant to floodplain management and mitigation planning.

- Policy 1.3 Emergency Preparedness Plans. The City shall annually evaluate and update, as necessary, the Comprehensive Emergency Management Plan, Sarasota County Local Mitigation Strategy, Floodplain Management Plan, and National Flood Insurance Program (NFIP) Community Rating System.
- Policy 1.4 Development Planning Practices. The City shall continue to evaluate the potential impact of tropical events on its buildings and land areas and update its planning practices and report its findings. Areas to focus on include: [several areas listed including Special Flood Hazard Areas].
- Policy 1.9 Public Awareness and Education. Maintain public education efforts regarding awareness and preparation for disaster and emergency events including community awareness presentations, the annual hurricane workshop, City website and newsletters. Educational efforts should include information about [several topics listed including Flood Insurance].

Policy 1.10 Community Hurricane Planning. Continue to pursue funding for the implementation of the hurricane mitigation projects listed in *Creating a Hurricane Tolerant Community*. Annually update the plan based on most current best management practices, community needs and City goals.

Policy 1.3 has been implemented on an on-going basis. The Comprehensive Emergency Management Plan was recently updated in 2019, the preparation of this plan represents another implementation of the policy.

Coordination with Creating a Hurricane Tolerant Community

In 1994 the City developed a study entitled “Creating a Hurricane Tolerant Community” (HTC). The HTC: reviewed the geography of the community as it relates to hurricane impacts; offered solutions to address potential disaster problems before a hurricane occurs; and found a need for strengthened communication and education efforts. In 1994 the HTC was approved by the State as the City’s Pre-Disaster Redevelopment Plan, in order to reduce damage and prevent catastrophic hurricane damage to the community.

Integration with Post Disaster Redevelopment Plan

In addition, the city is currently coordinating with Sarasota County on the preparation of a Sarasota County Post Disaster Redevelopment Plan. As part of the planning process the City held meetings with representatives from outside agencies, including the Red Cross, SWFWMD, FDEP, Florida Fish and Wildlife (FWC) and the Coastal and Heartland National Estuary Partnership. The representatives provided input and support to the City’s long-term comprehensive plan goals and objectives.

Integration with Sarasota County Multi-Jurisdictional Local Mitigation Strategy

The City of Venice participates with the Sarasota County Unified Local Hazard Mitigation plan by participating with the multi-jurisdictional local mitigation strategy (LMS). The purpose of the Countywide LMS is to establish a mitigation plan to reduce disaster losses that may cross jurisdictional boundaries. The list combines pre-disaster and post-disaster mitigation projects. All types of mitigation projects are covered, not just flooding. A mitigation project is defined as having elements that reduce the natural hazard impact to the community.

Action items identified under this FMP will be coordinated with projects identified in the LMS. The CRS Coordinator will meet with the LMS committee to evaluate and share information. As a result, many of the action items identified in this plan will also be updated in the pertinent sections of the LMS plan. The floodplain management plan is incorporated into the LMS document as an appendix. The LMS project list and Venice Floodplain Management Plan portions of the LMS were updated by adoption of Resolution 2014-35 approved by the City Council 9/9/14. Resolution 2014-39, adopted on December 9, 2014, approved and adopted a combined Floodplain Management Plan that incorporates the Program for Public Information and flood insurance Coverage Improvement Plan into the document and the LMS. This process of adopting the LMS project list and Venice Floodplain Management Plan portions of the LMS will continue annually; the 5-Year FMP update is scheduled being presented to City Council on July 14, 2020, at their regularly scheduled public meeting.

The city coordinates its disaster management practices with Sarasota County Emergency Management under the LMS. The purpose of the LMS is to coordinate with participating jurisdictions to identify and prioritize projects and initiatives that are mitigating in nature. Sarasota County and each municipality

within the County - the cities of North Port, Venice, Sarasota, and the Town of Longboat Key, have approved the plan. The project list for 2019-2020 has been updated for incorporation into the LMS and is attached as Appendix D.

For the purpose of this Floodplain Management Plan, only the flood related goals and objectives of the LMS plan are addressed here:

LMS Work Group Goals

1. Reduce Structural Flooding
The City will continue to assess RL areas and find ways to decrease the impact of riverine and coastal flooding through Capital Improvement Projects (CIPs).
2. Reduce Flooding on Major Roadways
The City will construct projects that reduce flooding to major roadways and evacuation routes
3. Preserve Natural Habitats
 - a. The City will undertake projects that reduce impacts to natural habitats while controlling flooding.
 - b. The city will minimize developments in floodplains and wetlands.
4. Protect People from Flooding
 - a. Ensure residents, visitors, and businesses are given adequate warning of flood potentials.
 - b. Plan projects that protect lives and property.
5. LMS Plan
The City will work with the LMS Working Group to adopt, routinely update and implement the LMS Plan.

LMS Work Group Objectives

1. The LMS work group will evaluate and review ongoing mitigation practices as stated above.
2. The LMS work group will ensure that public funds are used in the most efficient manner by:
 - a. Evaluating and prioritizing mitigation projects, starting with those sites facing the greatest threat to life, health and property.
 - b. Utilizing public funding to protect public services and critical facilities
 - c. Utilizing public funding for projects on private property, where the benefits to the community exceed the cost.
 - d. Determining ways to maximize the use of outside funding sources.
 - e. Maximizing owner participation in mitigation efforts to protect their own properties
 - f. Encouraging property owner self-protection measures in preparing for storms and other hazards.
3. The Repetitive Loss area will be evaluated:
 - a. All property owners in the RL area shall be advised that an analysis will be conducted, and their input requested, on the hazard and recommended actions.
 - b. The City will coordinate with agencies or organizations that may have plans or studies that could affect the cause of impacts of flooding such as the SWFWMD mapping, FEMA D-FIRM update and FEMA Coastal A Risk mapping.
 - c. Each building in the RL will be visited and basic data collected. Protection measures, or drainage improvements, will be reviewed to determine whether alternate approaches are feasible.
 - d. The findings of the review will be documented, with a separate analysis for each area.
 - e. An annual evaluation of the RL activities is to be conducted, with an update of the RL areas every 5 years.

Integration with Sarasota County Multi-Jurisdictional Program for Public Information

The City of Venice, City of Sarasota, City of Northport, Town of Longboat Key and Sarasota County have recently come together to create a multijurisdictional Program for Public Information (PPI). Public Information activities like social media messages are shared with the intent to have one message across the different municipalities about floods. While not all outreach is a group effort it is beneficial to coordinate our messages to increase their impact and reduce confusion.

Other Resources

Other resources for the FMP include the following. The city coordinates floodplain management efforts with the Southwest Florida Regional Planning District and the committees responsible for creating the City of Venice Comprehensive Emergency Management Plan (CEMP) updated annually, the City of Venice Evaluation and Appraisal Report and the Stormwater Management Plan.

Section 9 - Floodplain Management Action Plan

This Floodplain Management Plan seeks to incorporate the best available information from all City resources and preventive activities. The listed below has been updated to reflect adjustment of the schedule based on CRS cycle being modified by FDEM to May cycle and the updated action plan is listed below in Table 10.

Table 10:

FMP Action Plan						
<i>Action Item</i>	Goal 1. Protect Critical Facilities	Goal 2. Protect Lives and Health	Goal 3. Protect homes, Schools and Businesses	Goal 4. Minimize damage costs	Goal 5. Ensure that New Construction	Deadline
<i>Plan Adoption</i>						Spring annually
<i>Plan Update</i>						Spring annually
<i>Monitoring and Reporting</i>	X	X	X	X	X	annually
<i>Community Rating System</i>	X	X	X	X	X	Each CRS visit
<i>Drainage Improvements</i>	X	X	X	X		Ongoing
<i>Drainage System Maintenance</i>	X	X	X			Ongoing
<i>Property Protection Funding</i>	X	X	X	X		Ongoing
<i>Regulatory Review</i>	X		X		X	Ongoing – at each committee meeting
<i>NFIP Administration</i>	X	X	X	X	X	Ongoing

<i>Action Item</i>	Goal 1. Protect Critical Facilities	Goal 2. Protect Lives and Health	Goal 3. Protect homes, Schools and Businesses	Goal 4. Minimize damage costs	Goal 5. Ensure that New Construction	Deadline
<i>CFMs</i>	X	X	X	X	X	Ongoing
<i>BCEGs</i>	X	X	X	X	X	Ongoing
<i>Flood Response Plan</i>	X	X	X	X	X	Ongoing
<i>Annual Mailings</i>		X	X		X	Various, throughout the year
<i>Technical References</i>		X	X		X	CRS Visit
<i>Public Information Projects</i>		X	X		X	Ongoing
<i>Public Information Messages</i>		X	X		X	Ongoing

The FMP Committee reviewed the activities in section 8 and 9. These activities included preventative, property protection, natural resource protection, emergency services, structural projects, and public information. Some of these activities were previously completed, while others are still ongoing. In reviewing the projects, the committee updated the list and considered recommendations for new projects as well as updating existing projects.

The FMP committee sets priorities for each of the recommended projects. The committee considered factors that included the benefits to the community, the audience the project can reach, whether the project was a one-time effort or would require periodic monitoring and/or maintenance, the amount of effort and resources the project will require, and the availability of staff and funds to implement the project. Projects that offer high benefits and are relatively inexpensive to implement received a high priority rating while others may receive either a medium or low rating if it did not offer a large benefit or reached a smaller audience. Projects that may qualify for grants or cooperative funding from the Southwest Florida Water Management District, regional, state or federal agencies also ranked higher.

Table 10 describes the action plan for the activities to implement. The committee periodically evaluates and updates this project list.

Coordination with Other Initiatives

As part of this FMP's action plan, it will be necessary to coordinate the efforts of this committee with those of other City strategies and plans to ensure consistency. The CRS committee will also regularly coordinate with the Sarasota County LMS committee to evaluate potential updates to the LMS or this FMP based on decisions and projects identified between these initiatives. In addition to this FMP being incorporated as an appendix to the LMS, the CRS committee will also evaluate and make recommendations for action items for mitigation of other types of hazards that are described in the LMS.

Post Disaster Mitigation

Mitigation from flooding and other hazards such as wind, fire or surge is handled on a county wide basis. Sarasota County Emergency Management is the primary agency charged with post-disaster mitigation assessment. The Emergency Management Chief or designee has the primary responsibility for assessing mitigation needs in the post-disaster environments. The Sarasota County Property Appraiser, Sarasota County Public Works Business Center, Sarasota County Planning and Development Business Center and Municipalities are the supporting agencies that work closest with Sarasota County Emergency Management in post-disaster mitigation assessment. The rest of this section describes the roles of these various groups.

Sarasota County Emergency Management Department is the coordinating organization for all post-disaster mitigation activities. The Emergency Management chief is the one responsible for coordinating the activities. They are responsible for coordinating all equipment and resources necessary for mitigation assessment are available when needed. Much of the work involves identifying opportunities for possible mitigation activities is carried out during the pre-disaster mitigation phase (e.g. during the mitigation project identification process carried out by the Sarasota County LMS Work Group). Opportunities for mitigation are also discovered during the initial and preliminary damage assessments and throughout the public assistance processes.

The Emergency Management Chief or designee also serves as the point of contact for providing information to residents of the county describing how they can minimize damage from future disasters. Priority will be also given to identifying mitigation opportunities for any public infrastructure damaged by the disaster. These mitigation measures are eligible for funding under the Public Assistance grant program. The Emergency Management Chief or designee will coordinate on an as needed basis with the Bureau of Recovery and Mitigation at the Florida Division of Emergency Management. Although Sarasota County Emergency Management does not have any formal agreements with agencies to assist in post-disaster mitigation activities, there is an annual agreement in place with the Southwest Florida Regional Planning Council to

coordinate mitigation planning activities. Local agencies within the county have historically worked together as needed in the aftermath of disasters.

Local agencies involvement may vary based on the specifics of each event. Emergency Management staff will contact all agencies for post-disaster mitigation activities and notify them as to their role in these operations. Notifications can be made via telephone using the Sarasota County Emergency Management Notification Directory located in the EOC. Most agencies will be represented at the EOC as the post-disaster operations continue. The Sarasota County Emergency Management Chief or designee will be responsible for coordinating mitigation activities with the municipalities and the State EOC. The City Managers or designee will be updated throughout the response, recovery and mitigation phases of the event. During non-event periods, meetings will be held quarterly or as required. During events, briefing meetings will be held daily or as determined based on the situation.

After a disaster the supporting municipalities document damage to public infrastructure, businesses and residences working in conjunction with Emergency Management. The Sarasota County LMS Work Group then considers the information gathered during the recovery phase, and determinations are made regarding potential mitigation projects

The Sarasota County Property Appraiser will support the Sarasota County Emergency Management by providing technical expertise regarding property values, damages and losses to properties as a result of a disaster.

The Sarasota County Planning and Development Business Center along with the similar municipal departments will provide support to Emergency Management in identifying mitigation activities that could reduce the vulnerability of public infrastructure, businesses and housing stock to damage and loss from natural and manmade disasters.

The Sarasota County Public Works Business Center and the Municipal Public Works Departments will assist the Emergency Management in identifying potential road, bridge, culvert and water and sewer mitigation projects.

Equipment, vehicles and supplies necessary for mitigation activity are located throughout the county and cities either in stations, assigned to individual personnel, or readily accessible to department personnel.

Personnel involved in mitigation activities will receive on-going training according to their individual needs. Sarasota County Emergency Management will work with all mitigation assessment team members to ensure that all training needs are met. The primary source for mitigation training is the Florida Division of Emergency Management. This training is available for members of the local jurisdictions as well.

Section 10 - Plan Adoption, Implementation, Evaluation, and Revision

This FMP serves as an appendix to Sarasota County's LMS, which is a state-approved multi-jurisdictional, multi-hazard plan. It adopted annually with the inclusion of the updated City of Venice Project list and replacement of the Floodplain Management Plan in the LMS with the newly adopted version. This version of the LMS, 5-Year Update of the FMP and City of Venice Project List update will be presented to City Council on July 14, 2020, at a public meeting.

The all annual and 5-year updates of the FMP are available for comments at our CRS Committee Meetings which are open to the public. In addition, the draft and final FMP is available on the city's website in ADA compatible format. Hard copies may also be reviewed in the Engineering Department at Venice City Hall, 401 W. Venice Ave., Venice, FL 34285

The CRS committee meets quarterly every year to evaluate the Coverage Improvement Plan, the Program for Public Information activities and this Floodplain Management Plan. They will evaluate the effectiveness and clarity of the messages and make updates as necessary.

Potential revisions may include, updates to the GIS information, addition of new city staff and CRS committee members, Target area revisions development of new projects and revisions to existing projects.

To implement and update the FMP:

1. The County's CRS Specialist will review the FMP to evaluate what sections and data require an update for that year.
2. The CRS Specialist will be responsible to get each project's status.
3. After the status information is gathered, the CRS Specialist prepares a summary of required changes to the FMP and project updates for review by the CRS Committee.
4. The CRS Committee will conduct a meeting (noticed and open to the public) to review the progress and recommend additional changes to the FMP.
5. The CRS Specialist assigns the revision items to members of the committee or designated staff.
6. The CRS Committee will conduct a meeting (noticed and open to the public) to review the draft document.
7. The draft document will be presented to the City Council for adoption

8. The updated plan will be posted on the City website, released to the media and made generally available to the public. The flood-related outreach activities will be presented and educate the public about the revised FMP.

An annual evaluation report will be submitted with the City's annual CRS recertification to indicate progress of the plan implementation. The plan itself will be updated at least every five years. In the last five years one of the city's biggest accomplishments for the floodplain management was the introduction of more effective outreach efforts including: more eye-catching graphics for print and digital media, more responses on the annual flood questionnaire, and joining with the county for a multijurisdictional PPI.

The FMP for this 5-year update was completely rewritten to emulate the Sarasota County Floodplain Management Plan in order to increase the clarity and flow for the reader. This plan will be reviewed by the Florida Department of Emergency Management. It will also be available for review by the public prior to a public meeting. The plan will then be adopted by the City Council and sent to ISO for review.

The next five-year cycle update for the FMP will begin in 2025.

Section 11 - References

City of Sarasota (2015-2020). *Floodplain Management Plan*.

City of Venice (2019). *Floodplain Management Plan*.

Sarasota County Local Mitigation Strategy Committee (2015). *Sarasota County Unified Local Mitigation Strategy*.

Sarasota County, FL (2017). *Hurricane Evacuation Map*.

City of Venice (2020) Budget Book

City of Venice (2017) Comprehensive Plan 2017-2027

The State of Florida (2018) Enhanced Hazard Mitigation Plan

NOAA, Smith, Adam B, "2018's "Billion Dollar Disasters in Context" Climate.gov,

Appendix A

CRS Committee Planning Document

Current Members of the CRS Committee

<i>Name</i>	Department/ Industry
<i>Kathleen Weeden</i>	Engineering Department
<i>Roger Clark</i>	Planning and Zoning
<i>Frank Conorozzo</i>	Building Department
<i>Mary Elizabeth Petty</i>	Flood Insurance
<i>John Meyers</i>	Real Estate
<i>Currently Vacant</i>	Financial Lending
<i>Robert Yoho</i>	Building Industry
<i>Mark Hawkins</i>	Building Industry
<i>Dave Warring</i>	Commercial/ Business Industry

Summary of the original plan

The original Floodplain Management Plan focused on the 10 steps listed in the CRS Coordinator's Manual 2013 edition.

Step 1: Organize a Planning Committee

Table shows the original members of the CRS Committee.

Activity	Department	Representative
Publicity	Public Information Office	Pam Johnsom
Comprehensive or Land Use Plan	Planning and Zoning	Scott Pickett
Building Code	Building	Greg Schneider
Zoning Ordinance	Planning and Zoning	Scott Pickett
Floodplain Management Regulations	Building, Engineering	Kathleen Weeden
Subdivision Ordinance	Planning and Zoning	Scott Pickett
Stormwater Management Regulations	Engineering	Kathleen Weeden
Insurance Agency	Shaefer Insurance	Renee Halback
Local Bank or Lender	Capital Bank	Mark Hampshire
Stakeholder	Berkshire Hathaway	John Meyers
Stakeholder	The Damex Corporation	Robert Yoho
Stakeholder	Hawk's Nest Construction Inc	Mark Hawkins
Stakeholder	Publix	Tim Adkins/Brian West
Public	Invited, Public Meeting	Invited Public Meeting

The committee planned to meet 6 times to cover 6 goals

- Assess the hazard
- Assess the problem
 - Assess flood insurance coverage – Review current policies
 - Hold a public meeting in affected, i.e. flood prone, area to discuss the natural hazards, problems and possible solutions. Not a reg. meeting.
 - Mail questionnaire to floodplain residents requesting info on their natural hazards, flood problems and possible solutions.

- Do brochure based on questionnaire, explaining planning effort/seeking comments.
- Set goals
- Review possible activities a. Determine who needs to be informed (target areas / audiences)
 - Draft an action plan a. Provide an opportunity for the public to comment on the plan
 - Have the plan adopted by City Council
- Evaluate progress & recommend changes

Step 2: Involve the Public

- Provide an opportunity for the public to comment on the plan
- Post the meeting schedule on the City website

Step 3: Coordinate with other agencies and their plans and efforts

Questions that were asked at the meeting to determine how to write this section

- What other studies have already been done?
- What other reports have been issued?
- What technical information has already been published?
- What other plans are being prepared, reviewed or in use?
- What other public outreach / information programs are being done?
- Which other non- city/non-government agencies, are involved?
- Current activities being implemented within the community to promote flood insurance, including activities by:
 - FEMA
 - FloodSmart
 - Risk MAP
 - State agencies
 - Local agencies
 - Insurance companies

Step 4: Assess the Hazard

- The committee should review, analyze and summarize data collected about the natural hazard from:
 - Existing flood studies
 - The Flood Insurance Study
 - Drainage problem studies
 - Historical records
 - Knowledge / experience of the community / committee
- Focus on the:
 - Source
 - Frequency
 - Extent
 - Cause of flooding
- Describe, in lay terms, the local flood hazard
 - How often it floods
 - Locations of areas that flood
 - Depth of flooding
 - Source / cause of flooding
 - Velocities
 - Warning time
- Assess the:
 - SFHA
 - All repetitive loss areas
 - Areas not mapped on the FIRM that have flooded in the past

- Surface flooding identified in other studies
- Create a map of the flood hazard areas
- Identify the Coastal A zone (where wave heights are between 1.5-3ft during the 100-year flood).
- Create a map showing target areas subject to different flooding conditions.
 - Have key with description of each area
 - Include building count on key
- Create a map plotting the number of flood insured buildings:
 - Structural coverage
 - Contents coverage
- Prepare an inventory of dams that would flood developed areas if they failed.
- Identify areas likely to be flooded as a result of:
 - Changes in floodplain development / demographics
 - Development in the watershed
 - Climate change / sea level rise
- Address ALL other natural hazards that may affect the community, as identified by the State's hazard mitigation plan.

Step 5: Assess the Problem

- Summarize the community's vulnerability to each hazard listed in step 4
- Describe the impact the hazard will have on:
 - Life safety
 - Need for warning
 - Evacuating residents and visitors
 - Public health hazards to individuals from flood waters
 - Critical facilities
 - Infrastructure
 - Community's economy
 - Major employers
- Create an inventory of the number and type of buildings owned by the community that are located in flood-prone areas
- Identify which buildings are insured for flood damage.
- Review historical damage to buildings (can be obtained from post-disaster damage assessment reports, flood insurance claims, disaster assistance data, flood control studies.
 - ALL properties that have received flood insurance claims payments
 - An estimate of the potential damage and dollar losses to vulnerable structures
 - Include damage done by mold and other flood related hazards, not just the flooding.
- Use Hazus-MH?
- Describe areas within the floodplain that provide natural functions:
 - Wetlands
 - Riparian areas
 - Sensitive areas
 - Habitat for rare / endangered species
- Describe impact on the community, watershed and natural resource areas, depending on trends in:
 - Development
 - Redevelopment
 - Population growth / loss
- Describe the impact of future flooding conditions (from step 4) on:
 - People
 - property
 - natural floodplain functions

Step 6: Set Goals

- Create a statement of goals
- Review floodplain management activities
- Draft the action plan
- Address ALL the major hazards that face the community
- A copy of the CIP elements of the draft plan must be sent to the FEMA Regional Office's flood insurance Liaison. Not for approval, for information purposes only.
- Determine what observable, objective and measurable outcomes are desired from each public information message.

Step 7: Review Possible Activities

- Systematically review, in lay terms:
- All of the different activities that could reduce or prevent the severity of the problems listed in step 5
- Review preventive activities such as:
 - Zoning
 - Stormwater management regulations
 - Building codes
 - Subdivision ordinances
 - Preservation of open space
 - Effectiveness of current regulatory standards and programs
 - Effectiveness of current preventive standards and programs
 - Property protection activities:
 - Acquisition,
 - How will the project be managed?
 - How will the land be used after it is acquired?
 - Retrofitting
 - Flood insurance
- Activities to:
 - Protect the natural and beneficial functions of the floodplain
 - Protect wetlands
- Review Emergency services:
 - Warning
 - sandbagging
- Review:
 - How the above can reduce future flood losses
 - Current standards in the community's plans and regulations
 - Whether the community should adopt or revise its plans and regulations
- Review structural projects such as channel modifications
- Determine the pros and cons of each activity for each area affected
- Determine community's capability to fund and implement each activity
- Determine whether current activities are achieving expectations or whether they should be modified
- Review whether the community's floodplain management regulatory standards are sufficient for current and future conditions
- Review:
 - public information activities
 - outreach projects Educational programs

Step 8: Draft an Action Plan

- Select and specify those activities appropriate to the community's resources, hazards, vulnerable properties
- Outside funding sources MUST be identified and researched

- Identify
 - who is responsible for implementing the action?
 - when it will be done,
 - how it will be funded
 - Prioritize the actions
- There must be an action item for each goal in step 6
- The plan must include a “process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans when appropriate.”
- Based on expected damage from a base flood or other disaster, establish, or revise:
 - Post-disaster redevelopment policies and procedures
 - Mitigation policies and procedures
 - Include activities to mitigate the effects of other natural hazards identified in #4
- Formulate public information messages for target audiences
 - Know your flood hazard / hazard disclosure
 - Insure your property for your flood hazard
 - Protect people from the hazard
 - Protect your property from the hazard
 - Build responsibly
 - Protect natural floodplain functions
 - Map Information Service / CRS 320
 - Flood protection information
 - Flood protection assistance / CRS 360
 - Flood insurance promotion / CRS 370
 - Drainage system maintenance / CRS 540
 - Flood warning and response / CRS 610 & dams CRS 630)
 - Improve flood insurance coverage
- Identify outreach projects to convey the messages
 - Describe project, who will do project and when it will be done
 - One project *MUST* be from elected leadership encouraging people to purchase or increase their flood insurance coverage
- Include procedures for an annual report covering:
 - Monitoring implementation of the plan
 - Reviewing progress of the plan
 - Recommending revisions to the plan

Step 9: Adopt the Plan

- The plan must be officially adopted:
 - A resolution or other formal document must be voted on by the community’s governing body
- The Plan must have a separate section or chapter for PPI activities with:
- Summary of assessment of local flood hazard
- Summary of the community’s natural floodplain functions
- Description of all public information activities currently being implemented in the community
- Flood insurance coverage assessment
- List of the target audiences
- The message for each audience
- Desired outcome for each message
 - Description of each project and activity to be carried out
 - Who will do it
 - When it will be done
 - Description of any Flood response preparations (FRP) projects
 - How the effectiveness of the PPI messages will be monitored and evaluate?

- Subsequent amendments must be officially adopted by the community's governing body

Step 10: Implement, Evaluate and Revise

- Describe how, when and by whom the plan will be monitored, evaluated and revised.
- Prepare an annual evaluation report on the progress of the plan (from step 8).
 - Must include a review of the community's new needs, goals, plans
 - Plans for the area based on: x New studies x Reports x Technical information
 - Hold a public meeting for review and comment on the draft update
 - Submit the report to the governing body
 - Release the report to the media
 - Make the report available to the public
- The annual report must include:
 - The target audiences, the messages and the desired outcomes of the PPI
 - The projects in the PPI to convey the messages
 - Which projects were implemented
 - Why some projects were not implemented
 - What progress was made towards desired outcomes
 - What should be revised, changed, dropped or initiated.
- The committee should review and approve the annual evaluation report
- Steps 4 & 5 / the hazard and problem assessments must be reviewed and brought up to date, accounting for:
 - New floodplain or hazard mapping
 - Annexation of flood-prone areas
 - Additional repetitive loss areas
 - Completed mitigation projects
 - Increased development in the floodplain or watershed
 - New flood control projects
 - Lack of maintenance of flood control projects
 - Major floods or other disasters that occurred since the plan was adopted
 - Any other change in flooding conditions/development exposed to flooding or other hazards covered in the plan
- The planning committee should continue to meet quarterly to evaluate the plan and revise the plan as needed
- Update the plan by October 1st at least every 5 years.
- Submit a copy of the plan update every 5 years

Submit

- A copy of the plan, or update plan, to be credited
 - The annual evaluation report
 - Document which department representatives implement, or have expertise in, which categories of mitigation measures
 - A copy of the resolution creating / recognizing the planning process and identifying the committee's membership
 - Meeting sign in sheets indicating participation by different departments
 - Copies of the publicity for the public meetings i.e. newspaper article / advertisement
 - Document all sources for studies, reports etc. reviewed.
 - A record of contact, meetings, coordination with external agencies and organizations
 - Copy of the resolution or formal adoption action by the governing body

Updating the plan for the current cycle

The plan has been updated in a few different ways. It has been reformatted to emulate the Sarasota County Floodplain Management Plan. Each section has a similar flow to the CRS Coordinator Manual

2017 edition section 510. The old plan at times was repetitive. This plan does not repeat information often and instead cites where the information can be found. The plan is also more visually appealing to read with more frequent headings which assists people with screen readers.

This plan is also ADA compliant including the tables and images. This way we can ensure an easier time for all our residents who would like to read this document.

Section 1 is the introduction of the plan and explains information about the city that is applicable to floodplain management. There is also a purpose section to make the reading easier to understand for people not in the floodplain management field. A section was also added to discuss the National Flood Insurance Program and Community Rating system.

Section 2 discusses the formation of the CRS committee in 2014. It also shows the most up to date list of committee members. Public involvement in the creation and upkeep of the plan is also included. The city coordinates with many other groups on floodplain management to share ideas and resources. These groups are listed in this section.

Section 3 discusses the most common hazards in Venice and goes into detail about each hazard. This section also contains information about historical claims, repetitive loss areas and vulnerable properties while complying with the privacy act. The historical hazards table is updated every year as well.

Section 4 discusses less frequent hazards, while not all of these hazards are not directly related to flooding like wildfires, wildfires can actually increase the likelihood of a flood.

Section 5 is about past studies, current codes and ordinances and how the city is preparing for a more resilient future. Especially regarding climate change and sea level rise.

Section 6 assesses how the flood hazards mentioned in section 3 and 4 affect life safety, public health, critical facilities and infrastructure, economy and residential and commercial buildings

Section 7 explains the beneficial functions of the floodplain including natural storage, water quality, habitat, economic benefits and more. The section also discusses how the city makes an effort to preserve our floodplains to maintain the benefits that these floodplains give us. There is a new table included in this section that lists each city park and lists what natural function asset they provide based on the National Wetlands Inventory.

Section 8 lists the goals of this plan. It separates each activity based on the type from preventative activities to natural resource protection. This section also describes how we coordinate with other plans and groups both internally (like the comprehensive plan) and those that are multijurisdictional (like LMS)

Section 9 is the floodplain management action plan. It hasn't changed very much between the last update and now. However, this section also includes coordination with other initiatives and post disaster mitigation.

Section 10 discusses the process of adoption, implementation, evaluation and revision of this plan.

Sections 11 is our references where we cite what resources we used during the update of this plan.

Adoption of the County-wide plan

There is no county-wide Floodplain Management Plan (FMP). We are a part of their FMP meeting to discuss and share ideas to better serve our citizens through floodplain management. One of the ways we have decided to become more effective with our outreach was to join the county and the other local jurisdictions in a Multi-Jurisdictional Program for Public Information (PPI). This helps deliver our messages consistently across jurisdictional boundaries.

The Multi-Jurisdictional Program for Public Information (County-wide PPI) was adopted by the City of Venice City Council August 27th 2019. It has been incorporated into the City's Floodplain Management and PPI program by resolution. From this point forward, the City will continue to complete the local City PPI activities included in Appendix E of this document in addition to the programs provided by the County-wide PPI to increase public information provided. The County-wide PPI was adopted by Resolution by BOCC on January 29, 2019 as an annex to the Unified Multi-Jurisdictional Local Mitigation Strategy (LMS). This LMS also includes the City of Venice adopted FMP as an annex along with the City's updated LMS Project List. The LMS and County-wide PPI includes of all the municipalities in Sarasota County including: The City of Venice, City of North Port, City of Sarasota, the Town of Longboat Key and unincorporated Sarasota County. The location of the Multi-Jurisdictional PPI is included in Appendix D.

Appendix B

CRS Committee Documentation

Summary of the Documentation to set up the Committee

There were seven meetings of the CRS Committee held at the beginning to write our initial FMP back in August and September of 2014. Below is a summary of these meetings.

There was a meeting notice posted in City Hall for all 7 meetings at least 2 weeks prior to the meeting to give the public the opportunity to go to the meetings.

This table below explains who was present at each of the 7 meetings including committee members and non-committee members. See Appendix A for the table of original members.

Name	Meeting 1	Meeting 2	Meeting 3	Meeting 4	Meeting 5	Meeting 6	Meeting 7
Gillian Carney	X	X	X	X	X	X	X
Kathleen Weeden	X	X	X	X	X	X	X
Mark Hampshire	X	X	X	X	X	X	X
Greg Schneider	X	X	X	X	X	X	X
Scott Pickett	X	X	X	X	X	X	X
Renee Halback	X	X	X	X	X	X	X
John Meyers	X	X	X	X	X	X	X
Robert Yoho	X	X	X	X	X	X	X
Mark Hawkins		X	X	X	X	X	X
Lori Stelzer	X						
Linda Dalton		X		X			
Greg Giles		X		X	X		
Pam Johnson					X		

The following sections are a summary of the original agenda and minutes.

Meeting 1

Agenda

Review analyze and summarize data from flood studies, historical records, the flood insurance study (FIS), drainage problem studies, knowledge/experience of community. The review will focus on the source, frequency, extent and cause of flooding. They assessed areas in the SFHA, repetitive loss areas, areas that have flooded in the past not on the FIRM, and surface flooding identified in other studies.

Create a map showing target areas subject to different flooding conditions including building count. Create another map plotting number of insured buildings and the types of coverage held.

Prepare an inventory of dams that could impact the city if compromised

Identify areas likely to flood due to changes in floodplain development, demographics, development in the watershed, climate change, and sea level rise.

Address all other natural hazards that may affect Venice as identified by the state's hazard mitigation plan.

Minutes

When the meeting was started members were welcomed and were given an overview of the intent of the committee to create the Floodplain Management Plan, Insurance Coverage Improvement Plan, and Program for Public Information Plan and why it was important for the community. The CRS was explained. Members received an overview of the Sunshine Law and how it applies to committee members by Lori Stelzer. Committee discussed flood hazards, causes and flood history in the community. Letter of Map Changes (LOMCs) were explained by Kathleen Weeden. New flood maps are on their way and they will bring more properties into the high risk area. In the meantime the SWFWMD model is a more accurate resource than the city appraiser. Realtors and insurance agents are encouraged to contact the city for a free flood zone determination. Freeboard was discussed. The city website lists historical flooding in the city, members also shared their flood experiences within Venice. CodeRED was discussed as a warning system for the community. Repetitive and Severe Repetitive loss properties were defined by Kathleen who also explained how the addresses can't be released by law. It was agreed that there needs to be more dialogue about insurance vs mitigation. The committee also discussed the Myakka Reservoir #2 inundation zone. Next steps for actions were discussed.

Meeting 2

Agenda

Review minutes from the previous meeting and approve them.

Summarize the community's vulnerability to each hazard determined in meeting 1. Describe the impact the hazard will have on life safety, need for warning, evacuating residents and visitors, public health hazards to individuals from flood waters, critical facilities, infrastructure, Venice's economy, major employers. Create an inventory of number and type of buildings owned by the city in the high risk area, identify which are insured for flood. Review historical damage to buildings. Describe areas within the floodplain that provide natural functions (like those mentioned in section 7 of the updated FMP). Describe impact on the community watershed and natural resource areas based on development, redevelopment and population changes. Describe the impact of future flooding conditions on people, property, and natural floodplain functions

Minutes

Kathleen welcomed everyone, thanked them for their service. Committee members introduced themselves.

Kathleen talked about the CRS and explained that as a Class 6 community we receive a 20% discount in insurance through the NFIP. We also have shared use agreements with other jurisdictions. Gillian handed out the draft CIP-FIA, and hopes to have the maps and all the tables completed prior to the next meeting to enable our discussion on insurance coverage within the City. FEMA FIRM's are used to quote insurance policies, but the City's Adopted floodplain map is more accurate and used to determine construction permits. Kathleen is available to any resident who needs a zone determination. Also, the City Ordinance no longer requires freeboard, but calls for first floor elevation to be 15" above the crown of the adjacent road. Kathleen reiterated that FEMA maps are available to the public at FEMA.gov and can be used to determine flood zones. The adopted floodplain map is based on recent riverine studies. Kathleen discussed flood zone areas and which areas may come into the floodplain with the new FEMA maps. Approximately 70% of homes purchased in Venice are cash purchases, and we need to inform the public of the benefits of flood insurance even if the banks don't require it, especially as 25% of our flood

losses are outside the floodplain. FEMA Mitigation grants can cover up to 75% of the costs to raise a home. Residents can call Kathleen for further information. We talked briefly on the impacts of flood hazards, a section from the recently updated Comprehensive Emergency Management Plan (CEMP) will be emailed, and we will review and comment on this prior to including it in the Floodplain Management Plan. New FIRMs will be coming out soon, although the exact date is unknown. The new FIRMs will bring more properties into the floodplain and we need to be prepared for that, and the questions that homeowners will have re house sales and insurance. We reiterated the need for outreach so that the residents are aware of, and sign up for, CodeRED – the warning system used by the City. Not only for hurricane warnings, but for boil water notices or unexpected items. We discussed the natural functions provided by areas within the floodplain.

Meeting 3

Agenda

Approve minutes from last meeting.

Create statement of goals, review floodplain management activities, draft an action plan. Address all major hazards that Venice faces.

A copy of CIP elements of draft plan must be sent to FEMA's regional office's flood insurance liaison for information purposes only

Determine what observable objective and measurable outcomes are desired from each public information message

Minutes

Discussed signing up for CodeRED and a temporary solution to enter people into the program until they can sign up on their own. Brochures will be printed detailing how to sign up for CodeRED, will check with emergency management to see if they have one already. Have CRS mailings that we currently mail to all residents to committee to be forwarded and distributed. Request that IT provides a projector for next meeting. Kathleen discussed HMGP grants and how they work. The committee discussed why we have repetitive and severe repetitive loss properties in the community. We need to work harder to get word out about mitigation grants to these properties. John Meyers said that he will demonstrate the process realtors go through and what info to hand out. Renee talked about the process for insurance agents when they run quotes, rep loss properties are flagged that insurance is only available via FEMA, but no details of the loss was displayed. Discussed permits. City is required to hold permits for 15 years. It was suggested people should look up their flood zones before they purchased.

Meeting 4

Agenda

Approval of minutes from previous meeting

Determine who needs to be informed, on what topic, by whom, and how.

Systematically review in lay terms all the activities that could reduce or prevent the severity of the problems listed in step 5. Review preventive activities like zoning, stormwater management regulations, building codes, subdivision ordinances, open space preservation, effectiveness of current regulatory standards and programs, and property protection activities. Property protection activities include:

acquisition, retrofitting, flood insurance, and protecting beneficial functions of the wetlands and floodplain.

Review Emergency services like warning and sandbags.

Review how above measures can reduce future flood losses, current standards in the community's plans and regulations and whether the community should adopt or revise plans and regulations.

Review structural projects like channel modifications.

Determine pros and cons of activities performed in each affected area.

Determine community's capability to fund and implement each activity

Determine whether current activities are achieving expectations or whether they should be modified

Review whether the community's floodplain management regulatory standards are sufficient for current and future conditions.

Review public information activities, outreach projects and educational programs

Minutes

Evaluate opportunities to review the Comp plan for flood policies. Check stormwater regulations, city has higher regulatory standards based on rate and volume lost. Check updates of Florida Building Code and International Code. See how permitting impacts subdivision through existing building code/cumulative/substantial loss. Continue to evaluate specifics of studies completed by the county or city. Coordinate with the media and insurance agents to get info about approximate coverage amounts. As an ongoing process, an evaluation of a cost benefit analysis of points earned in CRS by having the 10-year rule for substantial loss in city ordinance. Doesn't differentiate between flood damage and remodeling. Should reevaluate every 5 years. The city needs to do more to assist in retrofitting like getting the info out. The specifics of CIP and PPI were discussed.

Meeting 5

Agenda

Draft an action plan, provide an opportunity for the public to comment and adopt plan by council September 8th.

Select and specify activities appropriate to the city's resources, hazards, and vulnerable properties.

Identify outside funding sources including who is responsible, when will this be done, and how it will be funded.

Prioritize the action. There must be an action for each goal in step 6. Must include "process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans when appropriate."

Based on expected damage from a base flood or other disaster, establish or revise post-disaster redevelopment policies/procedures and mitigation policies and procedures.

Include activities to mitigate the effects of other natural hazards identified in #4

Formulate public information messages to target audiences Including the following: Know your flood hazard/hazard disclosure, insure your property for your flood hazard, protect people from the hazard, protect your property from the hazard, build responsibly, protect natural floodplain functions, Map Information Service / CRS 320, Flood protection information, Flood protection assistance / CRS 360, Flood insurance promotion / CRS 370, Drainage system maintenance / CRS 540, Flood warning and response / CRS 610 & dams CRS 630), Improve flood insurance coverage

Identify outreach projects to convey the messages, describe project, who will do it and when will it be done. One must come from elected leadership encouraging people to purchase flood insurance. Includes procedures for an annual report monitoring plan implementation, reviewing plan progress, and recommending plan revisions.

Minutes

The committee read through the draft Flood Management Plan (FMP) and made corrections and changes, to be reviewed again at the next meeting. There were no major changes or additions. The Committee read through the draft Program for Public Information plan (PPI) and made corrections and changes, to be reviewed again at the next meeting. Add a section for objectives. These should be the PPI objectives from the CRS manual Add a section for Research Add StormReady evaluation for stakeholders <http://www.stormready.noaa.gov/>. Add CERT training for HOA's <http://www.fema.gov/community-emergencyresponse-teams>. Coordinate any research with EOC and Chief Warman Some discussion regarding relocating the publications turnstyle closer to the building department. Pam Johnson will look into feasibility. A CRS point spread calculation needs to be done before adding more outreach activities. Any outreach through City channels needs to be reviewed by Pam Johnson before the 20th of each month. The Committee read through the draft Coverage Improvement Plan (CIP)) and made corrections and changes, to be reviewed again at the next meeting. Add a section on evaluating cost to property owners and cost to the city. Pam Johnson talked about CodeRED and that residents can always call the City and ask to be added to the system. We will transfer that duty to the engineering department. The committee agreed that an objective for the next year is to evaluate the benefit to property owners of the meeting the Cumulative Substantial Improvements section of the CRS (432d). Renee handed out information on insurance coverage policy premiums. We need to work with the insurance agents and the media on making sure property owners know the approximate costs of flood insurance, and the cost to themselves and the community of not having flood insurance.

Meeting 6

Agenda

The plan must be officially adopted via resolution or other formal document by our governing body

The plan must have separate sections for PPI activities with summary of all assessment of local flood hazards and a summary of the community's natural floodplain functions.

Describe all public information activities currently being implemented in the community including, flood insurance coverage assessment and list of target audiences. This will also include the message for each audience, desired outcome of message, description of each project and activity to be carried out, who is responsible for it, when it will get done. Description of Flood response preparations, effectiveness of PPI messages. All subsequent amendments must be adopted by our governing board

Minutes

The committee read through draft FMP and made suggestions for corrections and changes. There were no major edits. Then they read through the draft PPI and made suggestions for corrections and changes. There were no major edits. Then they read through the draft and made suggestions for corrections and changes. There were no major edits. Then they read through the draft CIP and made suggestions for corrections and changes. There were no major edits. The plan will be sent to council September 9th. The committee discussed CRS credits, pint distribution, and evaluating best credits to target. Discussed PPI messages and target audiences for those messages. Discussed how to evaluate effectiveness of CIP and PPI. Discussed seller's hazard disclosure form that realtors use. Kathleen gave an overview of the LMS partnership with the other jurisdictions. Discussed what agenda items should be added to the final set up meeting.

Meeting 7

Agenda

Describe how, when, and by whom the plan will be monitored and reviewed.

Prepare an annual evaluation report on progress of the plan. Must include review of Venice's needs, goals, and plans for the area. It must be based on new studies, reports and technical information. Hold a public meeting for review and comment on draft update. Submit the report to the governing body, release the report to the media, and make the report available to the public.

The annual report must include: The target audiences, the messages and the desired outcomes of the PPI, the projects in the PPI to convey the messages, which projects were implemented, why some projects were not implemented, what progress was made towards desired outcomes, what should be revised, changed, dropped or initiated.

The committee should review and approve the annual evaluation report.

Steps 4&5/ the hazard and problem assessments must be reviewed and brought up to date while accounting for

New floodplain or hazard mapping, Annexation of flood-prone areas, Additional repetitive loss areas, Completed mitigation projects, Increased development in the floodplain or watershed, New flood control projects, Lack of maintenance of flood control projects, Major floods or other disasters that occurred since the plan was adopted, any other change in flooding conditions/development exposed to flooding or other hazards covered in the plan.

The planning committee should continue to meet quarterly to evaluate and revise the plan as needed. Update the plan by October 1st every 5 years. Submit a copy of the updated plan every 5 years.

Minutes

The committee had been emailed the three plans which are to be presented at City Council on September 9th. It was agreed that some revisions should be made but they were tabled for the next meeting. We discussed the impacts of the cumulative coverage wording in the ordinance and the fact that Venice has no freeboard. Does the cumulative coverage hurt or help homeowners / the community? What is its actual intent? During 2014-2015 we should look into this and determine what the cost/benefits are of re-certifying or re-classifying. Would it take a new ordinance? Would it be an

improvement for the community or hinder improvements? Mark Hawkins has an upcoming meeting with the Builders Association to discuss this and will report back at our next meeting.

The annual report, if required for this year, will be submitted to City Council in memo format. We need to check that it is needed – the new PPI may be sufficient as the annual report. Mark Hawkins requested a copy of the result of the previous CRS audit, and a copy of the result of the upcoming audit once that is available. The Committee was reminded that the floodplain questionnaire has been publicized on the city website and in the papers. Copies were available for them to distribute to their clients. The City will do a CodeRED© test on September 12th. This has been publicized as part of the PPI. We discussed dates for the 2014-2015 meetings. A tentative schedule will be arranged and emailed to the committee members prior to a formal notice being made public. Tentative dates are 3rd Tuesday of each month, from 8.30am – 9.30am.

Documentation of the last 4 meetings

This section contains the documentation from the last four meetings dating back to May of 2019

Name	Affiliation	City Email	Address	Phone	Initial
Greg Schneider	City of Venice	gschnider@Venicegov.com	N/A	(941)882-7374	
John Meyers	Colowell Banker	jmeyers@Venicegov.com		(574)274-4639	
Brice Ferguson	Caliber Home Loans	bferguson@Venicegov.com		(941)735-9304	
Mark Hawkins	Hawks Nest Construction	mhawkins@Venicegov.com		(941)650-9499	
Kathleen Weeden	City of Venice	kweeden@Venicegov.com	N/A	(941)486-2626	
Kathryn Harring	City of Venice	kharring@Venicegov.com	N/A	(941)882-7412	
Robert Yoho	The Damex Corp.	ryoho@Venice gov.com		(941)626-9971	
David Waring	Publix Supermarket	dwaring@venicegov.com	N/A	(941)321-0643	
Mary E Petty	AAA Insurance	mepetty@venicegov.com		(941)468-9958	
Roger Clark	City of Venice	rclark@venicegov.com	N/A	(941)882-7432	
Donna Bailey	Sarasota County	dabailey@scgov.net	N/A	(941)861-0917	

**AGENDA
CITY OF VENICE
CRS Committee
REGULAR MEETING**

May 7th, 2019 AT 8:30 A.M. – Development Services

If you are disabled and need assistance, please contact the City Clerk's office at least 24 hours prior to the meeting.

- I. Call to Order
- II. Roll Call
- III. Approval of Minutes – February 5th
- IV. New Business
 - 1. Floodplain Management Plan Update
- V. Audience Participation (five-minute limit per speaker)
- VI. Adjournment





NOTE:

No stenographic record by a certified court reporter is made of this meeting. Accordingly, any person who may seek to appeal any decision involving the matters noticed herein will be responsible for making a verbatim record of the testimony and evidence at this meeting upon which any appeal is to be based.

CRS Committee Meeting

Date

5/16/18

Name	Affiliation	City Email	Address	Phone	Initial
Greg Schneider	City of Venice	gschneider@Venicegov.com	N/A	(941)882-7374	
John Meyers	Colowell Banker	jmeyers@Venicegov.com		(574)274-4639	
Brice Ferguson	Caliber Home Loans	bferguson@Venicegov.com		(941)735-9304	
Mark Hawkins	Hawks Nest Construction	mhawkins@Venicegov.com		(941)650-9499	
Kathleen Weeden	City of Venice	kweeden@Venicegov.com	N/A	(941)486-2626	
Kathryn Harring	City of Venice	kharring@Venicegov.com	N/A	(941)882-7412	
Robert Yoho	The Damex Corp.	ryoho@Venice.gov.com		(941)626-9971	
David Waring	Publix Supermarket	dwarling@venicegov.com	N/A	(941)321-0643	
Mary E Petty	AAA Insurance	mepetty@venicegov.com		(941)468-9958	
Roger Clark	City of Venice	rclark@venicegov.com	N/A	(941)882-7432	
Donna Bailey	Sarasota County	dabailey@scgov.net	N/A	(941)861-0917	

**AGENDA
CITY OF VENICE
CRS Committee
REGULAR MEETING
August 6th, 2019 AT 8:30 A.M. – Development Services**

If you are disabled and need assistance, please contact the City Clerk's office at least 24 hours prior to the meeting.

Call to Order

Roll Call

Approval of Minutes – May 7th

I. New Business

1. CRS Annual Recertification
2. CRS 5-year Cycle: Early 2020
3. FMP going to council late August
4. PPI videos and memes

II. Audience Participation (five-minute limit per speaker)

III. Adjournment

NOTE: No stenographic record by a certified court reporter is made of this meeting. Accordingly, any person who may seek to appeal any decision involving the matters noticed herein will be responsible for making a verbatim record of the testimony and evidence at this meeting upon which any appeal is to be based.

MINUTES
CITY OF VENICE
CRS Committee
May 7th, 2019

The CRS Committee met on May 7th, 2019 at 8:30-9:30 in Development Services Conference Room, 401 W Venice Ave Venice FL 34285.

Members Present: Greg Schneider, John Meyers, Mark Hawkins, Kathleen Weeden, Robert Yoho

Members Present Via Phone: Mary E Petty

Non-Members Present: Donna Bailey, Kathryn Haring

Member Not Present:

Discussion/Action:

Meeting Called to Order at 8:40 am

It was determined that in order to maintain our CRS points the Committee would not be disbanded but may meet less frequently, depending on points required to meet our CRS class.

Mark Hawkins called a motion to approve the previous meeting's minutes, Greg Schneider seconded it. The minutes from the previous meeting were approved unanimously.

Kathleen discussed with the group the changes that have occurred with the FMP including formatting and grammar change, updating the current budget info and updating to reflect recent development.

ADA compliance was also discussed. The FMP will be put into compliance once it is finalized. Kathleen discussed the changes made to incorporate ADA compliance. This included removing non-compliant documents from the website and staff training to ensure future documents will be compliant.

The concern of ADA compliance and Elevation Certificate availability on the website for CRS points was noted.

Donna mentioned that proper documentation of the PPI in the FMP would be to reference it as an annex to the LMS.

Meeting Adjourned at 9:15 am

Name	Affiliation	City Email	Address	Phone	Initial
Greg Schneider	City of Venice	gschnider@Venicegov.com	N/A	(941)882-7374	<i>GS</i>
John Meyers	Colowell Banker	jmeyers@Venicegov.com		(574)274-4639	<i>Phone</i>
Brice Ferguson	Caliber Home Loans	bferguson@Venicegov.com		(941)735-9304	<i>—</i>
Mark Hawkins	Hawks Nest Construction	mhawkins@Venicegov.com		(941)650-9499	<i>mhi</i>
Kathleen Weeden	City of Venice	kweeden@Venicegov.com	N/A	(941)486-2626	<i>KW</i>
Kathryn Harring	City of Venice	kharring@Venicegov.com	N/A	(941)882-7412	<i>KH</i>
Robert Yoho	The Damex Corp.	ryoho@Venice gov.com		(941)626-9971	
David Waring	Publix Supermarket	dwarling@venicegov.com	N/A	(941)321-0643	
Mary E Petty	AAA Insurance	mepetty@venicegov.com		(941)468-9958	<i>My</i>
Roger Clark	City of Venice	rclark@venicegov.com	N/A	(941)882-7432	
Donna Bailey	Sarasota County	dabailey@scgov.net	N/A	(941)861-0917	<i>—</i>

**AGENDA
CITY OF VENICE
CRS Committee
REGULAR MEETING
November 5th, 2019 AT 8:30 A.M. – Development Services**

If you are disabled and need assistance, please contact the City Clerk's office at least 24 hours prior to the meeting.

- I. Call to Order
- II. Roll Call
- III. Approval of Minutes – May 7th and August 6th
- IV. New Business
 - 1. City Attorney Kelly Fernandez and City Clerk Lori Stelzer: Refresher on Public Records and Sunshine Laws as Required by the Settlement Agreement in the Citizens for Sunshine and Anthony Lorenzo Litigation
 - 2. Review and update
 - a. Floodplain Management Plan (FMP)
 - b. Program for Public Information (PPI)
 - c. Coverage Improvement Plan (CIP)
- V. Audience Participation (five-minute limit per speaker)
- VI. Adjournment

NOTE: No stenographic record by a certified court reporter is made of this meeting. Accordingly, any person who may seek to appeal any decision involving the matters noticed herein will be responsible for making a verbatim record of the testimony and evidence at this meeting upon which any appeal is to be based.

MINUTES
CITY OF VENICE
CRS Committee
August 6th, 2019

The CRS Committee met on August 6th, 2019 at 8:30-9:30 in Development Services Conference Room, 401 W Venice Ave Venice FL 34285.

Members Present: Greg Schneider, John Myers, Kathleen Weeden, Mary E. Petty, Roger Clark

Members Present Via Phone: Mark Hawkins

Non-Members Present: Kathryn Harring, Donna Bailey

Member Not Present: Brice Ferguson, Robert Yoho, David Waring

Discussion/Action:

Meeting Called to Order at 8:40 am

There was no Quorum when the meeting was called to order. The approval of minutes for the May 7th meeting was tabled until next meeting.

Kathleen started off the meeting with the Floodplain Management Plan. This current update is considered an annual update and not a 5-year update. The FMP has had a few changes including format changes and new language to adopt the multijurisdictional PPI. The document has also become ADA compliant. This update will be presented to council at the end of August. The FMP will be on website after adoption. The 5-year update will be in early 2020. Revisions regarding the 5- year update will be discussed at the next meeting the 5th of November. The cycle for updating the FMP was shifted in order to match the CRS cycle. It was discussed that a longer-term goal is to join the county's multijurisdictional FMP.

The annual recertification for CRS was discussed. The last recertification was sent to FEMA at the end of July. It was off our normal cycle due to confusion with ISO and our 5-year cycle visit.

Mark Hawkins joined over the phone at 8:50.

Our 5-year cycle visit will take place in early 2020. The auditor has yet to be determined due to staffing issues within ISO.

The meeting then proceeded to talk about outreach for people in low risk areas due to large levels of development on the eastern side of the city. John and Mary both described how they explain risk levels to clients and that there is no such thing as no risk. The FEMA application

regarding the cost of flooding was discussed as a tool to explain to clients the real cost of flood waters.

It was determined that the next flood questionnaire should be updated to determine how well residents understand their risk. The current survey was pulled up online to show members the current questions.


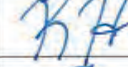
The latest memes and videos were shown to the group via PowerPoint to highlight our latest outreach involved in monthly messages, flood awareness week and a new set of memes still in the works regarding evacuation levels and flood zones. The videos were created by FEMA and are available on YouTube. They discuss how to prepare for a hurricane and a flood, how insurance financially protects you from a flood and a variety of survivor stories involving recent hurricanes that hit around the country and how insurance helped people rebuild.

Meeting Adjourned at 9:15 am

CRS Committee Meeting

Date

2/4/20

Name	Affiliation	City Email	Address	Phone	Initial
✓ Greg Schneider	City of Venice	gschnider@Venicegov.com	N/A	(941)882-7374	
✓ John Meyers	Colowell Banker	jmeyers@Venicegov.com		(574)274-4639	
✓ Mark Hawkins	Hawks Nest Construction	mhawkins@Venicegov.com		(941)650-9499	
✓ Kathleen Weeden	City of Venice	kweeden@Venicegov.com	N/A	(941)486-2626	
✓ Kathryn Haring	City of Venice	kharring@Venicegov.com	N/A	(941)882-7412	
✓ Robert Yoho	The Damex Corp.	ryoho@Venice gov.com		(941)626-9971	
David Waring	Publix Supermarket	dwarling@venicegov.com	N/A	(941)321-0643	
✓ Mary E Petty	AAA Insurance	mepetty@venicegov.com		(941)468-9958	phone
Roger Clark	City of Venice	rclark@venicegov.com	N/A	(941)882-7432	email has correct
✓ Donna Bailey	Sarasota County	dabailey@scgov.net	N/A	(941)861-0917	

**AGENDA
CITY OF VENICE
CRS Committee
REGULAR MEETING
February 4th, 2020 AT 8:30 A.M. – Development Services**

If you are disabled and need assistance, please contact the City Clerk's office at least 24 hours prior to the meeting.

Call to Order

- I. Roll Call
- II. Approval of Minutes – November 5th
- III. New Business
 - 1. Review 5 year rewrite of Floodplain Management Plan (FMP)
 - 2. New FIRM Map Update
- IV. Audience Participation (five-minute limit per speaker)
- V. Adjournment

NOTE: No stenographic record by a certified court reporter is made of this meeting. Accordingly, any person who may seek to appeal any decision involving the matters noticed herein will be responsible for making a verbatim record of the testimony and evidence at this meeting upon which any appeal is to be based.

MINUTES
CITY OF VENICE
CRS Committee
November 5th, 2019

The CRS Committee met on November 5th, 2019 at 8:30-9:30 in Development Services
Conference Room, 401 W Venice Ave Venice FL 34285.

Members Present: Greg Schneider, Kathleen Weeden, Mary E. Petty, Mark Hawkins

Members Present Via Phone: John Myers

Non-Members Present: Kathryn Harring, Lori Stelzer, Kelly Fernandez

Member Not Present: Brice Ferguson, Robert Yoho, David Waring, Roger Clark

Discussion/Action:

Meeting Called to Order at 8:42 am

Meeting minutes from the last two meetings from August and May were reviewed and a motion was made to approve the minutes by Mark Hawkins and seconded by Mary Petty. The minutes were approved unanimously with no alterations.

Kelly Fernandez reviewed the articles from the last year relating to the sunshine law. She also reviewed the basics of the sunshine law.

The Floodplain Management plan was discussed. The city plans to model our plan based on the Sarasota County's Floodplain Management Plan because they have recently been awarded more points than our current plan. The plan update is for our 5-year update. Sections of the FMP will be sent to the committee via email and reviewed at February's meeting.

The Program for Public Information is also merging with the county's multi-jurisdictional plan as well.

The Committee briefly spoke about map updates and how the mapping is determined. Our new preliminary maps should arrive early next year. A meeting will be arranged to explain the changes to the public.

Kathleen spoke of her plans to remove one of the outfalls on the beach in favor of a swale system to improve water quality.

Meeting Adjourned at 9:05 am

Advertising for public input on the plan

The city advertised for public input on the 5- year update in many different ways including but not limited to: paper flyers at other public meetings, social media, the city website, an email blast from our PIO, and mention in the city newsletter. See the Flyer and social media outreach below.

Flyer:

**FLOODPLAIN
MANAGEMENT
PLAN UPDATE**

**PUBLIC MEETING
NOTICE**

We are currently completing
our floodplain management
plan's 5-year update.

We would like to hear your
comments and questions!

To view the revised plan please
visit:

[https://www.venicegov.com/
government/engineering/
flood-protection/crs](https://www.venicegov.com/government/engineering/flood-protection/crs)

**326 S NOKOMIS AVE
COMMUNITY CENTER
ROOM F**

**3/26/2020
2PM-3PM**

**HOPE TO SEE YOU
THERE!**

Social Media Messages:



Public Meeting Minutes

This meeting has not occurred yet. It was supposed to be in the month of March but the meeting has been postponed due to COVID-19

When the meeting takes place this section will discuss the # of people in attendance, information provided, and recommendations from the public.

Appendix C

City Maps

ADA Notice: The maps in this document show the following

Figure 1: The City of Venice Flood Zones, Letter of Map Changes and Coastal Barrier Resource Act Areas within the city

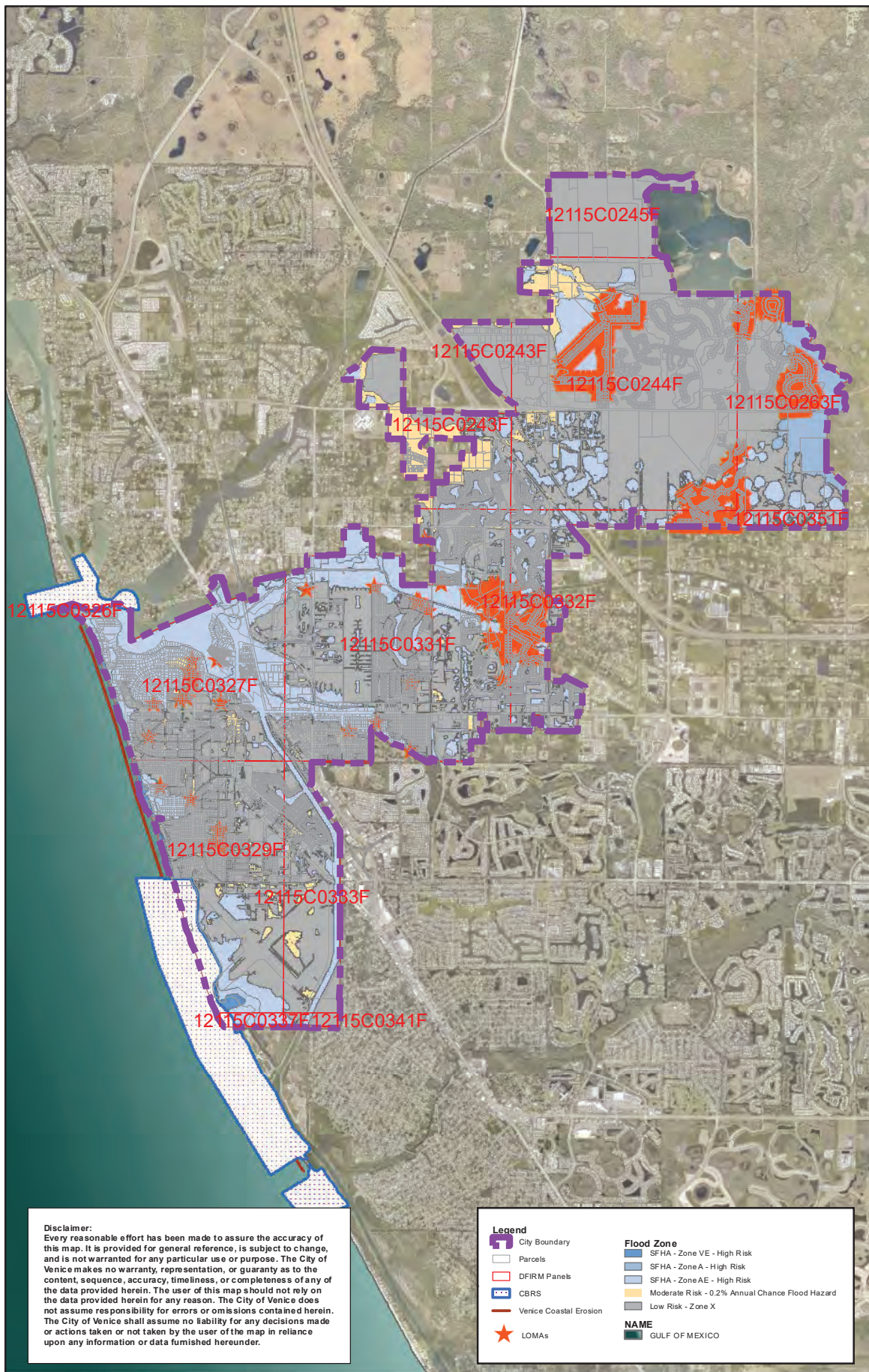
Figure 2: The City of Venice Flood Zones, The Coastal Erosion Line and the Historical Shore Line from four different periods of time ranging from 1883-1998

Figure 3: The City of Venice Flood Zones, Repetitive Loss Areas, Coastal Barrier Resource Act Areas, Coastal Construction Line, Coastal General Permit Line and Floodways within the city

Figure 4: The City of Venice Flood Zones, Open Space, Conservation Easements, Deed Restricted Areas and Critical Habitats

Disclaimer:

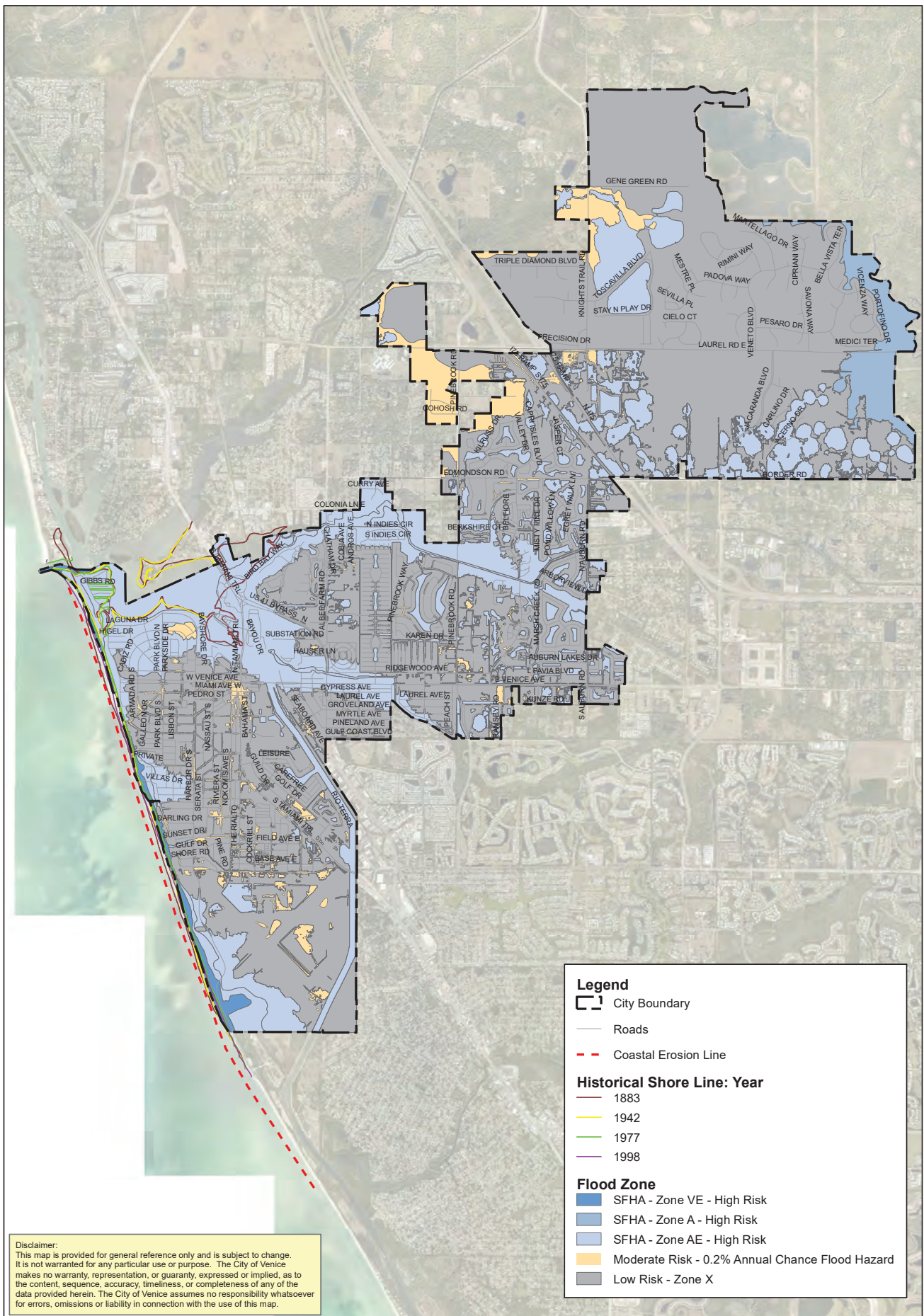
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City of Venice Appendix C. Figure 1 Regulatory Flood Map

Last Updated 6/17/2019



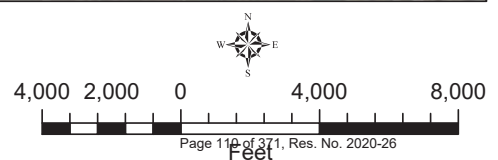


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Appendix C, Figure 2 City of Venice Coastal Erosion



Appendix D

LMS Venice Project List, Multijurisdictional PPI Annual Evaluation Report and Multijurisdictional PPI

Note: The Multijurisdictional Local Mitigation Strategy includes the LMS Project List and Multijurisdictional Program for Public Information in appendices. These documents have been included as Appendix D to be incorporated directly into the City of Venice Floodplain Management Plan. The Multijurisdictional LMS is currently being updated and will be published in 2021.

The Sarasota County Local Mitigation Strategy (LMS) Work Group City of Venice Project List

Pirority Note 1	Name of Project	Description of Project	Hazard Mitigated Note 2	Hazard Mitigation Strategy Note 3	Mitigation Goals Achieved Note 4	Funding Source	Jurisdiction Project Benefit Note 5	Jurisdiction Project Owner	Jurisdiction Project #	Agency Responsible for Implementation	Estimated Cost	Project New Note 6	Project Status Completed Note 6	Project Status In Progress Note 6	Project Status Deleted Note 6	Project Status Deferred Note 6	If Deferred, Why? Note 6	Timeframe for Project Completion	Mitigate New or Existing (N/E)
High	Public Outreach	Public outreach programs for all jurisdictions	ALL	ALL	3	N/A	ALL	ALL	N/A	LMS Work Group	\$10K			✓				Continuous	E
High	Police Dept. Relocate and EOC construction	Reconstruct PD facility to include City Command EOC	2, 7, 8, 9,11, 12, 15	2	5	Bond	ALL	V	1V	Police	\$16M			✓				2020	E
Medium	Relocate Fire Station #2	Construct new fire station outside flood zone	2, 7, 8, 9,11, 12, 15	2	5	N/A	ALL	V	3V	Fire	\$5M					✓	Funding		E
Medium	Directional signs for island evacuation	Acquire four signs for three bridges and roadways	2, 7, 8, 9,11, 12, 15	5	4	N/A	3,4	V	6V	Public Works	\$60K					✓	Funding		E
High	Fire Station #51 and City Hall generator	Emergency operations for city communications	2, 7, 8, 9,11, 12, 15	2	5	N/A	3,4	V	7V	City Hall	\$1.175M			✓				Under construction	E
High	Radio upgrade for the city department	Provide optimum radio communications	2, 7, 8, 9,11, 12, 15	5	5	NA	ALL	V	21V	Utilities, Police, PW	\$490K					✓	Funding		E
Low	Second House Program	Partner coastal with inland residents during emergencies	2, 7, 8, 9,11, 12, 15	5	1	N/A	3	V	23V	City Hall	\$10K					✓	Funding		E
Low	Relocate water plant elevated tank	Upgrade support system to prevent against flood and wind	2,7,9,12	2	5	N/A	ALL	V	26V	Utilities	\$725K					✓	Funding		E
Low	Upgrade Chuck Reiter elevated tank	Upgrade support system to prevent against flood and wind	2,7,9,11, 12,15	2	5	N/A	ALL	V	27V	Utilities	\$76K					✓	Funding		E
Low	Modify Pinebrook booster station	Waterproof and upgrade communication system	2, 7, 8, 9,11, 12, 15	2	5	N/A	ALL	V	28V	Utilities	\$100K					✓	Funding		E
Low	Coastal Area Redevelopment Study	Post disaster study	2, 7, 8, 9,11, 12, 15	5	2	N/A	ALL	V	29V	Dev. Service	\$50K					✓	Funding		E
Low	Coastal Compliance Program	Public education for retrofit and construction activities	2, 7, 8, 9,11, 12, 15	5	3	N/A	3	V	30V	Building	\$30K					✓	Funding		E
Medium	Coastal Land Acquisition Program	Purchase properties and preserve for open space	2,7,9,11	1	4	N/A	3	V	36V	Engineering	\$425K					✓	Funding		E
High	Relocate RO Water Plant	Construct facility out of the flood zone	2,7,9,11	2	5	N/A	ALL	V	42V	Utilities	\$40M					✓	Funding		E
High	Ajax property 2.0-3.0MGD booster station	Provide service to east side of town, construct interconnect with county	2,7,9,11, 12,15	2	5	SRF/ Revenue	3	V	44V	Utilities	\$10M							2022	N
Low	Venice Evacuation Study	Study to address the need for hurricane shelters in city	2,7,8,9,11, 12,14,15	5	1	N/A	ALL	V	50V	Planning	\$50K					✓	Funding		N
High	Fire Station 1 Replacement	Upgrade facility to meet current storm criteria	2,7,9,11, 12,15	3	5	N/A	ALL	V	55V	Fire	\$5M			✓				2022	E
High	Relocate PW to PD after new PD complete	Harden Structure and retrofit for PW Admin.	2, 7, 8, 9, 11,12, 15	2	5	N/A	3	V	57V	Public Works	\$750K			✓			Funding	2021	E
Low	Hurricane Tolerant Handbook	Update the 1994 hurricane study	9	5	3	N/A	ALL	V	61V	Planning	\$15K					✓	Funding		E
High	New Solid Waste and Recycling Complex	Relocate facility east and construct to hurricane codes	2,7,8,9,11, 12,15	2	5	N/A	ALL	V	62V	Public Works	\$3M					✓	Funding		E
High	Purchase Portable Generators for Lift Station	Provide emergency back up power outage	2,7,8,9,11, 12,15	5	1	Utilities revenue	ALL	V	64V	Utilities	\$450K					✓	Funding		E
Medium	Hurricane Louvers for Water Plant	Secure building for hurricanes	9,15	2	5	N/A	ALL	V	65V	Utilities	\$32K					✓	Funding		E
High	City Hall Reroof	Roof not built to code and condition is deteriorating	2,7,9,11, 12,15	2	5	N/A	ALL	V	66V	Public Works	\$600K		✓						E
Medium	2nd sanitary force main under Intracoastal	Add a secondary force main to add to secondary redundancy	2, 7, 9	5	5	N/A	3	V	69V	Utilities	\$1M			✓				2022	E
High	2nd sanitary force main under I-75	Add a secondary force main to add to secondary redundancy	2, 7, 9	5	5	Utilities revenue	3	V	70V	Utilities	\$3.5M			✓				2021	E
High	Reinforce Airport Hangars	Reinforce existing airport to meet hurricane standards	2, 7, 9, 11,12,15	2	2, 5	Airport / Grants	3	V	75V	Airport	\$1M								N
High	Construct New T-Hangars	Construct new T-Hangars meeting hurricane standards	2, 7, 9, 11,12,15	5	2	Airport / Grants	3	V	76V	Airport	\$1.5M								N

The Sarasota County Local Mitigation Strategy (LMS) Work Group City of Venice Project List

Priority Note 1	Name of Project	Description of Project	Hazard Mitigated Note 2	Hazard Mitigation Strategy Note 3	Mitigation Goals Achieved Note 4	Funding Source	Jurisdiction Project Benefit Note 5	Jurisdiction Project Owner	Jurisdiction Project #	Agency Responsible for Implementation	Estimated Cost	Project New Note 6	Project Status Completed Note 6	Project Status In Progress Note 6	Project Status Deleted Note 6	Project Status Deferred Note 6	If Deferred, Why? Note 6	Timeframe for Project Completion	Mitigate New or Existing (N/E)
Low	Relocate Airport Maintenance Facility	Relocate existing Airport Maint. Facility to meet hurricane stds.	2, 7, 9, 11, 12, 15	5	2	Airport / Grants	3	V	78V	Airport	\$650K								N
High	Airport Avenue Drainage Project	Upgrade existing drainage facilities to mitigate flood in evacuation route	2,7,9,11	6	2	Airport / Grants	3	V	79V	Airport	\$700K					✓	Funding		N
Medium	Live Oak Dr. Stormwater Improvements	Upsize existing stormwater pipes to reduce flooding	2,7,9,11	6	2	SRF	3	V	80V	Stormwater	\$600K			✓				Under construction	E
High	Nokomis Ave. South Stormwater	Upsize existing stormwater pipes to reduce flooding	2,7,9,11	6	2	CIP	3	V	81V	Stormwater	\$1.1M		✓						E
Medium	Outfall 9 Improvement	Study the drainage basin and increase the infiltration pond size	2,7,9,11	6	2	CIP/ Grants	3	V	82V	Stormwater	\$500K					✓	Funding		E
Medium	Golf Dr. Stormwater Improvements	Upsize existing stormwater pipes to reduce flooding	2,7,9,11	6	2	CIP/ Grants	3	V	83V	Stormwater	\$750K					✓	Funding		E
Medium	Beach Erosion Hot Spot Alternatives	Alternate erosion evaluation and construction	1,2,7,9	5	5	Grants	3	V	86V	Engineering	\$4M					✓	Funding		N
LOW	Mobile Command Unit	Design and Purchase a Mobile Command Unit for use during special events and emergencies.	2, 7, 8, 9, 11, 12, 15	2	5	N/A	ALL	V	87V	Police	\$500K					✓	Funding		N
Medium	Valencia Rd. Stormwater Improvements	Upsize existing stormwater pipes to reduce flooding	2,7,9,12	6	2	CIP/ Grants	3	V	88V	Stormwater	\$850K					✓	Funding		E
Medium	Circle Drive Drainage Improvement	Upsize existing stormwater pipes to reduce flooding	2,7,9,11	6	2	CIP/ Grants	3	V	89V	Stormwater	\$400K					✓	Funding		E
Medium	Church St. Drainage Improvement	Upsize existing stormwater pipes to reduce flooding	2,7,9,11	6	2	CIP/ Grants	3	V	90V	Stormwater	\$400K					✓	Funding		E
Medium	Parkdale & Parkside Dr. Drainage Improvement	Upsize existing stormwater pipes to reduce flooding	2,7,9,11	6	2	CIP/ Grants	3	V	91V	Stormwater	\$750K					✓	Funding		E
Medium	Venice Fire Station 3 EOC	Provide Equipment for Venice EOC at Fire Station 3 to allow for Emergency Management Operations	2,7,8,9,11, 12,14,15	5	5	N/A	ALL	V	92V	Fire	\$250,000					✓	Funding		E
High	Lightning and Surge Protection	Provide Lightning and Surge Protection to provide protection to City Technology and infrastructure.	2,7,8,9,11, 12,14,15	5	5	N/A	3,4	V	93V	Fire	\$105,000					✓	Funding		E
Medium	Construct 8E production well	Enhance system reliability	2,7,9	5	1,4	CIP	ALL	V	94V	Utilities	\$1.5M			✓				2021	N
High	Water Plant Generator	Purchase new generator for water plant for backup power	2,7,8,9,11, 12,15	2	1	CIP	All	V	95V	Utilities	\$1M			✓				2021	E
High	Fire Station #2 Hardening	Harden Facility for Storm Protection	2,7,8,9,11, 12,14,15	5	5	N/A	ALL	V	96V	Fire	\$250,000					✓	Funding		E

2020



SARASOTA COUNTY UNIFIED PROGRAM FOR PUBLIC INFORMATION (PPI) ANNUAL EVALUATION REPORT



Unincorporated Sarasota County, the City of Sarasota, the Town of Longboat Key,
the City of North Port, the City of Venice

Prepared by the Sarasota County Unified PPI Committee

Table of Contents

MISSION STATEMENT.....	2
BACKGROUND.....	2
PPI COMMITTEE.....	3
Committee Members.....	4
NATIONAL FLOOD INSURANCE PROGRAM.....	4
Unincorporated Sarasota County	5
The city of Sarasota.....	5
The Town of Longboat Key	5
The city of North Port	5
The city of Venice.....	5
FEDERAL FLOOD INSURANCE ASSESSMENT REVIEW.....	6
FEDERAL FLOOD MAP UPDATES.....	9
PROJECTS REVIEW.....	10
Key Sheet – Target Audiences.....	11
Key Sheet – Messages and Outcomes	12
Discontinued Outreach Projects List.....	13
Appendix Summary	13
Board Submittal Date Line.....	13
LIST OF FIGURES AND TABLES:	
Figure 1. 2019 PPI Committee Members, Affiliations, Departments.....	4
Table 1. 2018 vs 2019 Policy Count and Coverage Amount (Pre/Post FIRM)	7
Table 2. Insurance Occupancy	8
Table 3: Policy Count Comparison.....	9
APPENDIX A:	
Project List and Recommendations.....	14
APPENDIX B:	
Meeting Notes.....	19

MISSION STATEMENT

To promote public education and awareness of flood hazards, increase knowledge of flood risk, proper building techniques for floodplains, the importance of preserving floodplain functions, provide flood protection methods, promote flood insurance availability, and assist citizens with accurate flood zone maps and map updates, thus creating a safer community and a higher quality of life for all.

BACKGROUND

Sarasota County is located in southwest Florida with approximately 37 miles of open shoreline along the Gulf of Mexico. This area is prone to flooding caused by heavy rains or from storm surge that may be associated with tropical storms and hurricanes. The county contains more than 420 miles of tidally influenced rivers, streams, and canals. In addition, there are 43 named lakes covering 2,091 acres, and over 70 square miles of estuaries and bays that support diverse habitats for plants and animals.

Unincorporated Sarasota County and the cities of Sarasota, North Port, Venice, and the Town of Longboat Key make up Sarasota County. The Town of Longboat Key is uniquely located in both Sarasota and Manatee County. All are impacted by some form of flooding. All participate in the Community Rating System (CRS) and all make up this multi-jurisdictional Unified Program for Public Information (PPI). Collectively, there are numerous ongoing outreach efforts with goals to increase flood hazard awareness and to motivate actions to reduce flood damage, encourage flood insurance coverage, and to protect the natural functions of floodplains.

The PPI plan was developed over several years, finalized in December 2018 and formally adopted in January 2019. The benefits of a unified PPI plan include a more comprehensive outreach approach to provide communities and residents with clear, coordinated messages that are delivered in a cost-effective and consistent manner. This program helps coordinate community messaging to improve resource efficiency and message recognition. It's noted that flood-prone residents with better access to flooding information, such as their vulnerability to the flood risk and impacts, have a higher likelihood of being prepared to reduce their risk. The result is a well-informed public, a safer living environment and lower costs associated with flood loss.

PPI COMMITTEE

To reduce insurance cost to the residents in a more substantial manner and to reach more property owners through a more aggressive outreach program, Sarasota County along with the City of Sarasota, and The Town of Longboat Key formed the PPI committee in 2016. The City of Venice and the City of North Port joined in 2018 making all communities within Sarasota County participants in the PPI plan. The PPI committee also includes stakeholders such as the Sarasota Bay Estuary Program (SBEP), Mote Marine Institute, insurance agents, realtors, lenders, and contractors.

The PPI committee is tasked with evaluating the PPI plan each year to ensure the projects maintain their relevance and feasibility and to track progress and outcomes. An annual evaluation report is required to ensure the committee reviews and evaluates each of the projects and makes recommendations. The PPI committee met on December 11, 2019 to work through this evaluation process. The Sarasota County CRS Specialist is acting as the facilitator of this plan to track, implement, and manage the program.

Each year, the PPI committee considers the flood problems throughout the county and associated communities, evaluates who needs to be informed about flood related topics and how that information should be transmitted, and reviews the inventory of projects that are already underway. Formation of the committee and preparation of the PPI plan followed the steps outlined in the 2013 CRS Coordinators Manual, Section 330, Developing a Program for Public Information. The current updated committee members are shown in Figure 1 on the following page. The list includes their affiliations and their current position.

COMMITTEE MEMBERS

FIGURE 1: 2019 PPI Committee Members, Affiliations and Departments

NAME	AFFILIATION	DEPARTMENT
Donna Bailey	Sarasota County	Public Works
Ed McCrane	Sarasota County	Emergency Services
Steve Hardy	Sarasota County	Public Works
Robert Laura	Sarasota County	Public Works
James Linkogle	Town of Longboat Key	Public Works
Todd Kerkerling	City of Sarasota	Emergency Services
Cindy Cahill	City of Sarasota	Stormwater
Kathryn Harring	City of Venice	Stormwater
Elizabeth Wong	City of North Port	Stormwater
Katherine Howington	Sarasota County / Bankers Ins	Insurance Agency
Sherry Bitner	Sarasota County / RE Financial Services	Mortgage Broker
Darcy Young	Sarasota County / SBEP	Director Planning/Comm
Neil Fleet	Town of Longboat Key/AMI-Bay Isles	Property Mgmt
Don Hermey	City of Sarasota/Mote Marine	Env Health & Safety
Christina Pitchford	Sarasota County/RASM	Realtor
Carl Shoffstall	Sarasota County/CCNA	Coalition Chair
Dean McConville	City of North Port/State Farm Insurance	Insurance Agency
Mary Elizabeth Petty	City of Venice/AAA Insurance	Insurance Agency
Mark Hawkins	City of Venice/Hawks Nest Const	Contractor
Paul Semenec	Sarasota County	Additional Staff Resources
Des Companion	Sarasota County	Additional Staff Resources
Claire Aronson	Sarasota County	Additional Staff Resources
Thomas Sacharski	City of North Port	Alternate
Mary Foster	City of North Port/State Farm Ins	Alternate
Alan Fish	City of North Port/VBF Surveying	Alternate
Barbara Lockhart	City of North Port/Advisory Board	Alternate
Pete Travis	Sarasota County/Torrent Corp	Alternate
Jessica Williams	Sarasota County/We Are Floods Ins	Alternate
Sharon Gould	Sarasota County/Realtor	Alternate
Kathy Kelly Ohlrich	Sarasota County/CCNA	Alternate
Michael Dexter	Sarasota County / SBEP	Alternate

THE NATIONAL FLOOD INSURANCE PROGRAM (NFIP):

The CRS program is part of the NFIP and is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum requirements of the NFIP. Activities implemented through the CRS program provide credit scores, which are summarized through a regular audit process. Scores are formally accepted by FEMA and, when compared to prerequisites, are used to give a community their classification. The possible classifications range from Class 10 with the least credit points to Class 1 with the most credit points.

UNINCORPORATED SARASOTA COUNTY:

Sarasota County has participated in the CRS program since 1992. By implementing comprehensive floodplain management activities, Sarasota County has been rated as a Class 5 community since 2007. The result of this classification means NFIP insurance for Sarasota County property owners is discounted annually by 25% for high risk properties and 10% for medium to low risk policies, representing a savings of just over \$7 million dollars to residents of Sarasota County annually.

THE CITY OF SARASOTA:

The City of Sarasota has participated in the CRS (Community Rating System) program since 1992 to reduce flood insurance rates for the residents of the City. The City is rated a Class 6 community in the CRS program and that represents almost \$2 million dollars in savings to the City of Sarasota's jurisdiction NFIP (National Flood Insurance Policy) holders annually. This classification reduces NFIP flood insurance policies in special flood hazard areas (VE, AE, AH, A) by 20% and other (X500/X) hazard areas 10%. The City encourages everyone to have flood insurance, even in non-flood areas. Always remember: Flood water has no boundary!

THE TOWN OF LONGBOAT KEY:

The Town of Longboat Key has participated in the Regulatory phase of the National Flood Insurance program since July 30, 1971. The Town entered the CRS program in October 1991 and began receiving insurance discounts as a Class 9 Community, upgraded three times during the Town's history in the program to a current status of a Class 5 Community in May 2016. The Town will be retrograded to a Class 6 in May of 2020 due to FEMA and Insurance Service Office policy regulating the program, in regards, to Coastal Barrier Islands without rivers or streams. However, as a Class 6 Community, residents receive an average discount of \$208 per policy for an annual community savings of \$2,056,792.

THE CITY OF NORTH PORT:

The City of North Port has participated in CRS since 1992 North Port is currently a Class 6 community as of September 1, 2018. A CRS Class 6 allows residents to be eligible for discounts on their flood insurance, 20% in high risk areas and 10% in low risk areas. This represents a current savings of \$31,925 to North Port residents every year. Through a rerating process, North Port will be improving from a CRS Class 6 to a CRS Class 5 effective May 1, 2020. A CRS Class 5 will allow residents to be eligible for discounts on their flood insurance, 25% in high risk areas and 10% in low risk areas. This will represent a savings of \$38,931 to North Port residents every year.

THE CITY OF VENICE:

The City of Venice has participated in CRS since 1991. Venice is currently a class 6 as of 2005. A 6 allows the residents to be eligible for discounts on their flood insurance, 20% in high risk areas and 10% in low risk areas. This represents a current savings of \$627,592 to Venice residents every year.

FEDERAL FLOOD INSURANCE ASSESSMENT REVIEW:

One of the goals of the Unified PPI is to increase flood insurance coverage across all jurisdictions. Flood insurance is a requirement for structures located in the SFHA. Although we have identified CFHA, structures located solely in the CFHA are not required to purchase flood insurance, but it is recommended. Federal flood insurance data is provided to communities annually. Private flood insurance data is not provided and is therefore not a part of our review or assessment.

As part of the annual evaluation, the PPI committee reviewed the 2019 Federal NFIP flood insurance data. This data will be compared to future annual NFIP policy data to gauge if completed projects had a positive effect on the flood insurance policy count.

During this annual evaluation of the PPI, the committee assessed the flood coverage for each of their communities. One readily available source of information on flood hazards is federal flood insurance data. The following two statistics from the National Flood Insurance Program (NFIP) ask the questions.

1. Where do people have flood insurance policies?
2. Where have flood insurance claims been paid?

The areas of concentrated claims have been found to have storm surge and stormwater drainage issues associated with coastal, low lying areas and Pre-FIRM structures throughout the county.

The following tables 1 - 3, display the Federal flood insurance data as of December 2019. Combined, there are currently 64,510 policies in force with 23,288 or 36% of those policies located in non-SFHAs.

Flood insurance is required as a condition of federally backed mortgages or loans for structures located in a high-risk A, AE, or VE zones. Therefore, one would expect most policies to be in the A, AE, and VE zones.

Federal aid is contingent upon a community being a member of the NFIP. With flood insurance, Federal aid to private individuals is available through low interest loans after a declared disaster. If a homeowner does not have flood insurance, then those loans may not be available to them.

Our next PPI evaluation report or update will have a comparison of policies from 2019 vs 2020 and will delve deeper into flood insurance data in our communities and how we can focus on areas where flood insurance may be deficient.

As noted earlier, flood insurance data is only available for Federal flood insurance. Private insurers do not share their data with communities so their data is not reflected in the following tables.

Table 1 provides an overview of the Federal flood insurance policy count by flood zone. Properties in Zone D, A/AE, AH, AO, V/VE are required to carry flood insurance if there is a federally backed mortgage on the property. Zone X properties are not required by law to have a flood insurance policy, but it is recommended. Group policy information is only noted where indicated.

TABLE 1. 2019 Policy Count and Coverage Amount (Rounded to nearest dollar)

Zone	Community	Policies 2019	\$ of Insurance In-Force Pre and Post	\$ of Closed Paid Losses Pre-FIRM	\$ of Closed Paid Losses Post-FIRM
A/AE/AO/AH	Sarasota County	21,039	4,913,088,000	16,278,730	3,939,776
	City of Sarasota	6,192	1,490,722,600	3,318,072	165,207
	*Town of Longboat Key	*9,598	*2,211,093,900	*4,825,015	*261,348
	City of North Port	195	48,050,800	88,192	717,562
	City of Venice	3,045	555,609,600	1,455,453	15,778
V/VE	Sarasota County	642	110,722,300	2,137,250	121,673
	City of Sarasota	195	46,830,400	751,131	1,635
	*Town of Longboat Key	*310	*54,943,600	*902,164	*30,391
	City of North Port	0	0	0	0
	City of Venice	6	395,100	316,233	0
D	Sarasota County	23	4,759,500	405,490	77,032
	City of Sarasota	0	0	136,561	13,488
	*Town of Longboat Key	*0	*0	*0	*0
	City of North Port	0	0	0	0
	City of Venice	0	0	0	0
X (Standard)	Sarasota County	912	244,862,700	1,956,308	846,290
	City of Sarasota	332	89,105,700	761,640	201,366
	*Town of Longboat Key	*0	*0	*0	*0
	City of North Port	71	19,231,500	31,883	1,675
	City of Venice	576	120,593,200	193,761	11,213
X (Preferred)	Sarasota County	15,149	4,716,758,000	2,514,051	899,207
	City of Sarasota	1,377	431,268,000	1,644,016	85,185
	*Town of Longboat Key	*0	*0	*0	*0
	City of North Port	2,505	761,318,000	147,953	7,850
	City of Venice	2,323	727,700,000	278,288	34,598
Group Policies	Sarasota County	18	663,100	0	0
	City of Sarasota	2	\$69,800	0	0
Totals	All Communities	64,510	16,547,785,800	38,142,191	7,431,274

*It is important to note the Town of Longboat Key lies both in Sarasota and Manatee County. The data received by the Town of Longboat Key is not broken down by county and as such will reflect the whole values.

The total losses from all flood zones on Post-FIRM structures is approximately 19% of the losses on Pre-FIRM structures. This illustrates the impact sound floodplain regulations have for construction and how these regulations not only save money on insurance claims but also create a safer community.

A comparison of the low-risk, X-Zone (Pre-FIRM and Post-FIRM) paid losses compared to other zone losses, shows approximately 20% of paid losses are in the lowest risk zone. This statistic compares with National statistics.

Table 2 provides the insurance data for the different types of structures located within each community in the county.

TABLE 2. 2019 NFIP Insured Structures Breakdown by Building Type (Reported 12/31/2019)

Sarasota County & All Municipalities					
Unincorporated Sarasota County	Policies In-Force	\$ Premium	\$ Insurance In-Force	# of Closed Paid Losses	\$ of Closed Paid Losses
Single Family	25,114	18,640,274	7,346,505,200	1,865	23,332,877.33
2-4 Family	2,345	1,682,263	466,929,700	173	1,113,452.43
All other Residential	9,492	5,436,285	1,847,646,200	118	1,210,115.02
Non-Residential	832	28,089,177	9,990,853,600	126	1,782,212.31
City of Sarasota					
Single Family	2,746	3,684,419	822,298,500	415	5,257,940.78
2-4 Family	224	182,970	41,930,900	27	115,780.33
All other Residential	4,771	2,299,2235	1,021,866,800	84	1,085,386.02
Non-Residential	357	1,412,956	171,880,300	57	470,571.98
City of Venice					
Single Family	2,523	1,375,983	772,390,300	87	1,123,434.02
2-4 Family	348	268,834	58,728,500	30	510,970.40
All other Residential	2,893	1,480,556	492,440,000	82	501,509.63
Non-Residential	186	486,137	80,739,100	24	2,272,549.18
City of North Port					
Single Family	2,704	990,259	811,225,000	42	992,284.74
2-4 Family	38	12,902	8,077,000	0	0
All other Residential	13	3,638	2,128,000	0	0
Non-Residential	16	28,272	7,170,300	0	0
Town of Longboat Key					
Single Family	1,712	2,594,958	476,755,200	565	4,655,342.68
2-4 Family	784	717,423	155,019,200	61	392,374.39
All other Residential	7,231	3,784,754	1,571,875,300	116	677,003.15
Non-Residential	181	615,864	62,387,800	40	294,558.85

Approximately 64% of all (64,510) policies are within the moderate and high-risk SFHA and 36% are within the low-risk SFHA.

These statistics underscore two things:

1. The entire county is subject to flooding and the PPI should strive to reach all residents and businesses.
2. We should continue to review floodplain regulations for higher regulatory standards.

This PPI committee will strive to achieve 100% insurance coverage for all properties within the moderate and high-risk SFHA. Statistics show that many of the houses are pre-FIRM structures and insurance will help rebuild houses to current code when substantially damaged by flood events.

Table 3 below gives the final policy count (all policy types) county-wide. The next evaluation/update will give a comparison of 2019 vs 2020 data illustrating the number of policy changes within each municipality in the county.

TABLE 3. Policy Count

Community	2019	2020	Count Difference	%
Sarasota County	37,783			
City of Sarasota	8,098			
Town of Longboat Key	9,908			
City of Venice	5,950			
City of North Port	2,771			
Grand Total	64,510			

FLOOD MAP UPDATES:

Preliminary Flood Insurance Rate Maps (FIRMs) as part of the FEMA Risk Mapping, Assessment, and Planning (Risk MAP) program for Sarasota County were received December 2019. These preliminary FIRM updates include panels in coastal areas, as well as in the Phillippi Creek Watershed, Little Sarasota Bay Watershed, and the Lemon Bay Watershed. Based on these updated preliminary FIRMs, properties may move in and out of special flood hazard zones when the FIRM becomes effective. Our next Flood Insurance Assessment will reflect these map changes and will strive to determine what areas and targets we should focus on for future outreach projects or which current projects will include these areas.

Unincorporated Sarasota County has digitized, detailed flood studies not shown on the current FEMA flood maps. County staff determined these detailed flood studies using the criteria outlined by FEMA to establish the limits of the 1 % (percent) or Special Flood Hazard Area. These areas are included in our outreach efforts. Shown as the Community Flood Hazard Area (CFHA) on our online flood maps, they can be found at: <https://www.scgov.net/government/public-works/flood-maps>.

These flood studies were submitted to and accepted by FEMA in 2018 and 2019. They are incorporated into the preliminary FEMA RISK-Map received by all the communities within Sarasota County this last December 31, 2019. These preliminary maps are anticipated to become effective within the next 18-24 months.

PROJECTS REVIEW:

Through the process of developing the PPI, the committee developed projects aligned with the six required CRS topics, as well as three additional topics outlined as goals. It identified twenty (20) target audiences to whom the outreach messages should be delivered.

The following are the nine goals and key messages of the PPI. The first six goals are a requirement of the CRS program. Initiating the PPI program allows us to implement additional goals which are shown as seven through nine.

1. Increase flood hazard awareness
 - Discover flood risks in your area
2. Encourage flood insurance coverage
 - Purchase flood insurance for your home or business
 - Purchase renters flood insurance
3. Protect people from flood hazards
 - Turn around don't drown
 - Stay connected by signing up for the County's CodeRED system
 - Make a plan for emergencies, be prepared
4. Protect property
 - Keep debris out of driveway culverts and ditches and maintain your drainage swales (Only rain down the drain!)
5. Build responsibly
 - Obtain required permits before starting any home repair, improvement or construction
 - Be aware of substantial improvements rule.
6. Protect the natural functions of floodplains
 - Use low impact development (LID) such as rain barrels, bioretention systems, green roofs, pervious materials, and non-invasive vegetation on your property.
7. Encourage hurricane preparations
 - Make a plan and know your evacuation level
8. Educate people about flood economics
 - Build with the future in mind
9. Inform people about how sea level rise will affect our community
 - Reduce your exposure to the effects of sea level rise

Key Sheet – Target Audiences:

Audience		Description
A	Residents and businesses in Repetitive Loss Areas	This audience should understand their surroundings and the likelihood of floods. Insurance is strongly recommended.
B	Residents and businesses in the Special Flood Hazard Area	This audience should become aware of their high risk. Insurance is strongly recommended and often required (with a mortgage).
C	Residents and businesses in flood-prone areas	This audience should become aware of their high risk and insurance is strongly recommended.
D	Residents and businesses in the storm surge area	This audience should become aware of their high risk and insurance is strongly recommended.
E	Residents and businesses in moderate- to low-risk flood areas (Shaded X zones)	This audience should understand that although they are not in high risk areas, there is still a potential to flood, and insurance is recommended. These areas submit over 20 percent of NFIP claims and receive one-third of disaster assistance for flooding.
F	Community Association Institute (SWFL Chapter)	Membership includes condominium, cooperative and homeowner associations. The association can disseminate flood hazard information to their members.
G	Homeowners associations	Associations can education their constituents about flood risk, building properly and insurance.
H	Mobile homes associations	Associations can education their constituents about flood risk, building properly and insurance.
I	Condo Owners associations	Associations can education their constituents about flood risk, building properly and insurance.
J	Real estate professionals	These professionals are in contact with clients that are purchasing or renting properties. They will benefit from flood-related outreach and may relay information to their clients.
K	Real estate buyers	Individuals purchasing or renting property should be made aware of their flood risk and insurance options.
L	Insurance agents	These professionals are in contact with clients that are purchasing or renting properties. They will benefit from flood-related outreach and may relay information to their clients.
M	Lenders	These professionals are in contact with clients that are purchasing or renting properties. They will benefit from flood-related outreach and may relay information to their clients.
N	Mortgage Brokers	These professionals have direct contact with homebuyers.
O	Speakers of other languages	Informational material should be made available in languages other than English.
P	Building contractors and developers	This audience should be kept apprised of floodplain regulations and available county services. They are also in the position to communication information about building with flood risk in mind to their clients.
Q	Architects and/or designers, engineers	Professions responsible for design of homes should be aware of flood risks and insurance requirements.
R	Surveyors	Surveyors need to provide updated information for elevation certificates.
S	County leaders and/or commissioners; Barrier island elected officials	Leaders that can champion the outreach efforts and may have direct input for funding projects.
T	Youths in grades K-8	This sector provides educational opportunities about flood risks.

Key Sheet – Messages and Outcomes:

Topic		Message		Outcome	
1	Know your flood hazard	A1	Find out your flood risk.	a1	Better prepared and informed resident and businesses
2	Insure your property for your flood hazard	B1	Purchase flood insurance for your home, business or rental.	b1	Increased number of flood insurance policies.
3	Protect people from the flood hazard	C1	Turn around, don't drown.	c1	Saves lives
		C2	Stay connected. Subscribe to County services and social media to receive alerts. Stay tuned to local news channels and radio stations.		
4	Protect your property from the flood hazard	D1	Keep debris out of driveway culverts and ditches and maintain your drainage swales (Only rain down the drain).	d1	Reduced localized flooding.
		D2	Elevate your equipment/utilities	d2	Reduced loss of property and flood insurance claims.
5	Build responsibly	E1	Obtain required permits before starting any home repair, improvement or construction.	e1	Increased compliance and reduced flood loss.
		E2	Be aware of substantial improvement rule.		
6	Protect natural floodplain functions	F1	Keep our waters clean.	f1	Improvement in water quality and natural storage capacity.
		F2	Use Low Impact Development (LID) such as rain barrels, bioretention systems, green roofs, pervious materials, and non-invasive vegetation on your property.		
		F3	Build with conservation in mind; incorporate natural systems into designs.		
7	Hurricane preparedness	G1	Know your evacuation level.	g1	More residents evacuating when necessary.
		G2	Have a plan.	g2	Minimized damage and injury.
		G3	Storm surge can occur without hurricane force winds.		
8	Flood economics	H1	Floods can be costly to individuals, families and communities.	h1	Improvement in building standards.
		H2	Build with the future in mind.	h2	Reduced loss of property.
		H3	Insurance rates are not static.	h3	Reduced number of claims.
9	Sea level rise	I1	Plan for sea level rise	i1	Increased awareness and planning.
				i2	Reduced impact to life, property, health and safety.
				i3	Reduced impact to economy.

ADDITIONAL PROJECTS INFORMATION:

The committee recommends continuing the outreach projects as well as adding the following new project(s):

Floody the Frog Children's Outreach Initiative with the current activities:

- Environmental Stewardship Team (NEST) Annual Calendar Coloring Contest. This year's (2020) theme was flooding and water quality.
- Three outreach posters on flood safety and protection were developed to target children with messages about flood safety. These posters have been distributed to elementary school libraries and public libraries.
- A mascot costume was purchased for Floody the Frog and the mascot attends various events throughout the county.
- An interactive webpage is currently being developed for children. This webpage will be located on scgov.net and mirrored on the Water Atlas website as well. We expect the website to be 'live' by March 2020.

This project continues to be developed.

OUTREACH PROJECTS:

No outreach projects were discontinued because they were determined to be ineffective or not feasible to implement.

The PPI Committee will continue to implement and refine the PPI so that flood insurance is seen as a necessity and the efforts put forth by the committee will help keep it affordable.

APPENDIX A: Project List and Recommendations

The current project list was reviewed by the PPI Committee and the recommendations and/or changes for 2020 are noted in red.

APPENDIX B: Committee Meetings

Quarterly meetings summary and attendees.

This evaluation report was submitted to the Sarasota County BCC on _____, 2020.

APPENDIX A

2019

PROJECT LIST

REVIEW

AND

RECOMMENDATIONS

Project Number	Project Description	Audiences	Messages	Anticipated Outcomes	Jurisdictions	Distribution	Stakeholders	Related CRS Activities	Recommendations (changes in red)
1	Flood Protection Website – Water-Atlas	All	All	All	Sarasota County	Online	N/A	310, 320, 330, 340, 350	Created, continue updating content when needed.
2	Flood Protection Social Media	All			All	Social Media Blasts, 4 X year	N/A	330	Continue social media blasts. Recommend increasing to 6 X year.
3	Flood flyer	All	A1, B1, C1, C2, D1, D2, E1, E2, F1, G1, G2	a1, b1, c1, d1, d2, e1, f1, g1, g2	All	Advertise in phone book, once/year	N/A	540	Continue to advertise annually.
						Publish in Herald Tribune, once/year			Continue to advertise annually.
						Send to Municipalities, once/year	N/A		Continue to send updated flyers when appropriate.
4	Flood Information Workshops	All			All	Public workshops, 10 times/year. Increased to 30+ per year.	N/A	330	Recommend keeping 30+ per year. We added Grant Workshops to the schedule. Continue to schedule workshops.
5	Online Flood Zone Locator Application	All			All	Online	N/A	320, 350	Continue to keep online and add updates when needed.
6	Flood Response Preparation Media release messages	All	A1, B1, C1, C2, D1, D2, G1, G2, J1, J2	a1, b1, c1, d1, d2, g1, g2, j1, j2, j3	All	TV and Radio, once/year	N/A	332.b	We continue to have media release messages for FRP tied to Hurricane Season.
7	Flood Response Preparation Access Sarasota TV Crawls					TV, 4 X year	N/A	330, 600	We continue to have TV crawls for FRP tied to Hurricane Season.
8	Flood Response Preparation Social Media					Social Media Blasts, once/year	N/A	330, 600	We continue to have social media blasts for FRP tied to Hurricane Season.

Project Number	Project Description	Audiences	Messages	Anticipated Outcomes	Jurisdictions	Distribution	Stakeholders	Related CRS Activities	Recommendations (changes in red)
9	Add flood risk information to property appraiser records	All	A2	a2	All	Online	Property Appraiser	330, 442	Added in 2018. We continue to update flood data to property records.
10	Newsletter from elected officials	All	All	All	LBK, Venice, North Port	Newsletter, once/year	Elected officials		Discuss feasibility to implement this project community-wide in 2021.
11	Property Protection Advice	All	D1, D2, E1, E2	d1, d2, e1	Sarasota County	Flyer, once/year		360	We continue to advertise staff visits available to citizens for flood mitigation options.
12	Parks flyers	Targeted	F1, F2	f1	LBK, North Port	flyer, 4 times/year			Discuss feasibility to implement this project county-wide in 2021.
13	Repetitive Loss Areas Letter	Targeted	A1, B1, C1, C2, D1, D2, E1, E2, G1, G2, H1, H2, J1, J2, J3, J4	a1, b1, c1, d1, d2, e1, g1, g2, h1, h2, h3, j1, j2, j3	All	Mailout, once/year		330, 512	We continue to send notification letters to our RL areas promoting methods of mitigation.
14	CCNA presentation given by EOC	Targeted	All	All	Sarasota County	Presentation, once/year		330	Continue to give annually.
15	Neighborhood Environmental Stewardship Team Presentation	Targeted	All	All	Sarasota County	Presentation, once/year		330	Continue to give annually.
16	Educate real estate agents about flood zones and resources available at the County	Targeted	A1, B1	a1, b1	Sarasota County	Newsletter, once/year	Real Estate Professionals	330	We continue to reach out to Real Estate Agents through Newsletters sent through email.
17	RASM on the Road	Targeted	A1, B2	a1, b2	Sarasota County	Community Meetings, once/year	Real Estate Professionals	330	We will continue to give a presentation to RASM annually.

Project Number	Project Description	Audiences	Messages	Anticipated Outcomes	Jurisdictions	Distribution	Stakeholders	Related CRS Activities	Recommendations (changes in red)
18	Educate real estate agents about appropriate types/levels of insurance	Targeted	A1, B2, H1, H2, H3	a1, b2, h1, h2, h3	Sarasota County	Annual Workshop	Insurance Professionals	330	We will schedule the first workshop later this year.
19	Flood Disclosure and Information Brochure	All	A1, B1, F1, F2, G1, G2	a1, b1, f1, g1, g2	Venice, North Port	Brochure, 4 times/year	Real Estate Professionals; Insurance Professionals; Lenders	340	Recommend developing this brochure community-wide by 2021-2022.
20	Training for Online Map Services	All	A1, B1	a1, b1	Sarasota County	Annual Workshop	Real Estate Professionals; Insurance Professionals	330, 350	This is included in our regular workshops. Recommend creating a workshop dedicated to just training for the online map
21	Flood Brochure and information for savings in flood insurance	All	A1, D2, E1, E2, F1, F2, F3, H1, H2, H3	d2, e1, f1, h1, h2, h3	LBK, Venice, North Port	Newsletter, once/year	Insurance Professionals	370	Recommend implementing this project community-wide by 2021-2022.
22	Encourage elevation certificates	Targeted	A1, D2, E1, E2, F1, F2	a1, d2, e1, f1	All	Newsletter, once/year		330	We give recommendations through our phone logs.
23	Flood Insurance Improvement Plan	All	B1	b1	All	Mailout, once/year	Insurance Professionals	370	Recommend the committee implement an insurance plan by late 2021.
24	Flood Insurance Promotion	All	B1	b1	All	Mailout, once/year	Insurance Professionals	330,370	Sent with our annual RL notification letters.
25	Educate elected officials about flood topics	Targeted	All	All	LBK, Venice, North Port	Annual Workshop		330	Recommend implementing this project community-wide by 2021.
26	Host FFMA Elevation Certificate Workshops	Targeted	D2, E1	d2, e1	Sarasota County	Annual Workshop		330	Scheduled for October 2020.

Project Number	Project Description	Audiences	Messages	Anticipated Outcomes	Jurisdictions	Distribution	Stakeholders	Related CRS Activities	Recommendations
27	Floody The Frog, Flood Mascot - Children's Initiative	Targeted	A1, C1, G2	c1, g2	All	Local Libraries, Elementary School Libraries	Teachers, parents	330	We continue to promote Floody the Frog and flood protection for children.
28	Flood Zone Determination Letter	Targeted			Sarasota County	Individually, via email or postal		330, 340	We continue to provide this service to citizens on request.

APPENDIX B

2019

UNIFIED PPI

COMMITTEE MEETINGS

1ST Meeting – February 20, 2019

The Facilitator called the meeting to order. Introductions were given of participants (old and new), and we reviewed the purpose of the meeting. The City of North Port and the City of Venice joined us as permanent members. We discussed PPI Report Local Adoption requirements; Filling out blank Project Sheets using the key code; Upcoming outreach initiatives; Vote on quarterly meeting dates for the remainder of the year.

Committee Members in attendance:

MEMBER	REPRESENTING
Donna Bailey, CRS Specialist and Meeting Facilitator	Sarasota County
Ed McCrane, Manager Emergency Services	Sarasota County
James Linkogle, Public Works	Town of Longboat Key
Todd Kerkerling, Emergency Services	City of Sarasota
Kathryn Harring, Stormwater	City of Venice
Elizabeth Wong, PE, Stormwater	City of North Port
Sherry Bitner, RE Financial Services	Sarasota County
Darcy Young, Manager, Sarasota Bay Estuary Program	Sarasota County
Don Hermey, Maintenance, Mote Marine	City of Sarasota
Khansith Bouphe, Jones Edmunds Associates	Sarasota County
Mary Foster, State Farm Insurance	City of North Port
Barbara Lockhart, North Port Canal Watch Group Environmental Advisory Board	City of North Port
Alan Fish, VBF Surveying	City of North Port
Bob Laura, Manager, Stormwater	Sarasota County
Paul Semenec, Manager, Stormwater	Sarasota County

1:00 PM – Call meeting to order – introduction/welcome participants (new and old), review purpose of meeting.

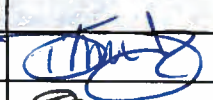

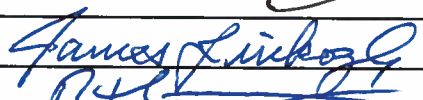
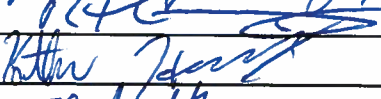
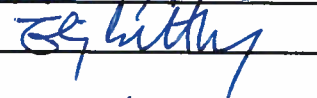

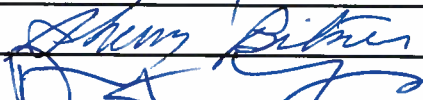

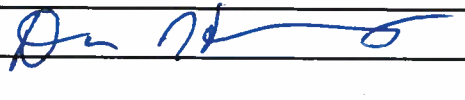
- Meeting called and introductions were made. The City of Venice and the City of North Port joins us as permanent members.
- 1:10 PM – Review PPI Report adoption and discuss dates for additional local adoption
- We reviewed the PPI report and discussed what other municipalities need to do to get the PPI adopted locally. Todd Kerkerling with the City of Sarasota noted they have auto-adopt for all elements of the LMS and with the PPI being an annex to the LMS it should auto-adopt for them.
- 1:20 PM – Review blank Project Sheets, key code from PPI and discuss
- We reviewed blank project sheets and the key code from the PPI that includes target audiences and messages. Elizabeth Wong asked for a digital copy. All other municipalities asked for copies as well.
- 1:45 PM – Review upcoming outreach initiatives
 - Flood Awareness Week coordinated messaging with the FFMA

- Flood Awareness Week proclamation
 - Flood Awareness Week Herald Tribune ad
 - Earth Day Celebration at Oscar Scherer State Park, April 20th? and flood protection handouts review
 - Any other initiatives coming up?
- We reviewed the upcoming outreach and discussed materials each community will contribute for the Earth Day initiative. Each community will need to print 250 copies. Once they have their items printed, they will contact Donna and she will pick them up. Each community will resend their logos for us to include on the artwork for Earth Day.
- Elizabeth Wong discussed the flood display on the property appraiser record cards. She suggested placing the sentence guiding readers to the flood map, be placed on top and the font enlarged. She states readers often miss it or disregard it.
- We discussed the real estate brochure that Kathryn Haring has created. It was suggested that the brochures direct the reader to the FEMA Map Center but it was noted that single properties are not shown on a Firmette, only an entire area. This may make it difficult for the reader to locate their own property. Kathryn has also included updates to their outreach and media (memes) and has them on the City of Venice website.
- Elizabeth Wong asked for a copy of the message that is going out in our utility bills promoting Flood Awareness Week.
- Sherry Bitner discussed videotaping and suggested 2-3-minute videos of maybe reading the messaging for our Flood Awareness Week. We briefly discussed the current project our CRS Coordinator Des is working on for possibly filming a workshop. Sherry also noted TV station could push the flood messaging out and we could work on YouTube videos.
- We discussed the Flood Response packages – Todd Kerkerling offered space at the City of Sarasota if needed to store the documents while we work on the project.
- The committee discussed elevation certificates and a disconnect between our CRS program and the FEMA regulations. We also discussed elevation certificates being available online. James Linkogle noted the pdfs need to be ADA compliant. We need to review whether ours meet this requirement.
- Elizabeth asked about Elevation Certificate training in North Port. They have a venue that would support 45-50 people. I will reach out to Marty Duran to discuss this possibility.
- 2:50 PM – Vote on quarterly meetings for remainder of the year
 - Future dates for meetings were discussed and agreed upon. Donna will send out an invitation to get these dates on everyone's calendars.
- ACTION ITEMS:
 - Donna will send out a copy of the utility bill messaging to North Port for their review.
 - Donna will send out the Flood Awareness Week messaging to all members for their review.
 - Donna will send out the digital project worksheets and key codes.
 - All communities will submit their logos to include on our Earth Day artwork
 - All communities will notify Donna when they have their materials printed and ready to pick up.

SARASOTA COUNTY PROGRAM FOR PUBLIC INFORMATION (PPI)
Committee Meeting
February 20, 2019 - 1:00 p.m. - 3:00 p.m.
Sarasota County Operations Center, BOB, Conference Room 1
1001 Sarasota Center Blvd., Sarasota, FL 34240





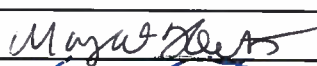


PPI COMMITTEE SIGN-IN SHEET

MEMBER OR ALTERNATE	REPRESENTING	SIGNATURE
Donna Bailey	Public Works, Sarasota County	
Ed McCrane	Emergency Services, Sarasota County	
Pat Haire	Communications, Sarasota County	
James Linkogle	Public Works, Town of Longboat Key	
Todd Kerkerling	Emergency Services, City of Sarasota	
Kathryn Harring	Stormwater, City of Venice	
Elizabeth Wong	Stormwater, City of North Port	
Katherine Howington	Bankers Insurance	
Sherry Bitner	RE Financial Service, Inc, Sarasota County	
Darcy Young	Sarasota Bay Estuary Program	
Neil Fleet	AMI-Bay Isles, Town of Longboat Key	
Don Hermey	Mote Marine, City of Sarasota	
Christina Pitchford	Realtor Association of Sarasota & Manatee, Sarasota County	
Pete Travis	Torrent Corporation, Sarasota County	
Jessica Williams	Wright Flood, Sarasota County	
Sharon Gould	Florida Moves, Sarasota County	
Kirsten Pedersen	Sarasota County Citizen Stakeholder	

SARASOTA COUNTY PROGRAM FOR PUBLIC INFORMATION (PPI)
Committee Meeting
February 20, 2019 - 1:00 p.m. - 3:00 p.m.
Sarasota County Operations Center, BOB, Conference Room 1
1001 Sarasota Center Blvd., Sarasota, FL 34240



PPI COMMITTEE SIGN-IN SHEET

MEMBER OR ALTERNATE	REPRESENTING	SIGNATURE
Kathy Kelley Ohlrich	CCNA, Sarasota County	
Carl Shoffstall	CCNA, Sarasota County	
Dean McConville	State Farm Insurance, City of North Port	
Mary Elizabeth Petty	AAA Insurance, City of Venice	
Mark Hawkins	Hawks Nest Construction, City of Venice	
Paul Semenec	Public Works, Sarasota County	
Khansith Bouphe	Jones Edmunds & Associates	
Heather Hansen	City of North Port	
Mary Foster	State Farm Insurance, City of North Port	
Alan Fish	VBF Surveying, City of North Port	
Barbara Lockhart	North Port Canal Watch Group & Environmental Advisory Board, City of North Port	
Brice Ferguson	City of Venice	
Claire Aronson	Communications, Sarasota County	

Bob Laura

stormwater

Robert Lane

2nd Meeting – April 10, 2019

The Facilitator called the meeting to order. Introductions were given and we reviewed the purpose of the meeting. Upcoming Preliminary Coastal Map updates were discussed; Hazard Disclosure; Earth Day Promotion outreach initiative.

Committee Members in attendance:

MEMBER	REPRESENTING
Donna Bailey, CRS Specialist and Meeting Facilitator	Sarasota County
Des Companion, CRS Coordinator	Sarasota County
Ed McCrane, Manager Emergency Services	Sarasota County
James Linkogle, Public Works	Town of Longboat Key
Todd Kerkerling, Emergency Services	City of Sarasota
Kathryn Harring, Stormwater	City of Venice
Heather Hansen for Elizabeth Wong, PE, Stormwater	City of North Port
Sherry Bitner, RE Financial Services	Sarasota County
Christina Pitchford, Realtor	Realtors Assoc. of Sarasota & Manatee (RASM)
Pete Travis, Torrent Corporation	Sarasota County
Jessica Williams, Wright Flood	Sarasota County
Khansith Bouphe, Jones Edmunds Associates	Sarasota County
Alan Fish, VBF Surveying	City of North Port
Bob Laura, Manager, Stormwater	Sarasota County
Paul Semenec, Manager, Stormwater	Sarasota County

2:00 PM – Call meeting to order – introduction of participants and purpose of meeting.

2:10 PM - Coastal Map Updates – Des Companion

- Current timeline for completion
- Coordinate and schedule meetings within jurisdictions (2 each?)
 - *Des Companion with Sarasota County discussed the FEMA Risk MAP updates: A handout for the process and legal requirements for preliminary maps was reviewed. This FEMA Risk MAP update will be a combination of the FEMA Coastal study and Sarasota County's Physical Map Revision (PMR) studies of Phillippi Creek, Lemon Bay and Little Sarasota.*
 - *According to FEMA's Mark Vieira, whom Des spoke with, Congress is expecting Sarasota County preliminary maps under the Risk MAP program at the end of December 2019, with FEMA Region IV outreach occurring sometime in February or March.*
 - *The following activities are suggested for each community to begin preparation, such as:*
 - *Reservations for 2 public meetings beginning the end of February or March/April 2020;*

- *Preparation to handle additional outreach, appeals and comments and phone calls,*
- *Draft media releases and postcard for mailing etc.*
 - *Since Longboat Key has its community split by Sarasota County and Manatee County, they should only need to provide one public meeting. Also recommended, we hold some at night and/or on the weekend so working residents can attend.*
 - *A LiMWA (Limit of Moderate Wave Action) line will be shown on the map. This will introduce the new flood zone in Sarasota county, "Coastal AE Zone" on maps. This flood zone is already part of the Florida Building Code.*
 - *Bob Laura with Sarasota County stated FEMA will provide a 'Changes since last effective FIRM' product that will outline those properties and areas that will change in both the FEMA Coastal study and the County updates we applied for. That is a new Risk MAP product that FEMA produces.*
 - *There is generally 90 days for comments and appeals, and 180 days for compliance and adoption. Bob noted historically FEMA makes the maps effective 12-18 months after the preliminary maps but with coastal areas that can be even longer, depending on the number of appeals received. Coastal map updates typically get more appeals and comments than other areas.*
 - *James Linkogle of Longboat Key discussed some changes in the Coastal Risk maps for his portion of Longboat Key located in Manatee county. He states the entire island was previously in the Special Flood Hazard Area (SFHA) and now has pockets of 500-year flood (0.2% annual chance) that show up and noted there is some concern as some parts of buildings now show the 0.2% annual chance flood while others remain in the SFHA.*
 - *Pete Travis with Torrent Corp. states FEMA will send a letter next year to all policy holders with new rates. All residential structures will have rating scores in the letter. The LiMWA line is a non-regulatory line that may be used for insurance rating as well.*
 - *Kat Harring with the City of Venice noted the LiMWA line is the extent of the 1.5' – 3' wave action.*
- **2:30 PM – Hazard Disclosure – CRS Activity**
 - *Sarasota/Manatee Board of Realtors, other groups for outreach*
 - *Map update – disseminating hazard disclosure*
 - *Realtor Brochure review / handout*
 - *Donna Bailey with Sarasota County spoke about the invitation to speak at the Realtors of Sarasota and Manatee (RASM) meeting in June set up by Christina Pitchford with RASM. A discussion was made about increasing presentations/speaking at Realtor Boards and other groups to quarterly to help get the word out. These groups are great at sharing this information.*
 - *The Real Estate brochure was reviewed and discussed. Christina noted there may be some reluctance from realtors to use it. We further discussed how we might be able to incorporate additional information the realtors may like and where we might be able to link this document online.*

- *Kat noted the real estate brochure she developed, and we discussed how we could blend both brochures together.*
 - *Christina Pitchford asked Kat if she would send her a copy of the brochure – Kat will send it to Donna and Donna will distribute it.*
 - *Donna asked everyone to please send their comments on the real estate brochure so they can be incorporated and reviewed at the next meeting.*
- **2:55 PM – Earth Day Promotion – April 27th at Oscar Scherer Park 10:00 a.m. – 4:00 p.m.**
 - *We quickly reminded everyone of our Earth Day promotion and that we still need flood literature from North Port and Longboat Key. Todd Kerker with City of Sarasota suggested the literature from Longboat Key could be dropped off in the City and he could deliver to us. Great idea!*
We quickly went over next meeting discussion shown below.
- **3:00 PM – Meeting adjourned**
- **Next Meeting Discussion:**
- PPI Committee webpage development and review
- Flood Insurance Promotion –
 - Target audience and messaging: Coastline
 - Develop promotional literature
Where to leave promotional literature

SARASOTA COUNTY PROGRAM FOR PUBLIC INFORMATION (PPI)

Committee Meeting

April 10, 2019 - 2:00 p.m. - 3:00 p.m.

Sarasota County Operations Center, BOB, Conference Room 1

1001 Sarasota Center Blvd., Sarasota, FL 34240



PPI COMMITTEE SIGN-IN SHEET

MEMBER OR ALTERNATE	REPRESENTING	SIGNATURE
Donna Bailey	Public Works, Sarasota County	<i>[Signature]</i>
Des Companion	Public Works, Sarasota County	<i>Desiree Companion</i>
Ed McCrane	Emergency Services, Sarasota County	on telephone - conference call
Pat Haire	Communications, Sarasota County	
James Linkogle	Public Works, Town of Longboat Key	on telephone - conference call
Todd Kerkerling	Emergency Services, City of Sarasota	<i>[Signature]</i>
Kathryn Harring	Stormwater, City of Venice	<i>[Signature]</i>
HEATHER HAUSEN Elizabeth Wong	Stormwater, City of North Port	<i>Heather A. W.</i>
Katherine Howington	Bankers Insurance	
Sherry Bitner	RE Financial Service, Inc, Sarasota County	<i>Sherry Bitner</i>
Darcy Young	Sarasota Bay Estuary Program	
Neil Fleet	AMI-Bay Isles, Town of Longboat Key	
Don Hermey	Mote Marine, City of Sarasota	
Christina Pitchford	Realtor Association of Sarasota & Manatee, Sarasota County	<i>[Signature]</i>
Pete Travis	Torrent Corporation, Sarasota County	<i>[Signature]</i>
Jessica Williams	Wright Flood, Sarasota County	on telephone - conference call
Sharon Gould	Florida Moves, Sarasota County	

SARASOTA COUNTY PROGRAM FOR PUBLIC INFORMATION (PPI)

Committee Meeting

April 10, 2019 - 2:00 p.m. - 3:00 p.m.

Sarasota County Operations Center, BOB, Conference Room 1

1001 Sarasota Center Blvd., Sarasota, FL 34240



PPI COMMITTEE SIGN-IN SHEET

MEMBER OR ALTERNATE	REPRESENTING	SIGNATURE
Kathy Kelley Ohlrich	CCNA, Sarasota County	
Carl Shoffstall	CCNA, Sarasota County	
Dean McConville	State Farm Insurance, City of North Port	
Mary Elizabeth Petty	AAA Insurance, City of Venice	
Mark Hawkins	Hawks Nest Construction, City of Venice	
Paul Semenec	Public Works, Sarasota County	
Khansith Bouphe	Jones Edmunds & Associates	<i>Khansith Bouphe</i>
Heather Hansen	City of North Port	
Mary Foster	State Farm Insurance, City of North Port	
Alan Fish	VBF Surveying, City of North Port	<i>Alan Fish</i>
Barbara Lockhart	North Port Canal Watch Group & Environmental Advisory Board, City of North Port	
Brice Ferguson	City of Venice	
Claire Aronson	Communications, Sarasota County	

Bob Laura

Public Works, Sarasota County

Robert Laura

Paul Semenec

Public Works stormwater

Paul

3rd Meeting – August 14, 2019

The Facilitator called the meeting to order. Introductions were given and we reviewed the purpose of the meeting. A new children's outreach 'Floody the Frog' initiative was discussed; more discussion of the upcoming Preliminary Flood Maps; Additional Flood Information Workshops; Flood Insurance Promotion; Flood and Hurricane Awareness Newsletter; Flood zones vs Evacuation Levels; and RLAA Notification Letter mail-out; NOAA Green Infrastructure Initiative.

Committee Members in attendance:

MEMBER	REPRESENTING
Donna Bailey, CRS Specialist and Meeting Facilitator	Sarasota County
Des Companion, CRS Coordinator	Sarasota County
Ed McCrane, Manager Emergency Services	Sarasota County
James Linkogle, Public Works	Town of Longboat Key
Todd Kerkerling, Emergency Services	City of Sarasota
Kathryn Harring, Stormwater	City of Venice
Elizabeth Wong, PE, Stormwater	City of North Port
Sherry Bitner, RE Financial Services	Sarasota County
Darcy Young, Manager, Sarasota Bay Estuary Program	Sarasota County
Christina Pitchford, Realtor	Realtors Assoc. of Sarasota & Manatee (RASM)
Pete Travis, Torrent Corporation	Sarasota County
Jessica Williams, Wright Flood	Sarasota County
Khansith Boupha, Jones Edmunds Associates	Sarasota County
Alan Fish, VBF Surveying	City of North Port
Bob Laura, Manager, Stormwater	Sarasota County
Don Hermey, Maintenance, Mote Marine	City of Sarasota
Neil Fleet, AMI-Bay Isles, HOA	Town of Longboat Key
Mary Foster, State Farm Insurance	City of North Port

2:00 PM – Call meeting to order – introduction/welcome participants review purpose of meeting.

Sarasota County:

- **RLAA notification letter mail-out:** Move from November to February
 - *Donna Bailey discussed moving the RLAA notification letter mail-out from November this year to February next year. With our snow-bird population, it makes better sense and will ensure most residents are here for the letter.*
- **Floody the Frog initiative:** NEST calendar; Posters in all elementary school libraries and public libraries
 - *We all reviewed the Floody the Frog draft poster and initiative. Elizabeth Wong suggested using her resources to make a PSA video. Their community has a great viral video history.*

- Don Hermey with Mote Marine stated they have a home school program and they may want posters for their program.
- Des Companion suggested reaching out to the Florida House for additional exposure.
- Todd Kerkering suggested the Education Foundation
- Is there a way to create a phone app since children spend time on their phones? We will look at that possibility as we get further into the initiative.

All Communities:

- **Flood Zone vs Evacuation Level:** Messaging and artwork - City of Venice
 - We reviewed the artwork for the flood zone vs evacuation level by Kat with the City of Venice.
 - Ed McCrane is working on creating a new web application for the evacuation levels.
- **Flood and Hurricane Awareness Newsletter:** Review content - Town of Longboat Key
 - We reviewed the newsletter James Linkogle puts out for the Town of Longboat Key with updates to their FMP. They are currently updating their FMP and will survey their citizens.
 - We talked about tailoring the letter to our community for next year's mail-out.
 - Mary suggested looking into the Post Office "Every Door Direct Mail" process for sending the letter. She believes the cost is approximately .18 per letter.
 - Elizabeth Wong states they send a newsletter to all of their residents at 2 x year.
- **Flood Map & Risk Map update:** Follow up/continue discussion on plan for outreach
 - We briefly spoke about follow up for the upcoming flood map & Risk Map updates.
 - They are still expected at the end of December this year, per Bob Laura.
 - Elizabeth Wong asked if she could get a list from us for the communities to perform a notification mail-out. Bob stated yes.
- **Flood Insurance Promotion Discussion:** What communities already have it
 - We spoke briefly about the Flood Insurance Promotion and how we might be able to initiate the process. Des Companion discussed bringing back cumulative substantial improvement/damage repair.
 - We discussed private insurance vs NFIP.
- **Additional Flood Information Workshops:** Coordination with other communities – City of North Port
 - Christina Pitchford states the annual meeting for RASM (Realtor Association of Sarasota & Manatee) is coming up. We can see about collaborating for a workshop.

FOR OUR NEXT MEETING IN DECEMBER: NOAA Green Infrastructure - review and discuss at our next meeting

<https://coast.noaa.gov/data/docs/digitalcoast/gi-cost-benefit.pdf>

- **Darcy spoke briefly about the NOAA green infrastructure initiative.**
 - Of interest is a program to address downspout flooding.
 - We will review the attached link for more information and discuss this at the next meeting.

THE NEXT PPI COMMITTEE MEETING IS SCHEDULED FOR DECEMBER 11, 2019. An agenda and will be sent out the Friday before (December 6, 2019).

SARASOTA COUNTY PROGRAM FOR PUBLIC INFORMATION (PPI)

Committee Meeting

August 14, 2019 - 2:00 p.m. - 3:00 p.m.

Sarasota County Operations Center, BOB, Conference Room 2

1001 Sarasota Center Blvd., Sarasota, FL 34240



PPI COMMITTEE SIGN-IN SHEET

MEMBER OR ALTERNATE	REPRESENTING	SIGNATURE
Donna Bailey	Public Works, Sarasota County	<i>[Signature]</i>
Des Companion	Public Works, Sarasota County	<i>Des Companion</i> on telephone
Ed McCrane	Emergency Services, Sarasota County	
Pat Haire	Communications, Sarasota County	
James Linkogle	Public Works, Town of Longboat Key	<i>J Linkogle</i>
Cindy Cahill	Flood Zone Specialist, City of Sarasota	
Todd Kerker	Emergency Services, City of Sarasota	<i>TK</i>
Kathryn Harring	Stormwater, City of Venice	<i>Kathryn Harring</i>
Elizabeth Wong	Stormwater, City of North Port	<i>Elizabeth Wong</i>
Katherine Howington	Bankers Insurance	
Sherry Bitner	RE Financial Service, Inc, Sarasota County	<i>Sherry Bitner</i>
Darcy Young	Sarasota Bay Estuary Program	present — forgot to sign
Neil Fleet	AMI-Bay Isles, Town of Longboat Key	<i>[Signature]</i>
Don Hermey	Mote Marine, City of Sarasota	<i>[Signature]</i>
Christina Pitchford	Sarasota County	<i>[Signature]</i>
Pete Travis	Torrent Corporation, Sarasota County	present — forgot to sign
Jessica Williams	Wright Flood, Sarasota County	<i>[Signature]</i>

SARASOTA COUNTY PROGRAM FOR PUBLIC INFORMATION (PPI)

Committee Meeting

August 14, 2019 - 2:00 p.m. - 3:00 p.m.

Sarasota County Operations Center, BOB, Conference Room 2

1001 Sarasota Center Blvd., Sarasota, FL 34240



PPI COMMITTEE SIGN-IN SHEET

MEMBER OR ALTERNATE	REPRESENTING	SIGNATURE
Kathy Kelley Ohlrich	CCNA, Sarasota County	
Carl Shoffstall	CCNA, Sarasota County	
Dean McConville	State Farm Insurance, City of North Port	
Mary Elizabeth Petty	AAA Insurance, City of Venice	
Mark Hawkins	Hawks Nest Construction, City of Venice	
Paul Semenec	Public Works, Sarasota County	
Khansith Boupna	Jones Edmunds & Associates	<i>Khansith Boupna</i>
Heather Hansen	City of North Port	
Mary Foster	State Farm Insurance, City of North Port	on telephone
Alan Fish	VBF Surveying, City of North Port	<i>Alan Fish</i>
Barbara Lockhart	North Port Canal Watch Group & Environmental Advisory Board, City of North Port	
Brice Ferguson	City of Venice	
Claire Aronson	Communications, Sarasota County	
Sharon Gould	Florida Moves, Sarasota County	
Robert Laura	Public Works, Sarasota County	<i>Robert Laura</i>

4TH Meeting – December 11, 2019

The Facilitator called the meeting to order. Introductions were given and we reviewed the purpose of the meeting. We discussed the addition of a flood survey to the website; Questions on the survey were reviewed and revised; Additional outreach initiatives including video; Flood messaging on Utility bills; Annual Evaluation Report review.

Committee Members in attendance:

MEMBER	REPRESENTING
Donna Bailey, CRS Specialist and Meeting Facilitator	Sarasota County
Ed McCrane, Manager Emergency Services	Sarasota County
James Linkogle, Public Works	Town of Longboat Key
Todd Kerkerling, Emergency Services	City of Sarasota
Cyndi Cahill, Stormwater	City of Sarasota
Kathryn Harring, Stormwater	City of Venice
Sherry Bitner, RE Financial Services	Sarasota County
Darcy Young, Manager, Sarasota Bay Estuary Program	Sarasota County
Christina Pitchford, Realtor	Realtors Assoc. of Sarasota & Manatee (RASM)
Pete Travis, Torrent Corporation	Sarasota County
Jessica Williams, Wright Flood	Sarasota County
Khansith Boupha, Jones Edmunds Associates	Sarasota County
Bob Laura, Manager, Stormwater	Sarasota County
Michael Dexter, Sarasota Bay Estuary Program	Sarasota County
Don Hermey, Maintenance, Mote Marine	City of Sarasota
Neil Fleet, AMI-Bay Isles, HOA	Town of Longboat Key
Thomas Sacharski, City of North Port	City of North Port
Marty Foster, State Farm Insurance	City of North Port

2:00 PM – Call meeting to order – introduction/welcome participants review purpose of meeting

SARASOTA COUNTY:

1. Add flood survey: Add to the website for next year's evaluation report data

- The committee reviewed the FMP flood survey. It was suggested to add a disclaimer at the top of the survey stating the information will be used for no other purpose than tracking flood issues throughout Sarasota County.
- The following FMP Survey question revisions were suggested:
 - 1: Consider not using the full address so there are no privacy issues.
 - 7: Include month of storm and whether or not it was a named storm
 - 9: Add examples of flood protection in case they don't know
 - 13: Also ask if NFIP or Private insurance
 - 14: Add the question "Was it useful?"
 - 15: Add the question "Was it useful?"
 - 16: Ask where they attended the workshop and add website link to workshops

17: Add website for evacuation levels

20: Add whether their property is affected by tides (king tides)

21: Ask what jurisdiction they live in

- It was also discussed to consider making a podcast or video for the flood zone workshops.
- The committee also discussed the preliminary RISK maps we are expecting at the end of this year. They thought it would be useful to include a link to other municipalities on the mapping page.

2. Floody the Frog Initiative: Posters, Costume, Events

- The committee discussed the debut of Floody the Frog, the posters and upcoming events such as the annual Earth Day celebration at Oscar Scherer State Park in April.

3. Flood Messaging on Utility Bills: Scheduled March 2020 to coincide with Flood Awareness Week

2019 Utility Bill Message for Sarasota County:

Be prepared this year!

Buy flood insurance for peace of mind because it only takes one storm.

Flood Awareness Week March 11-17

For more information, visit scgov.net (keyword flood protection

Or call 941-861-5000

- The committee reviewed the message from last year's utility bill. We discussed the flood messaging for Flood Awareness Week 2020. The dates will be March 9-16. The committee suggested adding Floody to the printed utility bill message.
- It was also suggested to see if we can add a link to the website for bill pay that will allow the user to fill out a FMP flood survey.

4. Evaluation Report Review: Comments are due by February 12, 2020.

- The committee briefly reviewed the evaluation report. Municipalities that haven't provided flood insurance data for the evaluation report will request that information.

HANDOUTS: Flood Survey; Evaluation Report

NEXT MEETING:

March 11, 2020 – finalize the PPI Evaluation Report

ACTION ITEMS:

- Each municipality that didn't provide flood insurance data will request it from ISO and email it to Donna Bailey to incorporate into the report.
- Comments to the report are due by February 12th

SARASOTA COUNTY PROGRAM FOR PUBLIC INFORMATION (PPI)

Committee Meeting

December 11, 2019 - 2:00 p.m. - 3:00 p.m.

Sarasota County Operations Center, BOB, Conference Room 1

1001 Sarasota Center Blvd., Sarasota, FL 34240



PPI COMMITTEE SIGN-IN SHEET

MEMBER OR ALTERNATE	REPRESENTING	SIGNATURE
Donna Bailey	Public Works, Sarasota County	
Steve Hardy	Communications, Sarasota County	
Des Companion	Public Works, Sarasota County	
Ed McCrane	Emergency Services, Sarasota County	
James Linkogle	Public Works, Town of Longboat Key	
Cindy Cahill	Flood Zone Specialist, City of Sarasota	
Todd Kerkering	Emergency Services, City of Sarasota	
Kathryn Harring	Engineering, City of Venice	
Elizabeth Wong	Stormwater, City of North Port	
Katherine Howington	Bankers Insurance	
Sherry Bitner	RE Financial Service, Inc, Sarasota County	
Darcy Young	Sarasota Bay Estuary Program	
Micheal Dexter	Sarasota Bay Estuary Program	
Neil Fleet	AMI-Bay Isles, Town of Longboat Key	
Don Hermey	Mote Marine, City of Sarasota	
Christina Pitchford	Sarasota County	
Pete Travis	Torrent Corporation, Sarasota County	on phone
Jessica Williams	Wright Flood, Sarasota County	

SARASOTA COUNTY PROGRAM FOR PUBLIC INFORMATION (PPI)

Committee Meeting

December 11, 2019 - 2:00 p.m. - 3:00 p.m.

Sarasota County Operations Center, BOB, Conference Room 1

1001 Sarasota Center Blvd., Sarasota, FL 34240



PPI COMMITTEE SIGN-IN SHEET

MEMBER OR ALTERNATE	REPRESENTING	SIGNATURE
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Carl Shoffstall	CCNA, Sarasota County	
Dean McConville	State Farm Insurance, City of North Port	
Mary Elizabeth Petty	AAA Insurance, City of Venice	
Mark Hawkins	Hawks Nest Construction, City of Venice	
Paul Semenec	Public Works, Sarasota County	
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Thomas Sacharski	City of North Port	1 Sign on phone
Mary Foster	State Farm Insurance, City of North Port	on phone
Alan Fish	VBF Surveying, City of North Port	
Barbara Lockhart	North Port Canal Watch Group & Environmental Advisory Board, City of North Port	
Claire Aronson	Communications, Sarasota County	
Sharon Gould	Florida Moves, Sarasota County	
Robert Laura	Public Works, Sarasota County	Robert Laura

RESOLUTION NO. 2019-10

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF VENICE, SARASOTA COUNTY, FLORIDA, TO UPDATE THE CITY OF VENICE SECTION OF THE SARASOTA COUNTY LOCAL MITIGATION STRATEGY WORK GROUP PROJECT LIST AND THE FLOODPLAIN MANAGEMENT PLAN OF THE SARASOTA COUNTY UNIFIED LOCAL MITIGATION STRATEGY 2016; TO ADOPT THE UPDATED FLOODPLAIN MANAGEMENT PLAN, SARASOTA COUNTY UNIFIED LOCAL MITIGATION STRATEGY 2016 AND SARASOTA COUNTY MULTI-JURISDICTIONAL PROGRAM FOR PUBLIC INFORMATION TO SERVE AS THE FORMAL GUIDES FOR THE CITY OF VENICE'S FLOODPLAIN MANAGEMENT AND HAZARD MITIGATION ACTIVITIES IN ACCORDANCE WITH THE NATIONAL FLOOD INSURANCE PROGRAM FOR COMMUNITY RATING SYSTEM AND 42 U.S.C. §5165, 44 C.F.R. §201.6, PART 1 OF CHAPTER 252, FLORIDA STATUTES, AND FLORIDA ADMINISTRATIVE CODE CHAPTER 27P-22; SUPERSEDING RESOLUTION NO. 2018-35; AND PROVIDING AN EFFECTIVE DATE

WHEREAS, the City of Venice is subject to natural and man-made hazards including hurricanes, tornadoes, floods, fires and chemical releases which may cause damage to life, property, natural resources and the local economy; and

WHEREAS, initiatives identified on the Local Mitigation Strategy Project List are given more consideration by state-managed funding programs such as the Hazard Mitigation Grant program, Emergency Management Preparedness Assistance Trust Fund, Communities Trust, Community Development Block Grant, Coastal Partnerships Initiative, and HOME; and

WHEREAS, the Floodplain Management Plan serves as the guide for floodplain management activities for the City of Venice as required of all communities participating in the National Flood Insurance Program and seeking project funding from the Flood Mitigation Assistance Program; and

WHEREAS, the Local Mitigation Strategy, which incorporates the Floodplain Management Plan, serves as the flood mitigation plan required of all communities participating in the National Flood Insurance Program and seeking project funding from the Flood Mitigation Assistance Program; and

WHEREAS, the Local Mitigation Strategy can serve as the Post-Disaster Redevelopment Plan as required of all coastal counties in Florida; and

WHEREAS, the City of Venice's Floodplain Management Plan and the Sarasota County Multi-Jurisdictional Program for Public Information (PPI) Plan adopted by the Board of County Commissioners on the 29th day of January 2019 are a representation of the City of Venice and Sarasota County's commitment to reduce vulnerability and risks from flooding, and to inform

the public of the hazards of flood, serving as a policy guide as resources are committed toward reducing the effects of flooding, and as a guide to increase public safety through outreach.

WHEREAS, the Floodplain Management Plan, Local Mitigation Strategy and PPI Plan are designed to be process-oriented documents with review and revision policies that allow them to be changed to meet new or changing conditions including hazard-event frequency, perceived local needs and funding opportunities; and

WHEREAS, the Floodplain Management Plan has been updated to meet the requirements of the Community Rating Systems program and includes the PPI Plan and the Flood Insurance Coverage Improvement Plan; and

WHEREAS, the Multijurisdictional PPI Committee is comprised of a cross-section of employees and community stakeholder members from Sarasota County, the City of Venice, the City of Sarasota, the City of North Port, the Town of Longboat Key, the Sarasota Bay Estuary Program, and a cross-section of stakeholders including Mote Marine representation, realtor, insurance agent, mortgage lender, and private citizens, and is open for participation to any and all interested parties, and is chaired by the Sarasota County Stormwater Department Director, or his designee, and

WHEREAS, the City of Venice Community Ratings System Floodplain Management Plan Committee has received public input and has updated the City of Venice portion of the Sarasota County Local Mitigation Strategy Work Group Project List and the Floodplain Management Plan of the Local Mitigation Strategy.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF VENICE, FLORIDA, as follows:

SECTION 1. The Whereas clauses above are ratified and confirmed as true and correct.

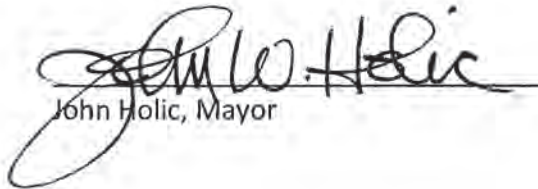
SECTION 2. The Venice City Council hereby updates the City of Venice section of the Sarasota County Local Mitigation Strategy Work Group Project List and the Floodplain Management Plan, and adopts the updated Floodplain Management Plan, the updated Sarasota County Unified Local Mitigation Strategy 2016, and the Sarasota County Multi-Jurisdictional Program for Public Information Plan as the formal guides for City of Venice floodplain management and hazard mitigation activities.

SECTION 3. The updated City of Venice section of the Sarasota County Local Mitigation Strategy Work Group Project List, City of Venice Floodplain Management Plan Annual Update, and the Sarasota County Multi-Jurisdictional Program for Public Information Plan are attached as Exhibits A, B and C, respectively.

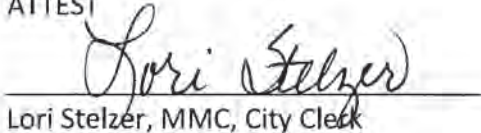
SECTION 4. Upon adoption, this resolution shall supersede Resolution No. 2018-35.

SECTION 5. This resolution shall take effect immediately upon adoption.

APPROVED AND ADOPTED AT A REGULAR MEETING OF THE VENICE CITY COUNCIL HELD ON THE 27TH DAY OF AUGUST 2019.

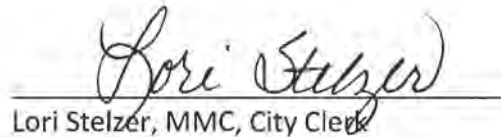

John Holic, Mayor

ATTEST


Lori Stelzer, MMC, City Clerk

I, **LORI STELZER**, MMC, City Clerk of the City of Venice, Florida, a municipal corporation in Sarasota County, Florida, do hereby certify that the foregoing is a full and complete, true and correct copy of a Resolution duly adopted by the City Council of said City at a meeting thereof duly convened and held on the 27th day of August, 2019, a quorum being present.

WITNESS my hand and the official seal of said City this 27th day of August 2019.


Lori Stelzer, MMC, City Clerk

(S E A L)

Approved as to form:


Kelly Fernandez, City Attorney

SARASOTA COUNTY MULTI-JURISDICTIONAL PROGRAM FOR PUBLIC INFORMATION

Sarasota County | October 2018



**Celery Fields Project
Natural Floodplain Functions
Sarasota County**

**SARASOTA COUNTY
MULTI-JURISDICTIONAL
PROGRAM FOR PUBLIC INFORMATION**

Prepared for:

Sarasota County
1001 Sarasota Center Blvd.
Sarasota, Florida 34240

Prepared by:

Jones Edmunds & Associates, Inc.
7230 Kyle Court
Sarasota, Florida 34240

October 2018

REVISIONS

Date	Revision

TABLE OF CONTENTS

1 INTRODUCTION	1-1
Purpose	1-1
2 PLANNING COMMITTEE.....	2-1
3 ASSESSMENT OF PUBLIC INFORMATION NEEDS.....	3-1
Priority areas.....	3-1
Repetitive loss areas	3-5
Flood insurance coverage assessment	3-10
Current public information efforts	3-21
4 TARGET AUDIENCES	4-1
5 MESSAGES AND OUTCOMES	5-1
Topic 1: Know your flood hazard	5-2
Topic 2: Insure your property for your flood hazard	5-2
Topic 3: Protect people from flood hazard	5-2
Topic 4: Protect your property from flood hazard.....	5-3
Topic 5: Build responsibly	5-3
Topic 6: Protect natural floodplain functions	5-4
Topic 7: Hurricane preparedness.....	5-4
Topic 8: Flood economics	5-4
Topic 9: Sea level rise	5-5
6 PROGRAM FOR PUBLIC INFORMATION (PPI) PROJECTS	6-1
Outreach projects	6-1
Flood response projects	6-4
Examination of other public information initiatives	6-5
7 IMPLEMENTATION, MONITORING AND EVALUATION.....	7-1
8 PPI ADOPTION	8-1

LIST OF TABLES

Table 2-1	Program for Public Information committee members	2-1
Table 2-2	PPI committee meetings	2-2
Table 3-1	Causes of repetitive flooding	3-7
Table 3-2	Policy and claim statistics for pre-FIRM structures	3-10
Table 3-3	Policy and claim statistics for post-FIRM structures	3-11
Table 3-4	Policy and claim statistics by occupancy type	3-11
Table 4-1	Target audiences	4-1
Table 6-1	Flood topics covered by PPI projects	6-2
Table 7-1	Status of PPI projects	7-1

LIST OF FIGURES

Figure 1-1	Sarasota County	1-2
Figure 2-1	PPI committee	2-2
Figure 3-1	Sarasota County Special Flood Hazard Areas	3-2
Figure 3-2	Sarasota County Community Flood Hazard Areas.....	3-3
Figure 3-3	Sarasota County Hurricane Evacuation Zones.....	3-4
Figure 3-4	Repetitive loss areas analysis	3-6
Figure 3-5	Flood insurance policies in unincorporated Sarasota County	3-12
Figure 3-6	Flood insurance claims in unincorporated Sarasota County	3-14
Figure 3-7	Potential flood insurance coverage improvement for buildings - Area 1	3-15
Figure 3-8	Potential flood insurance coverage improvement for buildings - Area 2	3-16
Figure 3-9	Potential flood insurance coverage improvement for buildings - Area 3	3-17
Figure 3-10	Potential flood insurance coverage improvement for buildings - Area 4	3-18
Figure 3-11	Potential flood insurance coverage improvement for buildings - Area 5	3-19
Figure 3-12	Potential flood insurance coverage improvement for buildings - Area 6	3-20
Figure 3-13	Sarasota County online flood map	3-22

APPENDIX A – PPI PROJECTS

ATTACHMENT 1 – PPI MEETING MINUTES

ATTACHMENT 2 – FLOOD WARNING AND RESPONSE MESSAGES

1 INTRODUCTION

PURPOSE

The Sarasota PPI is multi-jurisdictional and includes all areas of Sarasota County including unincorporated Sarasota, the City of Sarasota, Town of Longboat Key, the City of North Port, and the City of Venice. Sarasota County is a community located on the west coast of Florida that has approximately 590 square miles of land and 37 miles of open shoreline along the Gulf of Mexico. There are more than 420 miles of rivers, streams and canals within the county. In addition, there are 43 named lakes covering 2,091 acres, as well as more than 70 square miles of estuaries and bays that support diverse habitats for plants and animals. The subtropical weather pattern in this region provides frequent extreme weather events including flooding from tropical depressions and hurricanes. Extreme and severe summer rains can cause flooding in various locations throughout the county. These events may pose a significant threat to life and property. As such, Sarasota County has a number of ongoing outreach efforts with goals to increase flood hazard awareness, encourage flood insurance coverage, protect people from the flood hazard, protect property, build responsibly, protect the natural functions of floodplains, encourage hurricane preparations, educate people about flood economics and inform people about how sea level rise will affect the community.

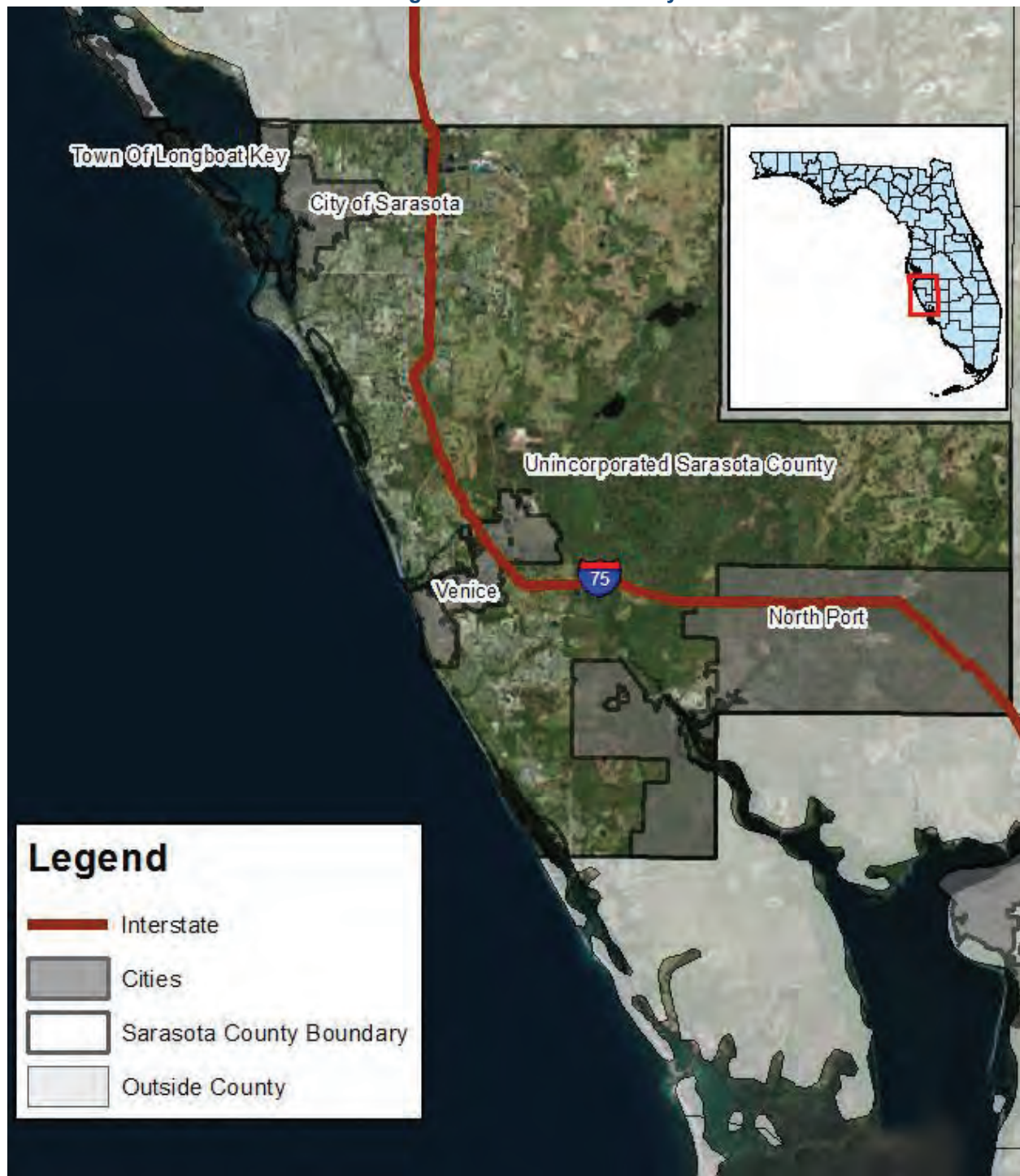
The county has been actively participating in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) since 1992. The CRS program provides flood insurance premium reductions to participating communities. The reductions are based on the community's floodplain management programs, which include the public information outreach activities. The county initiated the Program for Public Information (PPI), a Federal Emergency Management Agency (FEMA) planning tool, to coordinate outreach efforts. The county's purpose in developing this plan is to improve communication and coordination of outreach efforts and provide information about flood hazards and ways to protect people, property and natural floodplain functions to residents.

There are seven steps to prepare the PPI, which include:

1. Establish a PPI committee.
2. Assess the community's public information needs, including identifying target audiences.
3. Formulate outreach messages.
4. Identify outreach projects to convey the messages.
5. Examine other public information initiatives by the county and other agencies.
6. Prepare the PPI document and adopt the PPI.
7. Implement, monitor and evaluate the PPI.

This PPI is part of Sarasota County's overall Floodplain Management Plan (FMP), which is an appendix to Sarasota County's Local Mitigation Strategy (LMS). The LMS is a state-approved multi-jurisdictional, multi-hazard plan that serves not only unincorporated Sarasota County, but also the City of Sarasota, City of Venice, City of North Port and the Town of Longboat Key. The geographic and jurisdictional scope of the Sarasota PPI includes all unincorporated areas of Sarasota County, the City of Sarasota and Town of Longboat Key, City of North Port, and the City of Venice (Figure 1-1). This PPI offers a structure in line with the Program for Public Information activity of the CRS.

Figure 1-1 Sarasota County



2 PLANNING COMMITTEE

The current plan was created and continues to be updated by a committee (Figure 2-1) consisting of Sarasota County staff as well as public stakeholders. The plan represents a collaboration of representatives from planning and development, emergency, public works and engineering services, public and private sector agencies, and residents. Committee members also include representation from real estate, mortgage and insurance industries, as well as neighborhood associations. Each year, the PPI committee will evaluate the county's flooding issues and existing outreach projects and will update and/or develop new projects.

Table 2-1 describes the committee members.

Table 2-1 Program for Public Information committee members

Government Members	Representing
Donna Bailey, dabailey@scgov.net	Floodplain Manager, Sarasota County
Ed McCrane, emccrane@scgov.net	Emer. Services, Sarasota County
Claire Aronson, caronson@scgov.net	Public Information Officer, Sarasota County
James Linkogle, jlinkogle@longboatkey.org	Floodplain Manager, Town of Longboat Key
Todd Kerkerling, Richard.Kerkerling@sarasotaFL.gov	Floodplain Manager, City of Sarasota
Non-Government Stakeholder Members	Representing
Neil Fleet, nfleet@amiwra.com (Stakeholder for Town of Longboat Key)	AMI-Bay Isles
Don Hermey, dhermey@mote.org (Stakeholder for City of Sarasota)	Mote Marine
Katherine Howington, katherine.howington@bankersinsurance.com	Bankers Insurance
Sherry Bitner, sherryb@verizon.net	Solutions First Mortgage
Darcy Young, darcy@sarasotabay.org	Sarasota Bay Estuary Program
Christina Pitchford, christina@yourhometownconsultant.com	Your Hometown
Pete Travis, pete.travis@torrentcorp.com	Torrent Corporation
Jessica Williams, jessica.williams@weareflood.com	Wright Flood
Sharon Gould, sharon.gould@floridamoves.com	Florida Moves
Kirsten Pedersen, kpedersen01@gmail.com	Citizen Stakeholder
Kathy Kelley Ohlrich, kkohlrich@gmail.com	Coalition of City Neighborhood Associations (CCNA)
Carl Shoffstall, carlS@Floridaplaystructures.com	Coalition of City Neighborhood Associations (CCNA)

The committee meets regularly to develop and update the plan. Table 2-2 describes the committee meetings. Key topics during the committee meetings include:

- Plan organization
- Identify priority areas for outreach
- Assessment of flood insurance coverage
- Determination of priority audiences for outreach activities
- Inventory and evaluation of other public information initiatives at the county as well as other agencies
- Development of outreach messages
- Review of possible outreach activities
- Plan implementation and update

Figure 2-1 PPI Committee



Table 2-2 PPI committee meetings

Date	Discussion Topics
May 24, 2017	Organized the committee members; discussed goals and objectives for the PPI; discussed current Community Rating System status; reviewed PPI requirements and committee responsibilities; discussed current outreach efforts and ideas.
Aug. 15, 2017	Committee discussed target audiences and areas for outreach as well as the messages to convey; reviewed progress of current outreach activities and provided input on new ways to reach target audiences through activities that can be initiated by the stakeholders.
Nov. 28, 2017	Committee reviewed the PPI messages and outcomes. The committee reviewed the projects list along with the messages and made suggestions to improve certain projects. The committee also discussed the upcoming Flood Awareness Week and how the PPI can coordinate with FFMA, FDEM, FEMA, insurance agents and realtors to deliver consistent messaging.
Feb. 13, 2018	Committee reviewed the projects list and the status of each project. Committee members will be reviewing the draft report documenting the overall PPI process.
May 14, 2018	The committee reviewed the draft PPI report, the messages for the Flood Awareness Week initiative and discussed additional outreach project ideas.

Agendas, sign-in sheets and meeting notes for the above meetings and subsequent meetings to update the plan are provided in the attachments that accompany this PPI (Attachment 1). PPI committee meetings which are advertised in newspapers and on the County's website, and are open to the public.

3 ASSESSMENT OF PUBLIC INFORMATION NEEDS

More than 30,000 structures in Sarasota County are within FEMA's Special Flood Hazard Areas (SFHA). The county is exposed to flooding from hurricanes, tropical storms, storm surges, and stormwater runoff resulting from heavy rainfall. Watershed management plans cover all of Sarasota County and provide an excellent means to identify priority areas for floodplain management activities and areas where the buildings should carry flood insurance.

PRIORITY AREAS

Sarasota County is mostly flat, and due to its geographic location in the subtropics, the entire county is vulnerable to damage caused by flooding from tropical storms, hurricanes and heavy rainfall. As an example of this widespread issue, nearly 17 percent of paid losses for Sarasota County are for structures located outside of the SFHA. In order to identify priority areas of concern, the county has been tracking historical flooding issues using Geographic Information Systems (GIS) and is performing a Repetitive Loss Areas Analysis (RLAA) (see FMP Section 3, Historical Claims and Repetitive Loss Areas). In addition, Sarasota County has developed and maintained a comprehensive watershed management plan for all watersheds within the county. These plans include stormwater models developed to describe the flooding potential for areas within the county. The results of these plans help to identify those areas that are vulnerable to flooding from small storms or less frequent, larger storms.

Areas susceptible to flood hazards include the SFHA (Figure 3-1) and the Sarasota County Community Flood Hazard Areas (CFHA) identified through the county's watershed management plans (Figure 3-2). Other areas can also be significantly impacted by storm surge as depicted by the county's hurricane evacuation zones (Figure 3-3), with Zone A being the most vulnerable. Based on the county's assessment of flood hazards, priority areas within the community include the following:

- Coastal lands – These areas have experienced flooding and erosion resulting from severe weather systems such as hurricanes, tropical storms, intense rainfall and surge. During several hurricanes, high tides and surge have caused damage to many homes, seawalls, and roads along the Sarasota coastline.
- Phillippi Creek – This creek is one of the county's major drainage systems. The system ultimately discharges into Sarasota Bay and is tidally influenced. The area draining to this system is approximately 57 square miles and represents the most populous basin in the county. This area consists of residential, commercial and agricultural land uses. The flat topography of this drainage basin makes this area highly susceptible to flooding as well as storm surge.
- Myakka River – This river is a major drainage system within the county. Along with its tributaries, the area that drains to this system represents approximately 75 percent of the lands in the county. This river ultimately discharges into the Charlotte Harbor Estuary. The area is predominantly undeveloped, providing natural floodplain functions and habitat for a diversity of wildlife and other natural functions. Although most of the area is undeveloped, there are pockets of homes adjacent to the main river that are prone to flooding. Some of the most vulnerable areas for coastal flooding and storm surge are areas along the Myakka River in the southern portion of the county.
- Localized flooding areas of concern throughout the county were also identified through the county's watershed management plans and RLAA. These areas have been delineated in GIS (see Figures 3-3 through 3-5, and Figure 3-8 of the FMP).

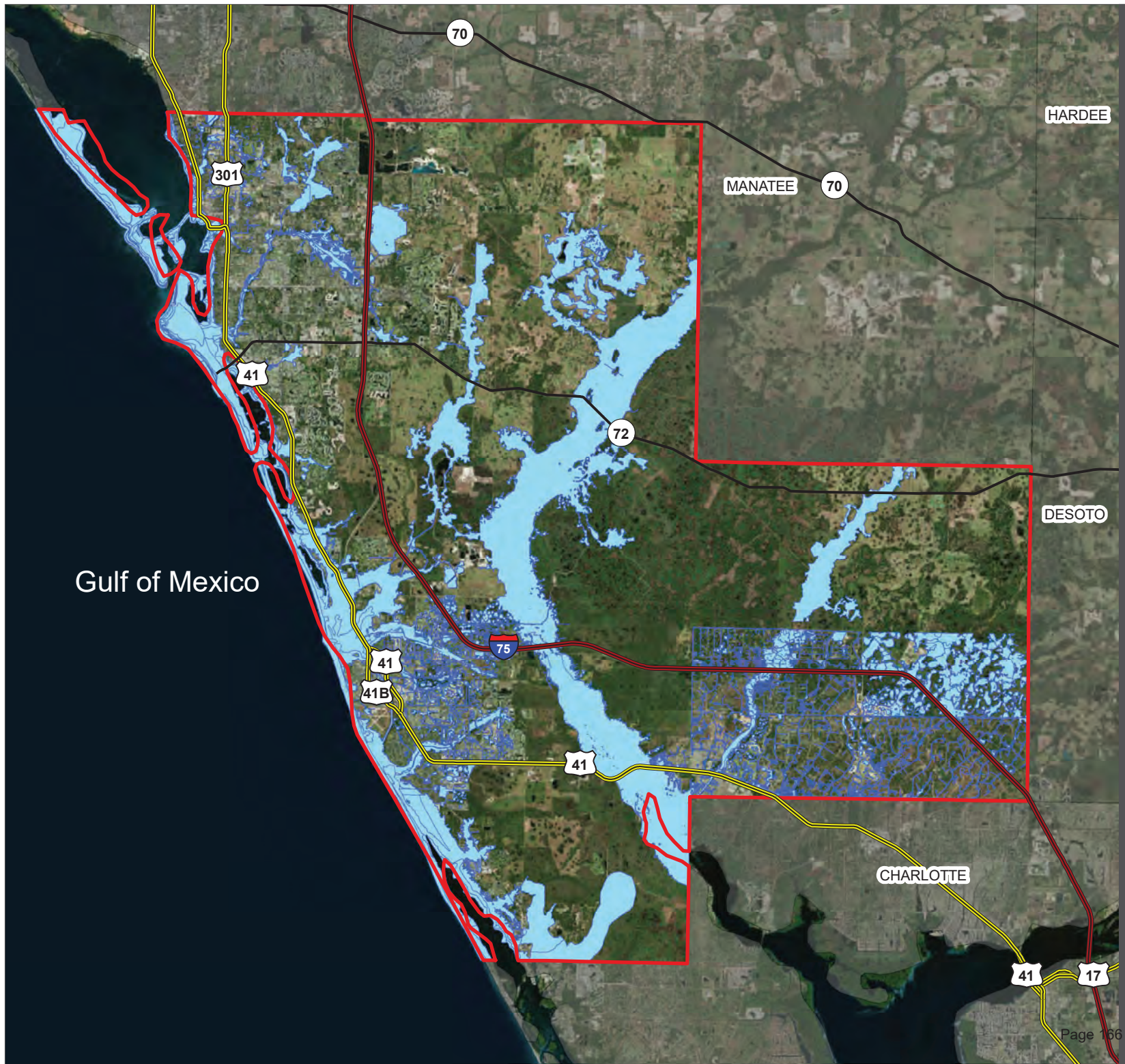
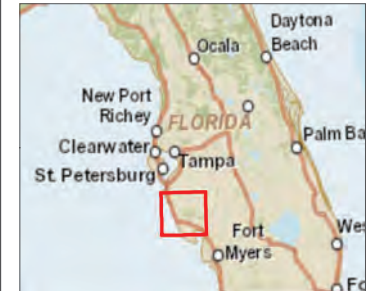




Figure 3-1
Special Flood Hazard
Areas within
Sarasota County
**Sarasota County Program
for Public Information**



-  Sarasota Boundary
-  Special Flood Hazard Area



0 12,000 24,000



Feet
1:300,000

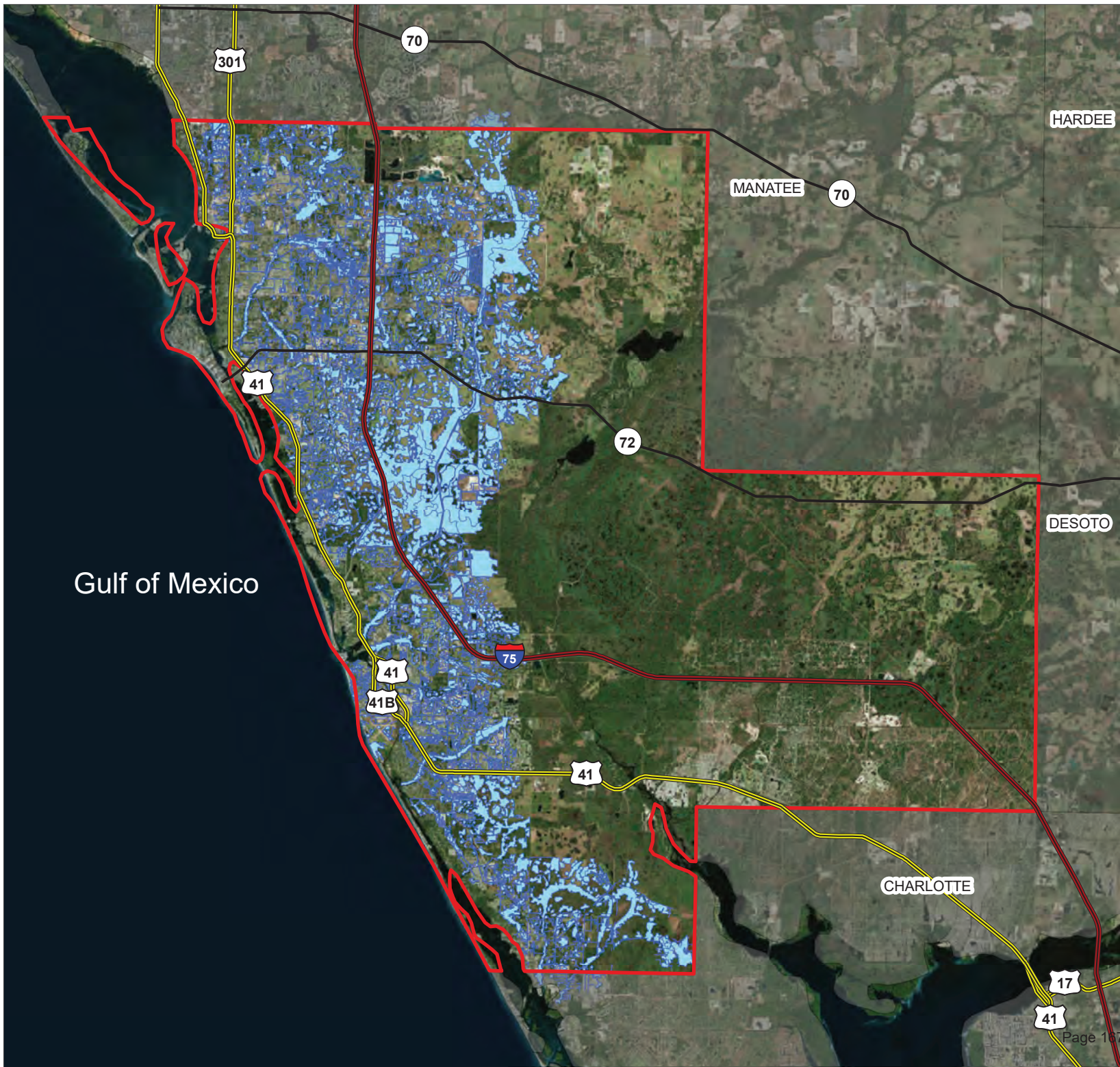
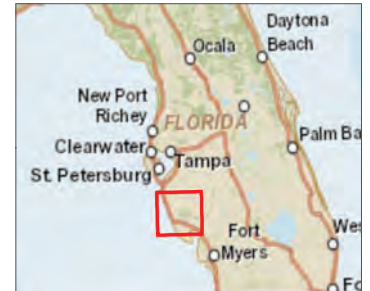




Figure 3-2

**Sarasota County
Community Flood
Hazard Areas**

**Sarasota County Program
for Public Information**

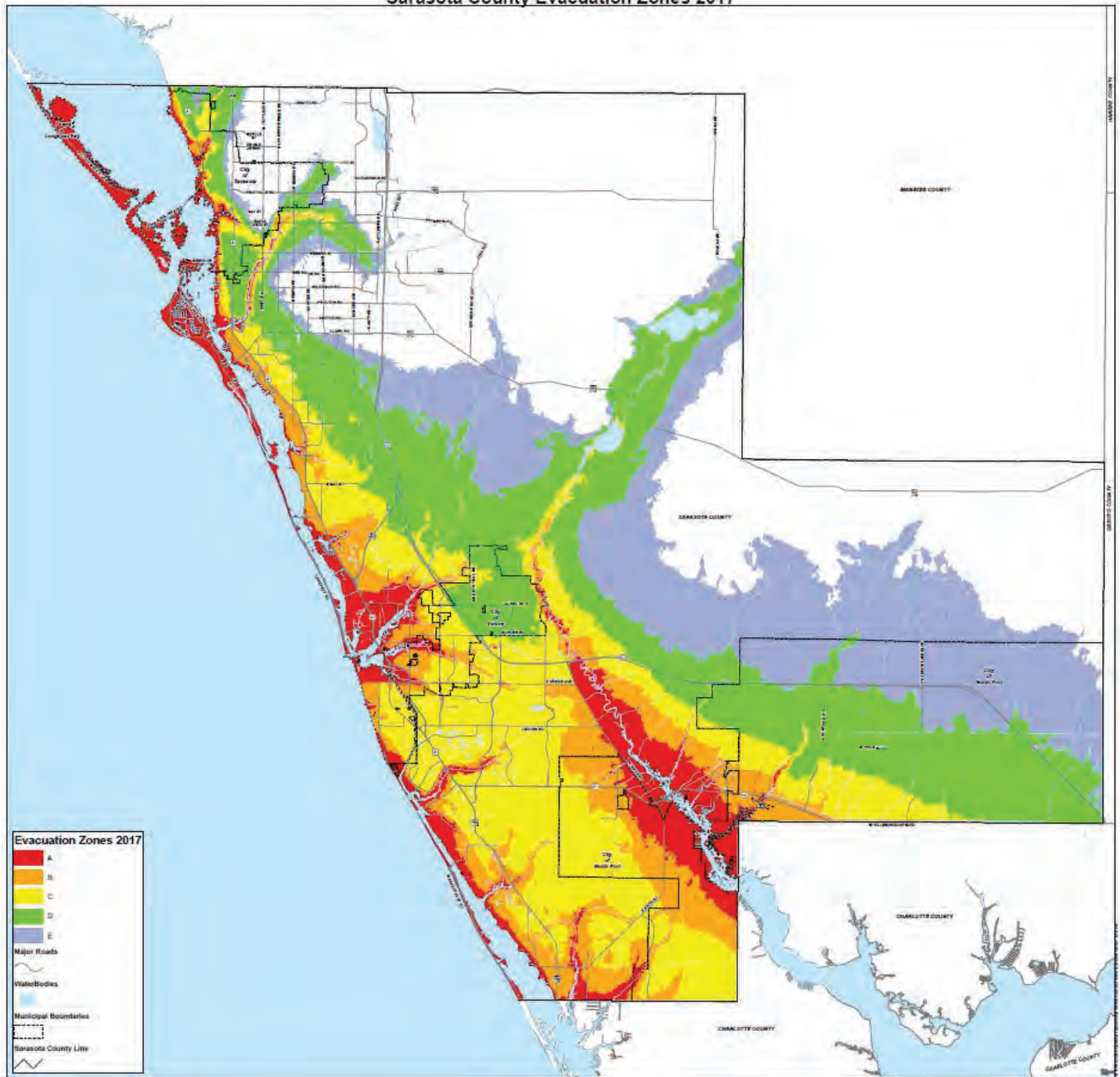


-  Sarasota County Boundary
-  Community Flood Hazard Area



0 12,000 24,000
Feet
1:300,000

Figure 3-3 Sarasota County Hurricane Evacuation Zones
Sarasota County Evacuation Zones 2017



REPETITIVE LOSS AREAS

Sarasota County performed a repetitive loss areas analysis using the most recent repetitive loss properties data from FEMA, with the goal of reducing the number of repetitive loss properties (RLPs) within Sarasota County. A Repetitive Loss Structure is an NFIP-insured structure that has had at least two paid flood losses of more than \$1,000 each in any 10-year period since 1978. There are currently 253 RLPs for Sarasota County. A Severe Repetitive Loss (SRL) Structure is defined as a residential property that is covered under an NFIP flood insurance policy and (a) has at least four NFIP claim payments (including building and contents) over \$5,000 each, and the cumulative amount of such claims payments exceeds \$20,000; or (b) at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building. For both (a) and (b) above, at least two of the referenced claims must have occurred within any 10-year period, and must be more than 10 days apart. Sarasota County has twenty SRL properties. Eleven of these properties have since been mitigated either by demolition or by providing flood protection.

Sarasota County is deemed a Class C community in the Community Rating System program and is required to have a floodplain management plan or area analyses for its repetitive loss areas.

Stormwater Utility and the CRS Coordinator adhere to the data pertaining to SRLs and RLPs as protected under the Federal Privacy Act of 1974.

Sarasota County mapped the RLPs and evaluated nearby properties with the same potential for flooding. The repetitive loss areas include the properties on the repetitive loss list and all nearby properties that may experience similar flooding conditions. The repetitive loss areas were delineated based on compilation of the following data:

- Repetitive loss properties and data (e.g., number of losses and associated cost).
- LiDAR (elevation data, land slope).
- Conveyance system components (e.g., location and size of stormwater pipes, ditches, storage basins, work requests).
- Floodplains (e.g., WMP studies and FIRMs).
- Storm surge areas.
- Streetview.
- Historical flooding complaints.

Figure 3-4 illustrates the repetitive loss areas identified by the analysis. Flooding occurrences in these areas were due to significant storm events combined with structures located in or around water bodies. The terrain characteristics with respect to these structures can be described as low-lying areas with a high depth to the water table. Table 3-1 describes the causes of flooding for these repetitive loss areas as they relate to significant storms.

Sarasota County continually evaluates the repetitive loss areas, with the most recent evaluation and major update conducted in 2016/2017. The project, still in progress, consists of a desktop evaluation of existing and potential new repetitive loss areas, and a field investigation of the properties.

Figure 3-4 Repetitive Loss Areas Analysis

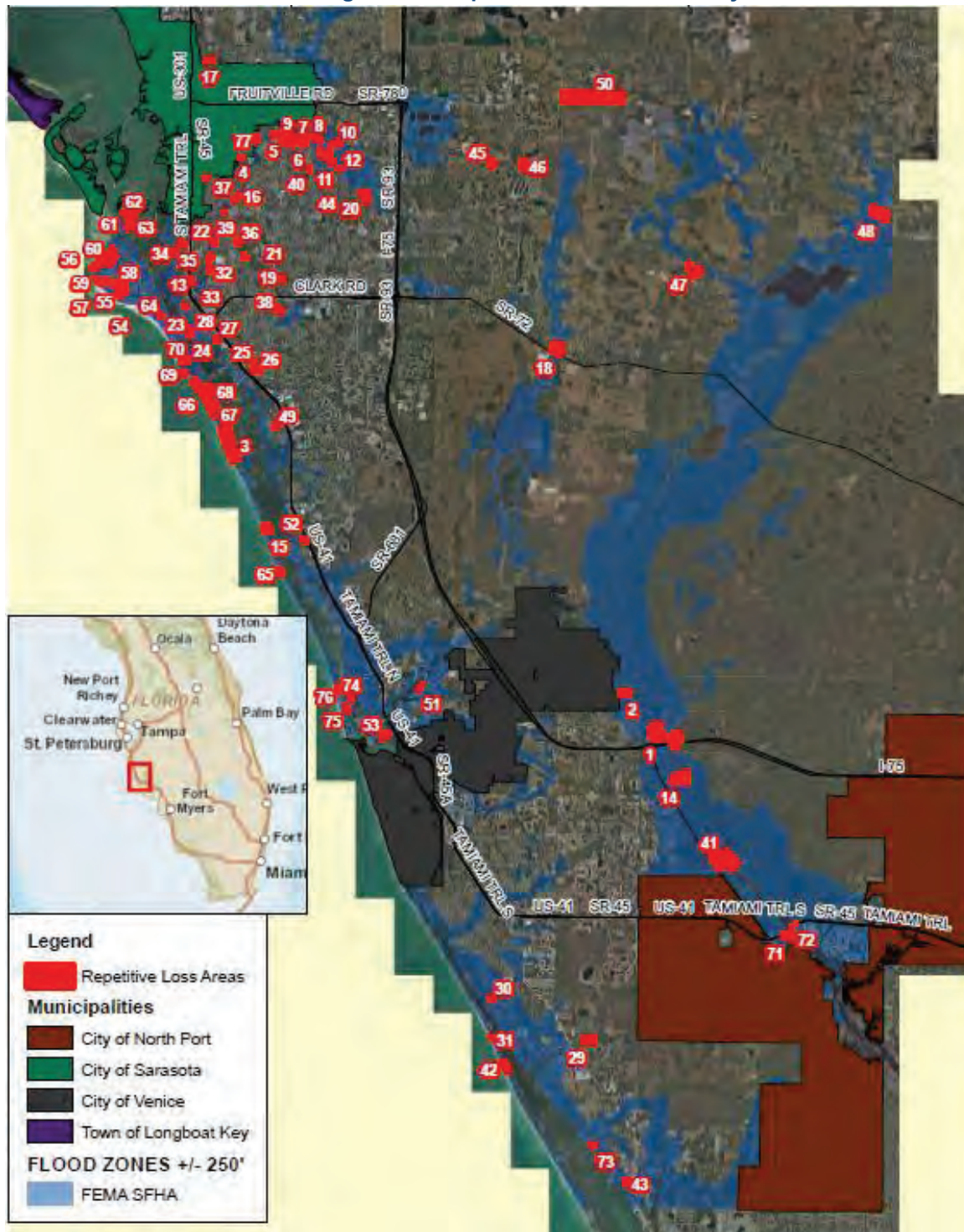


Table 3-1 Causes of Repetitive Flooding

Repetitive Loss Area Map ID	Building Count	Causes of repetitive flooding
1	61	Hurricane Gabrielle (2001): 5 to 10 inches of rainfall, storm surge, and wave action. Storms April through July (2003): 8 to 10 inches of rainfall. Waters did not recede for over 30 days in some parts of the County. Tropical Depression One (1992): Excess of 20 inches of rainfall.
2	49	Hurricane Gabrielle: 5 to 10 inches of rainfall, storm surge, and wave action. Tropical Depression One: Excess of 20 inches of rainfall.
3	171	Hurricane Gabrielle: 5 to 10 inches of rainfall, storm surge, and wave action. Tropical Storm Josephine
4	15	Tropical Depression One: Excess of 20 inches of rainfall.
5	42	Tropical Depression One: Excess of 20 inches of rainfall.
6	257	Storms April through July: 8 to 10 inches of rainfall. Waters did not recede for over 30 days in some parts of the county.
7	14	Storms April through July: 8 to 10 inches of rainfall. Waters did not recede for over 30 days in some parts of the county.
8	24	Tropical Depression One: Excess of 20 inches of rainfall.
9	11	Tropical Depression One: Excess of 20 inches of rainfall.
10	19	Tropical Depression One: Excess of 20 inches of rainfall.
11	38	Tropical Depression One: Excess of 20 inches of rainfall.
12	24	Tropical Depression One: Excess of 20 inches of rainfall. Tropical Storm Dean (1995): 9 to 11 inches of rainfall.
13	13	Subtropical Storm One (1982): Approximately 6 inches of rainfall, storm surge, and wave action.
14	36	Hurricane Gabrielle: 5 to 10 inches of rainfall, storm surge, and wave action. Storms April through July: 8 to 10 inches of rainfall. Waters did not recede for over 30 days in some parts of the county.
15	21	Subtropical Storm One: Approximately 6 inches of rainfall, storm surge, and wave action.
16	14	Tropical Depression One: Excess of 20 inches of rainfall.
17	13	Tropical Depression One: Excess of 20 inches of rainfall.
18	13	Tropical Storm Dean: 9 to 11 inches of rainfall.
19	14	Tropical Storm Dean: 9 to 11 inches of rainfall.
20	108	Tropical Depression One: Excess of 20 inches of rainfall. Tropical Storm Dean: 9 to 11 inches of rainfall.
21	23	Tropical Storm Dean: 9 to 11 inches of rainfall.
22	14	Tropical Depression One: Excess of 20 inches of rainfall. Tropical Storm Dean: 9 to 11 inches of rainfall.
23	13	Tropical Storm Dean: 9 to 11 inches of rainfall.
24	8	Tropical Depression One: Excess of 20 inches of rainfall.
25	9	Tropical Depression One: Excess of 20 inches of rainfall.
26	50	Tropical Depression One: Excess of 20 inches of rainfall.
27	9	Tropical Depression One: Excess of 20 inches of rainfall.

Repetitive Loss Area Map ID	Building Count	Causes of repetitive flooding
28	12	Tropical Storm Dean: 9 to 11 inches of rainfall.
29	12	
30	11	Tropical Depression One: Excess of 20 inches of rainfall.
31	10	
32	12	Tropical Storm Dean: 9 to 11 inches of rainfall.
33	18	Tropical Storm Dean: 9 to 11 inches of rainfall.
34	15	Tropical Depression One: Excess of 20 inches of rainfall.
35	21	Tropical Storm Dean: 9 to 11 inches of rainfall.
36	14	Tropical Storm Dean: 9 to 11 inches of rainfall.
37	15	Tropical Storm Dean: 9 to 11 inches of rainfall.
38	17	Tropical Storm Dean: 9 to 11 inches of rainfall.
39	5	Tropical Depression One: Excess of 20 inches of rainfall.
40	18	Storms April through July: 8 to 10 inches of rainfall. Waters did not recede for over 30 days in some parts of the county.
41	658	Storms April through July: 8 to 10 inches of rainfall. Waters did not recede for over 30 days in some parts of the county.
42	31	
43	21	
44	12	Tropical Depression One: Excess of 20 inches of rainfall.
45	16	Hurricane Gabrielle: 5 to 10 inches of rainfall, storm surge, and wave action.
46	15	Hurricane Gabrielle: 5 to 10 inches of rainfall, storm surge, and wave action.
47	14	
48	10	Storms April through July: 8 to 10 inches of rainfall. Waters did not recede for over 30 days in some parts of the county.
49	16	Tropical Storm Dean: 9 to 11 inches of rainfall.
50	60	
51	16	Tropical Depression One: Excess of 20 inches of rainfall.
52	16	Tropical Storm Dean: 9 to 11 inches of rainfall.
53	28	Tropical Depression One: Excess of 20 inches of rainfall.
54	10	Hurricane Elena (1985): Approximately 3 inches of rainfall, storm surge, and wave action.
55	156	Subtropical Storm One: Approximately 6 inches of rainfall, storm surge, and wave action. Hurricane Elena: Approximately 3 inches of rainfall, storm surge, and wave action. Hurricane Gabrielle: 5 to 10 inches of rainfall, storm surge, and wave action. Tropical Storm Dean: 9 to 11 inches of rainfall. Tropical Storm Josephine (1996)
56	8	Tropical Depression One: Excess of 20 inches of rainfall.
57	16	Tropical Depression One: Excess of 20 inches of rainfall.
58	17	Tropical Depression One: Excess of 20 inches of rainfall.
59	27	Hurricane Gabrielle: 5 to 10 inches of rainfall, storm surge, and wave action.

Repetitive Loss Area Map ID	Building Count	Causes of repetitive flooding
60	111	Hurricane Gabrielle: 5 to 10 inches of rainfall, storm surge, and wave action. Tropical Depression One: Excess of 20 inches of rainfall. Tropical Storm Dean: 9 to 11 inches of rainfall.
61	36	Subtropical Storm One: Approximately 6 inches of rainfall, storm surge, and wave action.
62	11	Tropical Storm Dean: 9 to 11 inches of rainfall.
63	40	Hurricane Elena: Approximately 3 inches of rainfall, storm surge, and wave action. Subtropical Storm One: Approximately 6 inches of rainfall, storm surge, and wave action. Tropical Storm Dean: 9 to 11 inches of rainfall. Tropical Storm Josephine
64	10	Hurricane Elena: Approximately 3 inches of rainfall, storm surge, and wave action. Tropical Depression One: Excess of 20 inches of rainfall.
65	17	Subtropical Storm One: Approximately 6 inches of rainfall, storm surge, and wave action.
66	54	Hurricane Elena: Approximately 3 inches of rainfall, storm surge, and wave action. Subtropical Storm One: Approximately 6 inches of rainfall, storm surge, and wave action. Tropical Depression One: Excess of 20 inches of rainfall. Tropical Storm Josephine
67	13	Tropical Depression One: Excess of 20 inches of rainfall. Un-named storm (1997): 10 inches of rainfall.
68	33	Hurricane Elena: Approximately 3 inches of rainfall, storm surge, and wave action.
69	11	Subtropical Storm One: Approximately 6 inches of rainfall, storm surge, and wave action.
70	51	Tropical Depression One: Excess of 20 inches of rainfall. Tropical Storm Dean: 9 to 11 inches of rainfall.
71	53	Hurricane Elena: Approximately 3 inches of rainfall, storm surge, and wave action. Hurricane Frances (2004): county experienced four back-to-back hurricanes between August and September 2004. Hurricane Gabrielle: 5 to 10 inches of rainfall, storm surge, and wave action. Tropical Storm Josephine Tropical Storm Keith (1988): 1 to 3 inches of rainfall, storm surge, and wave action.
72	4	Hurricane Elena: Approximately 3 inches of rainfall, storm surge, and wave action. Hurricane Frances: county experienced four back-to-back hurricanes between August and September 2004. Hurricane Gabrielle: 5 to 10 inches of rainfall, storm surge, and wave action. Tropical Storm Josephine Tropical Storm Keith: 1 to 3 inches of rainfall, storm surge, and wave action.

Repetitive Loss Area Map ID	Building Count	Causes of Repetitive Flooding
73	16	Tropical Depression One: Excess of 20 inches of rainfall.
74	17	Tropical Depression One: Excess of 20 inches of rainfall.
75	14	Storms April through July: 8 to 10 inches of rainfall. Waters did not recede for over 30 days in some parts of the county. Tropical Storm Dean: 9 to 11 inches of rainfall.
76	19	Storms April through July: 8 to 10 inches of rainfall. Waters did not recede for over 30 days in some parts of the county. Tropical Storm Dean: 9 to 11 inches of rainfall.
77	27	Tropical Depression One: Excess of 20 inches of rainfall. Tropical Storm Dean: 9 to 11 inches of rainfall.

FLOOD INSURANCE COVERAGE ASSESSMENT

There are approximately 40,000 policies currently in effect for Sarasota County. About 24,000 of those policies are for structures within the SFHA, indicating that there is a significant number of homeowners that opted to carry flood insurance even though they may not be required. However, there are approximately 30,000 structures located in the SFHA. This difference in number of total structures in the SFHA versus number of policies in the SFHA may indicate there are many homes that do not have a federally backed mortgage and are not required to carry a NFIP flood insurance policy. It should be noted that policies from private flood insurance companies are not reported to the county. Overall, most of the policies in force are for single-family homes (26,146 policies). Most of the claims come from this group, representing approximately \$21.9 million in paid losses from 1,799 claims. Overall, there have been approximately \$25.6 million in paid losses for the county. Table 3-2 and Table 3-3 describe the policy and claim statistics for Sarasota County.

Table 3-2 Policy and Claim Statistics for Pre-FIRM Structures

Zone	Policies*	Number of closed paid losses*	Closed paid losses*
A01-30, AE	9,644	1,069	\$11,740,220
A	242	207	\$3,425,560
AO	0	0	\$0
AH	0	0	\$0
AR	0	0	\$0
A99	0	0	\$0
V01-30, VE	528	173	\$2,137,250
V01-30, VE	0	0	\$0
D	2	42	\$405,490
B, C, X	2,548	169	\$2,222,122
Total	12,964	1,660	\$19,930,642

*As of 3/31/2017

Table 3-3 Policy and Claim Statistics for Post-FIRM Structures

Zone	Policies*	Number of closed paid losses*	Closed paid losses*
A01-30, AE	12,392	211	\$1,894,063
A	789	199	\$1,984,073
AO	0	0	\$0
AH	0	0	\$0
AR	0	0	\$0
A99	0	0	\$0
V01-30, VE	301	11	\$121,673
V01-30, VE	0	0	\$0
D	36	2	\$77,032
B, C, X	13,503	125	\$1,609,642
Total	27021	548	\$5,686,483

*As of 3/31/2017

The county maintains insurance for facilities that it owns, including flood insurance for facilities that are shown to be at risk for flooding.

As described by Table 3-4, there are approximately forty thousand policies compared to the approximately thirty-seven thousand structures that are located in the SFHA (see Section 6 for an analysis of the residential and commercial buildings located in the SFHA). This high percentage is contributed to the outreach efforts and regular flood information workshops that the county conducts every year. As illustrated in Figure 3-5, the flood insurance policies cover more than just buildings along the coastal areas, but also cover much of the inland areas. Sarasota County is proactive in identifying areas with flooding issues by conducting watershed management plans throughout the county, and by conducting public meetings and workshops to educate residents about their risks.

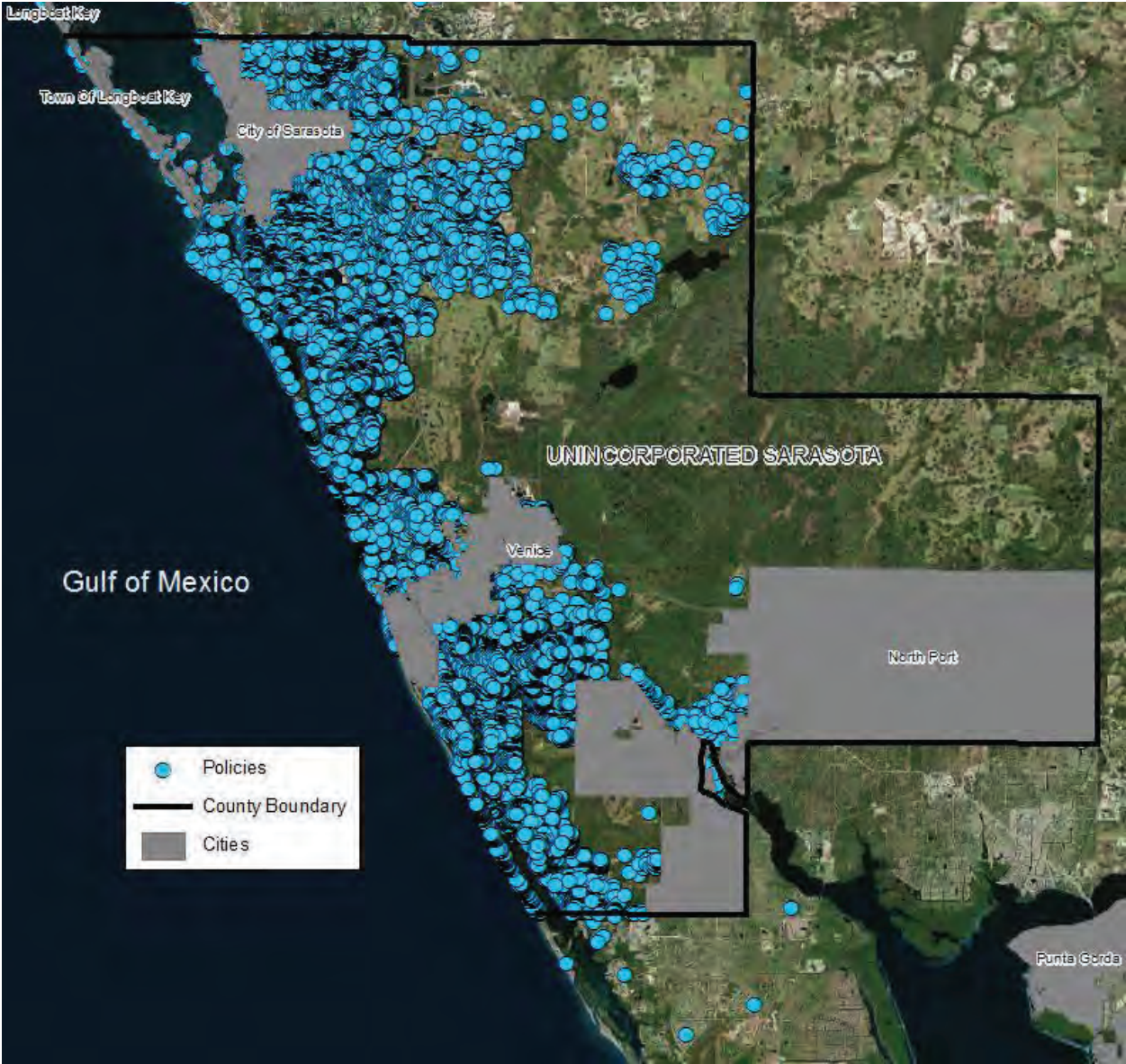
Structures in the community are at risk for flooding whether or not structures are located within a designated SFHA. As illustrated by Table 3-2 and Table 3-3, nearly 17 percent of paid losses for Sarasota County are for structures outside of the SFHA. Most of the policies in effect are for single-family homes (26,146 policies). Most of the claims come from this group, representing approximately \$21.9 million in paid losses from 1,799 claims.

Table 3-4 Policy and Claim Statistics by Occupancy Type

Occupancy type	Policies*	Closed paid losses*
Single-Family	26,146	\$21,881,591
2-4 Family	2,625	\$1,091,672
All Other Residential	10,310	\$1,210,115
Non-Residential	904	\$1,441,914
Total	39,985	\$25,625,292

*As of 3/31/2017

Figure 3-5 Flood Insurance Policies in Unincorporated Sarasota County



Sarasota County geocoded the historical claims data (Figure 3-6). This data was overlaid with other data, such as topographic information, FEMA flood zones, historical flooding complaints, and other information to identify areas within the County that are at risk for flooding. The combination of policies and claims information that the county geocoded can help the county determine, not only where flood risk exists, but also where residents do not currently have flood insurance and are in high risk areas. Section 6 illustrates the use of this data to determine homes that the County can target for outreach.

The county is in the process of improving the information that is currently in the flood insurance coverage assessment to delineate additional target audiences that will benefit from outreach relating to flood insurance. These may include homes in the SFHA that may not have flood insurance in place, homes located in the CFHA, or additional homes in areas identified to have historical flooding complaints. **A review of damaged buildings / historical claims indicate that there are areas that have potential to improve flood insurance coverage.** This data provided valuable information about which structures had flood insurance claims, as well as whether structures in the area had NFIP flood insurance policies in place or not. Figures Figure 3-7 through Figure 3-12 illustrate examples of areas that may benefit from additional outreach regarding flood insurance. These areas are in or close to floodplains and contain buildings that may not carry flood insurance. Some of these areas had previous flood insurance claims and therefore, there exists a real risk of flooding for buildings in the same area without flood insurance. Using this information the county can determine which addresses may be at risk of flooding and may not have flood insurance.

Figure 3-6 Flood Insurance Claims in Unincorporated Sarasota County

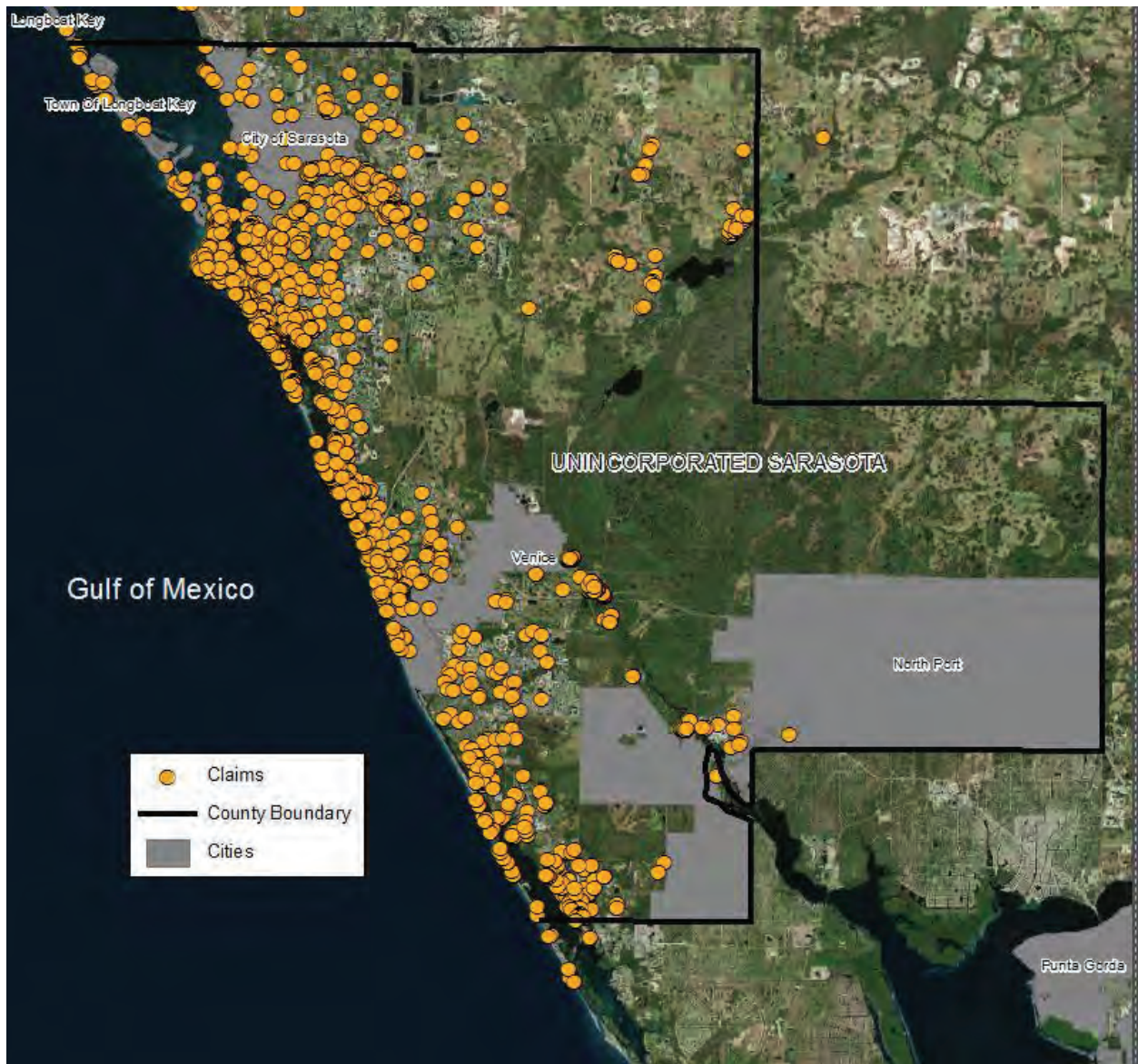


Figure 3-7 Potential Flood Insurance Coverage Improvement for Buildings - Area 1



Figure 3-8 Potential Flood Insurance Coverage Improvement for Buildings - Area 2

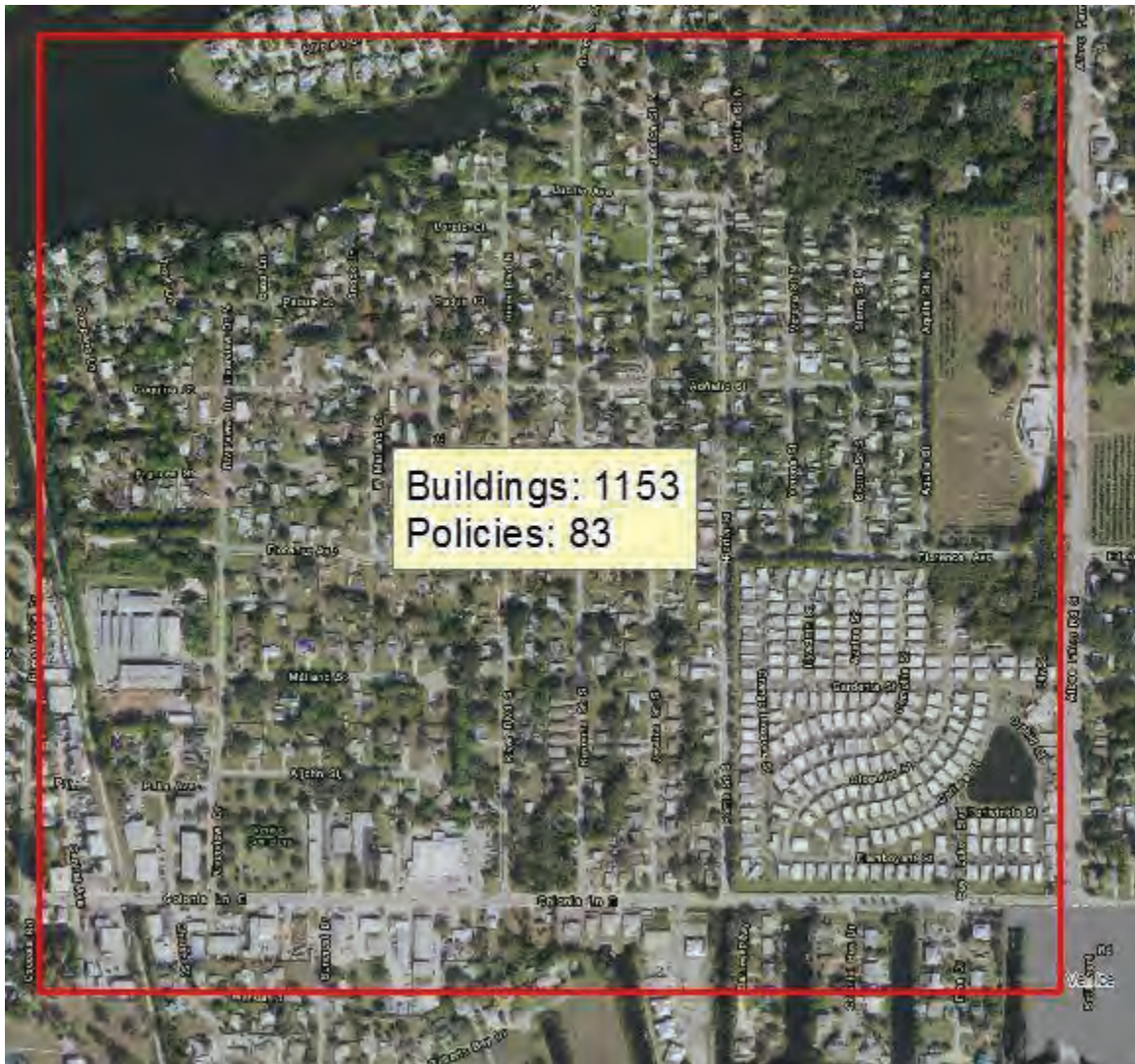


Figure 3-9 Potential Flood Insurance Coverage Improvement for Buildings - Area 3

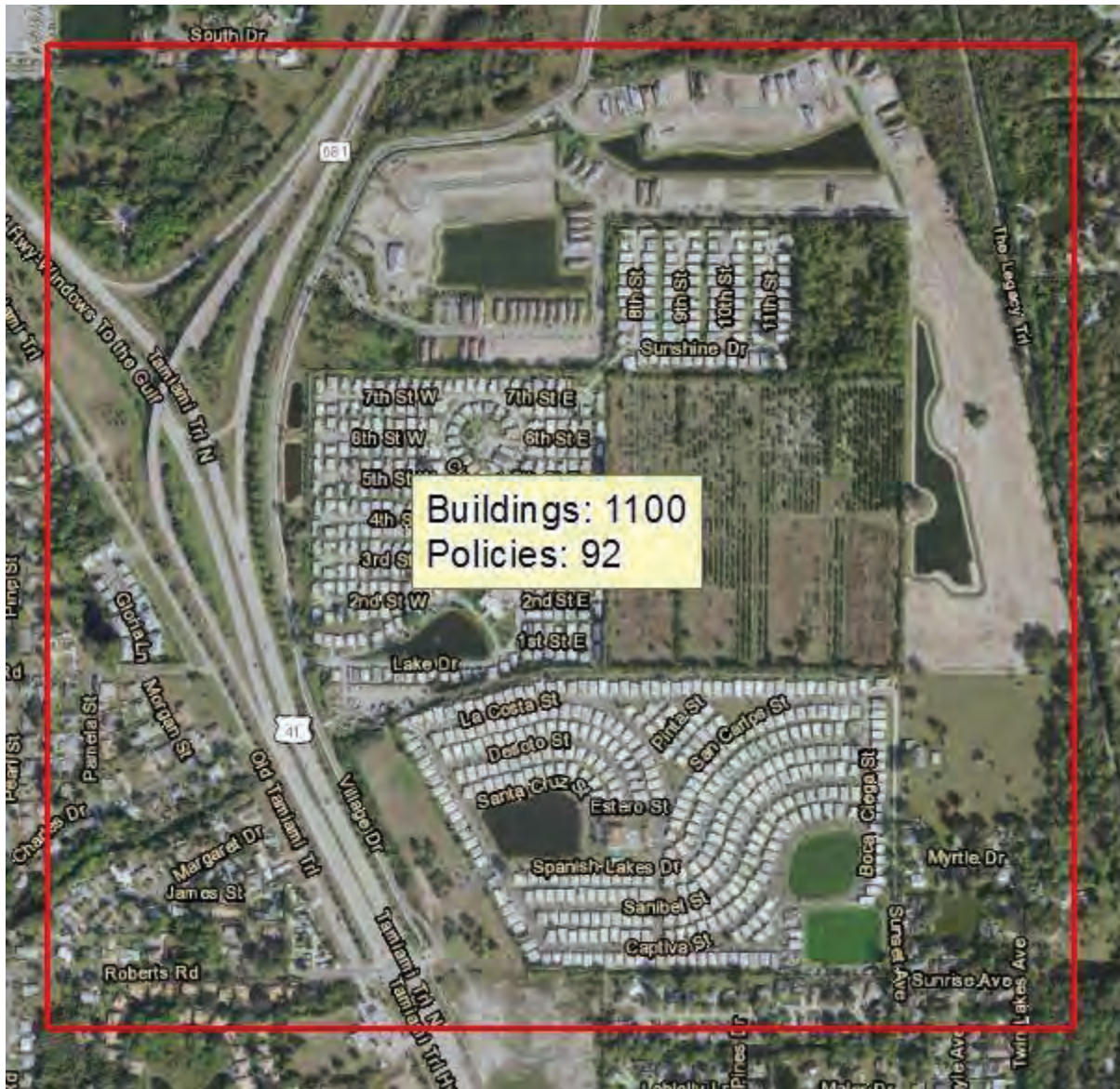


Figure 3-10 Potential Flood Insurance Coverage Improvement for Buildings - Area 4



Figure 3-11 Potential Flood Insurance Coverage Improvement for Buildings - Area 5



Figure 3-12 Potential Flood Insurance Coverage Improvement for Buildings - Area 6



CURRENT PUBLIC INFORMATION EFFORTS

The PPI committee discussed ongoing efforts to prepare, implement and monitor a range of flood-related public information activities. The PPI committee reviewed these projects to assess potential revisions to improve the messaging and its reach to the intended audiences. These activities included efforts initiated by the county as well as other agencies. These projects are described below.

FLOOD FLIER

The Communications Department developed a flood flier to highlight the CRS topics. The flier was developed with the objective of remaining simple, providing concise messaging and showing available resources and contact information. The flood flier was previously advertised in the phonebook, the Herald Tribune and sent to municipalities within Sarasota County. Subjects covered in the flier include flood risk information, building responsibly, flood insurance, flood safety, flood protection, and natural floodplain functions. The flood flyer was also translated into Spanish.

PROPERTY APPRAISER RECORDS

Committee members worked with the property appraiser to add flood information on the parcel records online. Users are now able to view their FIRM information, such as FIRM panel, flood zone, floodway, Base Flood Elevation, as well as other flood hazard areas identified through the county's watershed management plans. Property records also provide a link to the county's flood zone locator website as well as contact information for the municipality in which the parcel is located.

FLOOD INFORMATION WORKSHOPS

Sarasota County currently conducts regular workshops throughout the county. These are general presentations with Q&A sessions for the public. The committee suggested that new locations should be identified for next year. In addition, there may be an opportunity for this committee to develop and incorporate more CRS messages. Subjects covered in the workshops include flood risk information and flood insurance.

PARKS FLIER

The county maintains more than 140 parks throughout the county. They manage these natural resources to preserve the beneficial functions for the community, including natural floodplain functions, wildlife protection, water quality improvement and recreation. A listing of the county's parks is included in the Section 7 of the FMP (Natural Floodplain Functions). Fliers distributed for the county parks will contain flood-related information and messages. Subjects covered in the flier include natural floodplain functions.

FLOOD PROTECTION WEBSITE

Sarasota County developed a flood protection website to provide valuable information to the public about their flood risk, ways to protect themselves, flood insurance and resources that are available at the county. The website was recently revised to be consistent with the CRS priority subjects, including knowing your flood risk, building responsibly, buying flood insurance, flood safety, flood protection and natural floodplain functions.

FLOOD ZONE LOCATOR WEBSITE

Sarasota County recently developed a web map application to provide flood risk information to users (Figure 3-13). The web map application allows users to search for their property using the map or by entering their address. The service provides the following information:

- Effective FEMA flood information (flood zone, floodway, FIRM panel, base flood elevation, etc.).
- Community Flood Hazard Areas –Flood risk areas identified by the watershed management plans.
- Wetlands.
- Parcel information.
- Elevation certificates.

FLOOD INFORMATION CALL CENTER

Sarasota County has a call center that serves as a clearinghouse for public inquiry, including questions about flood risk. Staff provides inquirers with FIRM information as well as directs callers to the right resources at the county, such as building officials, engineering or the CRS coordinator for flood insurance information.

Figure 3-13 Sarasota County Online Flood Map



REAL ESTATE DISCLOSURE

The Florida Realtors organization has developed a flood insurance notice notifying buyers about potential insurance requirements and encouraging them to consult with a flood insurance carrier to learn more about the flood risk for the property, availability of flood insurance and current and future anticipated cost of flood insurance. Subjects covered in the notice include flood insurance.

Another initiative in this region is a project by Pinellas County who recently developed a real estate disclosure brochure and training program that informs potential buyers about what flood zone the property is in and if flood insurance is required. Realtor workshops were developed to train agents on using the online flood map information service and provide valuable information to their buyers. This same concept can be used to augment the information and services that the Florida Realtors organization already provides to their customers within Sarasota County and surrounding communities. Subjects covered in the brochure and training program include flood risk information, building responsibly, flood insurance and flood protection.

COALITION OF CITY NEIGHBORHOOD ASSOCIATIONS

There is an annual presentation, usually in early May, given by the county's Emergency Operations Center. This year, notices were sent out to 43 neighborhood associations. Ed McCrane, who is a member of this PPI committee, usually presents on topics of emergency preparedness and can include flood-related topics in future presentations. Subjects covered in the presentations include flood safety and emergency preparedness.

4 TARGET AUDIENCES

The PPI committee identified target audiences, including residents and businesses for which outreach projects can be developed. More than 30,000 buildings are currently in the SFHA and there would be more if we account for the flood risks identified through the county's watershed management plans and Repetitive Loss Areas Analysis. Residents and businesses in these areas should be aware of the flood risks and insurance options. In addition to the general residents identified for at-risk areas, each of the stakeholders also identified specific audiences they had direct contact with and can provide valuable assistance for reaching those audiences. Table 4-1 describes the target audiences.

Table 4-1 Target audiences

Audience		Description
A	Residents and businesses in Repetitive Loss Areas	This audience should understand their surroundings and the likelihood of flood and insurance is strongly recommended.
B	Residents and businesses in the Special Flood Hazard Area	This audience should become aware of their high risk and insurance is strongly recommended and often required.
C	Residents and businesses in flood-prone areas	This audience should become aware of their high risk and insurance is strongly recommended.
D	Residents and businesses in the storm surge area	This audience should become aware of their high risk and insurance is strongly recommended.
E	Residents and businesses in moderate- to low-risk flood areas (Shaded X zones)	This audience should understand that although they are not in high-risk areas, there is still a potential to flood and insurance is recommended. These areas submit over 20 percent of NFIP claims and receive one-third of disaster assistance for flooding.
F	Community Association Institute (SWFL Chapter)	Membership includes condominium, cooperative and homeowner associations.
G	Home owners associations	Associations can educate their constituents about flood risk, building properly and insurance.
H	Mobile homes associations	Associations can educate their constituents about flood risk and insurance.
I	Condo owners associations	Associations can educate their constituents about flood risk and insurance.
J	Real estate professionals	These professionals are in contact with clients that are purchasing or renting properties. They will benefit from flood related outreach, and may relay information to their clients.
K	Real estate buyers	Individuals purchasing or renting property should be made aware of their flood risk and insurance options.
L	Insurance agents	These professionals are in contact with clients that are purchasing or renting properties. They will benefit from flood related outreach and may relay information to their clients.
M	Lenders	These professionals are in contact with clients that are purchasing or renting properties. They will benefit from flood related outreach, and may relay information to their clients.
N	Mortgage brokers association	These professionals have direct contact with homebuyers.

O	Speakers of Other Languages	Informational material should be made available in languages other than English.
P	Building contractors and developers	This audience should be kept apprised of floodplain regulations and available county services. They are also in the position to communicate information about building with flood risk in mind to their clients.
Q	Surveyors	Surveyors need to receive updated information about elevation certificates.
R	Architects and/or designers	Professions responsible for design of homes should be aware of flood risks and insurance requirements.
S	County leaders and/or commissioners; Barrier island elected officials	Leaders that can champion the outreach efforts and may have direct input for funding projects.
T	Youth ages K-8	This sector provides educational opportunities about flood risks.

5 MESSAGES AND OUTCOMES

The PPI committee developed key messages and intended outcomes consistent with the CRS topics, as well as additional specific messages tailored to certain audiences. Topics included the six themes that recur throughout the CRS manual: know your flood hazard; insure your property for your flood hazard; protect people from the hazard; protect your property from the hazard; build responsibly; and protect natural floodplain functions. The committee also identified additional topics that are specific to the needs of the communities in this region. These additional topics include hurricane preparedness, flood economics and sea level rise.

Specific objectives were also developed for certain audiences. These objectives were identified as unmet needs by the stakeholders as they relate to their respective professions. The objectives address issues often encountered during their interactions with clients, organizations, consumers and others. Specific objectives included:

- Architects and designers – Educate buyers about designs that will not increase insurance costs.
- County leaders and/or commissioners; Barrier island elected officials – Educate this audience about flood risks and encourage flood insurance; encourage consistent and programmatic approach to educate residents about flood risks.
- Home builders/developers –Think about long-term costs - why build low instead of high?; educate this audience about code requirements (including zoning) vs. FEMA requirements vs. risk; look at rating class options.
- Community Association Institute (West Florida Chapter) – Provide information about flood risk topics and resources available at the county.
- Mortgage brokers association – Provide information about flood risk topics and resources available at the county.
- Chamber of Commerce – Provide information about flood risk topics and resources available at the county.
- Schools – Provide education materials about flood risk.
- Consumers – Educate consumers to ask the right questions of builders. Know that savings may offset extra construction costs. Do not let flood insurance policies lapse. Understand map changes before they happen and save. Risk is not identified on a map. Know the sources of information related to flood risk including existing highwater marks.
- Homebuyers and realtors – Educate buyers and realtors to ask or relay information about flood risk.
- Homeowners associations – Use email lists to relay information about flood risk topics.
- Utility customers – Provide information about flood risk topics and available resources in utility bill inserts. Information should be short and concise.
- Mobile homes and condominium owners associations – Often, these audiences are at increased risk. Email and/or provide informational brochures to educate these audiences about flood risk topics.

Guided by the topics and objectives above, the PPI committee developed the following key messages and outcomes.

TOPIC 1: KNOW YOUR FLOOD HAZARD

In Sarasota County, flooding and other drainage problems can result after several inches of rain in a short period of time or after several days of continued rain. Certain areas within Sarasota County are classified as high flood risk areas. In addition to the flood risk areas identified on the FEMA maps, Sarasota County has also delineated other areas that are at risk for flooding that were identified through their watershed management plans. Residents and property owners need to be aware of the flood risks in their area.

KEY MESSAGES

“Find out what flood risks are in your area.”

OUTCOMES

- Better prepared and informed residents and businesses.
- Informed property owners and buyers.

TOPIC 2: INSURE YOUR PROPERTY FOR YOUR FLOOD HAZARD

Property owners in Sarasota County should take measures to protect their investment, including purchasing flood insurance. For some homeowners, flood insurance may be required if the property is located in a Special Flood Hazard Area (SFHA) and they have a government-backed loan such as a Federal Housing Administration (FHA) or Department of Veterans Affairs (VA) loan. Property owners should also be aware that even though their property may not be in a SFHA, it may still be subject to flooding and that most homeowner's insurance do not cover flood. Homeowners who have flood insurance often recover quicker from a flooding event than those without flood insurance.

KEY MESSAGES

“Purchase flood insurance for your home or business.” Even if your home is not located in a designated SFHA that may require flood insurance, you may still be at risk for flooding.

“Purchase flood insurance for your rental.” Most renter's insurance policies do not cover damage caused by floods. Flood insurance is available for your valuables even if you rent.

OUTCOMES

- Increased number of flood insurance policies.
- Faster recovery from flooding event.

TOPIC 3: PROTECT PEOPLE FROM FLOOD HAZARD

Floods can occur quickly and people should be prepared. There are certain steps that people can take before, during and after a storm that will help protect themselves and their family and minimize damage to their properties. Several resources can help them prepare, including preparation guides and automated alert systems.

KEY MESSAGES

“Turn around, don’t drown.” Avoid areas already flooded, especially if the water is flowing fast. Do not attempt to cross flowing streams or flooded roadways.

“Stay connected.” Sign up for the county’s CodeRED notification system, social media and be aware of the local news channel and radio stations for weather-related emergencies.

“Get a plan.” Make a plan for emergencies involving floods, hurricanes and other natural disasters. Plan for evacuation routes, locations for high ground, food, water, shelter and emergency supplies. Be sure to include preparations for pets.

OUTCOMES

- Save lives.

TOPIC 4: PROTECT YOUR PROPERTY FROM FLOOD HAZARD

Approximately 30,000 structures in Sarasota County were built before there were flood regulations or flood maps (prior to December 1971, these structures are called “Pre-FIRM”). If they are in a high-risk flood zone, these structures are the most vulnerable to flood risks. There are certain measures that can be taken when constructing or improving a home to reduce the risk of flood damage. These measures include modifications to the structures themselves as well as other types of activities that do not include the structure, such as keeping drainage ditches clean and inlets clear of debris.

KEY MESSAGES

“Keep debris out of driveway culverts and ditches, and maintain your drainage swales (Only rain down the drain).”

“Elevate your equipment and/or utilities.”

OUTCOMES

- Reduced localized flooding.
- Reduced flood insurance claims.

TOPIC 5: BUILD RESPONSIBLY

Sarasota County enforces specific building regulations in the SFHA to protect people and buildings from flooding while maintaining natural floodplain functions. In addition to these areas, the county also enforces certain regulations in Community Flood Hazard Areas (CFHA) that they have identified through their own watershed management plans and field investigations. Builders should contact Sarasota County to find out what permits are required before starting the project.

KEY MESSAGES

“Get required permits before you start any home repair, improvement or construction.”

“Be aware of substantial improvements rule.”

OUTCOMES

- Increased compliance.

- Reduced flood losses.

TOPIC 6: PROTECT NATURAL FLOODPLAIN FUNCTIONS

Increased development has led to increased stormwater runoff and resulted in flooding in many areas. However, there are areas that naturally flood and benefit our community. Areas such as wetlands, preserves and other types of floodplains perform many natural functions and provide recreational benefits in the community. Residents and developers should be aware of these benefits and are encouraged to protect these resources and incorporate natural designs.

KEY MESSAGES

“Use Low Impact Development (LID), such as rain barrels, bioretention systems, green roofs, pervious materials, and non-invasive vegetation on your property.”

“Build with conservation in mind; incorporate natural systems into designs.”

OUTCOMES

- Improvement in water quality.
- Improvement in natural storage capacity.

TOPIC 7: HURRICANE PREPAREDNESS

Hurricane season starts in June and runs through November with the worst months being from late August until October. Residents should assess their risks and know their home's vulnerability to storm surge, flooding and wind. People should develop a plan for protecting themselves, their pets and their homes. Residents need to be aware of the evacuation zones and heed evacuation orders.

KEY MESSAGES

“Make a plan.”

OUTCOMES

- More residents evacuating when necessary.
- Minimized loss of life and injury.
- Minimized damage to property and belongings.

TOPIC 8: FLOOD ECONOMICS

Making homes and infrastructure more flood-proof provides positive economic, environmental and social benefits for communities. Residents should be aware of the potential costs related to damage from flood. Communities should build with the future in mind, providing benefits that include minimizing loss of property and infrastructure, enhancing the natural systems and improving public spaces to attract businesses and recreational enthusiasts.

KEY MESSAGES

“Build with the future in mind.” Consider projects that take into account the future flood conditions and enhance the natural systems.

OUTCOMES

- Improvement in building standards.
- Reduced loss of property.
- Reduced number of claims.

TOPIC 9: SEA LEVEL RISE

Being on the coast of the Gulf of Mexico, Sarasota County is very susceptible to the potential impacts of Sea Level Rise (SLR). Not only will projected increases in sea level affect homes and infrastructure along the coast of Sarasota County, but more frequent inland flooding can occur due to high tailwater conditions that can diminish the stormwater system capacity to send runoff to the Gulf.

KEY MESSAGES

“Reduce your exposure to effects of SLR.” Increased exposure to flooding in our low-lying coastal and inland areas may threaten our quality of life.

OUTCOMES

- Increased awareness and planning.
- Reduced impact to life, property, health and safety.
- Reduced impact to economy.

6 PROGRAM FOR PUBLIC INFORMATION (PPI) PROJECTS

The PPI committee evaluated existing outreach projects to determine whether they can be improved as well as identified new projects to increase flood awareness and educate residents about the resources available at the county. The committee reviewed the following projects, and the list will continue to grow with future meetings and stakeholder input.

OUTREACH PROJECTS

Flood flier – The committee continues to evaluate and refine the flood flier that is distributed to the public via print and online.

Property appraiser flood information – Sarasota County GIS staff worked with the property appraiser to develop GIS information that can be queried through the property appraiser website. The flood risk information is part of the parcel data that is available to the public.

Flood information storymap – Sarasota County is currently developing an Esri storymap as a resource for the public to be able to find information relating to flood risks in their area, download elevation certificates, learn about natural floodplain functions and other information that will help them better prepare for flood hazards.

Repetitive loss property / Repetitive loss area letter – Sarasota County sends out letters to repetitive loss properties and other properties located in a repetitive loss area (as determined from analysis of repetitive loss properties) to inform homeowners about flood risks. The letter also informs residents about what they can do to protect themselves and minimize property damage, as well as the resources that are available from the county, state and federal agencies.

Flood Awareness Week – Sarasota County and the PPI committee are coordinating with the Florida Floodplain Managers Association, local municipalities, the Sarasota Bay Estuary Program, and FEMA to formulate consistent messages to educate the public about flood risks and ways to protect themselves and their property. These messages will go out to conference attendees, social media and other media outlets during Flood Awareness Week.

Flood information workshops – Sarasota County conducts regular workshops throughout the county. There is an opportunity for the PPI committee to develop and incorporate more CRS messages. Subjects covered in the workshops include flood risk information and flood insurance.

Hazard disclosure - Real estate agencies are represented on the committee and their disclosure practice and information brochures are reviewed by the PPI committee. The real estate agents will disseminate the messages developed through this committee, including providing a brochure or the flood flier to potential buyers.

Flood protection information – The PPI committee will review the county's website to be sure additional messages (above the six general topics) and flood warning messages are coordinated with other warning messages. This project will also add specific pages regarding flood-related hazards for sea level rise and flood economics. **The PPI committee discussed additional messages, including topics for hurricane preparedness, flood economics, and sea level rise.**

Coastal erosion map – Sarasota County developed a coastal erosion map that will be published on their flood map website. The information will be used to disclosed coastal erosion hazards to the public and planning agencies.

Flood protection assistance – The PPI committee will review the county’s property protection advice (PPA), property advice provided after a site visit (PPV) and financial assistance advice (FAA) procedures. The committee will also review ways to publicize the county’s services for PPA, PPV and FAA.

Open space preservation – The PPI committee will review educational materials (brochures, signs, field trips, etc.) in open space areas that also have identified natural floodplain functions.

Drainage system maintenance – The PPI committee will review the messages for regulations prohibiting dumping in streams and ditches currently on the county’s website and flood flier.

Social media – Sarasota County posts on its Facebook, Twitter accounts information about various topics, including flood-related issues. These platforms present a great opportunity to relay information about flood risks and get the messages out. These platforms can be used during regular operations as well as distribute important safety information during a hazard event.

Each of the projects above were developed to deliver messages associated with one or more of the flood topics identified in Section 5 (Messages and Outcomes). Table 6-1 describes the flood topics that are covered by each project.

Table 6-1 Flood topics covered by PPI projects

Project	Know your flood hazard	Insure your property for your flood hazard	Protect people from the flood hazard	Protect your property from flood hazard	Build responsibly	Protect natural floodplain functions	Hurricane preparedness	Flood economics	Sea level rise
Flood flier	✓	✓	✓	✓	✓	✓	✓		
Property appraiser flood information	✓								
Flood information storymap	✓	✓	✓	✓	✓	✓			
Repetitive loss property / repetitive loss area letter	✓	✓	✓	✓	✓	✓			
Coastal erosion map	✓				✓	✓		✓	
Flood Awareness Week	✓	✓	✓	✓	✓	✓	✓	✓	✓
Flood information workshops	✓	✓	✓	✓	✓	✓	✓	✓	✓
Hazard disclosure	✓	✓	✓	✓	✓				
Flood protection information	✓	✓	✓	✓	✓	✓	✓	✓	✓
Flood protection assistance	✓	✓		✓	✓	✓			

Open space preservation						✓			
Drainage system maintenance				✓					
Social media	✓	✓	✓	✓	✓	✓	✓	✓	✓

Specific information about each project, including the audience, specific messages and outcomes, distribution methods, stakeholders, and assigned staff are provided in Appendix A. In addition to the messages and outcomes, the committee also recognized that there needs to be a way to measure the success of these projects and came up with possible indicators for the effectiveness of these messages. These indicators are also included in the project descriptions in Appendix A.

DISTRIBUTION METHODS

Sarasota County uses several methods to publicize the flood information and the services that the county offers. These methods include newspaper advertisements, websites, social media, utility bill inserts, fliers, brochures and presentations to the public. Certain methods are more costly than others, while others may be more effective in publicizing the information. The publicity and distribution methods for each project will depend on the type of project, how much information needs to be included, cost of implementation and target audience. Direct mail that includes too much information can be lost to the audience and ultimately thrown in the trash, especially if that mail is accompanied by other advertisements and clippings often included in the mail these days. This method is also costly.

Today, most people are using the internet get their news. Traditional sources of information like newspapers or magazines have declined in use over the last decade. According to a recent article by Aaron Smith (*Older Adults and Technology Use*, 2014) describing a recent study by the Pew Research Center, even the older population (i.e., seniors) are increasingly turning to the internet for information. Other studies have shown that the internet is more popular than newspapers and radio as a news source, ranking just behind TV. Americans today routinely get their news from multiple sources and a mix of platforms. More than nine in ten American adults (92 percent) get news from multiple platforms on a typical day, with half of those using four to six platforms daily, according to a 2010 article by Kristen Purcell, Lee Rainie, Amy Mitchell, Tom Rosenstiel and Kenneth Olmstead titled *Understanding the Participatory News Consumer*.

Although Sarasota County does use the direct mail method, the preferred method would:

- Minimize the probability of information being discarded.
- Increase the frequency of distribution.
- Minimize cost so that resources can be used to increase frequency of distribution and/or provide for multiple distribution methods instead/

Based on the criteria above and recent trends in technologies, the PPI committee concluded that the most effective way to reach the community is through a combination of communication tools, including:

- Sarasota County flood Information website.
- Sarasota County's social media (Facebook and Twitter).
- Email blasts to neighborhood associations.
- Utility bill inserts.

- Informational kiosks and events throughout the county.
- Direct mail to select target audiences.
- Flood and hurricane information events.
- Newspaper advertising.
- Television crawls.

FLOOD RESPONSE PROJECTS

The Sarasota County Flood Warning and Response Plan (FWRP) establishes a framework through which Sarasota County may prepare for, respond to and recover from saltwater or freshwater flooding conditions. Part of the FWRP's goal is to develop messages and dissemination tools centered on flood warning and response. These were prepared in advance and will not be delivered until a flood is impending or occurs. The PPI committee has reviewed several of the flood response messages as part of developing the flood information storymap outreach project. The committee will continue to review the other flood response messages and dissemination methods to ensure that the messages are concise and delivered in the most effective and efficient manner. Dissemination methods include:

- Media releases.
- Access Sarasota TV crawls.
- Web / social media.
- Contact center.
- Email/Constant Contact.
- Sarasota County website.
- CodeRed.
- Emergency Alert System (EAS).
- Wireless Emergency Alerts (WEA).
- Door hangers.
- FEMA Flood Insurance Claims handbook.
- Build Back Safer and Stronger brochure.
- FEMA After the Flood flier.
- ICC Flood Cleanup brochure.
- Filing Your Flood Insurance Claim flier.

Attachment 2 contains the Flood Warning and Response messages reviewed.

EXAMINATION OF OTHER PUBLIC INFORMATION INITIATIVES

The PPI committee looked at other public information activities in addition to outreach projects, including how best to set up a website on flood protection (CRS activity 350). In addition to the six priority CRS topics, Sarasota County will include information relating to hurricane preparedness, flood economics and Sea Level Rise. The county will also provide links to real-time gage data and post elevation certificates on the website.

The PPI committee also examined the types of technical assistance that are needed throughout the community and the best ways to publicize these flood protection services (CRS activities 320, 350 and 360). As a result, the county's flood protection website will list specific methods that can be used to protect a property or home. In addition, these services and contact information for these services will be listed on the flood fliers, county websites, newspaper advertisements, television crawls and social media. Resources for technical assistance will also be described and listed in letters sent to repetitive loss properties and other properties located in repetitive loss areas.

Projects developed through the PPI committee will ultimately enhance the county's CRS rating. Projects that can be related back to creditable activities in the CRS include:

ACTIVITY 320 – MAP INFORMATION SERVICE

Property appraiser flood information – This project provides valuable FIRM information to the public pertaining to the parcel of interest. This service is made available online and links to the county's web map service which is publicized on a brochure. The brochure will be distributed annually through several media outlets.

Flood information storymap – The Storymap provides FIRM information, access to available elevation certificates, and other hazard information. This will improve the County's ability to query and distribute the information the public. This service will be made available online and will be linked to the County's web map service, which is publicized on a brochure will be distributed annually through several media outlets.

ACTIVITY 340 – HAZARD DISCLOSURE

Hazard disclosure project – Real estate professionals will have access to the County's flood information tools and provide valuable FIRM information to potential buyers. The committee discussed ways to disseminate the flood risks to potential buyers and reviewed several disclosure forms and brochures, which realtors will provide to potential buyers. The committee reviewed a brochure developed and used by other communities that may be used to help develop a similar one for Sarasota County. Outreach can also be performed through realtor organizations for training on what resources are available at the county. Real estate professionals are contacted at least annually and representatives are members of this PPI committee.

ACTIVITY 350 – FLOOD PROTECTION INFORMATION

Flood protection information website – The PPI committee will review the county's website to be sure additional messages (above the six general topics) and flood warning messages are coordinated with other warning messages. The committee decided to add 3 additional topics. These topics included:

- Hurricane preparedness.
- Flood economics.
- Sea level rise.

The committee discussed several messages to convey to the public with regards to the three topics and decided on the appropriate messages as discussed in Section 5. The flood protection website will be publicized via a brochure that will be distributed annually through several media outlets.

Flood information storymap – The storymap enhances the county's existing flood protection information website by providing FIRM information, access to available elevation certificates and other hazard information that is much easier to understand. This service will be made available online and will be linked to the county's web map service which is publicized on a brochure. The brochure will be distributed annually through several media outlets.

ACTIVITY 360 – FLOOD PROTECTION ASSISTANCE

Flood protection assistance – The PPI committee will review the county's property protection advice (PPA), property advice provided after a site visit (PPV), and financial assistance advice (FAA) procedures. The committee will also review ways to publicize the county's services for PPA, PPV and FAA on an annual basis.

Repetitive loss property / repetitive loss area letter – The committee will review the current repetitive loss property/areas letters to identify improvements that can be made to disseminate information about flood protection assistance services that the county offers. The letter is sent out annually to property owners.

ACTIVITY 370 – FLOOD INSURANCE PROMOTION

Flood information storymap – Sarasota County performed a flood insurance coverage assessment to determine the level of coverage and needs. The county promotes flood insurance through its flood workshops. The PPI committee also developed messages to promote flood insurance and these messages were incorporated into the county's flood information storymap.

ACTIVITY 540 – DRAINAGE SYSTEM MAINTENANCE

Drainage system maintenance – The PPI committee will review and suggest improvements to the messages for regulations prohibiting dumping in streams and ditches currently on the county's website and flood flier that is distributed annually to media outlets and at events.

7 IMPLEMENTATION, MONITORING AND EVALUATION

The PPI committee meets quarterly to implement, monitor and evaluate the progress of the projects. The committee evaluates each project's effectiveness and revises the project as necessary to achieve the desired goals. The project sheets (Appendix A) are updated as necessary to reflect changes to the status or implementation of the projects. The PPI committee develops an annual evaluation noting the status of existing projects and/or provide information on new initiatives. The annual evaluation will be incorporated into the PPI report, which will serve as a living document that is updated on an annual basis. Table 7-1 summarizes the status of the PPI projects.

Each year the updated PPI is approved by the committee and submitted to the Sarasota County Commission.

Table 7-1 Status of PPI projects

Project	Status	Last Updated
Flood Flier	Completed; Developed in both English and Spanish.	October 2017
Property appraiser flood information	Completed; Under review for possible revisions to include link to the appropriate sections of the flood protection information website.	January 2018
Flood information storymap	In progress; Site developed in testing environment; Currently being reviewed by the PPI committee.	May 2018
Repetitive loss property / repetitive loss area letter	In progress; Will be reviewed by the PPI committee.	May 2018
Coastal erosion map	Completed the coastal erosion mapping that will be published on the flood map website.	May 2018
Flood Awareness Week	In progress; Coordinating with FFMA and FEMA for consistent messaging.	May 2018
Flood information workshops	Ongoing; PPI committee will review additional information to present at workshops.	May 2018
Hazard disclosure	Ongoing. Reviewing disclosure brochures and other ways to disseminate information to potential buyers.	May 2018
Flood protection information	Complete; Site currently under development by USF.	July 2018
Flood protection assistance	In-progress; Messages and contact information being incorporated into flood	May 2018

Project	Status	Last Updated
	flier, Storymap and flood protection website; PPI committee will review target audience for messaging (i.e., Repetitive loss properties and areas). Committee will review procedures for providing services for property protection and financial assistance advisory.	
Open space preservation	Not started	May 2018
Drainage system maintenance	In progress; Messages incorporated into other project initiatives.	May 2018
Social media	Ongoing; Will review messages for Flood Awareness Week.	May 2018

8 PPI ADOPTION

The Sarasota County PPI was adopted by the Sarasota County Commission on MMMMDD, YYYY.
The PPI committee submits an annual update to the board.

APPENDIX A

PPI projects

Key Sheet - Target Audiences

Audience		Description
A	Residents and businesses in Repetitive Loss Areas	This audience should understand their surroundings and the likelihood of flood and insurance is strongly recommended.
B	Residents and businesses in the Special Flood Hazard Area	This audience should become aware of their high risk and insurance is strongly recommended and often required.
C	Residents and businesses in flood-prone areas	This audience should become aware of their high risk and insurance is strongly recommended.
D	Residents and businesses in the storm surge area	This audience should become aware of their high risk and insurance is strongly recommended.
E	Residents and businesses in moderate- to low-risk flood areas (Shaded X zones)	This audience should understand that although they are not in high risk areas, there is still a potential to flood and insurance is recommended. These areas submit over 20 percent of NFIP claims and receive one-third of disaster assistance for flooding.
F	Community Association Institute (SWFL Chapter)	Membership includes condominium, cooperative and homeowner associations. The association can disseminate flood hazard information to their members.
G	Home owners associations	Associations can educate their constituents about flood risk, building properly and insurance.
H	Mobile homes associations	Associations can educate their constituents about flood risk and insurance.
I	Condo owners associations	Associations can educate their constituents about flood risk and insurance.
J	Real estate professionals	These professionals are in contact with clients that are purchasing or renting properties. They will benefit from flood-related outreach and may relay information to their clients.
K	Real estate buyers	Individuals purchasing or renting property should be made aware of their flood risk and insurance options.
L	Insurance agents	These professionals are in contact with clients that are purchasing or renting properties. They will benefit from flood-related outreach and may relay information to their clients.
M	Lenders	These professionals are in contact with clients that are purchasing or renting properties. They will benefit from flood-related outreach and may relay information to their clients.
N	Mortgage brokers association	These professionals have direct contact with homebuyers.
O	Speakers of other languages	Informational material should be made available in languages other than English.
P	Building contractors and developers	This audience should be kept apprised of floodplain regulations and available county services. They are also in the position to communicate information about building with flood risk in mind to their clients.
Q	Architects and/or designers, engineers	Professions responsible for design of homes should be aware of flood risks and insurance requirements.
R	Surveyors	Surveyors need to receive updated information about elevation certificates.
S	County leaders and/or commissioners; Barrier island elected Officials	Leaders that can champion the outreach efforts and may have direct input for funding projects.
T	Youths in grades K-8	This sector provides educational opportunities about flood risks.

Key Sheet - Messages and Outcomes

Topic		Message		Outcome	
1	Know your flood hazard	A1	Find out your flood risk.	A1	Better prepared and informed residents and businesses.
2	Insure your property for your flood hazard	B1	Purchase flood insurance for your home, business, or rental.	B1	Increased number of flood insurance policies.
3	Protect people from flood hazard	C1	Turn around, don't drown.	C1	Save lives.
		C2	Stay Connected. Subscribe to County services and social media to receive alerts. Stay tuned to local news channels and radio stations.		
4	Protect your property from flood hazard	D1	Keep debris out of driveway culverts and ditches, and maintain your drainage swales (Only Rain Down the Drain).	D1	Reduced localized flooding.
		D2	Elevate your equipment/utilities.	D2	Reduced loss of property and flood insurance claims.
5	Build responsibly	E1	Get required permits before you start any home repair, improvement, or construction.	E1	Increased compliance and reduced flood loss.
		E2	Be aware of substantial improvements rule.		
6	Protect natural floodplain functions	F1	Keep our waters clean.	F1	Improvement in water quality and natural storage capacity.
		F2	Use Low Impact Development (LID), such as rain barrels, bioretention systems, green roofs, pervious materials, and non-invasive vegetation on your property.		
		F3	Build with conservation in mind; incorporate natural systems into designs.		
7	Hurricane preparedness	G1	Know your evacuation zone.	G1	More residents evacuating when necessary.
		G2	Have a plan.	G2	Minimized damage and injury.
		G3	Storm surge can occur without hurricane force winds		
8	Flood economics	H1	Floods can be costly to individuals, families and communities.	H1	Improvement in building standards.
		H2	Build with the future in mind.	H2	Reduced loss of property.
		H3	Insurance rates are not static.	H3	Reduced number of claims.
9	Sea level rise	I1	Plan for SLR.	I1	Increased awareness and planning.
				I2	Reduced impact to life, property, health and safety.
				I3	Reduced impact to economy.

OUTREACH PROJECT - SARASOTA COUNTY FLOOD FLIER ENGLISH

PROJECT DESCRIPTION	The Communications Department developed a flood flier to highlight the CRS topics. The flier was developed with the objective of remaining simple, providing concise messaging and showing available resources and contact information. The flood flier was previously advertised in the phonebook, the Herald Tribune and sent to municipalities within Sarasota County. Topics covered in the flier include flood risk information, building responsibly, flood insurance, flood safety, flood protection, and natural floodplain functions.
WHEN WILL THIS PROJECT BE IMPLEMENTED?	Begin date: October 2017 End date: Ongoing
WHO IS THE TARGET AUDIENCE?	All residents
WHAT CRS TOPICS ARE COVERED?	<input checked="" type="checkbox"/> TOPIC 1: KNOW YOUR FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 2: INSURE YOUR PROPERTY FOR YOUR FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 3: PROTECT PEOPLE FROM THE FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 4: PROTECT YOUR PROPERTY FROM FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 5: BUILD RESPONSIBLY <input checked="" type="checkbox"/> TOPIC 6: PROTECT NATURAL FLOODPLAIN FUNCTIONS <input type="checkbox"/> TOPIC 7: HURRICANE PREPAREDNESS <input type="checkbox"/> TOPIC 8: FLOOD ECONOMICS <input type="checkbox"/> TOPIC 9: SEA LEVEL RISE
WHAT ARE THE MESSAGES?	A1, B1, C1, C2, D1, D2, E1, E2, F1, G1, G2
WHAT ARE THE OUTCOMES?	A1, B1, C1, D1, D2, E1, F1, G1, G2
WHO IS RESPONSIBLE FOR THE PROJECT?	Donna Bailey, CFM CRS Specialist Sarasota County Government 1001 Sarasota Center Blvd. Sarasota, FL 34240 941-861-0917 (office); 941-525-8915 (cell) Email: dabailey@scgov.net
HOW WILL THIS PROJECT BE DISTRIBUTED?	<ul style="list-style-type: none"> - Advertise in phonebook, once/year - Publish in Herald Tribune, once/year - Send to municipalities, once/year - Online

ARE THERE RELATED
CRS ACTIVITIES?

320 – This flier helps to publicize the county’s map information service. The committee determined what map information to provide.

360 – The flier publicizes the county’s flood protection services, including providing property protection advice (PPA) and site visits (PPV).

370 – The flier advises people to buy flood insurance.

540 – The flier encourages residents to keep swales and drainage ditches clear of debris to ensure water flow, and publicizes the county’s flood protection website to learn more about maintaining drainage systems.

610 – The flier publicizes the radio stations for emergency content and encourages residents to stay safe. It publicizes and reinforces the "Turn around, don’t drown" campaign.

WHAT
STAKEHOLDERS ARE
INVOLVED?

Lenders, realtors, insurance agents

WHICH
JURISDICTIONS ARE
INVOLVED IN THIS
PROJECT?

- Sarasota County
- City of Sarasota
- Town of Longboat Key
- City of North Port
- City of Venice

WHAT ARE THE
POSSIBLE SUCCESS
INDICATORS?

- Increased web traffic.
- Increased number of FEMA policies.
- Increased subscribers to the county’s alert system and social media.

WHAT IS THE
PROJECT STATUS?

OCTOBER 2017

Flier completed.

Anywhere it Rains it Can Flood

Hurricanes, tropical storms and heavy rainfall can occur any time in Sarasota County, making YOUR property subject to flooding.

1. Find out what your flood hazard is.
View flood maps at www.scgov.net/FloodMaps.

6. Protect natural floodplain functions.
Keep swales and drainage ditches clear of debris to ensure water flow.



Only rain down the drain!

5. Build responsibly.
Find out what permits are required. Be aware of substantial improvement rules.



2. Buy flood insurance.
Contact your agent for rates and coverage options or visit www.floodsmart.gov.



3. Stay safe.
Tune to radio stations 1450 AM or 970 AM for up-to-date flood and emergency information.



Turn around, don't drown.



4. Protect your property from flood hazards.
Raise electrical system components.

Call Sarasota County at 941-861-5000 for a property protection consultation or site visit to evaluate your drainage and retrofitting options. Visit www.scgov.net/FloodProtection.



Be prepared.

- Know your hurricane evacuation zones.
- Inventory and photograph everything in your home or business.
- Make a flood emergency plan.

Everything you need to know is in the Sarasota County Disaster Planning Guide available at www.scgov.net/AllHazards.

OUTREACH PROJECT - SARASOTA COUNTY FLOOD FLIER SPANISH

PROJECT DESCRIPTION	<p>The Communications Department developed a flood flier to highlight the CRS topics. The flier was developed with the objective of remaining simple, providing concise messaging and showing available resources and contact information. The flood flier was previously advertised in the phonebook, the Herald Tribune and sent to municipalities within Sarasota County. Topics covered in the flier include flood risk information, building responsibly, flood insurance, flood safety, flood protection and natural floodplain functions.</p> <p>A large segment of the population speaks Spanish. The flier was translated into Spanish.</p>
WHEN WILL THIS PROJECT BE IMPLEMENTED?	<p>Begin date: October 2017</p> <p>End date: Ongoing</p>
WHO IS THE TARGET AUDIENCE?	Spanish speaking population
WHAT CRS TOPICS ARE COVERED?	<p><input checked="" type="checkbox"/> TOPIC 1: KNOW YOUR FLOOD HAZARD</p> <p><input checked="" type="checkbox"/> TOPIC 2: INSURE YOUR PROPERTY FOR YOUR FLOOD HAZARD</p> <p><input checked="" type="checkbox"/> TOPIC 3: PROTECT PEOPLE FROM THE FLOOD HAZARD</p> <p><input checked="" type="checkbox"/> TOPIC 4: PROTECT YOUR PROPERTY FROM FLOOD HAZARD</p> <p><input checked="" type="checkbox"/> TOPIC 5: BUILD RESPONSIBLY</p> <p><input checked="" type="checkbox"/> TOPIC 6: PROTECT NATURAL FLOODPLAIN FUNCTIONS</p> <p><input type="checkbox"/> TOPIC 7: HURRICANE PREPAREDNESS</p> <p><input type="checkbox"/> TOPIC 8: FLOOD ECONOMICS</p> <p><input type="checkbox"/> TOPIC 9: SEA LEVEL RISE</p>
WHAT ARE THE MESSAGES?	A1, B1, C1, C2, D1, D2, E1, E2, F1, G1, G2
WHAT ARE THE OUTCOMES?	A1, B1, C1, D1, D2, E1, F1, G1, G2
WHO IS RESPONSIBLE FOR THE PROJECT?	<p>Donna Bailey, CFM</p> <p>CRS Specialist</p> <p>Sarasota County Government</p> <p>1001 Sarasota Center Blvd.</p> <p>Sarasota, FL 34240</p> <p>941-861-0917 (office); 941-525-8915 (cell)</p> <p>Email: dabailey@scgov.net</p>
HOW WILL THIS PROJECT BE DISTRIBUTED?	<ul style="list-style-type: none"> - Advertise in phonebook, once/year - Publish in Herald Tribune, once/year - Send to municipalities, once/year

- Online

ARE THERE RELATED CRS ACTIVITIES?	<p>320 – This flier helps to publicize the county’s map information service. The committee determined what map information to provide.</p> <p>360 – The flier publicizes the county’s flood protection services, including providing property protection advice (PPA) and site visits (PPV).</p> <p>370 – The flier advises people to buy flood insurance.</p> <p>540 – The flier encourages residents to keep swales and drainage ditches clear of debris to ensure water flow, and publicizes the County’s flood protection website to learn more about maintaining drainage systems.</p> <p>610 – The flier publicizes the radio stations for emergency content and encourages residents to stay safe. Publicizes and reinforces the "Turn around, don’t drown" campaign.</p>
WHAT STAKEHOLDERS ARE INVOLVED?	Lenders, realtors, insurance agents
WHICH JURISDICTIONS ARE INVOLVED IN THIS PROJECT?	<ul style="list-style-type: none"> - Sarasota County - City of Sarasota - Town of Longboat Key - City of North Port - City of Venice
WHAT ARE THE POSSIBLE SUCCESS INDICATORS?	<ul style="list-style-type: none"> - Increased web traffic. - Increased number of FEMA policies. - Increased subscribers to county’s alert system and social media
WHAT IS THE PROJECT STATUS?	<p>OCTOBER 2017</p> <p>Flier completed.</p>

Donde Quiera Que Llueva Puede Inundarse

Los huracanes, tormentas tropicales y fuertes lluvias pueden suceder en cualquier momento en el Condado de Sarasota, SU propiedad está sujeta a inundaciones.

1. Averigüe cuál es el peligro de inundación en su propiedad.
Vea los mapas de inundaciones en www.scgov.net/FloodMaps.

6. Proteja las funciones naturales de las zonas de desagüe.
Mantenga las grietas y las zanjas de drenaje libres de escombros para asegurar el flujo de agua.

¡Solo debe haber lluvia en el desagüe!

5. Construya responsablemente.
Averigüe qué permisos se requieren. Tenga en cuenta las reglas de mejoras sustanciales.

2. Compre seguro contra inundaciones.
Comuníquese con su agente para obtener tarifas y opciones de cobertura o visite www.floodsmart.gov.

3. Manténgase a salvo.
Sintonice las estaciones de radio 1450 AM o 970 AM para obtener información actualizada sobre la inundaciones y emergencias.

Dese vuelta, no se ahogue.

4. Proteja su propiedad de los peligros de inundación.
Mantenga elevados los componentes del sistema eléctrico.

Llame al Condado de Sarasota al 941-861-5000 para solicitar una consulta y revisar sus opciones en la protección de su propiedad. Visite www.scgov.net/FloodProtection.

Este preparado.

- Conozca sus zonas de evacuación de huracanes.
- Inventariar y fotografiar todo en su casa o negocio.
- Haga un plan de emergencia contra inundaciones.

Todo lo que necesita saber está en la Guía de Planificación de Desastres del Condado de Sarasota disponible en www.scgov.net/AllHazards.

OUTREACH PROJECT - SARASOTA COUNTY COASTAL EROSION MAPPING

PROJECT DESCRIPTION	Coastal erosion / mean high water mark mapping application.
WHEN WILL THIS PROJECT BE IMPLEMENTED?	Begin date: 08/2016 End date: April 2018
WHO IS THE TARGET AUDIENCE?	Coastal residential & commercial property owners, buyers, developers
WHAT CRS TOPICS ARE COVERED?	<input checked="" type="checkbox"/> TOPIC 1: KNOW YOUR FLOOD HAZARD <input type="checkbox"/> TOPIC 2: INSURE YOUR PROPERTY FOR YOUR FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 3: PROTECT PEOPLE FROM THE FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 4: PROTECT YOUR PROPERTY FROM FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 5: BUILD RESPONSIBLY <input checked="" type="checkbox"/> TOPIC 6: PROTECT NATURAL FLOODPLAIN FUNCTIONS <input type="checkbox"/> TOPIC 7: HURRICANE PREPAREDNESS <input type="checkbox"/> TOPIC 8: FLOOD ECONOMICS <input type="checkbox"/> TOPIC 9: SEA LEVEL RISE
WHAT ARE THE MESSAGES?	A1; E1; E2; F3; H2
WHAT ARE THE OUTCOMES?	A1; C1; D2; E1; H1; H2; H3; I1; I2; I3
WHO IS RESPONSIBLE FOR THE PROJECT?	Donna Bailey, CFM CRS Specialist Sarasota County Government 1001 Sarasota Center Blvd. Sarasota, FL 34240 941-861-0917 (office); 941-525-8915 (cell) Email: dabailey@scgov.net
HOW WILL THIS PROJECT BE DISTRIBUTED?	Website – GIS maps
ARE THERE RELATED CRS ACTIVITIES?	320 – MI5

WHAT STAKEHOLDERS ARE INVOLVED?	
WHICH JURISDICTIONS ARE INVOLVED IN THIS PROJECT?	<ul style="list-style-type: none"> - Sarasota County - City of Sarasota - Town of Longboat Key - City of Venice
WHAT ARE THE POSSIBLE SUCCESS INDICATORS?	<ul style="list-style-type: none"> - Reduced loss of property. - Reduced number of claims. - Reduced compliance issues.
WHAT IS THE PROJECT STATUS?	2018 Ongoing

OUTREACH PROJECT - SARASOTA COUNTY FLOOD AWARENESS WEEK

PROJECT DESCRIPTION	Sarasota County Flood Awareness Week
WHEN WILL THIS PROJECT BE IMPLEMENTED?	Begin date: April 2018 End date: Annually
WHO IS THE TARGET AUDIENCE?	All residents
WHAT CRS TOPICS ARE COVERED?	<input checked="" type="checkbox"/> TOPIC 1: KNOW YOUR FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 2: INSURE YOUR PROPERTY FOR YOUR FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 3: PROTECT PEOPLE FROM THE FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 4: PROTECT YOUR PROPERTY FROM FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 5: BUILD RESPONSIBLY <input checked="" type="checkbox"/> TOPIC 6: PROTECT NATURAL FLOODPLAIN FUNCTIONS <input checked="" type="checkbox"/> TOPIC 7: HURRICANE PREPAREDNESS <input checked="" type="checkbox"/> TOPIC 8: FLOOD ECONOMICS <input checked="" type="checkbox"/> TOPIC 9: SEA LEVEL RISE
WHAT ARE THE MESSAGES?	A1, B1, C1, C2, D1, D2, E1, E2, F1, F2, F3, G1, G2, G3, H1, H2, H3, I1
WHAT ARE THE OUTCOMES?	A1, B1, C1, D1, D2, E1, F1, G1, G2, H1, H2, H3, I1, I2, I3
WHO IS RESPONSIBLE FOR THE PROJECT?	Donna Bailey, CFM CRS Specialist Sarasota County Government 1001 Sarasota Center Blvd. Sarasota, FL 34240 941-861-0917 (office); 941-525-8915 (cell) Email: dabailey@scgov.net
HOW WILL THIS PROJECT BE DISTRIBUTED?	- Through social media online and through local events
ARE THERE RELATED CRS ACTIVITIES?	330 – outreach 540 – Publicity 610 - Publicity

WHAT STAKEHOLDERS ARE INVOLVED?	
WHICH JURISDICTIONS ARE INVOLVED IN THIS PROJECT?	<ul style="list-style-type: none"> - Sarasota County - City of Sarasota - Town of Longboat Key - City of North Port - City of Venice
WHAT ARE THE POSSIBLE SUCCESS INDICATORS?	<ul style="list-style-type: none"> - Increased number of FEMA policies. - Better prepared and informed residents and businesses. - Reduced loss of property. - Reduced number of claims. - Better water quality.
WHAT IS THE PROJECT STATUS?	MAY 2018 The project is complete

STATE IN BRIEF

ORLANDO
Man gets life sentence in synthetic opioid death

A Pennsylvania man has been sentenced to life in prison for supplying synthetic opioids to a woman who died in Florida.

Court records show that 43-year-old Jeremy Achey was sentenced Friday in Orlando federal court. He was convicted in January of conspiracy to distribute and distribution of controlled substances.

Authorities say Achey was one of the largest synthetic drug distributors on Alphabay Market, a "Darknet" marketplace for illicit substances. Records show Achey mailed thousands of packages containing synthetic drugs to hundreds of customers throughout the United States.

Prosecutors say Achey sold one gram of Tetrahydrofuran fentanyl, a synthetic analogue of fentanyl, in February 2017 to a 24-year-old Orlando woman, who later died of an overdose.

TAMPA
Student allegedly had gun at school

Authorities say a Florida junior high student has been charged with bringing a handgun to school.

A Hillsborough County Sheriff's Office news release says the 13-year-old boy was arrested Thursday afternoon at Dowdell Middle School in Tampa.

The release says a witness told school staff that the boy had the gun in his backpack and then placed it inside a large tractor tire near the school's bike rack. A school resource officer reported finding a loaded Bersa Thunder .380 semi-auto handgun.

Officials say the boy fled the area before being arrested, but his mother returned him to the school later Thursday.

The mother refused to allow the boy to speak with officials. He was taken to Hillsborough County Juvenile Assignment.

KEY WEST
GUILTY plea in theft of an antique gold bar

One of two men accused of stealing a Key West

museum's 17th-century gold bar in 2010 has pleaded guilty.

Appearing Friday at Key West's federal courthouse, Richard Steven Johnson, of Rio Linda, California, pleaded guilty to conspiring to steal an object of cultural heritage and stealing a major artwork.

The 74.85-ounce gold bar valued at \$556,000 was found in 1980 on a 1622 Spanish galleon wreck site off the Florida Keys by late shipwreck

salvor Mel Fisher.

Until the theft, the bar was displayed in an acrylic case at the Mel Fisher Maritime Museum where visitors could touch it. Investigators proved that Johnson broke the case. Johnson's sentencing date was not set. Alleged co-conspirator Jarred Alexander Goldman, Palm Beach Gardens, Florida, is scheduled for trial next month.

No information is available regarding the bar's status.



This August 2010 photo shows a 17th-century gold bar, valued at \$550,000, at the Mel Fisher Maritime Heritage Museum in Key West. One of two men accused of stealing the gold bar has pleaded guilty.

[ROB O'NEAL / THE KEY WEST CITIZEN VIA AP]

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Flood Awareness Week 2018

Go to scgov.net for more information.

Anywhere it Rains it Can Flood

Hurricanes, tropical storms and heavy rainfall can occur any time in Sarasota County, making YOUR property subject to flooding.

6. Protect natural floodplain functions.

Keep swales and drainage ditches clear of debris to ensure water flow. Visit scgov.net/FloodProtection.

Only rain down the drain!

5. Build responsibly.

Find out what permits are required. Be aware of substantial improvement rules. Visit scgov.net/building.

Be prepared.

- Know your hurricane evacuation zones.
- Inventory and photograph everything in your home or business.
- Make a flood emergency plan.

Everything you need to know is in the Sarasota County Disaster Planning Guide available at scgov.net/AllHazards.

1. Find out what your flood hazard is.

View flood maps at scgov.net/FloodMaps.

2. Buy flood insurance.

Contact your agent for rates and coverage options or visit floodsmart.gov.

3. Stay safe.

Tune to radio stations 1450 AM or 970 AM for up-to-date flood and emergency information.

Turn around, don't drown.

4. Protect your property from flood hazards.

Raise electrical system components.

Call Sarasota County at 941-861-5000 for a property protection consultation or site visit to evaluate your drainage and retrofitting options. Visit scgov.net/FloodProtection.



TOWN OF LONGBOAT KEY 2018 FLOOD AND HURRICANE AWARENESS NEWSLETTER

Flood Hazards – How to protect yourself and your property

Flood Hazard Area

Longboat Key residents live within a floodplain. Additionally, all of Longboat Key is designated as a Special Flood Hazard Area since our community is subject to a one percent or greater chance of flooding in any year. Your property may be vulnerable to flooding from heavy storms. Contact the Longboat Key Planning, Zoning & Building Department (941-316-1966) or the Public Works Department (941-316-1988) to find out which flood zone your property is in according to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMS).

Flood Warning

Longboat Key, Manatee, and Sarasota

Warnings are issued via television and radio. Tune in to these media for instructions during times of possible severe weather. The Town of Longboat Key CodeRED Emergency Notification System provider delivers automated telephone notifications to registered participants.

Register your information for the CodeRED Emergency Notification System online at www.longboatkey.org (click on Residents, CodeRED). RE-REGISTER to update your settings if you initially registered prior to March 2016.

Hurricane evacuation maps are printed in the Sarasota and Bradenton phone books. Sarasota and Manatee County Hurricane Evacuation Maps are also available at the Police Department at 5460 Gulf of Mexico Drive, Fire Department at 5490 Gulf of Mexico Drive, Town Hall and Building Department at 501 Bay Isles Road, and at the Public Works Department located at 600 General Harris Street.

Flood Safety

Being aware of what steps you can take to minimize your loss prior to a flood is the first step to safety.

- Listen for weather updates and stay informed.
- Keep portable radio, flashlight and fresh batteries on hand.
- Turn off gas and electricity. (Call service provider for assistance.)
- Clear your yard, porch or patio of all loose objects.
- Moor your boat securely.
- Store enough drinking water for 5 days in clean containers.
- Know your evacuation route; know where to go.
- Have a backup plan if the storm track changes.

Caution: Do not drive or walk through a flooded area. Drowning is the number one cause of flood related deaths. Statistically, more people drown in their cars than any place else during flood events. Currents can be deceptive; six inches of moving water can sweep you off your feet. Don't drive around road barriers, the road may be washed out or there may be downed power lines. The number two killer during flood events is electrocution. Electrical current can flow through water. Report downed power lines to FPL (1-800-4-OUTAGE or 1-800-468-8243).

Don't Forget Your Pets!

If you must evacuate do not leave your animals behind. Evacuate them to a pre-arranged safe location if they cannot stay with you during the evacuation period. (Remember, pets are only allowed at pet friendly designated shelters.) If there is a possibility that disaster may strike while you are away from home, there are precautions you can take to increase your pet's chance of survival but they are not a substitute for evacuating with your pets. For more information, contact the Humane Society of the United States, Disaster Services, 2100 L Street NW, Washington DC 20037 (www.hsus.org), 202-452-1100.

Hurricane Evacuation

You may be advised to leave the island between 30 and 72 hours before a hurricane strikes. Because of expected off island heavy rains and gale force wind conditions, evacuation during daylight hours is strongly recommended. Evacuation routes may be flooded 24 hours before a hurricane hits. Although forcible evacuation is legal, Longboat Key Public Safety Departments will not force you to evacuate against your will. Any person who wishes to remain on the Key after evacuation has been ordered will be asked to give the Police Department the name of their next of kin. After Town Staff evacuates the Key and flooding begins, there may be no water and sewer service, nor telephone or electric power service. All buildings, regardless of height, will be subject to severe damage and, quite possibly, total destruction. Persons residing in condominiums above the first floor are advised that they are just as much at risk as are those residing in single family homes. Please note that elevators in multi-floor buildings may not function. By calling one number, 511, motorists everywhere in the State can find out about construction updates, lane closures, traffic incidents, severe weather reports and Amber and Silver Alerts. For more information about this new Statewide service, please visit: <http://www.fl511.com/>.

Property Protection

Moving outdoor furniture and relocating downstairs furniture to upper stories or higher locations may minimize loss. Sandbags can be placed to help slow down flood waters reaching your possessions. Retrofitting is a way to minimize loss prior to floods occurring. This involves building flood walls, elevating structures, etc. The Longboat Key Planning, Zoning & Building Department can assist property owners in retrofitting techniques and in how to select a contractor.

Flood Insurance

Regular homeowner insurance policies do not cover losses due to flooding. The Federal Insurance Administration (FIA) makes flood insurance available to everyone in the Town through private insurance agents. This is because the Town of Longboat Key participates in the National Flood Insurance Program (NFIP) which is administered by the FIA. For most individuals a home and its contents are their greatest investments. More information is available at <http://www.floodsmart.gov/floodsmart/>.

We strongly urge you to buy flood insurance to protect yourself from a devastating loss. Through the efforts of Town staff participating in the Community Rating System (CRS) Programs, citizens are eligible for up to a 25% discount on flood insurance rates. Continued citizen support of these programs and their requirements will help mitigate against future loss as well. Information about Federally backed flood policies is available to everyone in the Town through private insurance agents. Property owners can insure their buildings and contents, and renters can insure their possessions.

Further Information and Flood Zone Determination

As a public service, the Town of Longboat Key will provide you with the following information upon request:

- Where your property on Longboat Key lies within one of the respective Manatee or Sarasota County maps within the Special Flood Hazard Area (SFHA) as shown on the current Flood Insurance Rate Map (FIRM).
- Additional flood insurance risk data for a site, such as the FIRM zone and the base flood elevation requirements, including any additional freeboard requirement above the Base Flood Elevation (BFE) shown on the FIRM.
- We have a handout on the flood insurance purchase requirement that can help people who need a mortgage or loan for a property in the SFHA.
- The Town maintains elevation certificates for new and substantially improved structures in the SFHA.
- The Town updates the Flood Insurance Rate Maps as needed when revisions are made to the maps.
- The Town also has information in addition to the FIRM information, problems not shown on the FIRM, special flood related hazards, historical flood information, and natural floodplain functions.
- To obtain flood zone and flood protection assistance information, please contact the Planning, Zoning & Building Department (941-316-1966) located at 501 Bay Isles Road on Longboat Key from 8:00 am to 5:00 pm, Monday through Friday. There is no charge for this service.

A variety of pamphlets and other information are available, as well as copies of the Flood Insurance Rate Maps. Realtors, Insurance Agents or property owners can also obtain copies of Elevation Certificates on file for Longboat Key properties. When available, Flood Elevation certificates for a particular address are accessible at [www.longboatkey.org/PlanningZoning & Building Department/Elevation Certificates](http://www.longboatkey.org/PlanningZoning&BuildingDepartment/ElevationCertificates). Additionally, the Manatee County Central Library (941-748-5555) and

Sarasota County Selby Public Library (941-861-1100) have reference sections devoted to floodplain management, protection and information.

Disaster Mitigation Efforts

The Town participates with both Sarasota and Manatee County Local Mitigation Strategy (LMS) groups. These groups are designed to insure our municipality is prepared for all types of disasters. The LMS insures the Town is eligible for disaster mitigation funding after a declared event. The LMS also includes the Town's primary Floodplain Management Plan. Both the LMS document and the Annual Report on the Town's Floodplain Management Plan are available at Town Hall for review. Please take an opportunity to visit, and/or call the Public Works Department at (941) 361-6411, ext. 2213 for additional information.

How Can I Help Our Community?

Do your part in helping to preserve the storm drainage systems. Do not throw anything into drainage structures, ditches, swales, or streams. This is a violation of Town Ordinances. Often grass clippings, mulches, branches and debris can accumulate and clog or plug storm water flow through the system and potentially contribute to flooding.

Who Can I Call If I See:

- | | |
|---|--|
| ▪ Illegal dumping? | (941) 316-1976 Police Community Services |
| ▪ Debris or blockages in a drainage system? | (941) 316-1988 Public Works |
| ▪ Construction work without a permit? | (941) 316-1966 Planning, Zoning & Building |

Home Improvements

Be aware that for any structure in the Town of Longboat Key, local ordinances, as well as Federal and State Laws and Codes, require that:

- Any structure that is damaged to more than 50% of its market value, OR
- Any structure where improvements are planned where the cost of improvements to the structure is more than 50% of its market value, OR
- Any combination of the two above; then, ...

The repair or improvements must be built to meet current floodplain Codes including, in some cases, elevation of the structure to the required flood elevation. These requirements will be explained to you when you apply for building permits. Contact the Planning, Zoning & Building Department (941-316-1966) for more information.

Repetitive Loss Properties

For the purposes of identifying properties facing significant risk of flooding, the NFIP defines a Repetitive Loss Property as "one that has had two or more losses of greater than \$1,000 each within any 10-year period."

Compared to the occurrence of a fire, people in floodplains are 27 times more likely to experience a flood during a 30-year mortgage.

Some repetitive loss buildings have been replaced or properly elevated. Some owners of repetitive loss properties have simply dropped National Flood Insurance coverage for economic or coverage limitation reasons.

If you want more information regarding aspects of owning a repetitive loss property, what measures can be taken to help prevent loss, or retrofitting and mitigation efforts to bring your property into compliance, please contact the Planning, Zoning & Building Department at (941) 316-1966.

Town staff members are available to conduct site visits, when requested, to discuss flooding, drainage problems and retrofitting options. You can also contact Florida Division of Emergency Management (FDEM), or State Floodplain Management Office (floods@em.myflorida.com, 850-413-9960), or the FDEM Website: www.floridadisaster.org.

TOWN OF LONGBOAT KEY 2018 SUMMER EDITION

Public Works Department
600 General Harris Street
Longboat Key, FL 34228
Phone: 941-361-6411, ext. 2213
Email: jlinkogle@longboatkey.org
www.longboatkey.org

TOWN COMMISSION

George Spoll, Mayor
Ed Zunz, Vice Mayor
Randy Clair, District 1
Ken Schneier, District 3
Jack Daly, District 4
Jim Brown, At Large
Irwin Pastor, At Large

Tom Harmer, Town Manager

Register your **CodeRED Emergency Notification information** online at www.longboatkey.org (Click on Residents, CodeRED). Did you register **PRIOR** to March 2016? You should **RE-REGISTER** to opt-in for Severe Weather Warnings. The additional service warns residents by cell phone, text, and/or email when the National Weather Service issues tornado, flooding, or other severe weather warnings.

2018 FLOOD-HURRICANE AND DISASTER AWARENESS SEMINAR

"The Aftermath of "IRMA-Geddon"

The annual disaster preparedness seminar is to be held on Thursday, May 31 from 3:15pm to 6:00pm at the Longboat Key Club Harbourside Ballroom, 3000 Harbourside Drive, Longboat Key. The keynote speaker is Elizabeth Cuevas-Neunder, President of the Puerto Rican Chamber of Commerce of Florida. Invited speakers are Bob Harrigan, ABC7 News Chief Meteorologist, and Sarasota and Manatee County Emergency Managers. RSVP required to the Chamber of Commerce at 383-2466. First 125 pre-registered attendees will receive a giveaway bag with a ticket for a door prize and a virgin Hurricane drink. Light appetizers served, compliments of The Resort at Longboat Key Club. Disaster Preparedness Seminar is sponsored by Aqua Plumbing & Air.

Longboat Key Receives Deeper Discount for Community Rating System

The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages Community Floodplain management activities that exceed the minimum NFIP requirements. For CRS participating communities, flood insurance premium rates are discounted in increments of 5% (i.e., a Class 1 community would receive a 45% premium discount, while a Class 9 community would receive a 5% discount). Longboat Key is now a Class 5 CRS participating community with a **25%** premium discount. Check with your insurance agent at renewal time to insure you are getting the proper discount. CRS Coordinator James Linkogle will be happy to answer any of your questions and is available at (941) 361-6411, ext. 2213.

DATE	POST
4/28/18 Facebook	Did you know that most areas in Sarasota County are potentially prone to some amount of flooding from excessive rainfall or tidal influences? Property owners need to know their flood risk. Go to https://ags2.scgov.net/SarcoFlood/ to find yours.
4/28/18 Twitter	Did you know that most areas in Sarasota County are potentially prone to some amount of flooding from excessive rainfall or tidal influences? Property owners need to know their flood risk. Go to https://ags2.scgov.net/SarcoFlood/ to find yours.
4/29/18 Facebook	Flood insurance is available to everyone regardless if you rent, own or have a business. Flood insurance is not included in your property insurance policy, but flood insurance for full coverage begins at \$450 a year for a \$250,000 structure and \$100,000 contents. Premiums are based on your flood risk. For more information, visit https://www.fema.gov/national-flood-insurance-program .
4/29/18 Twitter	Did you know that flood insurance is available to everyone regardless if you rent, own or have a business? Flood insurance is not included in your property insurance policy. Premiums are based on your flood risk. For more information, visit https://www.fema.gov/national-flood-insurance-program .
4/30/18 Facebook	Stay safe. Intense or excessive rainfall can overtop canals and ditches, flooding streets. Remember to turn around, don't drown, as driving in flooded streets can stall your car and cause wave action to further flood structures along the road. Prepare ahead for bad weather and make a flood emergency plan today. For more information, visit http://www.nws.noaa.gov/os/water/tadd/ .
4/30/18 Twitter	Stay safe. Intense or excessive rainfall can overtop canals and ditches, flooding streets. Remember to turn around, don't drown, as driving in flooded streets can stall your car. Prepare ahead for bad weather and make a flood emergency plan today. For more information, visit http://www.nws.noaa.gov/os/water/tadd/ .
5/1/18 Facebook	Protect your property from flood hazards. Insurance is your first level of protection. Other methods include installing flood vents where appropriate or raising electrical system components. For more

	information on how to protect your property, visit scgov.net/floodprotection or call 941-861-5000.
5/1/18 Twitter	Protect your property from flood hazards. Insurance is your first level of protection. Other methods include installing flood vents where appropriate or raising electrical system components. For more information on how to protect your property, visit scgov.net/floodprotection or call 941-861-5000.
5/2/18 Facebook	Build responsibly. Avoid building in floodplains. Before you build, find out what the regulations are and what permits are required. Be aware of substantial improvement rules, which are there to correct structures built before regulations and flood mapping. These apply when a structure is below a known base flood elevation. For more information, visit scgov.net/floodprotection .
5/2/18 Twitter	Before you build, find out what the regulations are and what permits are required. For more information, visit scgov.net/floodprotection .
5/3/18 Facebook	Protect our natural floodplain functions. Keep swales and drainage ditches clear of debris to ensure water flow. Report the dumping of materials to 941-861-5000. Learn more about natural floodplains at scgov.net/floodprotection .
5/3/18 Twitter	Protect our natural floodplain functions. Keep swales and drainage ditches clear of debris to ensure water flow. Report the dumping of materials to 941-861-5000. Learn more about natural floodplains at scgov.net/floodprotection .
5/4/18 Facebook	Most areas in Sarasota County are prone to some amount of flooding from coastal flooding, including sea level rise. Learn about scientific predictions for rising sea levels in Sarasota County and potential impacts on our coastal community. https://coast.noaa.gov/digitalcoast/tools/slr
5/4/18 Twitter	Most areas in Sarasota County are potentially prone to some amount of flooding from coastal flooding, including sea level rise. Learn about scientific predictions for rising sea levels in Sarasota County and potential impacts on our coastal community. https://coast.noaa.gov/digitalcoast/tools/slr
5/5/18 Facebook	What would it cost if Sarasota County lost its infrastructure or pristine beaches due to flooding? In 2014, the economic value of Sarasota Bay was reported at \$11.8

	<p>billion.</p> <p>But there are ways to help. Mitigation through insurance, retrofitting, relocation or elevating saves a community \$6 for every \$1 spent. For more information about federal grant programs for mitigating your structure, visit fema.gov/grants.</p>
5/5/18 Twitter	<p>What would it cost if Sarasota County lost its infrastructure or beaches due to flooding? In 2014, the economic value of Sarasota Bay was reported at \$11.8 billion.</p> <p>But mitigation can save a community \$6 for every \$1 spent. For more information, visit fema.gov/grants.</p>

OUTREACH PROJECT - SARASOTA COUNTY FLOOD INFORMATION STORYMAP

PROJECT DESCRIPTION	Sarasota County is currently developing an Esri storymap as a resource for the public to be able to find information relating to flood risks in their area, download elevation certificates, learn about natural floodplain functions, and other information that will help them better prepare for flood hazards.
WHEN WILL THIS PROJECT BE IMPLEMENTED?	Begin date: October, 2017 End date: Ongoing
WHO IS THE TARGET AUDIENCE?	All residents
WHAT CRS TOPICS ARE COVERED?	<input checked="" type="checkbox"/> TOPIC 1: KNOW YOUR FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 2: INSURE YOUR PROPERTY FOR YOUR FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 3: PROTECT PEOPLE FROM THE FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 4: PROTECT YOUR PROPERTY FROM FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 5: BUILD RESPONSIBLY <input checked="" type="checkbox"/> TOPIC 6: PROTECT NATURAL FLOODPLAIN FUNCTIONS <input type="checkbox"/> TOPIC 7: HURRICANE PREPAREDNESS <input type="checkbox"/> TOPIC 8: FLOOD ECONOMICS <input type="checkbox"/> TOPIC 9: SEA LEVEL RISE
WHAT ARE THE MESSAGES?	A1, B1, C1, C2, D1, D2, E1, E2, F1
WHAT ARE THE OUTCOMES?	A1, B1, C1, D1, D2, E1, F1
WHO IS RESPONSIBLE FOR THE PROJECT?	Donna Bailey, CFM CRS Specialist Sarasota County Government 1001 Sarasota Center Blvd. Sarasota, FL 34240 941-861-0917 (office); 941-525-8915 (cell) Email: dabailey@scgov.net
HOW WILL THIS PROJECT BE DISTRIBUTED?	<ul style="list-style-type: none"> - Social media - Publicized at annual events and workshops - Online

ARE THERE RELATED
CRS ACTIVITIES?

320 – The storymap provides FIRM information, access to available elevation certificates, and other hazard information. This will improve the county’s ability to query and distribute the information the public.

350 – The storymap enhances the county’s existing flood protection information website by providing FIRM information, access to available elevation certificates, and other hazard information that is much easier to understand.

WHAT STAKEHOLDERS ARE INVOLVED?	Lenders, realtors, insurance agents
WHICH JURISDICTIONS ARE INVOLVED IN THIS PROJECT?	- Sarasota County
WHAT ARE THE POSSIBLE SUCCESS INDICATORS?	<ul style="list-style-type: none">- Increased web traffic.- Increased number of FEMA policies.- Increased subscribers to County’s alert system and social media.
WHAT IS THE PROJECT STATUS?	JULY, 2018 Draft storymap completed.

OUTREACH PROJECT - SARASOTA COUNTY FLOOD PROTECTION ASSISTANCE

PROJECT DESCRIPTION	Notify the public that flood protection assistance is available.
WHEN WILL THIS PROJECT BE IMPLEMENTED?	Begin date: January 2016 End date: On going
WHO IS THE TARGET AUDIENCE?	All residents of unincorporated Sarasota County
WHAT CRS TOPICS ARE COVERED?	<input checked="" type="checkbox"/> TOPIC 1: KNOW YOUR FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 2: INSURE YOUR PROPERTY FOR YOUR FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 3: PROTECT PEOPLE FROM THE FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 4: PROTECT YOUR PROPERTY FROM FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 5: BUILD RESPONSIBLY <input checked="" type="checkbox"/> TOPIC 6: PROTECT NATURAL FLOODPLAIN FUNCTIONS <input type="checkbox"/> TOPIC 7: HURRICANE PREPAREDNESS <input type="checkbox"/> TOPIC 8: FLOOD ECONOMICS <input type="checkbox"/> TOPIC 9: SEA LEVEL RISE
WHAT ARE THE MESSAGES?	A1, B1, C2, D1, D2, E1, E2, F3, H1, H2, H3
WHAT ARE THE OUTCOMES?	A1, B1, C1, D1, D2, E1, F1, H1, H2, H3
WHO IS RESPONSIBLE FOR THE PROJECT?	Desiree Companion, CFM CRS Coordinator Sarasota County Government 1001 Sarasota Center Blvd. Sarasota, FL 34240 941-861-0802 (office) Email: dcompani@scgov.net
HOW WILL THIS PROJECT BE DISTRIBUTED?	- Online through our website
ARE THERE RELATED CRS ACTIVITIES?	360 – PPA, PPV, FAA

WHAT STAKEHOLDERS ARE INVOLVED?	
WHICH JURISDICTIONS ARE INVOLVED IN THIS PROJECT?	- Sarasota County
WHAT ARE THE POSSIBLE SUCCESS INDICATORS?	<ul style="list-style-type: none"> - Reduced loss of property. - Reduced number of claims. - Protection of natural functioning floodplains.
WHAT IS THE PROJECT STATUS?	MAY 2018 The project is complete

OUTREACH PROJECT - SARASOTA COUNTY FLOOD PROTECTION INFORMATION WEBSITE

PROJECT DESCRIPTION	Flood protection information – Sarasota County Water Atlas http://www.sarasota.wateratlas.usf.edu/flood-protection#flood-protection
WHEN WILL THIS PROJECT BE IMPLEMENTED?	Begin date: 2017 End date: ongoing – pages updated as necessary
WHO IS THE TARGET AUDIENCE?	All residents
WHAT CRS TOPICS ARE COVERED?	<input checked="" type="checkbox"/> TOPIC 1: KNOW YOUR FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 2: INSURE YOUR PROPERTY FOR YOUR FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 3: PROTECT PEOPLE FROM THE FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 4: PROTECT YOUR PROPERTY FROM FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 5: BUILD RESPONSIBLY <input checked="" type="checkbox"/> TOPIC 6: PROTECT NATURAL FLOODPLAIN FUNCTIONS <input checked="" type="checkbox"/> TOPIC 7: HURRICANE PREPAREDNESS <input checked="" type="checkbox"/> TOPIC 8: FLOOD ECONOMICS <input checked="" type="checkbox"/> TOPIC 9: SEA LEVEL RISE
WHAT ARE THE MESSAGES?	A1, B1, C1, C2, D1, D2, E1, E2, F1, F2, F3, G1, G2, G3, H1, H2, H3, I1
WHAT ARE THE OUTCOMES?	A1, B1, C1, D1, D2, E1, F1, G1, G2, H1, H2, H3, I1, I2, I3
WHO IS RESPONSIBLE FOR THE PROJECT?	Donna Bailey, CFM CRS Specialist Sarasota County Government 1001 Sarasota Center Blvd. Sarasota, FL 34240 941-861-0917 (office); 941-525-8915 (cell) Email: dabailey@scgov.net
HOW WILL THIS PROJECT BE DISTRIBUTED?	- Main webpages for flood protection

ARE THERE RELATED CRS ACTIVITIES?	330 - Outreach
	320 – Map information service
	350 – Flood protection information
	360 – Publicity
	540 – Publicity
	610 - Publicity

WHAT
STAKEHOLDERS ARE
INVOLVED?

WHICH
JURISDICTIONS ARE
INVOLVED IN THIS
PROJECT?

- Sarasota County

WHAT ARE THE
POSSIBLE SUCCESS
INDICATORS?

- Reduced loss of property.
- Reduced number of claims.
- Reduced compliance issues.
- Increased FEMA flood policies.
- Water quality.
- Safer community.

WHAT IS THE
PROJECT STATUS?

2018
The project is complete

OUTREACH PROJECT - SARASOTA COUNTY FLOOD ZONE WORKSHOPS

PROJECT DESCRIPTION	Public flood zone workshops
WHEN WILL THIS PROJECT BE IMPLEMENTED?	Begin date: 2015 End date: ongoing
WHO IS THE TARGET AUDIENCE?	ALL
WHAT CRS TOPICS ARE COVERED?	<input checked="" type="checkbox"/> TOPIC 1: KNOW YOUR FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 2: INSURE YOUR PROPERTY FOR YOUR FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 3: PROTECT PEOPLE FROM THE FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 4: PROTECT YOUR PROPERTY FROM FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 5: BUILD RESPONSIBLY <input checked="" type="checkbox"/> TOPIC 6: PROTECT NATURAL FLOODPLAIN FUNCTIONS <input checked="" type="checkbox"/> TOPIC 7: HURRICANE PREPAREDNESS <input checked="" type="checkbox"/> TOPIC 8: FLOOD ECONOMICS <input checked="" type="checkbox"/> TOPIC 9: SEA LEVEL RISE
WHAT ARE THE MESSAGES?	A1, B1, C1, C2, D1, D2, E1, E2, F1, F2, F3, G1, G2, G3, H1, H2, H3, I1
WHAT ARE THE OUTCOMES?	A1, B1, C1, D1, D2, E1, F1, G1, G2, H1, H2, H3, I1, I2, I3
WHO IS RESPONSIBLE FOR THE PROJECT?	Des Companion CFM CRS Coordinator Sarasota County Government 1001 Sarasota Center Blvd. Sarasota, FL 34240 941-861-0802 (office) Email: dcompani@scgov.net
HOW WILL THIS PROJECT BE DISTRIBUTED?	- Through various libraries, HOAs and interest groups

ARE THERE RELATED CRS ACTIVITIES?	330 - outreach 320 – Map Information Service 350 – Flood Protection Information 360 – Publicity 540 – Publicity 610 - Publicity
WHAT STAKEHOLDERS ARE INVOLVED?	Lenders, Realtors, Insurance Agents
WHICH JURISDICTIONS ARE INVOLVED IN THIS PROJECT?	<ul style="list-style-type: none"> - Sarasota County - City of Sarasota - City of North Port
WHAT ARE THE POSSIBLE SUCCESS INDICATORS?	<ul style="list-style-type: none"> - Reduced loss of property. - Reduced number of claims. - Reduced compliance issues. - Increased FEMA flood policies. - Water quality. - Safer community.
WHAT IS THE PROJECT STATUS?	2018 Ongoing

FLOOD ZONE WORKSHOPS

Attention residents, lenders, insurance and real estate agents!

You're invited to attend a flood zone workshop.

You'll learn about your flood risks, zones, maps, regulations, mandatory insurance purchase requirements and why flood zone maps are continuously updated.

All workshops are from 10:15 a.m. to noon. No registration required.



North Port Library

13800 Tamiami Trail, North Port

Tuesday, Jan. 30

Tuesday, Feb. 20

Tuesday, March 20

Tuesday, April 17

Tuesday, Sept. 25

Selby Library

1331 First St., Sarasota

Tuesday, Jan. 23

Tuesday, Feb. 13

Tuesday, May 8

Tuesday, Sept. 18

Gulf Gate Library

7112 Curtiss Ave., Sarasota

Tuesday, March 6

Wednesday, Sept. 19

Tuesday, Oct. 16



Elsie Quirk Library

100 Dearborn St., Englewood

Wednesday, Jan. 24

Thursday, March 29

Wednesday, Sept. 12

Thursday, Oct. 11

Thursday, Nov. 8



Jacaranda Library

4143 Woodmere Park Blvd., Venice

Tuesday, Jan. 9

Thursday, Feb. 22

Thursday, March 15

Wednesday, Sept. 26

Wednesday, Oct. 17



Fruitville Library

100 Coburn Road, Sarasota

Thursday, Feb. 15

Wednesday, April 4

Tuesday, Oct. 9

Tuesday, Nov. 13



Want to schedule a presentation for your organization?

Call the Sarasota County Contact Center at 941-861-5000 and ask for Des Companion.

2018 schedule


Sarasota County
scgov.net | 941.861.5000

OUTREACH PROJECT - SARASOTA COUNTY HAZARD DISCLOSURE

PROJECT DESCRIPTION	Hazard disclosure / Special Flood Hazard Area (SFHA) with a direct link to the flood protection webpages. flood zone locator application: ags3.scgov.net/sarcoflood
WHEN WILL THIS PROJECT BE IMPLEMENTED?	Begin date: 2016 End date: ongoing – maps updated as necessary
WHO IS THE TARGET AUDIENCE?	All residents
WHAT CRS TOPICS ARE COVERED?	<input checked="" type="checkbox"/> TOPIC 1: KNOW YOUR FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 2: INSURE YOUR PROPERTY FOR YOUR FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 3: PROTECT PEOPLE FROM THE FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 4: PROTECT YOUR PROPERTY FROM FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 5: BUILD RESPONSIBLY <input checked="" type="checkbox"/> TOPIC 6: PROTECT NATURAL FLOODPLAIN FUNCTIONS <input checked="" type="checkbox"/> TOPIC 7: HURRICANE PREPAREDNESS <input checked="" type="checkbox"/> TOPIC 8: FLOOD ECONOMICS <input checked="" type="checkbox"/> TOPIC 9: SEA LEVEL RISE
WHAT ARE THE MESSAGES?	A1, B1, C1, C2, D1, D2, E1, E2, F1, G1, G2, G3, H1, H2, H3, I1
WHAT ARE THE OUTCOMES?	A1, B1, C1, D2, E1, G1, G2, H1, H2, H3, I1, I2, I3
WHO IS RESPONSIBLE FOR THE PROJECT?	Donna Bailey, CFM CRS Specialist Sarasota County Government 1001 Sarasota Center Blvd. Sarasota, FL 34240 941-861-0917 (office); 941-525-8915 (cell) Email: dabailey@scgov.net
HOW WILL THIS PROJECT BE DISTRIBUTED?	- Part of our flood zone locator application
ARE THERE RELATED CRS ACTIVITIES?	322 - MI5 400 – Flood mapping

WHAT STAKEHOLDERS ARE INVOLVED?	
WHICH JURISDICTIONS ARE INVOLVED IN THIS PROJECT?	<ul style="list-style-type: none"> - Sarasota County - City of Sarasota - Town of Longboat Key - City of North Port - City of Venice
WHAT ARE THE POSSIBLE SUCCESS INDICATORS?	<ul style="list-style-type: none"> - Reduced loss of property. - Reduced number of claims. - Reduced compliance issues. - Increased FEMA flood policies.
WHAT IS THE PROJECT STATUS?	2017 The project is complete

OUTREACH PROJECT - SARASOTA COUNTY HAZARD DISCLOSURE

PROJECT DESCRIPTION	Hazard disclosure / Community Flood Hazard Area (CFHA) with a direct link to the Flood protection webpages. flood zone locator application: ags3.scgov.net/sarcoflood
WHEN WILL THIS PROJECT BE IMPLEMENTED?	Begin date: 2016 End date: ongoing – maps updated as necessary
WHO IS THE TARGET AUDIENCE?	All residents
WHAT CRS TOPICS ARE COVERED?	<input checked="" type="checkbox"/> TOPIC 1: KNOW YOUR FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 2: INSURE YOUR PROPERTY FOR YOUR FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 3: PROTECT PEOPLE FROM THE FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 4: PROTECT YOUR PROPERTY FROM FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 5: BUILD RESPONSIBLY <input checked="" type="checkbox"/> TOPIC 6: PROTECT NATURAL FLOODPLAIN FUNCTIONS <input checked="" type="checkbox"/> TOPIC 7: HURRICANE PREPAREDNESS <input checked="" type="checkbox"/> TOPIC 8: FLOOD ECONOMICS <input checked="" type="checkbox"/> TOPIC 9: SEA LEVEL RISE
WHAT ARE THE MESSAGES?	A1, B1, C1, C2, D1, D2, E1, E2, F1, G1, G2, G3, H1, H2, H3, I1
WHAT ARE THE OUTCOMES?	A1, B1, C1, D2, E1, G1, G2, H1, H2, H3, I1, I2, I3
WHO IS RESPONSIBLE FOR THE PROJECT?	Donna Bailey, CFM CRS Specialist Sarasota County Government 1001 Sarasota Center Blvd. Sarasota, FL 34240 941-861-0917 (office); 941-525-8915 (cell) Email: dabailey@scgov.net
HOW WILL THIS PROJECT BE DISTRIBUTED?	- Part of our flood zone locator application
ARE THERE RELATED CRS ACTIVITIES?	322 - MI5 400 – Flood mapping

WHAT STAKEHOLDERS ARE INVOLVED?	
WHICH JURISDICTIONS ARE INVOLVED IN THIS PROJECT?	<ul style="list-style-type: none"> - Sarasota County - City of Sarasota
WHAT ARE THE POSSIBLE SUCCESS INDICATORS?	<ul style="list-style-type: none"> - Reduced loss of property. - Reduced number of claims. - Reduced compliance issues. - Increased FEMA flood policies.
WHAT IS THE PROJECT STATUS?	2017 The project is complete

OUTREACH PROJECT - SARASOTA COUNTY PROPERTY APPRAISER FLOOD DISPLAY

PROJECT DESCRIPTION	Flood information displayed on the tax assessor database/property appraiser online records.
WHEN WILL THIS PROJECT BE IMPLEMENTED?	Begin date: September 2017 End date: Ongoing / data is updated and uploaded daily
WHO IS THE TARGET AUDIENCE?	All residents and non-residents
WHAT CRS TOPICS ARE COVERED?	<input checked="" type="checkbox"/> TOPIC 1: KNOW YOUR FLOOD HAZARD <input type="checkbox"/> TOPIC 2: INSURE YOUR PROPERTY FOR YOUR FLOOD HAZARD <input type="checkbox"/> TOPIC 3: PROTECT PEOPLE FROM THE FLOOD HAZARD <input type="checkbox"/> TOPIC 4: PROTECT YOUR PROPERTY FROM FLOOD HAZARD <input type="checkbox"/> TOPIC 5: BUILD RESPONSIBLY <input type="checkbox"/> TOPIC 6: PROTECT NATURAL FLOODPLAIN FUNCTIONS <input type="checkbox"/> TOPIC 7: HURRICANE PREPAREDNESS <input type="checkbox"/> TOPIC 8: FLOOD ECONOMICS <input type="checkbox"/> TOPIC 9: SEA LEVEL RISE
WHAT ARE THE MESSAGES?	A1
WHAT ARE THE OUTCOMES?	A1
WHO IS RESPONSIBLE FOR THE PROJECT?	Donna Bailey, CFM CRS Specialist Sarasota County Government 1001 Sarasota Center Blvd. Sarasota, FL 34240 941-861-0917 (office); 941-525-8915 (cell) Email: dabailey@scgov.net
HOW WILL THIS PROJECT BE DISTRIBUTED?	- Online through the Property Appraiser's website

ARE THERE RELATED
CRS ACTIVITIES?

310 – Elevation certificates are available on the direct link to the flood zone locator program.
320 - Map Information Service.
340 – Hazard disclosure – realtors use this service to advise their clients.
410 – Flood hazard mapping.
440 – This flood display links directly to the county’s map flood zone locator program. The committee determined what map information to display on the property appraiser website.

WHAT STAKEHOLDERS ARE INVOLVED?	Realtors, lenders and insurance agents
WHICH JURISDICTIONS ARE INVOLVED IN THIS PROJECT?	<ul style="list-style-type: none"> - Sarasota County - City of Sarasota - Town of Longboat Key - City of Venice - City of North Port
WHAT ARE THE POSSIBLE SUCCESS INDICATORS?	<ul style="list-style-type: none"> - Increased web traffic. - Increased number of FEMA policies.
WHAT IS THE PROJECT STATUS?	SEPTEMBER 2017 Project completed.

Projects / Progress

Property Appraiser Flood Information Display

<https://ags3.scgov.net/parcels/>

Property record information last updated on: 11/8/2017

FEMA Flood Zone (Data provided by Sarasota County Government as of 11/6/2017)

FIRM Panel	Floodway	SFHA	Flood Zone **	Community	Base Flood Elevation (ft)	CFHA *
0133F	OUT	IN	VE	125150	14	OUT
0133F	OUT	IN	VE	125150	13	OUT

* If your property is in a SFHA or CFHA, use the [map](#) to determine if the building footprint is within the flood area.

** For more information on flood and flood related issues specific to this property, call (941) 954-4127
For general questions regarding the flood map, call (941) 861-5000.



OUTREACH PROJECT - SARASOTA COUNTY RL NOTIFICATION LETTER

PROJECT DESCRIPTION	Sarasota County repetitive loss area notification letter. City of Sarasota repetitive loss area notification letter.
WHEN WILL THIS PROJECT BE IMPLEMENTED?	Begin date: January 2017 End date: Ongoing / this is an annual letter
WHO IS THE TARGET AUDIENCE?	Property owners in the repetitive loss areas
WHAT CRS TOPICS ARE COVERED?	<input checked="" type="checkbox"/> TOPIC 1: KNOW YOUR FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 2: INSURE YOUR PROPERTY FOR YOUR FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 3: PROTECT PEOPLE FROM THE FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 4: PROTECT YOUR PROPERTY FROM FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 5: BUILD RESPONSIBLY <input checked="" type="checkbox"/> TOPIC 6: PROTECT NATURAL FLOODPLAIN FUNCTIONS <input type="checkbox"/> TOPIC 7: HURRICANE PREPAREDNESS <input type="checkbox"/> TOPIC 8: FLOOD ECONOMICS <input type="checkbox"/> TOPIC 9: SEA LEVEL RISE
WHAT ARE THE MESSAGES?	A1, B1, C1, C2, D1, D2, E1, E2, F1, G2, G3
WHAT ARE THE OUTCOMES?	A1, C1, D2, E1, G1, G2, H1, H2, H3, I1
WHO IS RESPONSIBLE FOR THE PROJECT?	<p>Sarasota County Donna Bailey, CFM CRS Specialist Sarasota County Government 1001 Sarasota Center Blvd. Sarasota, FL 34240 941-861-0917 (office); 941-525-8915 (cell) Email: dabailey@scgov.net</p> <p>City of Sarasota Todd Kerkerling, CEM, CFM, FPEM Emergency Manager City of Sarasota 2099 Adams Lane Sarasota, FL 34237 (941) 363-5811 Email: Richard.Kerkerling@sarasotaFL.gov</p>

HOW WILL THIS
PROJECT BE
DISTRIBUTED?

- Annually through postal mail.

ARE THERE RELATED
CRS ACTIVITIES?

330 – Outreach, Topics 1-7
540 - Publicity
610 - Publicity

WHAT
STAKEHOLDERS ARE
INVOLVED?

WHICH
JURISDICTIONS ARE
INVOLVED IN THIS
PROJECT?

- Sarasota County
- City of Sarasota

WHAT ARE THE
POSSIBLE SUCCESS
INDICATORS?

- Increased number of FEMA policies.
- Decreased permits for flood repair.

WHAT IS THE
PROJECT STATUS?

LETTER IS DUE ANNUALLY.

OUTREACH PROJECT - SARASOTA COUNTY SOCIAL MEDIA OUTREACH

PROJECT DESCRIPTION	Sarasota County maintains Facebook and Twitter account pages to inform the public about various topics including flood-related issues. These platforms present a great opportunity to relay information about flood risks and to get the messages out. These platforms can be used during regular operations as well as distribute important safety information during a hazard event.
WHEN WILL THIS PROJECT BE IMPLEMENTED?	Begin date: 2016 End date: ongoing – Social Media messages are blasted on a schedule through a CRS Communications Plan
WHO IS THE TARGET AUDIENCE?	ALL
WHAT CRS TOPICS ARE COVERED?	<input checked="" type="checkbox"/> TOPIC 1: KNOW YOUR FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 2: INSURE YOUR PROPERTY FOR YOUR FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 3: PROTECT PEOPLE FROM THE FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 4: PROTECT YOUR PROPERTY FROM FLOOD HAZARD <input checked="" type="checkbox"/> TOPIC 5: BUILD RESPONSIBLY <input checked="" type="checkbox"/> TOPIC 6: PROTECT NATURAL FLOODPLAIN FUNCTIONS <input checked="" type="checkbox"/> TOPIC 7: HURRICANE PREPAREDNESS <input checked="" type="checkbox"/> TOPIC 8: FLOOD ECONOMICS <input checked="" type="checkbox"/> TOPIC 9: SEA LEVEL RISE
WHAT ARE THE MESSAGES?	A1, B1, C1, C2, D1, D2, E1, E2, F1, F2, F3, G1, G2, G3, H1, H2, H3, I1
WHAT ARE THE OUTCOMES?	A1, B1, C1, D1, D2, E1, F1, G1, G2, H1, H2, H3, I1, I2, I3
WHO IS RESPONSIBLE FOR THE PROJECT?	Donna Bailey, CFM CRS Specialist Sarasota County Government 1001 Sarasota Center Blvd. Sarasota, FL 34240 941-861-0917 (office); 941-525-8915 (cell) Email: dabailey@scgov.net
HOW WILL THIS PROJECT BE DISTRIBUTED?	- Social Media / Facebook and Twitter

ARE THERE RELATED CRS ACTIVITIES?	330 – Outreach
	320 – Map Information Service
	350 – Flood Protection Information
	360 – Publicity
	540 – Publicity
	610 – Publicity

WHAT
STAKEHOLDERS ARE
INVOLVED?

WHICH
JURISDICTIONS ARE
INVOLVED IN THIS
PROJECT?

- Sarasota County

WHAT ARE THE
POSSIBLE SUCCESS
INDICATORS?

- Reduced loss of property
- Reduced number of claims
- Reduced compliance issues
- Increased FEMA flood policies
- Water quality

WHAT IS THE
PROJECT STATUS?

2018
Ongoing

ATTACHMENT 1

PPI Meeting Minutes



AGENDA

SARASOTA COUNTY PROGRAM FOR PUBLIC INFORMATION (PPI) COMMITTEE KICK-OFF MEETING

May 24, 2017 @ 10:30 a.m. – 12:00 p.m

Sarasota County Operations Center, BOB, Conference Room 7

1001 Sarasota Center Blvd., Sarasota, FL 34240

GoTo Meeting login: <https://global.gotomeeting.com/join/239719189>

Call in number: (872) 240-3311; Access Code: 239-719-189

INVITEES:

Official Members	Representing
Donna Bailey, dabailey@scgov.net Ed McCrane, emccrane@scgov.net Kirsten Pedersen, kpedersen@scgov.net James Linkogle, jlinkogle@longboatkey.org Todd Kerkering, Richard.Kerkering@sarasotaFL.gov	Public Utilities, Sarasota County Emer. Services, Sarasota County Communications, Sarasota County Public Works, Town of Longboat Key Emergency Services, City of Sarasota
Stakeholder Members	Representing
Katherine Howington, katherine.howington@bankersinsurance.com Sherry Bitner, sherryb@verizon.net Darcy Young, darcy@sarasotabay.org Neil Fleet, nfleet@amiwra.com Don Hermey, dhermey@mote.org Christina Pitchford, christina@yourhometownconsultant.com Pete Travis, pete.travis@torrentcorp.com Jessica Williams, jessica.williams@weareflood.com Sharon Gould, sharon.gould@floridamoves.com Kathy Kelley Ohlrich, kkohlrich@gmail.com Carl Shoffstall, carlS@Floridaplaystructures.com	Bankers Insurance Solutions First Mortgage Sarasota Bay Estuary Program AMI-Bay Isles Mote Marine Your Hometown Torrent Corporation We Are Flood Florida Moves CCNA CCNA
Additional Resource Staff	Representing
Kelly Westover, kwestover@scgov.net Buster Chapin, Gerald.Chapin@sarasotaFL.gov	Sarasota County City of Sarasota
Consultants	Representing
Cece McKiernan, cece@mckiernanconsulting.us Khan Bouphe, kbouphe@jonesedmunds.com	McKiernan Consulting JEA



- 10:30 AM – Call meeting to order – Introduction of participants and purpose for PPI
- 11:00 AM – Highlight current outreach efforts
- 11:30 AM – Ongoing outreach efforts not listed (group)
- 11:45 PM – Presentation of suggested targeted outreach projects
- 11:55 PM – Next steps and next meetings – 8/15 & 9/19 (both 10:00 – 11:30)
- 12:00 PM - Adjourn



Sign-In Sheet - 05/24/2017

**SARASOTA COUNTY PROGRAM FOR PUBLIC INFORMATION (PPI) COMMITTEE
KICK-OFF MEETING**

<u>Attendees</u>	<u>Representing</u>	<u>Email</u>	<u>Signature</u>
Donna Bailey	SC Public Utilities	dabailey@scgov.net	
Ed McCrane	SC Emergency Management	emccrane@scgov.net	
Kirsten Pedersen	SC Communications	kpetersen@scgov.net	
James Linkogle	Town of Longboat Key	jlinkogle@longboatkey.org	
Todd Kerkerling	City of Sarasota	Richard.Kerkerling@sarasotaFL.gov	
Buster Chapin	City of Sarasota	Gerald.Chapin@sarasotaFL.gov	
Kelly Westover	SC Public Utilities	kwestover@scgov.net	KW
Katherine Howington	Bankers Insurance (Insurance)	katherine.howington@bankersinsurance.com	
Sherry Bitner	Solutions First Mortgage (Lender)	sherryb@verizon.net	
Darcy Young	Sarasota Bay Estuary Program	darcy@sarasotabay.org	
Neil Fleet	AMI-Bay Isles	nfleet@amiwra.com	
Don Hermey	Mote Marine Laboratory & Aquarium	dhermey@mote.org	RM on the phone

Christina Pitchford	Your Hometown (Realtor)	christina@yourhometownconsultant.com	
Pete Travis	Torrent Corporation (Insurance)	pete.travis@torrentcorp.com	
Jessica Williams	We Are Flood (Insurance)	jessica.williams@weareflood.com	
Sharon Gould	Florida Moves (Realtor)	sharon.gould@floridamoves.com	
Kathy Kelly Ohlrich	CCNA	kkohlrich@gmail.com	
Carl Shoffstall	CCNA	carls@floridaplaystructures.com	
Khan Bouphe	Jones Edmunds	kbouphe@jonesedmunds.com	
Cece McKiernan	McKiernan Consulting	cece@mckiernanconsulting.us	
Susan Gray	SARASOTA COUNTY		
GILLIAN CARNEY			

Kelley

[Handwritten signature]

Kathy Kelley Ohlrich

[Handwritten signature]
Cec McKiernan

PHONE:



NOTES

SARASOTA COUNTY PROGRAM FOR PUBLIC INFORMATION (PPI) COMMITTEE KICK-OFF MEETING

May 24, 2017 @ 10:30 a.m. – 12:00 p.m

Sarasota County Operations Center, BOB, Conference Room 7

1001 Sarasota Center Blvd., Sarasota, FL 34240

GoTo Meeting login: <https://global.gotomeeting.com/join/239719189>

Call in number: (872) 240-3311; Access Code: 239-719-189

ATTENDEES:

Official Members	Representing
Donna Bailey, dabailey@scgov.net	Public Utilities, Sarasota County
Kirsten Pedersen, kpedersen@scgov.net	Communications, Sarasota County
James Linkogle, jlinkogle@longboatkey.org	Public Works, Town of Longboat Key
Todd Kerkerling, Richard.Kerkerling@sarasotaFL.gov	Emergency Services, City of Sarasota
Stakeholder Members	Representing
Sherry Bitner, sherryb@verizon.net	Solutions First Mortgage
Darcy Young, darcy@sarasotabay.org	Sarasota Bay Estuary Program
Don Hermey, dhermey@mote.org	Mote Marine
Christina Pitchford, christina@yourhometownconsultant.com	Your Hometown
Pete Travis, pete.travis@torrentcorp.com	Torrent Corporation
Jessica Williams, jessica.williams@weareflood.com	We Are Flood
Kathy Kelley Ohlrich, kkohlrich@gmail.com	CCNA
Gillian Carney, GCarney@Venicegov.com	City of Venice
Additional Resource Staff	Representing
Kelly Westover, kwestover@scgov.net	Sarasota County
Susan Gray, sgray@scgov.net	Sarasota County
Consultants	Representing
Cece McKiernan, cece@mckiernanconsulting.us	McKiernan Consulting
Khan Boupha, kboupha@jonesedmunds.com	Jones Edmunds & Associates

Introductions and Objective

- a) Ongoing efforts to prepare, implement, and monitor a range of flood related public information activities.
- b) Half of committee members have to be shareholders. Current makeup of the committee includes representation by County staff; Real Estate Board; Mortgage Industry; Insurance Industry; Neighborhood Association; and Estuary Program Staff.

Highlight current outreach efforts

- a) Project List included in the Agenda
- b) Communications developed a flood flyer to highlight the CRS topics
 - o This flood flyer should remain simple – the messages should be concise and show available resources and contact information.
 - o The flood flyer was previously advertised in the phone book, the Herald Tribune, and sent to municipalities within Sarasota County.
 - o Kirsten suggested the committee evaluate the flyer.
- c) Donna Bailey mentioned that the County Property Appraiser might be able to add flood information directly on the parcel records online.
- d) Sarasota County currently conducts regular workshops throughout the County. These are general presentations with Q&A. Kelly Westover suggested new locations be identified for next year. In addition, there may be an opportunity for this committee to develop and incorporate more CRS messages.

Ongoing outreach efforts not listed (group)

- b) Realtor materials that address flood information
- c) Real estate disclosure project
- d) Parks flyers to include flood messages
- e) CCNA – there is an annual presentation in early May given by EOC (Ed McCrane)
 - o Email notices were sent out to 43 neighborhood associations

Presentation of suggested targeted outreach projects

- a) 'On hold' messaging at the call center that could contain flood information
- b) Have the flood flyer translated into Spanish
- c) Workshops that are directed to specific audiences such as realtors and insurance
- d) Jessica Williams suggested educating realtors about available resources
 - o Association can recommend realtors to attend the flood workshops
 - o Get flyers out to members
- e) Stakeholder members can disseminate messages through their organizations
- f) Coordination of outreach efforts with the Neighborhood Environmental Stewardship Team (NEST)

Next steps and next meetings – 8/15 & 9/19 (both 10:00 – 11:30)

- a) Continue to collect current outreach information
- b) Consider additional outreach and targets
- c) Compile flood response projects
- d) Develop topics/messages & link to measureable outcomes.

Adjourn



AGENDA

SARASOTA COUNTY PROGRAM FOR PUBLIC INFORMATION (PPI) COMMITTEE MEETING

August 15, 2017 @ 10:00 a.m. – 11:30 a.m.

Sarasota County Operations Center, BOB, Conference Room 1

1001 Sarasota Center Blvd., Sarasota, FL 34240

GoTo Meeting login: <https://global.gotomeeting.com/join/504280893>

Call in number: (646) 749-3131; Access Code: 504-280-893

INVITEES:

Official Members	Representing
Donna Bailey, dabailey@scgov.net	Public Utilities, Sarasota County
Ed McCrane, emccrane@scgov.net	Emer. Services, Sarasota County
Pat Haire, phaire@scgov.net	Communications, Sarasota County
James Linkogle, jlinkogle@longboatkey.org	Public Works, Town of Longboat Key
Todd Kerkerling, Richard.Kerkerling@sarasotaFL.gov	Emergency Services, City of Sarasota
Stakeholder Members	Representing
Katherine Howington, katherine.howington@bankersinsurance.com	Bankers Insurance
Sherry Bitner, sherryb@verizon.net	Solutions First Mortgage
Darcy Young, darcy@sarasotabay.org	Sarasota Bay Estuary Program
Neil Fleet, nfleet@amiwra.com	AMI-Bay Isles
Don Hermey, dhermey@mote.org	Mote Marine
Christina Pitchford, christina@yourhometownconsultant.com	Your Hometown
Pete Travis, pete.travis@torrentcorp.com	Torrent Corporation
Jessica Williams, jessica.williams@weareflood.com	We Are Flood
Sharon Gould, sharon.gould@floridamoves.com	Florida Moves
Kirsten Pedersen, kpedersen01@gmail.com	Sarasota County Citizen Stakeholder
Kathy Kelley Ohlrich, kkohlrich@gmail.com	CCNA
Carl Shoffstall, carlS@Floridaplaystructures.com	CCNA
Additional Resource Staff	Representing
Kelly Westover, kwestover@scgov.net	Sarasota County
Buster Chapin, Gerald.Chapin@sarasotaFL.gov	City of Sarasota
Consultants	Representing
Cece McKiernan, cece@mckiernanconsulting.us	McKiernan Consulting
Khan Bouphe, kbouphe@jonesedmunds.com	Jones Edmunds

- 10:00 AM – Call meeting to order – Introduction of participants and purpose of meeting
- 10:10 AM – Review PPI checklist
- 10:20 AM – Recap of current outreach efforts and new projects
- 10:40 AM – Development of target audiences
- 11:00 AM – Development of target messages and outcomes
- 11:25 AM – Next steps and next meeting – 9/19 (10:00 – 11:30)
- 11:30 AM - Adjourn



Sign-In Sheet

SARASOTA COUNTY PROGRAM FOR PUBLIC INFORMATION (PPI) COMMITTEE MEETING

August 15, 2017 @ 10:00 p.m. – 11:30 p.m


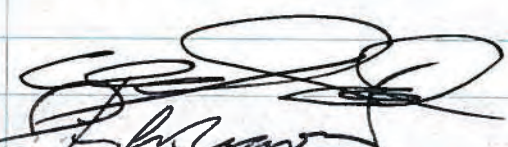




Sarasota County Operations Center, BOB, Conference Room 1

1001 Sarasota Center Blvd., Sarasota, FL 34240

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Attendees	Representing	Email	Signature
Donna Bailey	SC Public Utilities	dabailey@scgov.net	
Ed McCrane	SC Emergency Management	emccrane@scgov.net	
Pat Haire	SC Communications	phaire@scgov.net	
James Linkogle	Town of Longboat Key	jlinkogle@longboatkey.org	
Todd Kerkerling	City of Sarasota	Richard.Kerkerling@sarasotaFL.gov	
Buster Chapin	City of Sarasota	Gerald.Chapin@sarasotaFL.gov	
Kelly Westover	SC Public Utilities	kwestover@scgov.net	
Katherine Howington	Bankers Insurance (Insurance)	katherine.howington@bankersinsurance.com	
Sherry Bitner	Solutions First Mortgage (Lender)	sherryb@verizon.net	
Darcy Young	Sarasota Bay Estuary Program	darcy@sarasotabay.org	

Neil Fleet	AMI-Bay Isles	nfleet@amiwra.com	
Don Hermey	Mote Marine Laboratory & Aquarium	dhermey@mote.org	
Christina Pitchford	Your Hometown (Realtor)	christina@yourhometownconsultant.com	
Pete Travis	Torrent Corporation (Insurance)	pete.travis@torrentcorp.com	
Jessica Williams	We Are Flood (Insurance)	jessica.williams@weareflood.com	
Sharon Gould	Florida Moves (Realtor)	sharon.gould@floridamoves.com	
Khan Bouphe	Jones Edmunds	kbouphe@jonesedmunds.com	
Cece McKiernan	McKiernan Consulting	cece@mckiernanconsulting.us	
Kirsten Pedersen	Public stakeholder (resident)	kpetersen01@gmail.com	
Kathy Kelley Ohlrich	CCNA	kkohlrich@gmail.com	
Carl Shoffstall	CCNA	carls@floridaplaystructures.com	
Mollie K. Holland	SC Nest	mkholland@scgov.net	

SARASOTA COUNTY FLOODPLAIN MANAGEMENT PROGRAM

MEETING DATE:

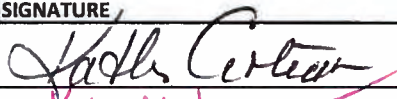



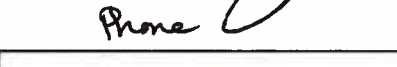



August 15, 2017

MEETING LOCATION:

Sarasota County Emergency Operation Center

SUBJECT:

Floodplain Management Plan Committee Meeting

NAME	REPRESENTING	EMAIL	SIGNATURE
Kathy Croteau	Sarasota County, Planning and Development Services, Building Dept.	kcroteau@scgov.net	
Kelly Westover	Sarasota County, Public Utilities CRS	kwestover@scgov.net	
Donna Bailey	Sarasota County, Public Utilities CRS	dabailey@scgov.net	
Ed McCrane	Sarasota County, Emergency Services	emccrane@scgov.net	
Allen Parsons	Sarasota County, Planning and Development Services	aparsons@scgov.net	
John King	Rampart Homes, Construction Industry	sales@ramparthomesinc.com	
Elizabeth Wong	City of North Port	ewong@cityofnorthport.com	
Kathleen Weeden	City of Venice	kathleen.weeden@venicegov.com	
Gillian Carney	City of Venice	Gcarney@venicegov.com	
James Linkogle	Town of Long Boat Key	jlinkogle@longboatkey.org	
Buster Chapin	City of Sarasota	gerald.chapin@sarasotagov.com	
Todd Kerkerling	City of Sarasota	Richard.Kerkerling@sarasotagov.com	
Sal Depaolis	ASCE Chapter President	sdepaolis@wraengineering.com	
Norm Robertson	ASCE Chapter Vice President	Norman.Robertson@atkinsglobal.com	
Kim Clayback	City of Bradenton	Kim.Clayback@cityofbradenton.com	
Dawn Turner	SWFWMD	Dawn.Turner@swfwmd.state.fl.us	

NAME	REPRESENTING	EMAIL	SIGNATURE
Scott Letasi	SWFWMD	scott.letasi@swfwmd.state.fl.us	
Mike Klosterman	Sarasota Memorial Healthcare Facilities	michael-klosterman@smh.com	
Michael Andreas	Security & Emergency Mgmt., Sarasota County Schools	michael.andreas@sarasotacountyschools.net	
Jim Bugyis	Sarasota Memorial Healthcare Facilities	jim-bugyis@smh.com	
Tammi Canelli	Sarasota County, SC Emergency Services	tcanelli@scgov.net	
Howard Berna	Sarasota County, Resource Protection	hberna@scgov.net	
Sherry Phillips-Smith	Sarasota County, EIT - GIS	sphillip@scgov.net	
Lin Kurant	Sarasota County, Real Property	lkurant@scgov.net	
Jon Robinson	Sarasota County, Parks, Rec and Natural Resources	jmrobins@scgov.net	
Kirsten Pedersen	Sarasota County Citizen Stakeholder	kpetersen@scgov.net	
Susan Gray	Sarasota County, Stormwater Administration Assistant	sgray@scgov.net	
Bob Laura	Sarasota County, Public Utilities Stormwater	rlaura@scgov.net	<i>Bob Laura</i>
Khan Bouphe	Jones Edmunds	kbouphe@jonesedmunds.com	<i>Khan Bouphe</i>
Arthur "Skip" Preece	Captiva Gardens HOA	skippreece@aol.com	
J.P. Marchand	Resident	jp.marchand@swfwmd.state.fl.us	
Cheryl Swenny	Sarasota County	cswenney@scgov.net	
NEIL FLEET	ADVANCED MANAGEMENT, INC.	NFLEET@AMIPRA.COM	<i>[Signature]</i>



NOTES

SARASOTA COUNTY PROGRAM FOR PUBLIC INFORMATION (PPI) COMMITTEE MEETING

August 15, 2017 @ 10:00 a.m. – 11:30 a.m.

Sarasota County Operations Center, BOB, Conference Room 1

1001 Sarasota Center Blvd., Sarasota, FL 34240

GoTo Meeting login: <https://global.gotomeeting.com/join/504280893>

Call in number: (646) 749-3131; Access Code: 504-280-893

Attendees:

Official Members	Representing	Present
Donna Bailey, dabailey@scgov.net	Public Utilities, Sarasota County	Y
Ed McCrane, emccrane@scgov.net	Emer. Services, Sarasota County	Y
Pat Haire, phaire@scgov.net	Communications, Sarasota County	Y
James Linkogle, jlinkogle@longboatkey.org	Public Works, Town of Longboat Key	Y
Todd Kerkerling, Richard.Kerkerling@sarasotaFL.gov	Emergency Services, City of Sarasota	Y
Stakeholder Members	Representing	
Katherine Howington, katherine.howington@bankersinsurance.com	Bankers Insurance	Y
Sherry Bitner, sherryb@verizon.net	Solutions First Mortgage	Y
Darcy Young, darcy@sarasotabay.org	Sarasota Bay Estuary Program	Y
Neil Fleet, nfleet@amiwra.com	AMI-Bay Isles	Y
Don Hermey, dhermey@mote.org	Mote Marine	N
Christina Pitchford, christina@yourhometownconsultant.com	Your Hometown	Y
Pete Travis, pete.travis@torrentcorp.com	Torrent Corporation	Y
Jessica Williams, jessica.williams@weareflood.com	We Are Flood	Y

Sharon Gould, sharon.gould@floridamoves.com	Florida Moves	N
Kirsten Pedersen, kpedersen01@gmail.com	Sarasota County Citizen Stakeholder	Y
Kathy Kelley Ohlrich, kkohlrich@gmail.com	CCNA	Y
Carl Shoffstall, carlS@Floridaplaystructures.com	CCNA	N
Additional Resource Staff	Representing	
Kelly Westover, kwestover@scgov.net	Sarasota County	Y
Susan Gray, sgray@scgov.net	Stormwater Administration Assistant	Y
Buster Chapin, Gerald.Chapin@sarasotaFL.gov	City of Sarasota	N
Consultants	Representing	
Cece McKiernan, cece@mckiernanconsulting.us	McKiernan Consulting	Y
Khan Boupha, kboupha@jonesedmunds.com	Jones Edmunds	Y

- 10:00 AM – Call meeting to order – Introduction of participants and purpose of meeting
- 10:10 AM – Review PPI checklist
- 10:20 AM – Recap of current outreach efforts and new projects
- 10:40 AM – Development of target audiences
- 11:00 AM – Development of target messages and outcomes
- 11:25 AM – Next steps and next meeting – 9/19 (10:00 – 11:30)
- 11:30 AM – Adjourn

Introductions were made by members in person and on the phone. The purpose of the meeting was explained by Cece McKiernan and Khan Boupha through a presentation that covered the bulleted points. The end of the presentation included an exercise where all members worked together to come up with audiences and messages for the 6 main topics. Highlights of the discussions included:

- Floodsmart is down. Existing flyers may have to be revised in the future. For now, the link will redirect to FEMA’s version of the website.

- James L. asked whether individual phone numbers should be listed under each topic on the flyer. Donna indicated that the process goes through a clearinghouse. There is one phone number to call, and inquirers will be directed to the appropriate department.
- Kirsten suggested a program that PGT had implemented for intellectual leaders – the sharing of information between companies and with the general public.
- Christina suggested a program the real estate sector used for outreach called “RASM on the road”. Christina also brought real estate disclosure forms realtors can use for disclosure that will give the PPI program stakeholder credit.
- Ed McCrane let us know there is a conference room at the EOC available for training sessions that seats from 300 – 400 people.
- Sherry Bitner (on phone) suggested something as simple as adding a link to flood insurance in your signature line can provide outreach.

During the exercise, the group identified target audiences. In addition to the general residents identified for at-risk areas, each of the stakeholders also identified specific audiences to which they had direct contact and can provide valuable assistance for reaching those audiences. These target audiences and the respective messages included:

The possible audiences & messages included:

AUDIENCES	MESSAGES
Architects and/or Designers	How to educate buyers on designs that will not increase insurance costs
County leaders and/or Commissioners; Barrier Island Elected Officials	Educate about flood risks and encourage flood insurance; Encourage consistent and programmatic approach to educate residents about flood risks
Home Builders/Developers	Why build low instead of high?; Educated audience about Code Requirements (including zoning) vs FEMA requirements vs risk; Rating Class options;
Community Association Institute (SWFL Chapter)	Outreach for flood risk topics and available resources at the county
Mortgage Brokers Association	Outreach for flood risk topics and available resources at the

	county
Chamber of Commerce	Outreach for flood risk topics and available resources at the county
Schools	Education materials about flood risk
Mortgage Broker Associations	Des gives workshops through this sector to educate about flood risk and the County's resources
Consumers	<p>Educate consumers to ask the right questions of builders. Know that savings may offset extra construction costs.</p> <p>Don't let your policy lapse.</p> <p>Understand map changes before they happen and save \$\$.</p> <p>Risk is not ID'ed on a map.</p> <p>Sources of information for highwater marks.</p>
Home Buyers / Realtors	Educate buyers / realtors to ask or relay information about flood risk.
Home Owners Associations	Email lists can be used to relay information about flood risk topics
Utility Customers	Provide information about flood risk topics and available resources in utility bill inserts.
Mobile homes and condo owner's associations	Email/informational brochures to educate about flood risk topics

The group also discussed some projects that are in progress as well as new project ideas. These projects included:

- Map changes workshops (completed)
 - Next time, may consider having an insurance professional at the map outreach meetings to provide changes in rate information.
- Flood flyer (completed)

- Property Appraiser Records (in-progress)
 - Flood information will be displayed on the property records
 - Information developed by the County's GIS department
 - Disclaimer will be added as the information is for the parcel and not necessarily for a particular structure.
- County flood risk website
 - Add subject "Don't let flood insurance coverage lapse"
 - Group should provide other ideas to include on the County's site
- Flood Map website
 - Develop a story map to not only display the flood information, but convey what it means
 - Keep web map simple for general public
 - Map services can be a tool for realtors
 - Training/presentations for realtors by realtors



AGENDA

SARASOTA COUNTY PROGRAM FOR PUBLIC INFORMATION (PPI) COMMITTEE MEETING

November 28, 2017 @ 10:00 a.m. – 11:30 a.m.

Sarasota County Operations Center, BOB, Conference Room 1

1001 Sarasota Center Blvd., Sarasota, FL 34240

GoTo Meeting login: <https://global.gotomeeting.com/join/637580949>

Call in number: (872) 240-3212; Access Code: 637-580-949

INVITEES:

Official Members	Representing
Donna Bailey, dabailey@scgov.net	Public Utilities, Sarasota County
Ed McCrane, emccrane@scgov.net	Emer. Services, Sarasota County
Pat Haire, phaire@scgov.net	Communications, Sarasota County
James Linkogle, jlinkogle@longboatkey.org	Public Works, Town of Longboat Key
Todd Kerkerling, Richard.Kerkerling@sarasotaFL.gov	Emergency Services, City of Sarasota
Stakeholder Members	Representing
Katherine Howington, katherine.howington@bankersinsurance.com	Bankers Insurance
Sherry Bitner, sherryb@verizon.net	Solutions First Mortgage
Darcy Young, darcy@sarasotabay.org	Sarasota Bay Estuary Program
Neil Fleet, nfleet@amiwra.com	AMI-Bay Isles
Don Hermey, dhermey@mote.org	Mote Marine
Christina Pitchford, christina@yourhometownconsultant.com	Your Hometown
Pete Travis, pete.travis@torrentcorp.com	Torrent Corporation
Jessica Williams, jessica.williams@weareflood.com	We Are Flood
Sharon Gould, sharon.gould@floridamoves.com	Florida Moves
Kirsten Pedersen, kpedersen01@gmail.com	Sarasota County Citizen Stakeholder
Kathy Kelley Ohlrich, kkohlrich@gmail.com	CCNA
Carl Shoffstall, carlS@Floridaplaystructures.com	CCNA
Additional Resource Staff	Representing
Kelly Westover, kwestover@scgov.net	Sarasota County
Buster Chapin, Gerald.Chapin@sarasotaFL.gov	City of Sarasota
Consultants	Representing
Cece McKiernan, cece@mckiernanconsulting.us	McKiernan Consulting
Khan Boupha, kboupha@jonesedmunds.com	Jones Edmunds



- 10:00 AM – Call meeting to order – Introduction of participants and purpose of meeting
- 10:10 AM – Review PPI checklist
- 10:20 AM – Summarize Messages and Target Audiences
- 11:00 AM – PPI Projects
- 11:25 AM – Next steps and next meeting
- 11:30 AM – Adjourn



Sign-In Sheet

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James Linkogle	Town of Longboat Key	jlinkogle@longboatkey.org	
Todd Kerkerling	City of Sarasota	Richard.Kerkerling@sarasotaFL.gov	on the phone
Buster Chapin	City of Sarasota	Gerald.Chapin@sarasotaFL.gov	
Kelly Westover	SC Public Utilities	kwestover@scgov.net	
Katherine Howington	Bankers Insurance (Insurance)	katherine.howington@bankersinsurance.com	
Sherry Bitner	Solutions First Mortgage (Lender) RE FINANCIAL SVCS. INC.	sherryb@verizon.net	
Darcy Young	Sarasota Bay Estuary Program	darcy@sarasotabay.org	

Neil Fleet	AMI-Bay Isles	nfleet@amiwra.com	
Don Hermey	Mote Marine Laboratory & Aquarium	dhermey@mote.org	
Christina Pitchford	Your Hometown (Realtor)	christina@yourhometownconsultant.com	
Pete Travis	Torrent Corporation (Insurance)	pete.travis@torrentcorp.com	
Jessica Williams	We Are Flood (Insurance)	jessica.williams@weareflood.com	<i>Jessica Williams</i>
Sharon Gould	Florida Moves (Realtor)	sharon.gould@floridamoves.com	
Khan Bouphe	Jones Edmunds	kbouphe@jonesedmunds.com	<i>K. Bouphe</i>
Cece McKiernan	McKiernan Consulting	cece@mckiernanconsulting.us	<i>Cece McKiernan</i>
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Kathy Kelley Ohlrich	CCNA	kkohlrich@gmail.com	
Carl Shoffstall	CCNA	carls@floridaplaystructures.com	
Claire Aronson	SC Communications	caronson@sc.gov.net	<i>Claire Aronson</i>



NOTES

SARASOTA COUNTY PROGRAM FOR PUBLIC INFORMATION (PPI) COMMITTEE MEETING

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Sherry Bitner, sherryb@verizon.net	Solutions First Mortgage
Neil Fleet, nfleet@amiwra.com	AMI-Bay Isles
Jessica Williams, jessica.williams@weareflood.com	We Are Flood
Additional Resource Staff	Representing
Claire Aronson, caronson@scgov.net	Communications, Sarasota County
Bob Laura, rlaura@scgov.net	Watershed Engineering
Consultants	Representing
Cece McKiernan, cece@mckiernanconsulting.us	McKiernan Consulting
Khan Boupha, kboupha@jonesedmunds.com	Jones Edmunds

1. 10:00 AM – Call meeting to order – Introduction of participants and purpose of meeting

Cece called the meeting to order.

There was a brief introduction of participants both in person and on the telephone. Cece then discussed the purpose of the meeting.

2. 10:10 AM – Review PPI checklist

A quick review of the PPI checklist including where we are now and what steps are left.

3. 10:20 AM – Summarize Messages and Target Audiences

We discussed how we can track messaging to be sure the messages are effective. Website counter, post-storm count of permits vs violations? James also discussed the need to track substantial improvements. What about the building department? Plan reviewers? Todd recommended looking at the percentage of code violations to the number of permits if that information is readily available in the permit system.

4. 11:00 AM – PPI Projects

- a) Sherry suggested links in the language of the website.*
- b) Sherry did notice the new flood information on the property appraiser page and thought that it was a great addition. Future revisions may include a link to the web story map when it is completed to provide more information.*
- c) James suggested method of providing information by prompting the audience with specific questions and linking to the “answers” to appropriate information.*
- d) We discussed the Flood Awareness Week and how we might coordinate with FFMA, FDEM, insurance agents and realtors.*
- e) Khan talked about the story-map. He reviewed a brief survey he created and implemented at his office to illustrate the lack of knowledge about flood related information the general public has.*
- f) Pat suggested creating a survey that will evaluate the answers (for example, if a person did not know the correct zone or does not know what Pre- and Post-FIRM mean, provide a link showing the user what they didn’t know). She also suggested a contact person shown at the end so if a user had questions, they can speak with someone. Khan will work on something that can be incorporated into the story-map.*
- g) Jessica inquired whether such a survey can be made available to her and folks in her industry. The information may prove valuable in terms of prompting and educating the realtor industry.*
- h) Ed McCrane talked about the County considering changing the language of evacuation zones to evacuation levels in an attempt to separate the confusion between evacuation zones and flood zones.*

- i) *Khan discussed the project brainstorming: committee members were encouraged to ask themselves these questions as we develop projects. Projects may not be implemented immediately, but it will be good to have a list of projects/ideas to pull from.*

5. 11:25 AM – Next steps and next meeting

Khan will send a template of the story-map next week for distribution to the committee members for comments along with the notes from today's meeting and a copy of the power-point presentation. We will look for a time in January for the next meeting and will let the committee members know. We are aiming to take this PPI plan to the Board for adoption in early Spring 2018.

6. 11:30 AM – Adjourn



AGENDA

SARASOTA COUNTY PROGRAM FOR PUBLIC INFORMATION (PPI) COMMITTEE MEETING

February 13, 2018 @ 10:00 a.m. – 11:30 a.m.

Sarasota County Operations Center, BOB, Conference Room 1

1001 Sarasota Center Blvd., Sarasota, FL 34240

GoTo Meeting login: <https://global.gotomeeting.com/join/954821653>

Call in number: (646) 749-3122; Access Code: 954-821-653

INVITEES:

Official Members	Representing
Donna Bailey, dabailey@scgov.net	Public Utilities, Sarasota County
Ed McCrane, emccrane@scgov.net	Emer. Services, Sarasota County
Pat Haire, phaire@scgov.net	Communications, Sarasota County
James Linkogle, jlinkogle@longboatkey.org	Public Works, Town of Longboat Key
Todd Kerkerling, Richard.Kerkerling@sarasotaFL.gov	Emergency Services, City of Sarasota
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Carl Shoffstall, carlS@Floridaplaystructures.com	CCNA
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Buster Chapin, Gerald.Chapin@sarasotaFL.gov	City of Sarasota
Consultants	Representing
Cece McKiernan, cece@mckiernanconsulting.us	McKiernan Consulting
Khan Bouphe, kbouphe@jonesedmunds.com	Jones Edmunds



- 10:00 AM – Call meeting to order – introduction of participants and purpose of meeting
- 10:10 AM – Review PPI checklist
- 10:20 AM – PPI projects list
 - Review Storymap
 - Flood Awareness Week messages
- 11:20 AM – Additional project ideas
- 11:25 AM – Next steps and next meeting
- 11:30 AM – Adjourn



Sign-In Sheet

SARASOTA COUNTY PROGRAM FOR PUBLIC INFORMATION (PPI) COMMITTEE MEETING

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Donna Bailey	SC Public Utilities	dabailey@scgov.net	
Ed McCrane	SC Emergency Management	emccrane@scgov.net	
Pat Haire	SC Communications	phaire@scgov.net	
James Linkogle	Town of Longboat Key	jlinkogle@longboatkey.org	
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Don Hermey	Mote Marine Laboratory & Aquarium	dhermey@mote.org	
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Khan Boupha	Jones Edmunds	kboupha@jonesedmunds.com	
Cece McKiernan	McKiernan Consulting	cece@mckiernanconsulting.us	
Kirsten Pedersen	Public stakeholder (resident)	kpedersen01@gmail.com	
Kathy Kelley Ohlrich	CCNA	kkohlrich@gmail.com	
Carl Shoffstall	CCNA	carls@Floridaplaystructures.com	
Claire Aronson	SC Communications	caronson@scgov.net	
JAMES PODLUCKY	EMERGENCY MGMT	jpodlucky@scgov.NET	
Robert Laura			



NOTES

SARASOTA COUNTY PROGRAM FOR PUBLIC INFORMATION (PPI) COMMITTEE MEETING

February 13, 2018 @ 10:00 a.m. – 11:30 a.m.

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Jessica Williams, jessica.williams@weareflood.com	We Are Flood
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Claire Aronson, caronson@scgov.net	Communications, Sarasota County
Consultants	Representing
Cece McKiernan, cece@mckiernanconsulting.us	McKiernan Consulting
Khan Boupha, kboupha@jonesedmunds.com	Jones Edmunds

- 10:00 AM – Call meeting to order – introduction of participants and purpose of meeting
Cece called the meeting to order. Introductions were made and the purpose of the meeting outlined.
- 10:10 AM – Review PPI checklist
Cece began with a presentation that reviewed the PPI Checklist for the committee members.

- 10:20 AM – PPI projects list
 - Review Storymap

Khan gave a brief overview of the storymap. Comments by members were as follows:

 - James suggested making it a county-wide tool so all users (municipalities, realtors, insurance agents, etc.) can use it for outreach.
 - Christina asked about elevation certificates. Where are they all housed. We discussed the legal requirements of surveyors to upload these to the state. At this time, they are not available from the state as they have additional QC to perform. She suggested as a representative of the Florida Realtors Association, they may be able to contact the state.
 - James also suggested it would be nice to have the elevation certificates from other municipalities shown. We will have to look into whether or not that would be feasible.
 - Khan used the NWI data for the mapping of the natural floodplains. We will also look into what the most current data is for our natural floodplains. Perhaps reach out to GIS?
 - Christina suggested changing the title on the “Build Responsibly” page to better reach our audience. It was agreed to consider other names such as “minimize your risk”, “build more resilience”, “build sustainably”, etc..

Todd suggested adding permit information in this section as well.

Christina mentioned the greenest house in the country is located in Siesta Key and was built by Josh Wynn. It might be a good idea to showcase this home.

Jessica Williams has a host of photos she can share with us.
 - Todd suggested connecting to the FEMA website links for floodproofing in the “Protect your home or business” section. He will send the links to Khan to add to the storymap.
 - James suggested adding content that flood insurance is available to everyone and Todd reminded us it includes renters. This information does follow further down but we should add it at this place as well.
 - Todd suggested a resources page with all of the contact information for each municipality. I will send all of the CRS contacts to Khan. Cece asked if we could also include stakeholder contact information on the resources page. Donna asked about having the stakeholders disseminate information and how that can

give us additional CRS points. Jessica will look into whether or not they could keep a log on calls they disseminate information on that would be available to the county for auditing purposes.

- Don Hermey suggested having analytics on the pdfs so we could track how many times they've been downloaded.
- Cece suggested as a last suggestion that a link to the elevation certificates be available on the front page so when people return, they don't have to scroll through to that section.
- Review Flood Protection Awareness Week messaging
 - We reviewed the messaging for FPAW and no additional comments were added. Darcy Young sent comments earlier that were already incorporated into the messaging that was reviewed. We discussed the proclamation and the Town of Longboat Key and the City of Sarasota would like to join us in our proclamation. I will reach out to the cities of Venice and North Port to see if they would also like to join us.
- 11:20 AM – Additional project ideas
 - We reviewed the projects and no additional project ideas were mentioned. We will continue to review the projects on the list and when we can implement them.
- 11:25 AM – Next steps and next meeting
 - We will send a doodle poll out in a couple of weeks to schedule the next meeting. Khan will finish the draft PPI document and we will send it out for comments by the members before the next meeting.
- 11:30 AM – Adjourn

DRAFT

ATTACHMENT 2

Flood warning and response messages

SARASOTA COUNTY COMMUNICATIONS DEPARTMENT

Flood warning and response messages and media release templates

1 FLOOD WARNING AND RESPONSE OUTREACH MESSAGES

The following messages were designed to help the public prepare for a flooding event, and provide safety measures during and after an event.

1.1 BEFORE AN IMPENDING FLOODING EVENT

- The following message is transmitted at the request of Sarasota County Emergency Management. Dangerous flooding conditions are expected in the area of [neighborhood or municipality] near the [water body]. Water is expected to rise _(height)___feet per _(hour)_. Water levels could reach _____Feet. Residents in and near this area are ordered to begin evacuating outside of the flood area at _(Dat/Time)___due to the threat of rising water and flooding conditions. A shelter has been opened at the [facility]. While using roadways, travelers are advised to use caution and should not attempt to drive through moving water or water of undetermined depth. Stay tuned to local media for emergency updates and additional information.
- The following message is transmitted at the request of Sarasota County Emergency Management. Flash flooding conditions are possible in the [street or neighborhood] area. Residents in this area should take immediate action to move to higher ground, avoid travel, remain indoors, and move to a safe area within that location. Flooding conditions may include rapidly rising and moving water, dangerous debris, and unsafe travel conditions. If travel is unavoidable, drivers should not attempt to drive through moving water or water of undetermined depth. Stay tuned to local media for emergency updates and additional information.
- Determine whether you are in a possible evacuation zone. If so, prepare a disaster kit and plan for moving immediately if an evacuation is ordered.
- If you plan to stay in your home, have your disaster kit ready. Ensure a food and water supply for several days. Stay off roads in heavy weather leading up to the storm. If you must venture outside, watch for downed power lines and flying debris.
- Do not use candles for lighting, as they pose a fire hazard.
- Do not use charcoal for indoor cooking.
- Remember... "only rain down the drain" – help prevent flooding from clogged storm drains and waterways. Keep debris and trash out of the streets, streams and ditches.

1.2 DURING A FLOODING EVENT

- At this time, a mandatory evacuation order is in place for all residents living in a mobile home.
- A voluntary evacuation is urged for all residents living in a low-lying area or on barrier islands.
- These evacuations may be upgraded Monday depending on storm conditions. Shelters will open after 5 p.m. Monday. Stay tuned to local media for the latest storm advisories. Currently, Sarasota County Schools will be open Wednesday, June 3, along with all county and municipal services.
- Do not drive into flooded areas. Six inches of water will reach the bottom of most passenger cars and may cause loss of control and possible stalling. One foot of water will float many vehicles.
- Do not walk through moving water. Six inches of moving water can make you fall. If you have to walk in water, walk where the water is not moving. Use a stick to check the firmness of the ground in front of you.
- If you must prepare to evacuate, secure your home. If you have time, bring in outdoor furniture. Move essential items to an upper floor.

- Turn off utilities at the main switches or gas valves if instructed to do so. Disconnect electrical appliances. Do not touch electrical equipment if you are wet or standing in water.
- If you've come in contact with floodwaters, wash your hands with soap and disinfected water.
- Be aware that flash flooding can occur. If there is any possibility of a flash flood, move immediately to higher ground. Do not wait for instructions to move.
- Be aware of streams, drainage channels, canyons and other areas known to flood suddenly. Flash floods can occur in these areas with or without typical warnings such as rain clouds or heavy rain.

1.3 AFTER A FLOODING EVENT

- Residual flooding to roads and neighborhoods have now subsided and you may return to your home. If your home has flooded, turn off the electrical main power if it can be done from a dry location before you enter. Never turn power on or off while standing in water. Don't turn the power back on until electrical systems are inspected by a qualified electrician.
- Residual flooding to roads and neighborhoods have now subsided and you may return to your home. If your house has been closed up for several days, enter briefly to open doors and windows and then wait outside for at least 30 minutes to allow the house to air out.
- It is important to begin the flood insurance claims process as soon as possible. The sooner your claim is filed, the sooner you will receive your check to begin rebuilding.
- Call your insurance agent or insurance company. Make sure you have the name of your insurance company, your policy number, your contact information, and the date of loss.
- Make a list of damaged or lost items and include their age and value when possible. Also note model and serial numbers for major appliances. If available, have receipts for damaged or destroyed items to share with the adjuster.
- It is important to be aware of a number of health and safety risks in a post-flood environment so you can take the necessary precautions to protect yourself and your family. Visit www.Sarasotacounty.org/flooding/safety.htm for some safety tips.
- Listen for news reports to learn whether the community's water supply is safe to drink. Remember to carry bottled drinking water to flooded areas.
- Discard any fresh or packaged food products that may have come in contact with floodwater.
- Protect yourself during clean-up by wearing protective clothing such as boots, gloves, and masks. Clean and disinfect everything that was in contact with floodwater.
- It is important to ventilate your home. Open all doors and windows to allow air to circulate and dry out your home. Dehumidify as soon as possible after a flood.
- Service damaged septic tanks, cesspools, pit, and leaching systems as soon as possible. Damaged sewage systems are serious health hazards.
- After a flood, mold growth can cause additional damage to your home. Active mold growth is slimy or fuzzy and is usually green, black, orange, or purple. Inactive mold is dry and powdery and may be white. Mold spores spread easily; they are carried by air currents, pets, and people.

Expenses related to water, moisture, mildew, or mold damage to the structure may be covered under your flood insurance policy for that structure.

To prevent mold, wash surface areas in the house, including the walls, staircases, and items that came in contact with floodwater. Disinfect and wipe surfaces dry with paper towels to minimize bacterial contamination.

Throw away any items that do not dry completely because they can harbor germs and produce mold, which can irritate allergies as well as lead to respiratory damage or other illnesses.

Keep the humidity and temperature as low as possible.

Isolate any moldy objects. Seal moldy trash in plastic bags and remove them immediately. Objects you can save should be dried or frozen as soon as possible. Freezing inactivates mold.

- If wild animals take refuge in your home, do not approach them. Wild animals such as snakes, opossums, and raccoons often seek refuge from floodwaters on upper levels of homes and have been known to remain after the water recedes. Call your local animal control office or wildlife resource office to handle the situation.
- Stay away from downed power lines, and report them to the power company.
- Return home only when authorities indicate it is safe.
- Stay out of any building that is surrounded by floodwaters.
- Use extreme caution when entering buildings; there may be hidden damage, particularly in foundations.
- Avoid floodwaters; water might be contaminated by oil, gasoline, or raw sewage. Water also might be electrically charged from underground or downed power lines.
- Avoid moving water and do not attempt to drive through standing water, even if it seems shallow.
- Check for structural damage before re-entering your home. Contact the appropriate professionals immediately if you suspect damage to water, gas, electric, and sewer lines.
- Throw away food that has come in contact with floodwaters. Boil water until authorities declare the water supply safe to drink.
- If the walls are damaged, take photographs of the baseboard. Then remove the baseboard. Knock small holes at floor level in the drywall, between the wall studs. This will permit moisture trapped behind the drywall to seep out and start drying.
- For flood insurance and flood risk information, visit [FloodSmart.gov/after](https://www.floodsmart.gov/after). To learn more about obtaining a flood insurance policy, call your insurance agent or call 1- 800 - 427-2419 to find an agent near you.

2 FLOOD WARNING AND RESPONSE MEDIA TEMPLATES

XXXXXX DATE XXXX

STORM NAME: County issues storm preparation instructions

SARASOTA COUNTY - In preparation of possible landfall by **STORM**, Sarasota County recommends residents take the following steps now in advance of the storm.

Determine whether you are in a possible evacuation zone. If so, prepare a disaster kit and plan for moving immediately if an evacuation is ordered.

If you plan to stay in your home, have your disaster kit ready. Ensure a food and water supply for several days. Stay off roads in heavy weather leading up to the storm. If you must venture outside, watch for downed power lines and flying debris.

Do not use candles for lighting, as they pose a fire hazard.

Do not use charcoal for indoor cooking.

Do not use generators indoors without adequate ventilations.

Secure lawn and garden tools and furniture and any other loose items around the home.

For further storm precautions, call the Sarasota County Contact Center at 941-861-5000 or visit www.scgov.net.

*Sarasota County prohibits discrimination in all services, programs or activities.
View the complete policy at www.scgov.net/ADA/Pages/default.aspx.*

SARASOTA COUNTY MEDIA RELATIONS

Sign up to receive the latest Sarasota County news at www.scgov.net.

861-NEWS

news@scgov.net



MEDIA RELEASE

FOR IMMEDIATE RELEASE

XXXXXX DATE XXXX

STORM NAME upgraded to CATEGORY

SARASOTA COUNTY - **STORM NAME** has been upgraded to **CATEGORY** and is slated to hit **WHERE** around **TIME/DATE**. **ACATEGORY** hurricane criteria means winds of **WHAT** mph. **STORM'S** winds are expected to be around **WHAT** mph with a storm surge of **HOW MANY** feet in **WHAT BODY OF WATER**.

Gov. Rick Scott has requested a presidential emergency declaration. On **DATE**, Gov. Scott declared a state of emergency for Florida.

Residents are strongly advised to stay off the roads, especially **WHERE**, unless evacuating immediately to a shelter.

XXX shelters are still open in Sarasota County:

LIST HERE

For more information on storm shelter locations, call the Sarasota County Contact Center at 941-861-5000 or visit www.scgov.net.

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XXXXXX DATE XXXX

STORM NAME: Evacuation areas remain closed

SARASOTA COUNTY - Areas evacuated due to **STORM NAME** remain closed while emergency service responders assess damage.

During this period, no one is being allowed into any mandatory evacuation area. The top priorities for law enforcement at this time are to open critical roads in order to transport critically ill and injured people, to ensure that law enforcement is maintained at an effective level, and to accommodate mutual aid responders traveling to Sarasota County to lend emergency assistance.

Emergency service will not be able to respond to 911 calls until winds drop below 45 mph. That suspension of response applies to all emergency services.

Assessment teams are currently conducting damage assessment and analyzing safety conditions. They will then develop plans to safely return people to their homes and businesses and open government offices.

When the evacuation order is lifted, residents will be allowed back into areas, based on those damage assessments. Assessments are expected to be complete by **TIME/DATE**. Until that time, residents are urged to remain off roads and be alert for downed power lines.

Watch for information updates on Sarasota County's website, www.scgov.net, and Access Sarasota (Channel 19 on Comcast and 32 on Verizon) and local television news reports.

Residents also can listen to local radio updates on:

- 102.5 FM WHTP
- 107.3 FM, WXGL
- 101.5 FM, WPOI
- 94.9 FM, WWRM
- 97.1 FM, WSUN
- 105.5 FM, WDUV

For more information on storm shelter locations, call the Sarasota County Contact Center at 941-861-5000 or visit www.scgov.net.

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STORM NAME: County announces bridge closings

SARASOTA COUNTY - In anticipation of possible landfall by **STORM**, Sarasota County will close the following bridges at **TIME/DATE**:

LIST BRIDGES AND LOCATIONS HERE.

Emergency services will not respond to 911 calls after winds reach 45 mph, or until winds drop below 45 mph. That suspension of response applies to all emergency services.

For more information, call the Sarasota County Contact Center at 941-861-5000 or visit www.scgov.net.

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XXXXXX DATE XXXX

STORM NAME: Power outage at lift station NAME OR NUMBER

SARASOTA COUNTY - Due to interruption of electrical service at the **NAME OF** lift station, Sarasota County is asking residents in the **WHAT area/subdivision** to limit the amount of waste that is flushed into the sanitary system.

Residents can do this by limited baths, showers and toilet flushing until power is restored to the lift station.

Power is expected to be restored by WHEN.
Power MAY NOT be restored until WHEN.

For more information, call the Sarasota County Contact Center at 941-861-5000 or visit www.scgov.net

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XXXXXX DATE XXXX

STORM NAME: Precautionary boil water advisories issued

SARASOTA COUNTY - Due to the interruption of water service caused by **STORM**, Sarasota County has issued a precautionary boil water alert for **GEOGRAPHIC AREA**.

While the advisory is in effect, the county advises affected customers to boil all tap water intended for drinking, preparation of food, washing of food utensils, making ice, brushing teeth or for first aid, making sure the water is brought to a rolling boil for one minute. Boiling the tap water disinfects it, destroying any harmful microorganisms. Bottled water can be used as an alternative to boiling the tap water.

Over the next few days, the county will collect a series of samples in the affected area and analyze them to ensure the drinking water wasn't contaminated by potentially harmful bacteria during the service interruption. Customers will be notified when the boil water advisory has been cancelled.

For more information, call the Sarasota County Contact Center at 941-861-5000 or visit www.scgov.net.

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XXXXXX DATE XXXX

STORM NAME: Precautionary boil water advisories lifted

SARASOTA COUNTY - Sarasota County has lifted a precautionary boil water advisory for those impacted by service interruption from **STORM NAME**, effective **TIME/DATE**. Bacteriological testing shows water is safe to drink.

County staff will be using an automated phone system today to notify residents within the affected area that the advisory has been lifted.

For additional information, call the Sarasota County Contact Center at 941-861-5000 or visit www.scgov.net.

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XXXXX DATE XXXX

STORM WATCH/WARNING lifted for Sarasota County

SARASOTA COUNTY - The National Weather Service announced at **TIME/DATE** that **STORM WATCH/WARNING** for Sarasota County had been lifted. **STORM** made landfall in the **WHAT AREA** at **TIME/DATE** and continues to move **WHERE**.

Information about the storm here

For information about storm preparation, call the Sarasota County Contact Center at 941-861-5000 or visit www.scgov.net/allhazards.

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XXXXXX DATE XXXX

National Weather Service issues **STORM WATCH/WARNING** for Sarasota County

SARASOTA COUNTY - The National Weather Service has issued at **DATE/TIME** a **WATCH/WARNING** for Sarasota County.

DETAILS ON THE STORM HERE.

For information about storm preparation, call the Sarasota County Contact Center at 941-861-5000 or visit www.scgov.net/allhazards.

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XXXXXX DATE XXXX

National Weather Service issues **STORM WATCH/WARNING** for Sarasota County

SARASOTA COUNTY - The National Weather Service has issued at **DATE/TIME** a **WATCH/WARNING** for Sarasota County.

DETAILS ON THE STORM HERE.

For information about storm preparation, call the Sarasota County Contact Center at 941-861-5000 or visit www.scgov.net/allhazards.

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XXXXXX DATE XXXX

Emergency Management continues to monitor STORM NAME

SARASOTA COUNTY - Sarasota County Emergency Management continues to monitor **STORM** as it approaches **WHERE**. The storm is expected to make landfall **WHEN**.

A tropical storm **WATCH/WARNING** is in effect for Sarasota County. This means county residents should expect to see rain and thunderstorms throughout the **DAY/NIGHT** on **WHEN** with a **WHAT PERCENT** chance of rain and wind gusts ranging from **WHAT-WHAT** mph.

At this time, Sarasota County schools remain open. No other closures have been announced at this time.

Motorists should take precaution on the roads during the heavy weather and secure personal property or signage around their homes and businesses.

Sarasota County Emergency Management is participating in conference calls with the State Emergency Operations Center and the National Hurricane Center.

Residents and visitors can monitor local media for storm updates or visit www.scgov.net/allhazards for more information.

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County issues storm instructions for utilities customers

SARASOTA COUNTY - In the wake of possible impacts from **STORM**, Sarasota County has issued the following instructions for county Public Utilities customers.

BEFORE THE STORM

Household water use: Plan to store enough water to drink and to clean with if service is interrupted. The general recommendation is one gallon of clean water per person per day.

Mobile home water heaters: Turn off electrical power to the water heater to ensure that if there is a loss of water pressure, the heating element in the water heater will not burn out. Because mobile home water heaters are side-fed, water can drain out of the heater, exposing the elements to air. If power is still connected when the elements become exposed, they can overheat and burn out. Residents returning to mobile homes should make sure that there is adequate water pressure in both hot and cold before turning on power to the water heater. Pressure is adequate when there is a steady, uninterrupted stream of water coming from the faucets.

AFTER A STORM

People who live on barrier islands: Wait until the county issues an "all clear" announcement that it is safe to enter the islands before returning. That announcement signals that local conditions are safe and utilities have been tested and are usable.

Water pressure: During a storm, Sarasota County Public Utilities decreases drinking water pressure so that, in the event of a line break, the utilities system does not lose its entire stored water supply. Lower pressure results in a much lower volume of lost water. Normal water pressure is maintained at a minimum of 20 psi. If pressure drops below that level during a line break, Sarasota County and the Health Department will issue a boil water advisory. People should boil water until notified otherwise.

Drinking water wells: People who get their drinking water from underground wells should be aware of their wells' locations and watch for signs of flooding around the wells. If the well floods, it may pump floodwater into the home instead of well water. Flooded wells also present the danger of electrical shock. Flooded wells should be tested by the health department after flooding subsides to ensure the well water is safe to drink.

Wastewater: Residents who notice a red light or hear an alarm buzzer at one of the county's lift stations should call the Sarasota County Public Utilities emergency number at 941-861-0573. Do not attempt to reset the buzzer or alarm. Also call to report sewer line breaks or spills.

For more information regarding drinking water and wastewater, call the Sarasota County Contact Center at 941-861-5000 or visit www.scgov.net.

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XXXXX DATE XXXX

County issues storm instructions for utilities customers

SARASOTA COUNTY - In the aftermath of **STORM**, Sarasota County has issued the following instructions for county Public Utilities customers.

People who live on barrier islands: Wait until the county issues an "all clear" announcement that it is safe to enter the islands before returning. That announcement signals that local conditions are safe and utilities have been tested and are usable.

Water pressure: During a storm, Sarasota County Public Utilities decreases drinking water pressure so that, in the event of a line break, the utilities system does not lose its entire stored water supply. Lower pressure results in a much lower volume of lost water. Normal water pressure is maintained at a minimum of 20 psi. If pressure drops below that level during a line break, Sarasota County and the Florida Department of Health will issue a boil water advisory. People should boil water until notified otherwise.

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XXXXX DATE XXXX

STORM: Instructions for handling sewage backflow in homes

SARASOTA COUNTY - Heavy rains from **STORM** have caused some sewage backflow in area homes. The following measures should be taken to ensure proper clean-up:

- Walls, hard-surfaced floors and many other household surfaces must be cleaned with soap and water and disinfected with a solution of one cup of bleach to five gallons of water
- Thoroughly disinfect surfaces that come in contact with food and children's play areas
- Wash all linens and clothing in hot water or dry-clean
- Items that cannot be washed or dry-cleaned, such as mattresses and upholstered furniture, must be air dried in the sun and sprayed thoroughly with a disinfectant
- Steam-clean all carpeting
- Fiberboard, fibrous insulation and disposable filters that have contacted floodwater or sewage should be replaced in your heating and air conditioning system.

Wear rubber boots and waterproof gloves during cleanup. Use caution when mixing household cleaners and disinfectants, since combining certain types of products can produce toxic fumes and result in injury or death.

In general, materials that cannot be thoroughly cleaned and dried within 24-48 hours should be discarded, regardless of their sentimental value.

For further information, call the Sarasota County Contact Center at 941-861-5000 or the Florida Department of Health in Sarasota County at 941-861-2900 or visit www.Floridadisaster.org.

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County issues safety tips for home repair in hurricane-damaged areas

SARASOTA COUNTY - The danger of a storm does not end when it passes. As local residents affected by **STORM** return to their homes and begin repairs, the Department of Health suggests taking the following safety precautions to prevent personal injury:

- If possible, work in pairs or groups.
- Take short breaks and work during the cooler hours of the day.
- Wear goggles, heavy gloves and steel-toed boots.
- Immediately clean all open wounds and cuts with soap and clean water. Cuts beyond minor scratches may require medical attention.
- Never assume that water-damaged structures are safe; leave immediately if shifting or unusual noises occur.
- Avoid lifting more than 50 pounds of debris or building materials. Two or more people should move bulky objects.
- Avoid heat stroke and heat exhaustion by wearing light-colored, loose-fitting clothing and drinking a glass of fluid every 15 to 20 minutes.
- Only experienced individuals should use chain saws and specialized equipment. When using chain saws or other heavy equipment, wear earplugs.
- To prevent electrocution in wet areas, turn power off at the main breaker.
- Never handle a downed power line.
- Never bring gasoline- or diesel-powered pumps, generators or pressure washers indoors as they release carbon monoxide - a deadly, colorless, odorless gas.
- Set priorities for clean-up tasks and pace the work over several days or weeks.
- Avoid exhaustion by taking frequent rest breaks and resuming a normal sleep schedule as soon as possible.
- Take advantage of disaster relief programs and services in your community.

For more information, visit the Department of Health website at www.doh.state.fl.us.

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STORM: County issues post-storm instructions

SARASOTA COUNTY - Sarasota County is issuing the following information related to frequently-asked questions in the aftermath of **STORM**:

Electricity

- Call Florida Power & Light at 800-468-8243 to report power outages
- Stay away from downed wires; they may be energized
- Use caution with generators; do not connect generators to the main switch gear. Connect appliances directly to the generator. Contact a local electrician for direction/connection. Generators can cause a backfeed on FPL wires, causing a hazard
- Contact a local electrician for repair of your customer-owned equipment (meter connection/meter can/wire from the meter connection to meter can and into your house.)
- Crews are trimming trees away from power lines as needed to restore electrical power. Sarasota County residents are requested to bundle yard debris according to normal procedure and place it curbside

Food

- People who have lost electricity should throw out all refrigerated or frozen items if the food is no longer cool to the touch. Frozen food that has been defrosted should not be refrozen.

Private wells

- Private wells should not be considered safe if the top of the well was under water; free well water testing is available by the Sarasota County Public Health Department. Water should be considered unsafe if there is a definite change in the odor, color, taste or other physical characteristic of the water.
- Do not use bathtubs or sinks for storage of drinking water, as this may pose a health threat due to back flow contamination.
- Treat any water from flooded private wells used for drinking and cooking until notified otherwise. Residents without electricity may treat water by mixing a 1/4-teaspoon of household bleach per one gallon of water or two drops per quart of water. Shake the mixture and allow it to stand for 30 minutes to let the chlorine work. Do not use any bleach products with added perfume or scents.
- Well water testing can be arranged by calling the Florida Department of Health in Sarasota County at 941-861-2900 beginning **DATE/TIME**

Garbage collection

- Sarasota County garbage collection will occur **WHEN** for those whose pickup was missed **WHEN** and those whose regular collection day is **WHEN**. This is only for Waste Management customers in the unincorporated area of Sarasota County. It does not include yard waste or debris.

Yard debris

- **WHAT???**

Schools

- All Sarasota County schools will be open **DATE**

Transportation

- Sarasota County Area Transit (SCAT) has resumed normal services. All buses are handicap accessible.

Animals

- All found animals in Sarasota County should be taken to Sarasota County Animal Services, 8451 Bee Ridge Road, Sarasota

For more information, call the Sarasota County Contact Center at 941-861-5000 or visit www.scgov.net.

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STORM: Shelter locations announced

SARASOTA COUNTY - Due to possible landfall of **STORM NAME**, the Sarasota County Emergency Operations Center was activated to Level 1 at **TIME/DATE**. An evacuation of people with special needs began at **TIME** and is expected to take at least **HOW MANY** hours. Storm shelters will open at **TIME/DATE**.

The following shelters have been opened:

- Ashton Elementary, 5110 Ashton Road, Sarasota
- Bishop Nevins Academy, 4380 Fruitville Road, Sarasota
- Booker Middle School, 2250 Myrtle St., Sarasota
- Brentwood Elementary, 2500 Vinson Ave., Sarasota
- Brookside Middle School, 3636 S. Shade Ave., Sarasota (**Accepts pets**)
- Garden Elementary School, 700 Center Road, Sarasota
- Glenallen Elementary School, 7050 Glenallen Blvd., Sarasota
- Gulf Gate Elementary School, 6500 S. Lockwood Ridge Road, Sarasota
- Heron Creek Middle School, 6501 W. Price Blvd., Sarasota (**Accepts pets**)
- Lakeview Elementary School, 7299 Proctor Road, Sarasota
- North Port High School, 6400 W. Price Blvd., North Port (**Accepts pets**)
- Phillippi Shores Elementary, 4747 S. Tamiami Trail, Sarasota
- Pine View School, 501 Old Venice Road, Sarasota (**Accepts pets**)
- Sarasota High School, 1000 S. School Ave., Sarasota
- Sarasota Middle School, 4826 Ashton Road, Sarasota
- Southside Elementary, 1901 Webber St., Sarasota
- Taylor Ranch Elementary School, 2500 Taylor ranch Road, Sarasota
- Toledo Blade Elementary, 1201 Geranium Ave., North Port
- Tuttle Elementary School, 2863 Eighth St., Sarasota
- Venice Community Center, 326 Nokomis Ave. S., Venice
- Woodland Middle School, 2700 Panacea Blvd., Sarasota

Evacuees should be prepared to be away from home at least two nights, **DAY AND DAY**. To shelter your pet, you must provide proof of updated license and vaccinations, and contain your pet in an appropriate pet carrier. If you are unable to comply with these requirements, then you must make other arrangements to shelter your pet. Pet shelters are limited to dogs and cats only

For directions to shelter locations, contact the Sarasota County Contact Center at 941-861-5000 or visit www.scgov.net.

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XXXXXX DATE XXXX

STORM NAME: Evacuation lifted

SARASOTA COUNTY - After completing damage and power surveys in the aftermath of **STORM**, Sarasota County has lifted the mandatory evacuation for barrier islands, mobile homes, mainland water and other low-lying areas, effective **TIME/DATE**.

Evacuating residents may be required to show personal identification, such as a driver's license or pay stub, as proof of address or employment to be readmitted.

For more information, call the Sarasota County Contact Center at 941-861-5000 or visit www.scgov.net.

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MEDIA RELEASE **FOR IMMEDIATE RELEASE**

XXXXXX DATE XXXX

STORM: mandatory evacuations announced

SARASOTA COUNTY - Sarasota County has issued a declaration of emergency and called for mandatory evacuation for mobile homes, barrier islands and low-lying areas, as of **TIME/DATE**. The following areas are affected: **LIST AREAS HERE**.

Residents in those areas should complete mandatory evacuation by midnight tonight. Residents will not be allowed back in those areas after that time. The Venice Avenue Bridge will remain open to vehicular traffic **DAY**.

Evacuating residents should take personal identification, such as a driver's license or pay stub, as law enforcement officials may require proof of address or employment to be readmitted when the evacuation is lifted.

The following shelters will be open as of **TIME/DATE: (LIST HERE)**

Evacuees should be prepared to be away from home at least two nights, **DAY AND DAY**. Emergency services will be discontinued as of **TIME/DATE**. Emergency services will respond to life-and-death situations until sustained winds reach 45 mph. Gusts at that point could be 80 mph.

When emergency evacuation of barrier islands is completed, Sarasota County Utilities will reduce water pressure to those systems on Casey Key and Siesta Key. Enough positive pressure will be maintained in the system so that water and sewer lines do not become contaminated. When the evacuation order is lifted, pressure will be returned to normal levels.

The Emergency Operations Center was activated to Level 1 at **TIME/DATE**. An evacuation of people with special needs began at **TIME** and is expected to take at least 12 hours.

For information on shelter locations, contact the Sarasota County Contact Center at 941-861-5000 or visit www.scgov.net.

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MEDIA RELEASE **FOR IMMEDIATE RELEASE**

XXXXXX DATE XXXX

STORM: Sarasota County Commission declares state of emergency

SARASOTA COUNTY - Sarasota County commissioners today declared a state of emergency for Sarasota County to authorize expenditure of public funds and authorize applications for state and federal financial assistance in response to **STORM**. Meanwhile, the National Weather Service has issued a hurricane watch for an area along the western coast of Florida that includes Sarasota County.

At this time, a mandatory evacuation order is in place for all residents living in a mobile home. A voluntary evacuation is urged for all residents living in a low-lying area or on barrier islands. These evacuations may be upgraded **DAY** depending on storm conditions. Shelters will open after **TIME DAY**. Stay tuned to local media for the latest storm advisories.

Currently, Sarasota County Schools will be open **DAY**, along with all county and municipal offices. Continue to monitor local media and NOAA weather radio throughout today and tonight for the latest information.

For information about storm preparation, contact the Sarasota County Contact Center at 941-861-5000, or visit www.scgov.net/allhazards.

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XXXXXX DATE XXXX

Emergency Management urges caution on beaches with approach of STORM

SARASOTA COUNTY - Sarasota County Emergency Management continues to monitor **STORM** as it approaches **WHERE**. Emergency officials advise beach goers to take precautions for hazardous weather. Rip currents, heavy surf and lightning strikes are all potential hazards situations that intensify during severe weather situations.

Rip currents are the leading surf hazard and the No. 1 concern for beach lifeguards. About 80 percent of all beach rescues are related to rip currents. They result in more than 100 drownings every year in the United States.

(IF APPLICABLE)

A tropical storm **WATCH/WARNING** remains in effect for Sarasota County. This means Sarasota County residents should expect to see rain and thunderstorms throughout the **DAY/NIGHT** on **WHEN** with a **WHAT PERCENT** chance of rain and wind gusts ranging from **WHAT-WHAT** mph.

At this time, Sarasota County schools remain open. No other closures have been announced at this time.

Motorists should take precaution on the roads during the heavy weather and secure personal property or signage around their homes and businesses.

Sarasota County Emergency Management is participating in conference calls with the State Emergency Operations Center and the National Hurricane Center.

Residents and visitors can monitor local media for storm updates or visit www.scgov.net/allhazards.

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XXXXXX DATE XXXX

STORM: County urges residents injured in storm cleanup to seek tetanus shots

SARASOTA COUNTY - Residents who sustain injuries during cleanup efforts from **STORM** may need tetanus vaccinations. Individuals who have not had a cut or wound do not require tetanus vaccination regardless of their exposure to flood waters. Residents who sustain lacerations and/or puncture wounds and have not had a tetanus vaccination within the past 10 years require a tetanus booster.

If a person has an especially serious wound, then it is advised that he/she receive a tetanus booster within five years of last vaccination. If you sustain a wound or deep cut that concerns you, seek medical attention. Medical attention is required to determine if a tetanus booster is needed.

Proper wound care is essential for all cuts and lacerations regardless of exposure to flood waters.

Tetanus, commonly called lockjaw, is a bacterial disease that affects the nervous system. It is contracted through a cut or wound that becomes contaminated with tetanus bacteria. The bacteria can get in through even a tiny pinprick or scratch, but deep puncture wounds or cuts like those made by nails, knives or barbed-wire, for example are especially susceptible to infection with tetanus. Tetanus bacteria are present worldwide and are commonly found in soil, dust and manure. Infection with tetanus causes severe muscle spasms, leading to "locking" of the jaw so the patient cannot open his/her mouth or swallow, and may even lead to death by suffocation.

Tetanus is not transmitted from person to person. Common first signs of tetanus are a headache and muscular stiffness in the jaw (lockjaw) followed by stiffness of the neck, difficulty in swallowing, rigidity of abdominal muscles, spasms, sweating and fever. Symptoms usually begin eight days after the infection, but may range in onset from three days to three weeks.

For more information on tetanus, contact the Florida Department of Health in Sarasota County at 941-861-2900.

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STORM: Know the signs of heat exhaustion during storm cleanup

SARASOTA COUNTY - As Sarasota County begins recovering from **STORM**, residents should be aware of the warning signs of heat exhaustion.

Heat exhaustion is a milder form of heat-related illness that can develop after several days of exposure to high temperatures and inadequate or unbalanced replacement of fluids. Those most prone to heat exhaustion are the elderly, people with high blood pressure and people working or exercising in a hot environment. Know the warning signs:

- Heavy sweating
- Paleness
- Muscle cramps
- Tiredness
- Weakness
- Dizziness
- Headache
- Nausea or vomiting
- Fainting

The skin may be cool and moist. The victim's pulse rate will be fast and weak and breathing will be fast and shallow. If heat exhaustion is untreated, it may progress to heat stroke. Seek medical attention immediately if symptoms are severe or if the victim has heart problems or high blood pressure.

Otherwise, help the victim to cool off and seek medical attention if symptoms worsen or last longer than one hour. Cooling measures that may be effective include the following:

- Cool, nonalcoholic beverages, as directed by your physician
- Rest
- Cool shower, bath or sponge bath
- An air-conditioned environment
- Lightweight clothing

For more information on storm recovery, contact the Sarasota County Contact Center at 941-861-5000 or visit www.scgov.net/allhazards.

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View the complete policy at www.scgov.net/ADA/Pages/default.aspx.*

SARASOTA COUNTY MEDIA RELATIONS

861-NEWS
news@scgov.net

Sign up to receive the latest Sarasota County news at www.scgov.net.

XXXXXX DATE XXXX

STORM: County warns residents of carbon monoxide dangers

SARASOTA COUNTY - As residents begin **preparing for / cleaning up from STORM**, they are reminded to avoid carbon monoxide (CO) exposure by taking precautions with gas-powered appliances and charcoal or gas grills.

Carbon monoxide is an invisible, odorless, tasteless gas, and is highly poisonous. Depending on the level of exposure, CO may cause fatigue, weakness, chest pains for those with heart disease, shortness of breath upon exertion, nausea, vomiting, headaches, confusion, lack of coordination, impaired vision, loss of consciousness, and in severe cases, death.

Residents should take the following precautions to help prevent carbon monoxide poisoning:

- Do not burn charcoal or gas grills inside a house, garage, vehicle, tent or fireplace.
- Do not use gas-powered generators or pressure washers indoors or in the garage.
- If you suspect you are experiencing any symptoms of CO poisoning, open doors and windows, turn off gas appliances and go outside. In cases of severe CO poisoning, call 911.

For more information, call the Sarasota County Contact Center at 941-861-5000 or visit www.scgov.net.

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SARASOTA COUNTY MEDIA RELATIONS

861-NEWS

news@scgov.net

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XXXXXX DATE XXXX

Residents urged to take precautions against mosquito outbreak

SARASOTA COUNTY - As standing water from the heavy rainfall caused by STORM NAME increases the mosquito population, residents are urged to protect themselves against mosquito bites that may spread disease.

Until the water subsides, residents should avoid being outdoors at dusk and dawn, when mosquitoes commonly feed, wear long-sleeved clothing and pants when working outdoors, use mosquito repellents and eliminate standing water around the home, where mosquitoes lay their eggs.

Below are more tips to eliminate of potential breeding sites.

- Clean out eaves, troughs and gutters.
- Remove old tires or drill holes in those used in playgrounds to drain.
- Turn over or remove empty plastic pots.
- Pick up all beverage containers and cups.
- Check tarps on boats or other equipment that may collect water.
- Pump out bilges on boats.
- Replace water in birdbaths and pet or other animal feeding dishes at least once a week.
- Change water in plant trays, including hanging plants, at least once a week.
- Remove vegetation or obstructions in drainage ditches that prevent the flow of water.

For more information, call the Sarasota County Contact Center at 941-861-5000 and ask for Mosquito Management or visit www.scgov.net.

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SARASOTA COUNTY MEDIA RELATIONS

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news@scgov.net

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STAY CONNECTED

XXXXXX DATE XXXX

(Storm name): school and county closings announced

SARASOTA COUNTY - Due to STORM NAME, Sarasota County officials have declared that all county schools and government offices will be closed DAY.

There will be no trash pickup on DAY. Residents are advised not to put trash, yard waste or recyclables at the curb.

The utilities customer service office will close at TIME/DATE to perform system backups. In the event of an emergency, call 941-861-6790 for further information.

There will be no Sarasota County Area Transit (SCAT) service on DAY. A decision about DAY service will be made on DAY.

The Sarasota County Health Department will be closed DAY. For urgent health issues, call 911. For other health issues, call Sarasota County Emergency Information at 941-861-4636.

A mandatory evacuation for mobile homes, barrier islands and low-lying areas went into effect at TIME/DATE. Residents in those areas should complete mandatory evacuation by TIME. Residents will not be allowed back in those areas after that time. The Venice Avenue Bridge will remain open to vehicular traffic DATE.

The Emergency Operations Center was activated to Level 1 at TIME/DATE. An evacuation of people with special needs began at TIME and is expected to take at least 12 hours.

For more information, call the Sarasota County Contact Center at 941-861-5000 or visit www.scgov.net.

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SARASOTA COUNTY MEDIA RELATIONS

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861-NEWS

news@scgov.net

STAY CONNECTED



XXXXXX DATE XXXX

STORM: Local radio stations carry storm updates

SARASOTA COUNTY - The following local radio stations are carrying storm updates:

- 930 AM, WLSS Talk
- 1220 AM, WIBQ Talk
- 970 AM, WFLA Talk
- 94.9, FM Magic
- 97.1 FM, 97X
- 101.5 FM
- 102.5 FM
- 105.5 FM
- 107.3 FM
- 97.5 FM
- 98.3 FM
- 1230 AM, WONN
- 1430 AM, WLKF
- 1450 AM, WSRQ Talk
- 1320 AM, WENG Talk

For more information, call the Sarasota County Contact Center at 941-861-5000 or visit www.scgov.net.

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SARASOTA COUNTY MEDIA RELATIONS

861-NEWS

news@scgov.net

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STAY CONNECTED



XXXXX DATE XXXX

STORM NAME: Update on electrical outages

SARASOTA COUNTY - Local residents remain without power after **STORM** moved through the area **WHEN**. As of **TIME.DAY**, **HOW MANY** customers remain without power, down from **HOW MANY** customers at the beginning of the storm.

Florida Power & Light is making progress in restoring service throughout its territory, but as crews rebuild those hardest hit areas in **WHERE**, the progress will be slower. The hardest hit areas in **WHERE** have incurred so much damage that FPL must rebuild the system. FPL expects to provide estimated restoration times for all remaining areas **WHEN**.

For more information, call the Sarasota County Contact Center at 941-861-5000 or visit www.scgov.net.

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SARASOTA COUNTY MEDIA RELATIONS

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news@scgov.net

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STAY CONNECTED



Appendix E

PPI, Schedule and Outreach Templates

Program for Public Information

Plan Development:

The CRS Committee met 7 times in August and September, 2014, to develop the Program for Public Information Plan in conjunction with the Floodplain Management Plan. Steps taking during the development process are outlined in the meeting agendas, minutes and resolution adopting the CRS Committee in Appendix B. During the development process, review comments were received from Janice Mitchell, Insurance Program Specialist, FEMA Region IV, and through the Community Rating System review process. Based on comments received then and since, this plan has been updated to include additional documentation and clarification of the processes followed in completing the Floodplain Management Plan. In addition, the Program for Public Information and Coverage Improvement Plan were incorporated into the Floodplain Management Plan for clarity and more efficient monitoring of program goals and accomplishments.

Effective August 27, 2019, the City Council is scheduled to adopt a Resolution that joins the City of Venice to the multijurisdictional Program for Public Information. The multijurisdictional group will meet in addition to the City's CRS committee and will include city staff and members of the public (insurance agents, realtors, lenders, developers, etc.). The multijurisdictional PPI group is led by Sarasota County and has members representing the City of Venice, the City of North Port, the City of Sarasota and the Town of Longboat Key. By completing the outreach included in the City's PPI program and participating in the Multijurisdictional PPI Committee, it will increase our ability to get the message out more effectively, consistently and to a larger audience. The plan can be found as an annex to the Sarasota County Multijurisdictional LMS.

Plan Goals

The goal of the Floodplain Management Plan is to raise awareness in the community about local hazards, flood insurance, mitigation, and other flood related issues. In addition to addressing floodplain management issues, the Floodplain Management Plan incorporates the multijurisdictional Program for Public Information and Flood Insurance Coverage Improvement Plan into one document to provide a coordinated effort. The intent of the program is to provide effective messages and complete projects that assist the public in protecting themselves from the hazards of floods through increased education, flood insurance protection, and mitigation of potential flood risk. With guidance of the Community Ratings System Coordinator's Manual, 6 priority and 4 additional messages with local relevance have been identified to be delivered. The topics and desired outcomes are shown in Tables 4 and 5, below:

Table 4: Desired Outcomes

Goal	Outcome
1	Increased awareness about local flood hazards, especially as it pertains to the individual and their property.
2	Increased number of flood insurance policies throughout the City, in both the SFHA and Non-SFHA
3	Increased awareness about flood related hazards, resulting in reduction of flood related injuries.
4	Reduction in flood insurance claims and Substantial Improvement/Substantial Damage permit requests.

Goal	Outcome
5	Increased understanding of local laws and ordinances governing construction, leading to a reduction in Code Enforcement citations
6	Increased understanding of floodplain functions, and of local stormwater regulations, resulting in fewer Code Enforcement citations.
7	Increased awareness of the need for hurricane preparation, resulting in better prepared citizenry during an evacuation, and expedited insurance claims in the case of a flood event.
8	Increased awareness of flood safety resulting in better prepared citizenry during an evacuation, and reduction of flood related injuries.

Table 5: City PPI Plan Goals

Msg#	Topic		Message	Desired Goal
1	Know Your Hazard	a	Check to see if you live in the SFHA	1
1	Know Your Hazard	b	Flood Zone Assistance available at City	1
1	Know Your Hazard	c	Difference between riverine and surge flooding	1
1	Know Your Hazard	d	Localized flooding information	1
1	Know Your Hazard	e	Insure your property for your flood hazard	1
2	Buy Flood Insurance	a	Homeowners insurance does not protect against flood damage	2
2	Buy Flood Insurance	b	CRS discounts available	2
2	Buy Flood Insurance	c	30 day waiting period	2
3	Protect People from the Hazard	a	Do not walk through flowing flood-water	3
3	Protect People from the Hazard	b	Do not drive through flooded areas	3
3	Protect People from the Hazard	c	Stay away from power lines and electrical wires	3
3	Protect People from the Hazard	d	Have electricity turned off if property has been flooded	3

Msg#	Topic		Message	Desired Goal
3	Protect People from the Hazard	e	Watch your step – look out for animals and harmful insects in flood waters.	3
3	Protect People from the Hazard	f	Be alert for gas leaks	3
3	Protect People from the Hazard	g	Do not enter a building that has been flooded,	3
4	Protect Property from the Hazard	a	Keep driveway culverts clean and free of obstructions	4
4	Protect Property from the Hazard	b	Report ditch blockages to City Public Works Dept.	4
4	Protect Property from the Hazard	c	Retrofit your property: Re-grade or elevate structure	4
4	Protect Property from the Hazard	d	Elevate air handlers, electrical boxes and water heaters	4
4	Protect Property from the Hazard	e	Make sure your downspouts are clear and directed away from the house	4
4	Protect Property from the Hazard	f	Mitigation grants are available (FAA)	4
4	Protect Property from the Hazard	f	Property Protection Advice is available (PPA, PPV)	4
5	Build Responsibly	a	Check with Building Dept. before initiating construction or altering grades, to see if permit is needed	5
5	Build Responsibly	b	Report un-permitted construction	5
6	Protect Natural Floodplain Functions	a	Keep drainage area free of debris	6

Msg#	Topic		Message	Desired Goal
6	Protect Natural Floodplain Functions	b	Do not dump or throw anything into ditches, inlets or streams	6
6	Protect Natural Floodplain Functions	c	Limit use of fertilizers	6
7	Hurricane Preparedness	a	Know your evacuation level	7
7	Hurricane Preparedness	b	Inventory and photograph your home and contents, and store with insurance and important documents in a safe place	7
7	Hurricane Preparedness	c	Create a safety plan, with a checklist of steps to take before, during and after a hazard	7
7	Hurricane Preparedness	d	Attend the annual City sponsored Hurricane Preparation seminar in May	7
8	General preparedness	a	Register for CodeRED® early warning notification system	7
8	General preparedness	b	Tune into local TV and radio channels for flood notifications, or purchase a weather alert radio	7
9	Elevated and Flood-vented Properties	a	Keep flood vents open and unobstructed	4
9	Elevated and Flood-vented Properties	b	Non conversion statement for areas below the required minimum finished floor	4

Msg#	Topic		Message	Desired Goal
10	Flood Education	a	Teach children about flood safety and your safety plan	8

It is important for these messages to be tailored to meet the local conditions and the appropriate target audience. Public outreach information must be reviewed and evaluated to verify that it is effectively reaching the targeted audience and provides clear messages which are more likely to change behavior. Understanding these important priority and additional messages is critical to improving the accuracy of the perceptions of the risks as they relate to flooding and other hazards. Through accurate education, residents have an opportunity to make informed decisions and effective measure to protect life and property. This plan will seek to build on those messages and add additional, locally pertinent ones as necessary. For example, during the 2016 map updates additional outreach was released. Likewise, the new map updates taking place now also will have multiple means of communicating the change in risk. The city will utilize paper and digital media as well as public meetings, to reach the largest audience.

Target audiences were identified through discussion in the committee meetings by determining which areas would most benefit from different messages. Repetitive loss areas were identified as a high priority due to the close proximity of the Gulf of Mexico and the potential impacts of storm surge. During evaluation, groups that had interaction with property owners such as insurance agents, homeowner association and realtors were identified for targeted outreach because they had a larger opportunity to interact with the public, and it was important that they provide accurate and well informed information. Messages will be tailored to each group and are summarized in table 6 below. See Appendix E for the PPI Outreach Project worksheet.

During the CRS Committee meetings 2016-2017, it was determined that messages regarding Property Protection Advice (PPA and PPV) and Financial Assistance Advice (FAA) and should be clarified in the City's twice annual Utility Mailer to all residents (OP#7). These discussions continued in 2018 and 2019 with significant updates to types of outreach to make them more clear, inviting and concise.

Outreach Activities

The CRS Committee combines the staff expertise from the city building code, floodplain management, planning & zoning and public information with input from the insurance, real estate, construction, business and financial lending fields. Input from the general public was also included and opportunities to attend the meetings were published. The CRS Committee Meetings are continued on a quarterly basis at the City level. In addition, city staff is now attending the Sarasota County Floodplain Management and Multijurisdictional PPI Committee meetings as well.

By Resolution, the City Council is scheduled to adopt the Multijurisdictional PPI to improve outreach activities by reaching not only local city residents but have a more consistent message county-wide. Two of our existing members from the CRS committee and city staff will continue to meet four times a year with the Multijurisdictional PPI Committee which is led by Sarasota County includes members from the City of North Port, City of Sarasota, and Town of Longboat Key.

In addition to the Multijurisdictional PPI committee outreach, the local City Public outreach efforts will continue and include:

PPI Outreach Efforts

1. Quarterly meetings of the CRS Committee will be conducted, tentatively scheduled for November, February, May and August, to review the effectiveness of the current public outreach and coverage improvement efforts and recommend improvements or additions to the program. The CRS Committee will also conduct an annual evaluation/update of the existing plans with a formal update of the plans completed every 5 years. Documentation of the CRS Committee activities are included in Appendix B.
2. A pamphlet called “Understanding Stormwater and the Environment” which encourages residents to limit fertilizer use, water lawns on appropriate days, and be aware of illicit discharges into the stormwater system to protect natural function. The city published this in concert with a requirement of the National Pollution Discharge Elimination System (NPDES) permit program. This publication is available at the city Engineering Department and is distributed with the utility bills to all residents once a year.
3. The city periodically recruits volunteers to label inlets to reduce dumping into the waterways to protect natural function through education.
4. The city’s E-newsletter contains an article once a year that informs residents of the importance of the stormwater system and how they can do their part to maintain it to reduce flooding due to blocked inlets or drainage canals/swales and protect natural function.
5. Twice a year, a flyer is mailed with utility bills to educate residents on flooding, the federal flood insurance program, and flood safety. A copy of the Flood Protection Information provided to all residents is included in the last section below
6. A “Know your flood risk before you buy” flyer is provided in digital format to the Venice Area Board of Realtors (VABR) for distribution to their members, mailed yearly to local realtors and copies are hand carried to VABR for distribution to their membership. This brochure is for the realtors to hand out to their clients to promote flood insurance purchase and due diligence as it relates to flooding for building purchasers.
7. A targeted public information flyer is also provided annually to property owners within the repetitive loss areas as illustrated in Figure 2. Repetitive loss areas were identified as a target audience to attempt to reduce impacts due to flooding for the residents and NFIP program. Message includes importance of obtaining flood insurance, protecting your property from flooding and mitigation grant opportunities. A copy of the letter to repetitive loss area residents is included below.
8. Targeted outreach is provided periodically to homeowners’ associations and other groups such as the Venice Area Board of Realtors or insurance agents. Homeowners’ associations were chosen as a target area due to the opportunity to provide public outreach to communities through their homeowners’ association. Information provided to the homeowners’ association is then distributed to its members. The Venice Area Board of Realtors was chosen as an effective outreach to the real estate agents to improve knowledge about the importance of flood insurance and due diligence evaluation of potential flood risks to buyers and seller of properties. The insurance agents were chosen to improve knowledge regarding the importance of flood insurance and improve understanding of flood risks. Copies of letters sent to the Homeowners Association, Insurance Agents and Realtors are included below.

9. News releases are submitted by email to the Public Information Officer for distribution to the news media, social media, Venice City E-News and posting on the city website once the most appropriate method of distribution is determined.
10. Our social media messages have been updated to be more engaging to viewers they are attached at the end of this document.
11. The city website is updated as needed with the assistance of the Building and Information Technology Departments. The website includes links to relevant publications, other governmental emergency agencies and information to assist the public with flood related issues. The website links are tested monthly and updated as needed.
12. A list of Elevation Certificates (EC's) is available electronically on the city website. This list is updated on a monthly basis, although certificates are posted upon submittal of the finished construction certificate, and are listed by street address. Historical files were also reviewed and all available pre- and post-FIRM elevation certificates in the Building Department records were uploaded to the website. New Elevation Certificates are also being attached, electronically, to building permits to provide more effective evaluation of substantial improvement requests.
13. A free hurricane seminar is conducted each May by the City of Venice. The hurricane seminar covers flood prevention, protection and insurance through a presentation by the City Engineer, a Certified Floodplain Manager. It is advertised through press releases, area stakeholders, Venice City E-News and the city website.
14. The Venice City E-News is e-mailed to residents and posted on the city website. It includes a hurricane edition that explains the evacuation process, preventive measures, flood safety, flood insurance, emergency numbers and a list of supplies that should be stocked in an emergency event. This same information is included on the city web site.
15. Once a year the following FEMA publication F-696(312) is mailed to area realtors to hand out to their clients.
16. Once a year the following FEMA publication F-217 is mailed to area insurance agents to hand out to their clients.
17. The following FEMA publications are available for distribution to all residents at the Venice library (main branch), the Engineering department, and City Hall Lobby.

Publication #	Name
F-025 (3/11)	How the NFIP Works
F-061	Your Homeowners Insurance Does Not Cover Floods
F-084 (3/11)	Answers to Questions About the NFIP
F-217 (Rev 11/12)	The Benefits of Flood Insurance Versus Disaster Assistance
F-301	Top Ten Facts for Consumers
F-671 (10-12)	Know Your Risk
F-687	Flood Insurance Claims Handbook
F-696 (3/12)	Help Protect Your Customer's New Home
F-697 (8/13)	Protect Your New Home

17. The following Spanish literature FEMA publications are available for distribution to all customers at the Latino Grocery Store at Bird Bay Plaza:

Publication #	Name (Spanish Version)
L-186S	Nada podría arruinar el disfrute de su hogar ¿Si...?
F-684S	Preparación y seguridad en inundaciones
F-061S	Su Seguro de Vivienda de Residencia no Cubre Inundaciones
F-437S	Póliza de Riesgos Preferente
F-617S	Conozca su Riesgo
F-683S	Por qué usted necesita seguro de inundación
F-679S	Resumen de Cobertura

18. Periodic notices regarding the availability of FEMA publications are emailed to area Insurance Agents and Realtors.
19. FEMA Flood Insurance Rate Maps (FIRM) are available in the Engineering Department and at the Main branch of the Venice library. The flood zone boundaries can enable property owners, residents, developers, and insurance agents to determine what flood zone a specific property is located in. They can view these maps in person, or call and ask staff for information. Trained CFMs provide individual flood zone determinations and assist the public with determining the FIRM and the regulatory floodplains.
20. An interactive model showing the riverine model results and the related updated regulatory flood zones are available on the South West Florida Water Management District (SWFWMD) website. A link to this is on the City website by searching flood or on the Engineering Department website.
21. Special efforts are made to reach the non-English speaking outlets.
22. Additional outreach provided by Venice Area Board of Realtors (e-mailing out reminders regarding disclosure requirements and insurance information, Publix Supermarket (emergency preparation guide published), Florida Power & Light (web storm and flood information for homeowners and business), hurricane guides provided by local television and newspaper, Florida SERT, Floodsmart and Sarasota County Emergency Management which provide numerous outreach materials. Links to these excellent information sources are provided on the city's website and available printed copies of the materials are made available at City Hall and in the Engineering Department. Several of the publications are also available in the Venice Public Library.

Recommended Improvements

The following Public Information Activities are currently underway or to be implemented based on the CRS Committee recommendations:

Public Outreach activities:

1. Continue with the current public outreach activities as summarized in the 330 Outreach Project (OP) Worksheet included as Appendix E.
2. Coordinate with surveyors and insurance agents to provide Elevations Certificates to the city for recording and posting on the city website.
3. Determining whether it would be appropriate to approach realtors and lenders requesting that EC's be recorded with deeds.
4. Do more outreach to the HOA's through their professional organizations and affiliations.
5. Evaluate and discuss the possibility of HOA's becoming CERT trained.

- a. Contact HOAs to see if they are interested in becoming CERT trained by annual letter to HOAs.
6. Evaluate and discuss the possibility of stakeholders becoming StormReady supporters
7. Coordinating with local media and professional organization to provide press releases or columns for their newsletters for specific stories and events
8. Researching having a counter on the flood section of the website to determine usage.
9. Doing more public events:
 - i. Seek sponsors and geographically diverse venues throughout the city for maximum coverage.
10. Create the following maps, for both information and public outreach purposes, showing:
 - i. Repetitive loss areas (Privacy Act protected – internal use only). – to assist in identifying target areas for outreach.
 - ii. Map highlighting properties coming into the floodplain when the new FEMA maps are released for outreach purposes Properties coming into the floodplain.
 - iii. An overview of areas within the floodplain with uninsured properties.
11. Determine better, more locally pertinent messages to raise the community awareness of flood hazards, insurance and mitigation.
12. Encourage increased flood insurance coverage as outlined in the Coverage Improvement Plan adopted by City Council and updated annually.
13. Provide outreach to reach the hearing/sigh impaired; non-English speaking and residents that are not in touch with traditional communication outlets such as computer based outreach.
14. Publicize the annual test of CodeRed© test. Prior to test, issue press release and publish on city website alerting residents to sign up prior to test. Provide telephone registration to reach residents without computer based access.

The above activities will be monitored by the CRS Committee and performed primarily by the Engineering department, in conjunction with whichever City department, outside organization and/or community stakeholder(s) that best fit the project. Funding for all city complete projects will be from the Engineering/Stormwater budget. All projects will be performed, evaluated, and revised annually. The multi-jurisdictional PPI will also be updated annually. See the outreach materials heading for all planned projects, along with the department responsible for implementing the project, the messages to be relayed and the desired outcome, based on the goals of the Public Information Program.

Evaluation Methods:

The multijurisdictional PPI committee will meet on a quarterly basis to discuss progress towards the goals of the Public Information Plan and Flood Response Plan. The CRS Committee will also be updated on the plan as well. The PPI committee will complete an annual update of the plans based on those evaluations including the following:

1. Committee will conduct an annual review of the outreach methods, evaluate the effectiveness of the material and number of residents reached. This will be accomplished by reviewing the documents, mailing lists and any public feedback received by individual members or at the public meetings.
2. Committee will review the outreach messages to see if any improvements are required to increase clarity of the message.

3. Committee will discuss additional or improved outreach messages that should be considered based on feedback received by the committee members from the public and their personal review of the documents.
4. Committee review of the outreach documents to determine if any should be discontinued and replaced with a more effective method.
5. Target public outreach will be evaluated to discuss any proposed improvements to the documents.
6. Committee will evaluate the Target Area Map and target group list to determine if additional areas should be added or revised.
7. Committee will discuss opportunities to improve the performance of the outreach based on committee members and the public input.
8. Was there a flood event this past year? Was the public effectively informed on how to protect themselves before, during and after a flood? Committee will evaluate if there have been any new flood events through-out the year that require specific outreach.

Outreach Materials

PPI Outreach Project Worksheet																				
	Outreach Projects	Target Group #	Points per Topic	Topics Covered										Times per Year	Score	By	Goals - To Raise Awareness about			
				1	2	3	4	5	6	7	8	9	10				1	2	3	4
				Know Your Hazard	Buy Flood Insurance	Protect People from the Hazard	Protect Property from the Hazard	Build Responsibly	Protect Natural Floodplain Functions	Hurricane Preparedness	General Preparedness	Elevated and Flood-Vented Properties	Flood Education				Local Hazards	Flood Insurance	Mitigation	Other (Specified)
OP#1	FEMA Brochures in the Engineering Office		1		X									12		Eng. Dept		X		
OP#2	FEMA Brochures in City Hall Lobby		1		X									12		Eng. Dept		X		
OP#3	FEMA Brochures in the Venice Library		1		X									12		Eng. Dept		X		
OP#4	City Website		1	X	X	X	X	X	X	X	X	X	X	12		IT Dept.	X	X	X	
OP#5	FEMA F-683 (Why you need flood Insurance - Bldg. Dept.)		1		X									12		Eng. Dept		X		
OP#6	FEMA brochures to Latino Supermarket	6	1		X			X						12		Eng. Dept		X		
OP#7	Flood Protection Information Flyer in Utility Bill (All Residents)		1	X	X	X	X	X	X	X	X	X	X	2		Eng. Dept	X	X	X	
OP#8	FEMA F-696 to Venice Board of Realtors	3	1		X									1		Eng. Dept		X		
OP#9	Citywide Hurricane Seminar		1	X	X	X	X	X	X	X	X	X	X	1		Eng. Dept	X	X	X	
OP#10	HOA Mailing	2	1	X	X	X	X	X	X	X	X	X	X	1		Eng. Dept	X	X	X	
OP#11	Insurance Mailing + F-683	4	1		X									1		Eng. Dept		X		
OP#12	Realtor Mailing & "Flood Hazard: Check before you buy" flyer	3	1	X	X	X	X	X	X	X	X	X	X	1		Eng. Dept	X	X	X	
OP#13	Sarasota County Disaster Planning Guide		1	X	X	X	X	X	X	X	X	X	X	1		Sarasota County	X	X		
OP#14	Repetitive Loss Mailing (Targeted)	1	1	X	X	X	X	X	X	X	X	X	X	1		Eng. Dept	X	X	X	
OP#15	Insurance Mailing + FEMA 217	4	1		X	X	X	X	X	X	X	X	X	1		Eng. Dept	X	X	X	
OP#16	Flood Presentation to Venice Board of Realtors	3	1	X	X	X	X	X	X	X	X	X	X	1		Eng. Dept	X	X	X	
OP#17	Flooding Questionnaire (All Residents)		1	X										1		Eng. Dept	X	X		
OP#18	Publix Brochure: Preparing for a hurricane		1	X		X				X	X			1		Publix				Preparedness
OP#19	City of Venice Hurricane Guide		1		X	X								1		COV PIO	X	X		
OP#20	Email to Venice Board of Realtors re FEMA brochures	3	1		X									1		Eng. Dept		X		
OP#21	Forwarded FEMA training email to Insurance Agents	4	1		X									2		Eng. Dept		X		
OP#22	Tampa Bay Hurricane Guide		1	X	X	X	X	X	X	X	X	X	X	1		Tampa Bay Times	X	X		
OP#23	Publicity email: Code RED test (DATE)		1			X								1		COV PIO	X			Warning
OP#24	Library flyer: FIRMS and CodeRED (& DATE CodeRED test)		1	X		X								1		Eng. Dept	X	X		Warning
OP#25	Sarasota County PPI activities 2016-2017		1	X	X	X	X	X	X	X	X	X	X			Eng. Dept		X		
OP#26	Florida Division of Emergency Management (FDEM): Severe Weather Awareness Guide - printed and taken to Library, Chamber of Commerce and City Hall lobby		1	X	X	X				X	X			1		FDEM	X	X	X	
OP#27	FPL - Preparing for a Storm		1			X	X	X		X	X			1		FPL	X	X		Preparedness
OP#28	SERT - Quick Guide to Floodplain Management in Florida. (in reference section of library)		1	X	X		X	X	X					1		SERT / FDEM	X	X	X	
OP#29	LOWES Hurricane Guide		1								X	X		1		Lowes	X	X		
OP#30	City of Venice NPDES flyer in Utility Bills: Understanding Stormwater and the Environment		1					X	X				X	1		Eng. Dept	X			
OP#31	Home Depot Hurricane Guide		1	X	X									1		Home Depot	X	X	X	Preparedness
OP#32	City brochure: About the Mandatory Purchase of Flood Insurance		1		X	X	X			X	X			1		Eng. Dept	X	X	X	
OP#33	Repairing Your Flooded Home, Red Cross booklet. Available in DPW and Engineering Dept (Per OP#16)		1	X	X	X	X	X	X	X	X	X	X	1		Red Cross	X	X	X	Preparedness
OP#34	Annual Presentation to Realtors on 50% rule, by Bldg. Official	3	1	X	X	X	X	X	X	X	X	X	X	1		Bldg. Dept	X	X	X	Preparedness
OP#35	Joint LMS Presentations 2016-2017		1	X	X	X	X	X	X	X	X	X	X			SRQ EOM	x	x	x	
OP#36	Monthly Social Media Message		1	X	X	X	X	X	X	X	X	X	X	1		COV PIO		X		
OP#37	Condo Owners Mailing (Targeted)	6	1	X	X	X	X	X	X	X	X	X	X	1		Eng. Dept	X	X	X	
OP#38	Flood Response Plan Messages		1	X	X	X	X	X	X	X	X	X	X	1		Eng. Dept	X	X	X	

Item	Project	May	Done	June	Done	July	Done	Aug	Done
1	FEMA brochures in the Engineering office	Check		Check		Check		Check	
2	FEMA brochures in City Hall Lobby	Check		Check		Check		Check	
3	FEMA brochures in the Venice library	Check		Check		Check		Check	
4	City website (check links & update with news)	Check		Check		Check		Check	
5	FEMA F-683 (why you need flood insurance) in building Dept.	Check		Check		Check		Check	
6	FEMA brochures to Latin supermarket	Check		Check		Check		Check	
7	Flood protection information flyer mailed in Utility Bill (Mailed in May and Aug)	Flyers mailed		Get Mailing count from Southwest Direct		Email flyers to SouthWest Direct (the printing & mailing needed)		Flyers mailed	
8	FEMA F-696 to Venice Board of Realtors (Deliver with OP16)					Take brochures			
9	Citywide Hurricane Seminar	4th and 5th							
10	HOA Targeted mailing								
11	Insurance mailing + F683								
12	Realtor mailing + Hazard insert								
13*	Sarasota County Disaster Planning Guide	Check		Check		Check		Check	
14	Repetitive loss mailing	Send to Printer		Mail					
15	Insurance mailing + FEMA 217								
16	Flood presentation to Venice Board of Realtors					16th		Schedule for next year	
17	Flooding questionnaire	On City website, Taken to HOA presentations, flyer in City Hall, Flyer in library.		On City website, Taken to HOA presentations, flyer in City Hall, Flyer in library.		On City website, Taken to HOA presentations, flyer in City Hall, Flyer in library.		On City website, Taken to HOA presentations, flyer in City Hall, Flyer in library.	
18*	Publix brochure (preparing for a hurricane)	Check		Check		Check		Check	
19*	City of Venice Hurricane Guide	Check		Check		Check		Check	
20	Email to Venice Area Board of Realtors re FEMA Brochures								

J:\CRS\PP\NPDES_Schedule

Item	Project	May	Done	June	Done	July	Done	Aug	Done
21*	Forwarded FEMA web training emails to Insurance Agents	Forward		Forward		Forward		Forward	
22	Tamp Bay Hurricane Guide	Check		Check		Check		Check	
23	Publicity email & annual CodeRED test	Test - May 5th		Get numbers					
24	Library flyer (FIRMS and CodeRED)								
25	Sarasota County PPI Activities								
26*	Florida Division of Emergency management: Severe weather Awareness Guide. Printed and taken to library, Chamber of Commerce and City Hall lobby.	Check		Check		Check		Check	
27	FPL - Preparing for a storm	Check		Check		Check		Check	
28*	CERT - Quick guide to floodplain Management in Florida (in reference section of library)	Check		Check		Check		Check	
29	LOWES Hurricane Guide	Check		Check		Check		Check	
30	City of Venice NPDES flyer in Utility bills - Understanding stormwater and the Environment. (Mailed in Oct)							Update brochure	
31*	City brochure - About the Mandatory purchase of Flood Insurance. Make available in the lobby and mail with flood zone determinations.	Check		Check		Check		Check	
32	Home Depot - Hurricane Guide	Check		Check		Check		Check	
33	Red Cross - Repairing your flooded home. Available in DPW and Engineering	Check		Check		Check		Check	
34	Annual presentation on 50-50 rule, by Building Dept.								
35	Joint LMS Presentations								
36	Monthly Social Media messages (Sent by PIO)	do		do		do		do	
37	Condo Owners Targeted Mailing								
38	Flood Response Messages (As needed) (FRP#6)								
NPDES	Produce & publish articles for City newsletter	Monthly graphic from flyer series		Monthly graphic from flyer series		Monthly graphic from flyer series		Monthly graphic from flyer series	
NPDES	Advertise efforts for stormwater inlet marking program							Send info to PIO	

Item	ProjectMay		Done	June	Done	July	Done	Aug	Done
NPDES	Stormwater inlet marking program			Evaluate & Order materials		Schedule a date & Coordinate with volunteers.			
NPDES	Resident survey- City Newsletter								
NPDES	Resident survey-City Website								
NPDES	Resident survey- flyers in City Hall								
NPDES	There is No Poop Fairy - Flyers and signs								

Flood Insurance

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Flood Insurance will cover all surface floods even if the president does not declare a disaster.

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Those in moderate or low risk are eligible for a preferred risk rate

Contents insurance is available for renters and condo owners

There is a **30 day waiting period** so don't wait call you insurance agent or visit www.floodsmart.gov today!



Are you and your family protected?

Substantial Improvement/ Substantial Damage

Also known as the 50% rule!

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50% or greater than the value of the home (not including the land value) Your house will need to conform to the same flood protection measures as a new home.

The same rule applies if you are remodeling the house and the cost equals or exceeds 50% of market value.

This may require elevation or flood vents. **Check with the Building Division** when remodeling or repairing your home

Kathleen Weeden

City Engineer

(941) 882-7409

Alex Boudreau

Assistant City Engineer

(941) 882-7410

Visit www.venicegov.com for more information



**Flood Protection Information
for City of Venice Residents
from Mayor John Holic**

April 2019

If you or someone else are in life threatening danger **call 911**



Types of Alerts

Watch- keep a TV/weather alert radio nearby for alerts and be prepared for a flood

Warning- Take Shelter!
Flooding is happening!



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Preparing for the storm

- Create an emergency plan and practice it with every family member
- Know your evacuation level, route and shelters
- Attend the Hurricane Expo in April
- Keep driveway culverts free of obstruction, if clogged, it may cause localized flooding
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Know your Risk

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Areas along Hatchett Creek, Curry Creek, Deertown Gully, Flamingo Ditch, E Venice Ave and coastal areas may flood streets and yards with little warning.

High risk areas have a 1:4 chance of flooding during the life of a 30-year mortgage; moderate and low risk areas have a 1:5 chance. There is always a risk!

Find out your flood risk by contacting city hall or on our website. Maps are available at the library. Elevation Certificates can be found at City Hall or online

Flood Safety

- Turn around, Don't Drown! 6in of water can knock over a person, 2ft can move most vehicles
- Watch out for animals and insects
- Don't use open flame until the area is properly ventilated, check for leaks
- Don't enter a flooded building until it is cleared by an inspector
- Avoid downed powerlines and don't use appliances that have been flooded
- Have your electricity turned off if you have been flooded visit FPL.com



Build Responsibly

Elevating your home and utilities greatly decreases your risk of flood damage

- Keep flood vents open and unobstructed to prevent structural damage
- A non-conversion agreement is required for areas below the required minimum finished floor elevation

Check with the Building Division for a permit before starting construction or altering grades. Report unpermitted construction activities

Building Division (941)-486-2448

Protect Natural Floodplains

Open spaces protect against flooding by allowing a place for stormwater to collect and go into the ground. Enjoy our parks!

Pick up your dog's poop for cleaner waters

Limit the use of fertilizers and pesticides they can pollute our waters. Dispose of them and other hazardous materials at the Sarasota County Chemical Collection Center 250 S Jackson Rd, Wed-Sat 8am-4pm

Keep our inlets ditches and streams clean. If you see someone dumping hazardous materials or a broken silt fence call **Public Works** (941) 486-2422



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The same rule applies if you are remodeling the house and the cost equals or exceeds ~~50%~~ 50% of market value.

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See your Evacuation Level here

<https://ags3.scgov.net/knowyourlevel/>

Kathleen Weeden

City Engineer

(941) 882-7409

Kathryn Harring

Stormwater Engineering Research Analyst

(941) 882-7412

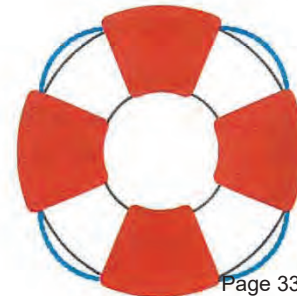
Visit www.venicegov.com for more information



**Flood Protection Information
for Home Owners
Associations (HOAs)
From Mayor John Holic**

April 2019

If you or someone else are in life threatening danger **call 911**



Types of Alerts

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- Mitigation grants are available for repetitive loss properties visit www.floridadisaster.org
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If you suspect you have a potential flooding problem, contact us to schedule an appointment and discuss your concerns. A representative can visit your property and we can offer recommendations to reduce your flood risk.

We do not offer detailed engineering advice. A detailed review by an independent professional may be necessary.

See your Evacuation Level here

<https://ags3.scgov.net/knowyourlevel/>

Kathleen Weeden

City Engineer

(941) 882-7409

Kathryn Harring

Stormwater Engineering Research Analyst

(941) 882-7412



Flood Protection Information for Repetitive Loss Areas From Mayor John Holic May 2019

If you or someone else are in life threatening danger **call 911**

Repetitive Loss Property: is an area which has two, or more claims of more than \$1000.00 have been paid by the National Flood Insurance Program (NFIP) within any 10-year period since 1978.



Visit www.venicegov.com for more info

Types of Alerts

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[Building Division \(941\)-486-2448](tel:941-486-2448)

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Stormwater Engineering Research Analyst

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Flood Protection Information for Condo Residents From Mayor John Holic May 2019

If you or someone else are in life threatening danger **call 911**



Types of Alerts

Watch- keep a TV/weather alert radio nearby for alerts and be prepared for a flood

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CITY OF VENICE

401 W. Venice Avenue, Venice, FL 34285

www.venicegov.com

(941) 486-2626 Fax (941) 480-3031

Date

Dear Local Insurance Agent:

Thank you for agreeing to advise your clients that purchasing flood insurance is a good idea. I am enclosing flood insurance brochure FEMA F-638, for you to distribute to your clients. If you would like additional copies please contact me at (941) 486-2626 ext. 25001 or kweeden@venicegov.com.

Together we can work to inform the public of the importance of flood dangers, protection and insurance.

Sincerely,

Kathleen J. Weeden, PE, CFM, LEED®AP
City Engineer



CITY OF VENICE

401 W. Venice Avenue, Venice, FL 34285

www.venicegov.com

(941) 486-2626

Fax (941) 480-3031

Date

Dear Local Insurance Agent:

I am enclosing a copy of FEMA F-217, *The Benefits of Flood Insurance Versus Disaster Assistance*, to help you discuss flood insurance needs with your clients. If you would like additional copies to keep in your office, please contact me at (941) 486-2626 ext. 25001 or kweeden@venicegov.com.

Thank you for agreeing to help residents remain aware of their flood hazard by utilizing the Mapping Information Service provided by the City to the community. The Building Department is able to give information on flood zones, Base Flood Elevation (BFE), the extent of past flooding on a given property, and whether flood insurance is mandatory for a given property. The Building Department staff can visit your client's property to discuss flood protection alternatives, and copies of FEMA Elevation Certificates are available from the Engineering Department. Both the Building Department and Engineering Department are located in City Hall, 401 W. Venice Avenue, Venice, FL 34285 and can be reached by telephone at: (941) 486-2626.

Residents considering building, making an addition to their property or installing other flood protection measures should contact the Building Department to determine whether a building permit is required. Properties can be protected from hazards by ensuring that construction debris is kept out of streams, ditches and storm drains. The library also maintains reference materials pertaining to other flood protection techniques which may help minimize damage to their property. Basement flooding may be minimized by checking that all downspouts are directed away from the house.

All residents should be aware that dumping in storm drains is a violation of City Code, Section 74-266. Dumping is harmful to our floodplains which are an extremely valuable, renewable resource, important to the economic welfare,

enjoyment, and physical well-being of all of our residents; floodplains provide natural flood storage and erosion control, and water quality maintenance as well as providing habitat and critical sources of energy for plants and animals.

As part of being informed about flood hazards, residents should also familiarize themselves with evacuation routes. These can be found in the Sarasota County annual Disaster Planning Guide, available in the library and at various other locations around the City, also on the Sarasota County website, at <http://sarasotagov.org/NDS/FloodMap.cfm>.

In order to receive flood and other emergency notifications, residents should sign up for codeRED alerts on the city website at <http://venicegov.com/>.

Prior to hurricane season, homeowners should talk about the dangers of flooding with all of the occupants of the home, including minors, and develop a disaster response plan. They may find the tools on the Red Cross website, at www.redcross.org, useful for this.

As a precaution, home owners should inventory and photograph the contents of their home, and put important papers and insurance policies in a safe place. This will help them with their insurance claims in the event that their home is flooded.

Together we can work to inform the public of the importance of flood dangers, protection and insurance.

Sincerely,

Kathleen J. Weeden, PE, CFM, LEED®AP
City Engineer



Flooding Questionnaire

The City of Venice Engineering Department is dedicated to providing our residents information about their flood hazards and their abilities to reduce their risk. Please fill out our Flood Questionnaire. It is a great way for us to see how we can serve you better.

1. What is your flood zone?

- ☐ VE
- ☐ AE
- ☐ X shaded
- ☐ X unshaded
- ☐ I don't know, do you know where to find it?

2. Do you have flood insurance?

- ☐ Yes, Contents Coverage
- ☐ Yes, Building Coverage
- ☐ Yes, Building and Contents Coverage
- ☐ No, I do not have flood insurance

3. If there was a flood tomorrow would you feel prepared to handle it?

- ☐ Yes, I know what to do
- ☐ No, I don't know what to do
- ☐ I have a plan but I would not feel prepared

4. How would you prepare for a flood event?

5. Have you visited our offices in City Hall, our website or the Venice library lately for information about flood risk, flood safety, flood insurance or the community rating system (CRS)?

- ☐ Yes
- ☐ No

6. What would you like to learn more about relating to flood risk, flood safety, flood insurance or the community rating system (CRS)?

- ☐ Flood Risk
- ☐ Flood Safety
- ☐ Flood Insurance
- ☐ Community Rating System (CRS)
- ☐ Other (please specify)

7. What neighborhood or street do you live in/on?

8. Do you have flooding issues in your neighborhood?

- ☐ Yes
- ☐ No

If Yes (please specify)

9. Do you have any flooding issues on your property?

- ☐ Yes
- ☐ No

If Yes (please specify)

10. Do you have any suggestions you believe would help mitigate the flood issues?

- ☐ Yes
- ☐ No

If Yes (please specify)

11. Thank you for participating in our flooding questionnaire! If you have any questions, please contact Kathryn Harring at (941) 882-7412 or kharring@venicegov.com. For more information check out www.venicegov.com

Final Question. Do you have any additional comments or concerns relating to floodplain management?



CITY OF VENICE

401 W. Venice Avenue, Venice, FL 34285

www.venicegov.com

(941) 486-2626 Fax (941) 480-3031

Date

Dear Local Real Estate Agent:

I am enclosing a copy of the City's flood hazard brochure, to help inform your clients of local flood hazards. If you would like additional copies to keep in your office, please contact Gillian Carney at (941) 882-7412 or GCarney@venicegov.com.

Thank you for agreeing to help residents remain aware of their flood hazard by utilizing the Mapping Information Service provided to the community by the City's Engineering and Building departments.

The Building Department is able to give information on flood zones, Base Flood Elevation (BFE), the extent of past flooding on a given property, and whether flood insurance is mandatory for a given property. The Building Department staff can also schedule a visit to your client's property to discuss flood protection alternatives.

FEMA Elevation certificates for many properties within the City of Venice can be found on the City's website at **XXXXX**. Copies of FEMA Elevation Certificates are also available from the Engineering Department.

Both the Building Department and the Engineering Department are located in City Hall, 401 W. Venice Avenue, Venice, FL 34285 and can be reached by telephone at: (941) 486-2626.

Residents considering building, making an addition to their property, or installing other flood protection measures should contact the Building Department to determine whether a building permit is required. Properties can be protected from hazards by ensuring that construction debris is kept out of streams, ditches and storm drains. The library also

maintains reference materials pertaining to other flood protection techniques which may help minimize damage to their property. Basement flooding may can be minimized by checking that all downspouts are directed away from the house.

All residents should be aware that dumping in storm drains is a violation of City Code, Section 74-266. Dumping is harmful to our floodplains which are an extremely valuable, renewable resource, important to the economic welfare, enjoyment, and physical well-being of all of our residents; floodplains provide natural flood storage and erosion control, and water quality maintenance as well as providing habitat and critical sources of energy for plants and animals.

As part of being informed about flood hazards, residents should also familiarize themselves with evacuation routes. These can be found in the Sarasota County annual Disaster Planning Guide, available in the library and at various other locations around the City, also on the Sarasota County website, at <http://sarasotagov.org/NDS/FloodMap.cfm>.

In order to receive flood and other emergency notifications, residents should sign up for codeRED® alerts on the city website at <http://venicegov.com/>.

Prior to hurricane season, homeowners should talk about the dangers of flooding with all of the occupants of the home, including minors, and develop a disaster response plan. They may find the tools on the Red Cross website, at www.redcross.org, useful for this. They are also invited to attend the annual Citywide Hurricane Seminar held at City Hall each April.

As a precaution, home owners should inventory and photograph the contents of their home, and put important papers and insurance policies in a safe place. This will help them with their insurance claims in the event that their home is flooded.

Together we can work to inform the public of the importance of flood dangers, protection and insurance.

Sincerely,

Kathleen J. Weeden, PE, CFM, LEED®AP
City Engineer

Everyone is in a Flood Zone

Everyone in Florida is in a Flood Zone, different properties may have a different level of risk. Flood Zones are determined by FEMA Flood Insurance Rate Maps (FIRMs). These maps set the minimum building requirements and insurance rates. Flood Zones are divided into 3 risk zones.

High Risk (Special Flood Hazard Area) *

Zones: V (V,VE)
A (A, AE, AH, AO)

Moderate to Low Risk**

Zones: X (shaded, unshaded)

*If building is in an SFHA, flood insurance is mandatory with a federally backed mortgage

**Moderate to Low risk zones account for over 25% of Nation Flood Insurance Program Claims.

To view your Flood Zone visit:

<https://msc.fema.gov/portal/home>

Or call 941-882-7412

Evacuation Levels

Determine when you should evacuate based on ground elevation and vulnerability to flooding. Always follow evacuation orders



Evacuation maps have 4 levels A, B, C, D

To view your evacuation level visit:

<https://ags3.scgov.net/knowyourlevel/>

Homeowners Insurance Does NOT Cover Flooding

To learn how to protect your new home visit www.venicegov.com/government/engineering/flood-protection/flood-insurance

Also speak to your insurance agent so you are covered for a rainy day



Address or Parcel ID: _____ Date: _____

- ☐ This property is in a Special Flood Hazard Area (SFHA) which is a high-risk area. Flood insurance is required for structures in the SFHA on this property if they have a mortgage from a federally regulated or insured lender

_____ or _____

- ☐ This property is in a moderate or low risk area. Flood insurance is recommended, and you may be eligible for a highly discounted rate.

_____ Also may apply _____

This property is in evacuation level ____.

This form is for informational purposes only. It does not imply that the referenced property will or will not be free from flooding or damage and does not create liability on the part of the realtor, the City of Venice or any officer or employee thereof.

Know Your Flood Risk Before You Buy



Flood Fun Facts

- Flooding happens everywhere not just the high-risk area
- Six (6) inches of moving water can knock over an adult, two (2) feet can carry away a truck.
- Water can also destroy a building
- One inch of water can cost \$27,000 or more!
- Flood water is not clean. It may have mud, chemicals, road oil, bacteria, viruses and other health hazards.
- If you are **in** the Special Flood Hazard Area (SFHA) there is a **25% chance** of flooding during a 30-year mortgage.
- If you are **outside of the SFHA** there is a **20% chance** of flooding during a 30-year mortgage. You are also eligible for a highly discounted insurance rate called the Preferred Risk Policy



Be Prepared!

Sign up for Code Red today to get emergency calls and texts. For more information visit <https://www.venicegov.com/government/fire/weather-and-disaster-information/code-red>

You can also visit the City's website to learn how to prepare for a flood and an emergency supplies list.

Flood Insurance

Talk to your insurance agent today to figure out the best coverage for you.

Condos and apartments may only cover the common areas. Protect your space with contents coverage.

Rates: The National Flood Insurance Program (NFIP) rates do not change company to company. Your rate is calculated based on your risk factors like: your flood zone, your lowest floor elevation, date and construction type of the building

An Elevation Certificate may be available for your property visit the city website to check or call 941-882-7412

Flood Insurance has a 30-day waiting period for coverage to take effect. **Don't Wait** get yours before a hurricane comes.

Building Smart

The City of Venice regulates development in the SFHA to reduce damage from future floods.

There are many things you can do to lower your risk

- Elevate your new home or existing one and all of your equipment like water heaters, A/C units and pool equipment above the base flood. Make sure you get your permits from the Building Division first!
- Plan for proper drainage and design a rain garden
- Install flood vents in areas below the base flood elevation
- For more information contact the Building Division or Engineering Dept.

Buying a fixer upper?

Be aware of substantial improvement rules:

Remodeling projects that cost more than or equal to 50% of the value of the original structure will be required to elevate to one foot above the base flood.

If your house has been substantially damaged by flood, fire or other causes (50% or more than original value) it must also be elevated to one foot above the base flood.



Watch

VS

Warning



Hazards are possible.

Stay on alert with TV or radio.

Get ready to move to safety with your emergency kit!



Hazards are imminent!

Seek shelter now!

Building Responsibly can minimize your flood risk



- Check if a permit is required before construction or altering grades
- Report un-permitted construction
- For more information about City Permits visit Venicegov.com



Protect your gold and build responsibly.

Reduce your cost to rebuild, before the storm hits.

Even I don't just rely on luck!



- Check if a permit is required before construction or altering grades
- Report un-permitted construction
- For more information about City Permits visit Venicegov.com

How do you receive flood warnings?

CodeRED



A

B

C

Answer: D. All of the Above

Sign up for the Venice's Code RED Today
and keep a weather alert radio in your
emergency kit

To sign up Visit venicegov.com



Hurricane Season is Starting!

Do you have a Plan?



Create safety and evacuation plans

Teach kids about flood safety

Find out more at www.ready.gov/make-a-plan

My hooman didn't want to evacuate when
Local officials told us to... Now we are here



Know your evacuation level, have a plan and
listen to local officials... don't end up like me

Fast Facts For Flood Insurance

30 Days

The length of the waiting policy before your policy takes effect.



Flooding caused by natural hazards are not typically covered by homeowner's insurance



Contents Coverage is available for Renters and Condo Owners



For More Information about Flood Insurance Visit www.floodsmart.gov

How much do you know about Flood Safety?



- Turn off electricity if you've been flooded
- Stay away from power lines and electric wires



- Don't drown Turn Around
- Watch out for animals, insects and other hazards



- Do not enter a flooded building until it has been cleared
- Watch out for gas leaks



Do you know your Flood Zone?
Don't be the turkey!



Call the Engineering Department at
(941) 882-7412
or look it up at www.venicegov.com



Do you know your Flood Zone?
Don't be scared!



Call the Engineering Department at
(941) 882-7412
or look it up at www.venicegov.com



Do you know your Flood Zone?



To determine your flood hazard and insurance requirements
call the Engineering Department at **(941) 882-7412**
or Visit www.venicegov.com

Are you and your family ready ?



- ❖ Know your Level: Find your Evacuation Zone by visiting Sarasota county's website
- ❖ Inventory and photograph your home and contents
- ❖ Create an emergency plan for your family and your pets
- ❖ For more Information visit Venicegov.com and ready.gov/hurricanes

Love your home? Protect it from Flooding!



- ✓ Clean your downspouts and direct them away from your house
- ✓ Keep driveway culverts clean and free of obstructions
- ✓ Retrofit your property
- ✓ Get a permit from the Building Department to elevate air handlers, electrical boxes and water heaters
- ✓ Seek expert advice on flooding or mitigation from the City's Engineering Department at 941-882-7412
- ✓ For more mitigation ideas check out FEMA's publication P-805



How do I mitigate my flood risk?

- ✓ Clean your downspouts and direct them away from your house
- ✓ Keep driveway culverts clean and free of obstructions
- ✓ Retrofit your property
- ✓ Get a permit from the Building Department to elevate air handlers, electrical boxes and water heaters
- ✓ Seek expert advice on flooding or mitigation from the City's Engineering Department at 941-882-7412
- ✓ For more mitigation ideas check out FEMA's publication P-805



Protecting Natural Resources Reduces Flood Risks

- Floodplains benefit the natural water flow and provide flood protection
- Dumping is a violation of City code Section 74-266
- Keep drainage areas free of debris



TURN AROUND

DON'T DROWN!

6 in= sweeps away cars and you!

2ft= carries trucks away



How Do I Protect my Property from a Flood?



Elevation



Flood Vents

- ❖ Keep flood vents open and unobstructed so water can flow through
- ❖ For information on how to reduce flood risk to buildings that can't be elevated read FEMA's P-1037
- ❖ The Building Department will determine if a non-conversion agreement is required to be completed and kept with the property deed

You don't have to be in the high risk area to experience a flood!



Flooding can happen anywhere!

Flood Insurance can help protect you.

Visit [floodsmart.gov](https://www.floodsmart.gov) for more information

You don't have to be in the high risk area to experience a flood!



Flooding can happen anywhere!
Flood Insurance can help protect
you. 06/25/2012

Visit [floodsmart.gov](https://www.floodsmart.gov) for more information

Appendix F

Flood Response Plan

Flood Response Preparations Plan

Plan Development:

As a part of the Community's Emergency Management System, the City works in conjunction with Sarasota County Emergency Management to coordinate our flood threat recognition system, storm surge map and our Comprehensive Emergency Management Plan (CEMP). The CEMP describes the methods and warning devices use to disseminate emergency warnings to the community, the flood response actions to be undertaken at different flood levels, and other information necessary to designated agencies and organizations in order to perform their assigned responsibilities.

During the CRS Committee meetings 2016-2017, it was determined that a Flood Response Preparations Plan (FRP) should be incorporated into the FMP, in accordance with CRS elements 330 (Flood Response Preparations) and 610 (Flood Warning and Response).

Plan Goals

The goal of the Flood Response Plan is to prepare key messages to be disseminated before, during, and after a flood, to determine how and when it is best to disseminate those messages and, ultimately, to help keep our residents safe when a flood event occurs.

The five key messages are:

1. The risk is real
2. Be prepared before a flood
3. Have an emergency plan
4. Be prepared during a flood
5. What to do after a flood.

Sarasota County Emergency Management participates in providing information to the citizens of Sarasota County in ongoing public outreach activities. This includes the use of newspaper advertisements, public services announcements, radio spots, flyers, fairs and conferences. Presentations are made at both public and private meetings to inform attendees of mitigation activities available. The county also actively supports public education regarding building policies in flood prone areas.

The City has many outreach projects concerning the threat of flooding – but the City's primary outreach project on flood preparation is the annual hurricane seminar which gives residents information on flood and hurricane warning and safety precautions. In addition to outreach, the County holds an annual Countywide hurricane drill, in which the City is an active participant. After the exercise, a Lessons-learned Report is submitted by each of the municipalities.

The FRP will include messages to be distributed prior to an expected flood event, during a flood event, and after a flood event. The messages will be prepared well in advance and reviewed and updated each year. The messages will be prepared in conjunction with the Topics and Messages in the PPI, as well as any in the City's Comprehensive Emergency Management Plan. The primary methods of distribution will initially be via the City's website and social media sites – with those messages easily shared by stakeholders, and additional methods being determined as the plan progresses.

The materials include templates and masters of handouts, mailers and press releases covering key messages that need to be disseminated before, during and after a flood, as well as written procedures explaining how the messages are to be copied and disseminated.

The FRP projects and procedures for dissemination will be reviewed, prepared, and updated by April 30th each year - prior to the City's annual Hurricane seminar each May. In addition, the materials may be included for review as part of the annual County wide hurricane eCity of Venice Flood Response Projects

Schedule and Outreach

In addition to the following, the City also shares flood response messages from Sarasota County Emergency, Management.

Table 1: When to Disseminate FRP Projects

FRP Project #	Project	Before a Flood event	During a Flood event	After a Flood event
1	Citywide Hurricane Seminar	X		
2	A Guide to Flood Safety (created by the State of Florida)	X	X	
3	What to do after a disaster in City Hall, Engineering Dept. and Library			X
4	City Website	X	X	X
5	Forwarded Sarasota County Social Media Messages about flood threats and levels (Twitter, FB)	X	X	X
6	Response Plan Message Templates	X	X	X

Table 2: Messages (FRP#8)

Timing	Message #	Message	Graphics	Delivered via
Before	1	A Flood watch remains in effect until tonight because of	1, 1a, 2, 2a, 4, 4a, 5, 6, 6a, 8, 8a	News Media, Social Media
Before	2	Attention Boaters: Please make sure your vessels are secured to boat lifts/docks. Remember to turn off power to lift, and make sure no power lines are in the water.		News Media, Social Media
Before	3	Make an emergency plan for your business	3	Social Media
Before	4	Make an emergency plan for your family	7, 9, 10	Social Media
During	5	The following roads in the city are seeing street flooding. The City of Venice requests that you avoid the following areas if possible:	2, 2a, 4, 4a, 6, 6a, 11, 12	News Media, Social Media
During	6	Sarasota County Parks & Recreation has closed Venice Myakka River Park, 7501 Laurel Rd. E., due to river flooding. The Myakka has risen to		News Media, Social Media



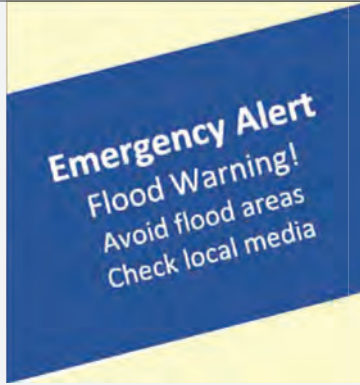


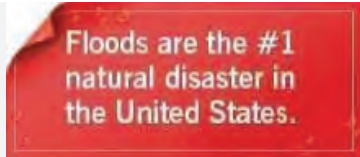


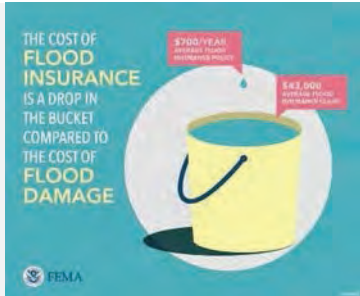

Timing	Message #	Message	Graphics	Delivered via
		the point that walkways are under water and there is no safe access to the floating dock. Staff locked the gate this morning and posted a sign to help visitors understand why the park has been closed.		
During	7	Do not walk or drive through flooded streets; You don't know what dangers are lurking in the water, and it only takes 6 inches of water to cause problems for some vehicles. Remember to "Turn Around, Don't Drown."	2, 2a, 4, 4a, 6, 6a, 11, 12	News Media, Social Media
During	8	The parking lot north of the Venice Fishing Pier is seeing severe flooding, please avoid the area.	1,1a	News Media, Social Media
During	9	The South Jetty walkway is: <ul style="list-style-type: none"> • Open but is being closely monitored. • Closed until further notice 	1, 1a	News Media, Social Media
During	10	Conserve water! The City of Venice Utilities Dept. requests that all residents within the City limit conserve their use of water, and reduce the amount of toilet flushes as possible during, this rain event. Our crews are working diligently to ensure continued service to our residents.		Code RED, Social Media
During	11	Conserve water! The City's sewer system is being affected by large volumes of water entering the system via multiple sources. To help reduce the burden on the city's facilities, please minimize toilet flushing, doing laundry, and other activities that contribute to the sewer system flows.		Code RED, Social Media
During	12	The City of Venice advises that sand, bags and shovels are available at the following locations for those needing to fill sandbags to protect their property:		Code RED, Social Media
After	13	The flood event is over and it's safe to return home, but check for the following...	14, 14a, 15, 15a, 13	News Media, Social Media

Procedure

- Media Outlets (emailed to by City of Venice PIO)
 - Herald Tribune
 - Venice Gondolier
- Social Media Outlets (Posted to by City of Venice PIO)
 - [Facebook account](https://www.facebook.com/CityofVeniceFlorida/) - <https://www.facebook.com/CityofVeniceFlorida/>
 - [Twitter account](https://twitter.com/cityofvenicefl?lang=en) - <https://twitter.com/cityofvenicefl?lang=en>
- Code RED[®]
 - Messages posted to Code RED[®] system by IT department and the PIO
- [Source](https://www.fema.gov/media-library/multimedia/collections/488): <https://www.fema.gov/media-library/multimedia/collections/488>

Table 4: Graphics to be used

Header	Picture and number below	Picture and number below	Picture and number below
Before Flood Graphic			
#	1	2	2a (Spanish)
Before Flood Graphic			
#	3	4	4a (Spanish)
Before Flood Graphic			
#	5	6	6a (Spanish)
Before Flood Graphic			
#	7	8	8a (Spanish)

Header	Picture and number below	Picture and number below	Picture and number below
Before Flood Graphic			
#	9	10	1a
During Flood Graphic			No image
#	11	12	No number
After Flood Graphic			
#	13	14	14a (Spanish)
After Flood Graphic			No image
#	15	15a (Spanish)	No number

New Outreach Materials

The City has also created a few new graphics that are released before and after a flood. They are pictured below.

Before





How do you receive flood warnings?

 CodeRED

A

 B

 C

Answer: D. All of the Above

Sign up for the Venice's Code RED Today
and keep a weather alert radio in your
emergency kit

To sign up Visit venicegov.com 

Before and After

How much do you know about Flood Safety?



- Turn off electricity if you've been flooded
- Stay away from power lines and electric wires



- Don't drown Turn Around
- Watch out for animals, insects and other hazards



- Do not enter a flooded building until it has been cleared
- Watch out for gas leaks



The City also recently created a brochure titled "What to do after a disaster" It is attached below.

Disaster Assistance

There are many funding opportunities for mitigation, repairs and housing assistance. Below is a list of disaster assistance programs and the organization that runs it

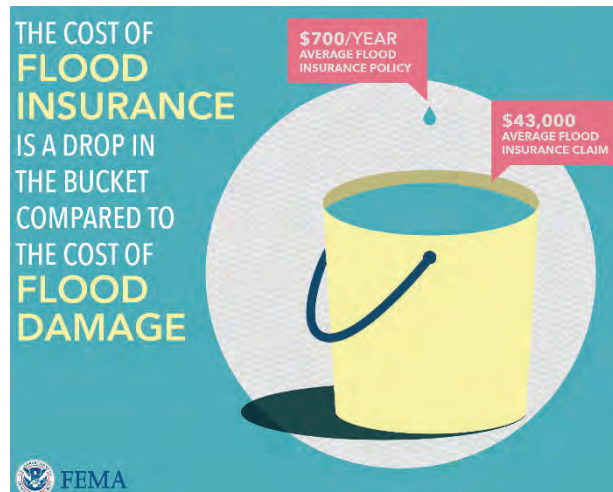


1. Individual and household program (FEMA)
2. Transitioning Shelter Assistance (FEMA)
3. Home and Personal Property Loan (SBA)
4. FHA 203 K Loan (HUD)
5. FHA 203 H Loan (HUD)
6. Title 1 Property Improvement Loan for Manufactured Homes (HUD)
7. Title 1 Home and Property Improvement Loan (HUD)
8. FL Small Business Emergency Bridge Loan Program (State)
9. Community Development Block Grants (Disaster Recovery/ HUD)
10. HOME Investment Partnerships Program (Federal Block Grant/ HUD)
11. State Housing Initiatives Partnership (SHIP/ FL Housing)

The best way to protect yourself financially from flooding is having a flood insurance policy. Flood Insurance will pay even if there is no Presidential emergency declaration; required for most forms of disaster assistance.

What else can I do after a disaster?

- ✓ Take photos of all building damage & damaged contents
- ✓ You must contact your insurance agent and submit a "Proof of Loss" within 60 days of a flood.
- ✓ Seek Emergency Assistance; register at Disaster Recovery Centers or online at www.DisasterAssistance.gov
- ✓ Apply for permits before rebuilding! Provide documentation of damage and cost estimates for repairs these should be prepared by a licensed FL contractor
- ✓ Determine if your property qualifies as a Substantial Damage or Improvement



Substantial Damage (SD)

Substantial Damage: Damage that occurs to a structure, regardless of cause, where the cost to repair equals or exceeds 50% of the market value of the structure prior to damage.

If a building is substantially damaged and it is below the base flood elevation it will need to be brought up to current flood code.

After a Disaster How is SD Determined?

Before you begin repairing your damaged home check what permits may be required

Local officials will conduct a structure condition survey of the affected areas to ID obviously unsafe structures and will use color-coded placards to determine safety of structure

SD is determined using FEMA's Substantial Damage Estimator to determine the cost of repairing the home to its pre-damaged condition. To learn more visit

<https://www.fema.gov/media-library/assets/documents/169099>



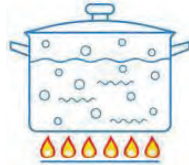
Increased Cost of Compliance Coverage may help with elevating your home after its been damaged. Ask your flood insurance agent for more info

For more information about SD contact the Building Division: (941) 483-5907

Returning Home After a Disaster

Returning after a disaster can be shocking but it's important to know what to do.

- ☐ Do not enter a damaged building until it has been cleared for re-entry
- ☐ Contact your adjustor and verify what proof you need for an insurance claim
- ☐ Remove wet contents ASAP and dry building with dehumidifiers or a/c to prevent mold.
- ☐ Throw away any thawed, smelly or contaminated foods. Especially if it touched floodwaters
- ☐ Boil water until health officials say not to
- ☐ Use a flashlight, not fire. If you smell gas call 911 and do not enter the building
- ☐ Report broken utility and electric systems to the appropriate authorities
- ☐ Get permits and hire licensed contractors
- ☐ Beware of insects Use insect repellent and wear long sleeves and pants
- ☐ Beware of stray animals; they may bite
- ☐ Don't use electric tools or turn on the power if you are standing in water.
- ☐ **FLOODING? BE SAFE!**
Turn Around Don't Drown
- ☐ Don't use generators or other fuel-burning devices unless in a well-ventilated area to prevent Asphyxiation



For more information please visit the following resources:

<https://www.venicegov.com/government/fire/weather-and-disaster-information>

<https://www.venicegov.com/government/engineering/flood-protection/before-during-and-after-a-flood>

<https://www.fema.gov/help-after-disaster>

https://www.hud.gov/program_offices/healthy_homes/Post-Disaster-Resources

<https://www.floridadisaster.org/dem/recovery/>

<https://www.sba.gov/disaster-assistance/>

<https://www.cdc.gov/disasters/returnhome.html>



What to do after a disaster



Appendix G

Flood Insurance Analysis and Coverage Improvement Plan

Flood Insurance Analysis City of Venice 2019

Insurance coverage based on active policies within the City of Venice. Derived from information received by ISO in June of 2019.

Table 1: CRS Class 6

	Total	SFHA	X-STD/AR/A99	PRP
Policies in Force	5,950	3,051	576	2,323
Premium	\$3,611,510	\$2,401,203	\$245,636	\$964,671
Average Premium	\$607	\$787	\$426	\$415

Insurance Overview

Within the City of Venice there are 5,950 flood insurance policies. The total premiums are \$3,611,510. The amount of insurance in force is \$1,404,297,900. There have been 223 closed paid losses that amounted to \$2,272,549.18.

There are 137 minus rated policies all within the A zone.

There are 72 flood insurance policies on manufactured homes. There has only been 1 paid loss amounting to \$11,729.

There have been 7 substantial damage closed paid losses.

Insurance Occupancy

Table 2: Insurance based on type of residency

Type of residency	Policies in Force	Premium	Insurance in Force	# of Closed Paid Losses	\$ of Closed Paid Losses	Adjustment Expense
Single Family	2,523	\$1,375,983	\$772,390,300	87	\$1,123,434.02	\$60,016.45
2-4 Family	348	\$268,834	\$58,728,500	30	\$510,970.40	\$24,624.30
All other residential	2,893	\$1,480,556	\$492,440,000	82	\$501,509.63	\$27,962.25
Non-Residential	186	\$486,137	\$80,739,100	24	\$136,635.13	\$6,665.00
Total	5,950	\$3,611,510	\$1,404,297,900	223	\$2,272,549.18	\$119,268.00

Table 3: Insurance in condos and non-condos

Type of building	Policies in Force	Premium	Insurance in Force	# of Closed Paid Losses	\$ of Closed Paid Losses	Adjustment Expense
Condo	3,341	\$1,788,900	\$559,869,500	76	\$846,076.38	\$40,653.85
Non-Condo	2,609	\$1,822,610	\$844,428,400	147	\$1,426,472.80	\$78,614.15
Total	5,950	\$3,611,510	\$1,404,297,900	223	\$2,272,549.18	\$119,268.00

Insurance by Zone

Table 4: Insurance by Zone

Flood Zone	Policies in Force	Premium	Insurance in Force	# of Closed Paid Losses	\$ of Closed Paid Losses	Adjustment Expense
A01-30 & AE Zones	3,045	\$2,293,830	\$555,609,600	112	\$1,411,149.34	\$69,987.75
A Zones	0	\$0	\$0	2	\$60,081.59	\$2,475.20
V01-30 & VE Zones	6	\$7,373	\$395,100	55	\$318,056.72	\$16,105.00
Low Risk Area Standard	576	\$245,636	\$120,593,200	40	\$204,973.78	\$11,240.00
Low Risk Area Preferred	2,323	\$964,671	\$727,700,000	14	\$278,287.75	\$19,460.05
Total	5,950	\$3,611,510	\$1,404,297,900	223	\$2,272,549.18	\$119,268.00

Insurance in Pre-FIRM buildings vs Post FIRM buildings

Table 5: Pre-FIRM

Zone	Policies in Force	Premium	Insurance in Force	# of Closed Paid Losses	# of Closed Paid Losses	Adjustment Expense
AE and A1-30	2,114	\$1,840,631	\$363,683,200	108	\$1,395,371.73	\$67,992.75
Unnumbered A	0	\$0	\$0	2	\$60,081.59	\$2,475.20
VE and V1-30	5	\$6,793	\$330,200	54	\$316,232.57	\$15,905.00
B, C and X	1,003	\$406,912	\$261,461,700	47	\$437,450.55	\$25,175.05
Standard X	409	\$142,050	\$80,658,700	38	\$193,760.91	\$10,390.00
Preferred X	594	\$264,862	180,803,000	9	\$243,689.64	\$14,785.05
Total	3,122	\$2,254,336	\$625,475,100	211	\$2,209,136.44	\$111,548.00

Table 6: Post FIRM

Zone	Policies in Force	Premium	Insurance in Force	# of Closed Paid Losses	\$ of Closed Paid Losses	Adjustment Expenditure
AE and A1-30	931	\$553,199	\$191,926,400	4	\$15,777.61	\$1,995.00
Unnumbered A	0	\$0	\$0	0	\$0.00	\$0.00
VE and V1-30	1	\$580	\$64,900	0	\$0.00	\$0.00
B, C and X	1,896	\$803,395	\$586,831,500	7	\$45,810.98	\$5,525.00
Standard X	167	\$103,586	\$39,934,500	2	\$11,212.87	\$850.00
Preferred X	1,729	\$699,809	\$546,897,000	5	\$34,598.11	\$4,675.00
Total	2,828	\$1,357,174	\$778,822,800	11	\$61,588.59	\$7,520.00

Flood Insurance Coverage Improvement Plan

Flood Insurance in the City

There are 11,467 insurable structures within the City of Venice. Data provided by Federal Emergency Management Agency (FEMA) indicates that the City of Venice has 5,950 insurance policies in force as of September, 2019. Of this number, 3,627 are eligible for CRS premium discounts, there are the 3,051 policies located in the Special Flood Hazard Area (SFHA) and the 576 policies in the X-STD/AR/A99 zones. The remaining 2,323 policies are considered preferred risk and are not eligible for CRS premium discounts.

The FEMA data lists an average premium of \$787 in the SFHA, \$423 in the X-STD/AR/A99 zones, and \$415 for those policies written as preferred risk. The average flood insurance premium in the City of Venice is \$607.

As a CRS class 6 community, insurance policy holders in the City of Venice are eligible for a discount of up to 20% on flood insurance premiums for policies purchased through the National Flood Insurance Program (NFIP).

Table 8 below shows the number of insurable buildings by flood zone. These figures are used for comparison with the FEMA supplied numbers of insurance policies by zone to determine which areas to target with flood insurance information.

Table 9: Insurable Buildings in the City of Venice 2018

Flood Zone	# of Buildings	# of Insurable Buildings
SFHA	2503	2407
Non SFHA	9334	9061
Total# Insurable buildings	11837	11467

The most recent figures from FEMA, dated September 2019, indicate 5,950 policies within the City, with a total of \$1,404,297,900.00 of insurance in force, and 7 substantial damage closed paid losses since 1978.

As of September 2019, the number of insurance policies on post-FIRM buildings is 2,828, almost 30% fewer than the 3,122 policies on pre-FIRM buildings. This may be a result of FEMA requirements raising the required finished floor elevation (FFE) as pre-FIRM buildings were built at grade and are at greater risk of flooding. However, there remain a few non-conforming buildings within the City and the City plans on tracking these in the future. Another contributing factor is the fact that, according to local realtors and lenders, 60% of home purchases in the City currently are cash purchases, lacking the mortgage requirement of flood insurance. As mitigation grants are only available for insured properties, the City realizes that this is another consideration when determining targeted outreach.

A complete Flood Insurance Analysis (FIA) was conducted by the City in 2019, based on FEMA figures from September 2019. The City plans on conducting an annual FIA to evaluate the effectiveness of the outreach programs, and make amendments where necessary. The FIA conducted in 2019 indicated that more outreach is necessary to Condo owners explaining that the Condo Association's Building coverage does not include contents coverage for individual units.

Plan Development:

The CRS Committee was formed in August 2014 to provide input related to development of an Updated Floodplain Management Plan including Program for Public Information and flood insurance Coverage Improvement Plan sections. The CRS Committee combines the staff expertise from the city building code, floodplain management, planning & zoning and public information with input from the insurance, real estate, construction, business and financial lending fields. Input from the general public was also included and opportunities to attend the meetings were published. Quarterly meetings of the CRS Committee will be conducted and are tentatively scheduled for November, February, May and August to review the effectiveness of the current public outreach and coverage improvement efforts and recommend improvements or additions to the program. The CRS Committee will also conduct an annual evaluation/update of the existing plans with a formal update of the plans completed every 5 years. This document represents the 5 year update.

As outlined in Appendices A and B, the CRS Committee met 7 times in August and September 2014 to develop the Coverage Improvement Plan in conjunction with the Floodplain Management Plan. Steps taking during the development process are outlined in the meeting agendas, minutes and resolution adopting the CRS Committee in Appendix B. During the development process, review comments were received from Janice Mitchell, Insurance Program Specialist, FEMA Region IV, and through the Community Rating System review process. Based on those comments, this plan has been updated to include additional documentation and clarification of the processes followed in completing the Floodplain Management Plan. In addition, the Program for Public Information and Coverage Improvement Plan were incorporated into the Floodplain Management Plan for clarify and more efficient monitoring of program goals and accomplishments. Participation in the Multijurisdictional PPI Committee will also include opportunities to increase participation in flood insurance.

The Multi-Jurisdictional Program for Public Information (County-wide PPI) was adopted by the City of Venice City Council August 27th 2019. It has been incorporated into the City's Floodplain Management and PPI program by resolution. From this point forward, the City will continue to complete the local City PPI activities in addition to the programs provided by the County-wide PPI to increase public information provided. The County-wide PPI was adopted by Resolution by BOCC on January 29, 2019 as an annex to the Unified Multi-Jurisdictional Local Mitigation Strategy (LMS). This LMS also includes the City of Venice's adopted FMP as an annex along with the City's updated LMS Project List. The County-wide PPI includes of all the municipalities in Sarasota County including: The City of Venice, City of North Port, City of Sarasota, the Town of Longboat Key and unincorporated Sarasota County.

Target Areas:

An evaluation was completed of the existing flood insurance policies within the city limits. These policies were reviewed for accuracy with any discrepancies regarding addresses forwarded to the NFIP for correction. The existing flood insurance policies were evaluated numerically to estimate the number of buildings that currently have flood insurance policies within the City. The mapping of the individual policy locations is in process by the Engineering Dept. Since this document is protected by the Privacy Act, only the general information regarding the policy locations has been included in this report and to the CRS Committee. A second evaluation of number of building greater than 500 SF within the city limits were estimated by GIS to determine the total number of insurable buildings within the city limits. Based on these estimates, approximately 59% of building within the city limits are insurable, but for a

variety of reasons, such as the high percentage of cash purchases, remain uninsured. This is especially concerning in high risk areas such as the coastal properties, low lying areas adjacent to Hatchett and Curry Creek and the identified repetitive loss areas.

Initial discussion by the CRS Committee set up a priority list for flood insurance coverage improvement target areas. The target areas are determined by the City based on the level of risk and an evaluation summary of the existing policies. The following priority ranking was established for the overall coverage improvement communication plan:

1. Repetitive Loss Areas (Shown tan with blue boundary) – Targeted mailings will be sent out annually to these areas to clarify the importance of flood insurance for the structure and contents.
2. Areas coming into the floodplain based on proposed draft map information (3 areas shown with red boundaries) – These areas received notification from FEMA prior to the raft D-FIRMS being issued. A targeted mailing was sent, by the City, to owners of properties coming into the floodplain when the DFIRMs were finalized. These residents currently receive information from our flyer mailed twice a year all residents that includes information regarding the importance of flood insurance for structure and contents.
3. Areas within the Special Flood Hazard Area (SFHA) or 100-year floodplain – After completion of the first year evaluation based on the insurance policy numbers and locations of policies is evaluated, additional targeted mailings will be provided in areas that are not showing improvement.
4. Areas outside the SFHA. – These residents currently receive information from our flyer mailed twice a year to all residents. The flyer includes information regarding the importance of flood insurance for structure and contents.

The SFHA consists of Zones A, AE, A1-A30, V, V1-V30, AO and AH.

The CIP project list is included in Appendix E.

DFIRM Impact Analysis

The City received finalized DFIRMs in May 2016, with an effective date of 11/4/2016. Following is the Impact analysis:

Table 10: DFIRM Impact Analysis

Item	Newly Mapped into the SFHA	Removed from the SFHA	Remaining in SFHA
# Structures	556	1146	1723
# Parcels	791	2073	1976
# Accounts(such as individual units within a condo)	1806	2769	6676

FEMA recently released the new preliminary flood maps 12/31/2019. This was a coastal study, it reevaluated all the DFIRM panels in the city. Venice is currently in the process of releasing these

preliminary maps to the public before the comment and appeals process. It appears as though 60 parcels are entering a higher risk while 1,279 parcels are being removed from the SFHA.

Plan Goals

The goal of this Flood Insurance Coverage Improvement plan shall be to:

1. Improve knowledge regarding the importance of flood insurance:
 - a. Insurance training – The City Engineer and the Stormwater Engineering Research Analyst have both completed Parts I and II of FEMA Insurance Agent Training to increase knowledge regarding NFIP and effectiveness of technical assistance provided to residents, real estate agents, insurance agents and others who request technical assistance from the city.
 - b. Twice a year, an informational flyer is sent to all residents, and targeted mailings to homeowners' association, realtors and insurance agents as outlined above.
 - c. An annual presentation is completed at the Venice Area Board of Realtors highlighting the importance of flood insurance, trying to clarify the myth "you don't need insurance," providing information that homeowners insurance does not cover flood and 30-day waiting period.
 - d. Informational brochures are provided at City Hall, the city Engineering Dept., the Venice Public Library and via the City's website.
2. Increase flood insurance coverage throughout the city for homeowners, renters and commercial properties:
 - a. Continue insurance related outreach activities included in PIP above.
 - b. Stress the importance of needing flood insurance to reduce the perception that "you don't need flood insurance because you are not in a flood zone," by providing flyers regarding required flood insurance and the impacts to the property owners in the event their property is flooded and they do not have flood insurance.
3. Look for opportunities to reduce flood losses to improve the sustainability of the flood insurance program.
4. In 5-year plan update, establish specific target areas based on developments, storm surge, flood zones and number of insured structures.
5. FEMA released their preliminary map updates as of early 2020. A significant number of properties will be removed from our high risk areas. The city will be preparing a lot of messaging that encourages residents to keep their flood insurance. This messaging will be available in English and Spanish and it will be present in the following locations
 - a. At public events
 - b. On social media
 - c. In the city newsletter
 - d. In public buildings like the library and city hall
 - e. Presentations at HOAs, VABR, etc.
 - f. The city website

Annex D



SARASOTA COUNTY FLOODPLAIN MANAGEMENT PLAN

Sarasota County | June 2018

**SARASOTA COUNTY
FLOODPLAIN MANAGEMENT PLAN**

Prepared for:

Sarasota County
1001 Sarasota Center Blvd.
Sarasota, Florida 34240

Prepared by:

Jones Edmunds & Associates, Inc.
730 NE Waldo Road
Gainesville, Florida 32641

Certificate of Engineering Authorization #1841

Jones Edmunds Project No.: 19006-049-01

June 2018

REVISIONS

Date	Revision

TABLE OF CONTENTS

1 INTRODUCTION	1-1
Purpose	1-1
Community Profile	1-3
Geographic Profile	1-3
Topography	1-3
Climate	1-3
Population and Demographics	1-3
Housing	1-4
Economy	1-4
National Flood Insurance Program	1-5
Community Rating System.....	1-5
2 PLAN ORGANIZATION AND DEVELOPMENT	2-1
Planning Committee	2-1
Public Involvement	2-2
Public Meetings.....	2-3
Additional Public Information Activities	2-3
Coordination	2-6
Review of Existing Studies and Information.....	2-6
Coordination with Other Agencies and Organizations	2-9
3 ASSESSMENT OF FLOOD HAZARDS.....	3-1
Coastal Flooding	3-1
Inland Flooding.....	3-4
Tropical Storm / Hurricane	3-11
Historical Claims and Repetitive Loss Areas	3-15
4 LESS FREQUENT FLOOD HAZARDS AND OTHER TYPES OF HAZARDS	4-1
Dam Failure.....	4-1
Levee Failure	4-1
Coastal Erosion.....	4-4
Other Hazards	4-5
Hail Storm.....	4-5
Lightning	4-6
Freeze	4-6
Tornado	4-6
Land subsidence / sinkholes	4-6

Wildfires	4-7
5 FUTURE FLOODING	5-1
Climate Change and Sea Level Rise	5-1
Future Development in the Watershed	5-3
Future Conditions Model	5-6
6 ASSESSMENT OF IMPACTS DUE TO HAZARDS	6-1
Life Safety	6-1
Public Health	6-4
Critical Facilities and Infrastructure	6-5
Economy and Major Employers	6-7
Residential and Commercial Buildings	6-7
7 NATURAL FLOODPLAIN FUNCTIONS	7-1
Beneficial Resources and Functions of Natural Floodplains	7-1
Natural Flood Storage and Erosion Control	7-1
Water Quality and Aquifer Recharge	7-1
Fish and Wildlife Habitat	7-1
Recreation	7-2
Economic Benefit	7-2
Protecting Our Natural Floodplains	7-2
8 FLOODPLAIN MANAGEMENT PLAN GOALS AND ACTIVITIES	8-1
Goals	8-1
Review of Possible Floodplain Management Activities	8-1
Integration with Sarasota County Post-Disaster Redevelopment Plan	8-20
Integration with Sarasota County Local Mitigation Strategy	8-20
9 FLOODPLAIN MANAGEMENT ACTION PLAN	9-1
Coordination with Other County Initiatives	9-1
10 PLAN ADOPTION, IMPLEMENTATION, EVALUATION AND REVISION	10-1
11 REFERENCES	11-1

LIST OF TABLES

Table 2-1	Floodplain Management Plan Committee Members	2-1
Table 2-2	FMP Committee Meetings	2-2
Table 2-3	Telephone or In-Person Coordination with Other Agencies	2-9
Table 2-4	Workshop Participants	2-10
Table 3-1	Probability of Tidal Water Elevations	3-4
Table 3-2	Saffir-Simpson Hurricane Wind Scale	3-11
Table 3-3	NHC Hurricane or Tropical Storms Return Intervals for the Tampa Bay Region	3-15
Table 3-4	NHC Hurricane Return Intervals for the Tampa Bay Region	3-15

Table 3-8	Causes of Repetitive Flooding	3-21
Table 4-1	Sarasota County Coastal Erosion.....	4-4
Table 6-1	Potential Impacts on Life Safety in Sarasota County.....	6-2
Table 6-2	Important Contact Information	6-3
Table 6-3	Critical Facilities in the SFHA.....	6-7
Table 6-4	Building Types in the SFHA	6-10
Table 7-1	Parks and Natural Lands	7-5
Table 8-1	Review of Existing Floodplain Management Activities.....	8-5
Table 8-2	Review of Possible Floodplain Management Activities.....	8-15
Table 9-1	Floodplain Management Action Plan	9-2

LIST OF FIGURES

Figure 1-1	Sarasota County	1-2
Figure 1-2	Population Projections for Sarasota County	1-4
Figure 1-3	Housing Units by Type	1-4
Figure 2-1	FMP Public Meeting	2-3
Figure 2-2	Sarasota County Floodplain Management Plan Website	2-4
Figure 2-3	Sarasota County Floodplain Management Survey Website	2-5
Figure 3-1	Special Flood Hazard Areas within Sarasota County	3-3
Figure 3-2	Areas Potentially Affected by Coastal Flooding	3-5
Figure 3-3	Sarasota County Community Flood Hazard Areas.....	3-8
Figure 3-4	Sarasota County Historical Flooding Issues/Complaints (Points)	3-9
Figure 3-5	Sarasota County Historical Flooding Issues/Complaints (Heat Map).....	3-10
Figure 3-6	Historical Tropical Storm and Hurricane Tracks for the United States Since 1842	3-14
Figure 3-7	Historical Tropical Storm and Hurricane Tracks for the Sarasota Area Since 1950 (within 75 nautical mile radius).....	3-14
Table 3-5	Policy and Claim Statistics for Pre-FIRM Structures	3-15
Table 3-6	Policy and Claim Statistics for Post-FIRM Structures.....	3-16
Table 3-7	Policy and Claim Statistics by Occupancy Type	3-16
Figure 3-8	Flood Insurance Policies in Unincorporated Sarasota County	3-18
Figure 3-9	Flood Insurance Claims in Unincorporated Sarasota County.....	3-19
Figure 3-10	Repetitive Loss Areas Analysis.....	3-20
Figure 4-1	National Dam Inventory for Sarasota County and Surrounding Areas	4-3
Figure 5-1	Estimated Global Sea Level Change	5-1
Figure 5-2	Relative Sea Level Change Projections – Gauge: 8726520, St. Petersburg, FL	5-2
Figure 5-3	Sea, Lake, and Overland Surges from Hurricane Model	5-3
Figure 5-4	Sarasota County Future Land Use	5-4
Figure 6-1	Critical Facilities	6-6
Figure 6-2	Sarasota County Building Outlines	6-9
Figure 6-5	Buildings in the SFHA	6-10
Figure 6-4	Potential Flood Insurance Coverage Improvement for Buildings - Area 1.....	6-11
Figure 6-5	Potential Flood Insurance Coverage Improvement for Buildings - Area 2.....	6-12
Figure 6-6	Potential Flood Insurance Coverage Improvement for Buildings - Area 3.....	6-13
Figure 6-7	Potential Flood Insurance Coverage Improvement for Buildings - Area 4.....	6-14
Figure 6-8	Potential Flood Insurance Coverage Improvement for Buildings - Area 5.....	6-15
Figure 6-9	Potential Flood Insurance Coverage Improvement for Buildings - Area 6.....	6-16
Figure 7-1	Celery Fields	7-1
Figure 7-2	Sarasota County Wetlands Inventory	7-3

Figure 7-3	Parks, Preserves and Environmentally Sensitive Lands Owned by Sarasota County	7-4
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ATTACHMENTS

Attachment 1 - 2016-2017 Economic Report
Attachment 2 - Flood Damage Protection Ordinance
Attachment 3 - Committee Meetings
Attachment 4 - Public Meetings
Attachment 5 - Flood Zone Workshops
Attachment 6 - References
Attachment 7 - FMP Report Comments
Attachment 8 - Post-Disaster Redevelopment Plan
Attachment 9 - Repetitive Loss Areas Analysis
Attachment 10 - PRMRWSA Reservoir Levee
Attachment 11 - Bahia Vista Levee
Attachment 12 - Sarasota County Evacuation Zones and Shelters
Attachment 13 - Project List
Attachment 14 - Adoption

1 INTRODUCTION

PURPOSE

Among all natural hazards, floods are the costliest and most pervasive hazard in the United States. Property losses from flooding events in the United States have been steadily increasing since the mid-1900s and have now reached billions of dollars per year.

The U.S. Federal Emergency Management Agency (FEMA) estimates that homes in high-risk areas have at least a 25% chance of flooding during a 30-year period. The National Weather Service estimates direct flood damages to property between 1985 and 2014 averaged approximately \$7.96 billion per year (adjusted to 2014 dollars for inflation).

Sarasota County is a Gulf Coast community located on the west coast of Florida that encompasses approximately 590 square miles of land, with 37 miles of open shoreline along the Gulf of Mexico. There are more than 420 miles of rivers, streams, and canals within the county. In addition, there are 43 named lakes covering 2,091 acres, and over 70 square miles of estuaries and bays that support diverse habitats for plants and animals. The majority of the canals were constructed to function as agricultural drainage canals and were not designed to convey flows from developed areas. After World War II, the county experienced significant growth and development along the shoreline, as well as other areas adjacent to water features.

The sub-tropical weather pattern in this region provides frequent extreme weather events including flooding from tropical depressions and hurricanes. Extreme and severe summer rains can cause flooding in various locations throughout the County. These events may pose a significant threat to life and property.

Sarasota County can experience flooding due to hurricanes or tropical storms, as well as heavy rainfall that can occur throughout the year in Florida. Hurricane Hermine, a category 1 hurricane, hit Sarasota County in September 2016 with peak winds of 54 mph and 9.38 inches of rainfall. Tropical Storm Colin caused flooding, power outages and beach erosion throughout the County in June 2016. Hurricane Charley, a category 4 hurricane, severely damaged hundreds of buildings and trees in August 2004. In June of 1992, Tropical Depression One exceeded the 100-year storm conditions, dropping more than 20 inches of rain in northern Sarasota County. An estimated 3,000 structures were flooded during this intense storm. The amount of claims paid out through the National Flood Insurance Program totaled approximately \$25.7 million since 1978 for unincorporated Sarasota County (FEMA, 2017). These claims only reflect properties that have had flood insurance policies in-force through the National Flood Insurance Program (NFIP).

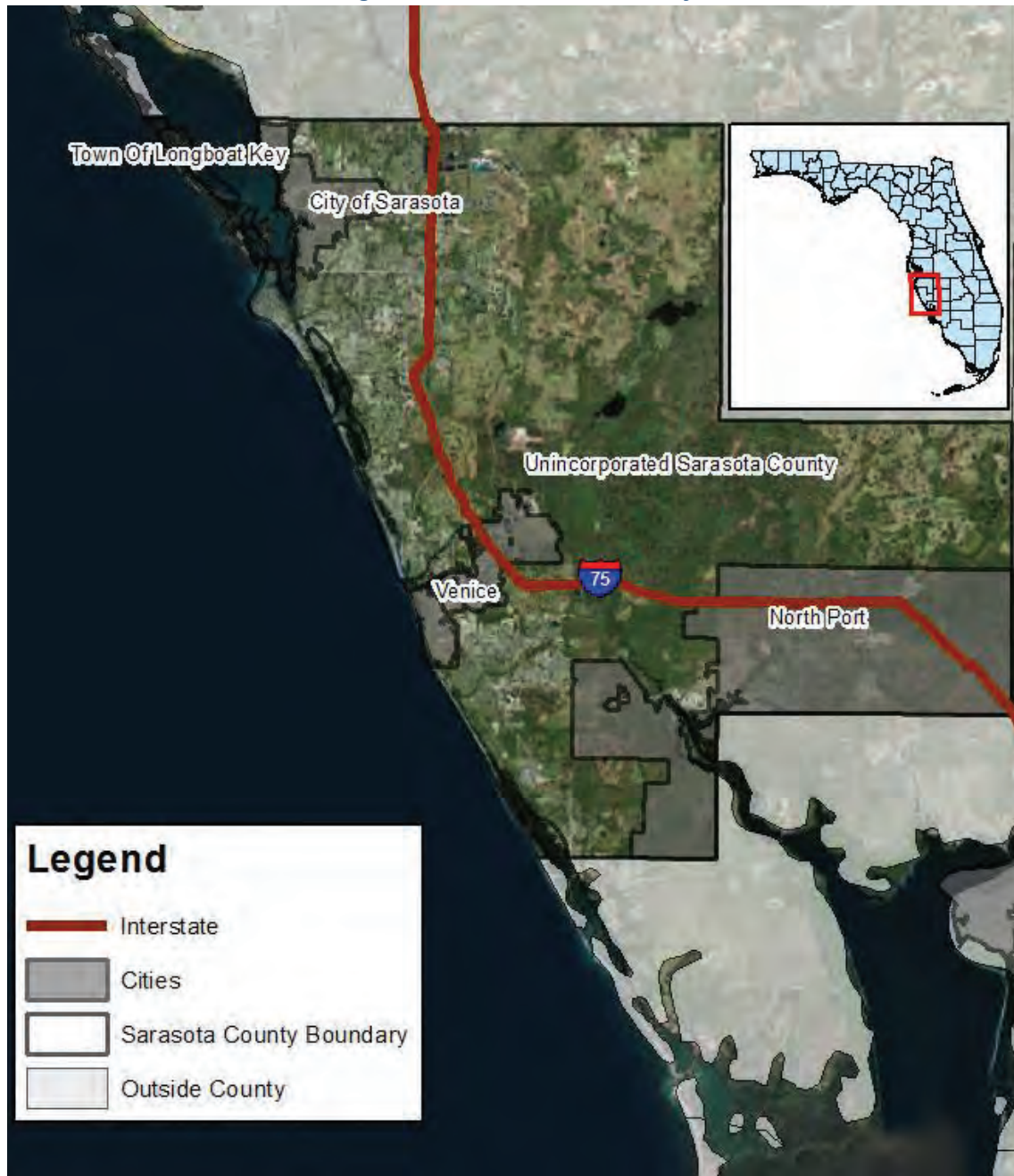
In order to plan for these types of flooding events, Sarasota County developed a Floodplain Management Plan (FMP). An FMP is a plan designed with the following objectives:

- To organize community resources in order to reduce or eliminate flood risks to people and property.
- Implementing strategies prior to a hazardous flooding event in order to help reduce the impacts of a disaster, which can result in substantial savings in life and property following the event.
- Give guidance in developing pre- and post-mitigation plans.
- Identifying priority projects and programs for funding.

- Increase the likelihood of State and Federal funding for pre- and post-hazard mitigation projects.

This FMP serves as an appendix to Sarasota County's Local Mitigation Strategy (LMS), which is a state-approved multi-jurisdictional, multi-hazard plan. The geographic and jurisdictional scope of the Sarasota FMP includes all unincorporated areas of Sarasota County (Figure 1-1). This FMP offers a structure in line with the Floodplain Management Planning activity of the Community Rating System (CRS). The CRS is a voluntary incentive program designed to encourage communities to exceed the minimum National Flood Insurance Program (NFIP) requirements.

Figure 1-1 **Sarasota County**



COMMUNITY PROFILE

GEOGRAPHIC PROFILE

Sarasota County is located on the west-central coast of Florida. It is bounded on the north by Manatee County, the east by Desoto County, the South by Charlotte County, and the west by the Gulf of Mexico. Unincorporated Sarasota County encompasses a total of 435 square miles. The county has approximately 37 miles of shoreline along the Gulf of Mexico, and is renowned for its sandy beaches and sparkling blue water.

TOPOGRAPHY

The generally flat topography of Sarasota County is characterized by pine flatwoods and other upland systems, numerous wetlands, and marshy tributary systems. Elevation ranges from sea level in the west to a maximum of 95 feet referenced to the North American Vertical Datum of 1988 (NAVD) in the northeast portion of the County. The barrier islands are low-lying and generally do not exceed 17 feet NAVD. However, the portion of unincorporated Sarasota County west of Interstate 75 where the majority of the development has occurred ranges from sea level to less than 20 feet NAVD. The Myakka River is the major stream within the county, and along with its tributaries, drains approximately 75% of the lands in the county.

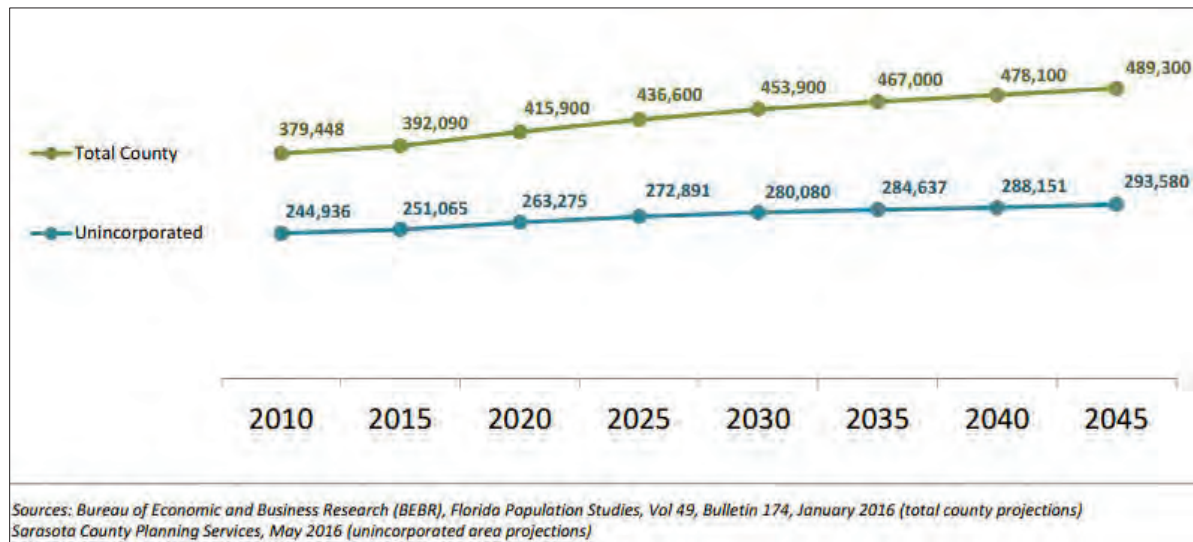
CLIMATE

The climate in Sarasota County is characterized as subtropical, with warm and humid summers, mild winters, and dry springs and falls. Summer daytime temperatures commonly reach to 90 degrees Fahrenheit or more. Average annual precipitation for the county is 53 inches. More than half of the annual rainfall typically falls during the summer months of June through September, mainly a result of convective storms. Winter frontal systems are the source of most of the precipitation during the remaining 8 months.

POPULATION AND DEMOGRAPHICS

Unincorporated Sarasota County's current population is approximately 255,000 according to the Bureau of Economic and Business Research at the University of Florida. In 2015, the Sarasota-Manatee metropolitan region was ranked 11th among America's 20 fastest-growing urban areas according to the US Census Bureau. Between 2014 and 2015, Sarasota County experienced a growth rate of 2.7 percent compared with a less than 1% growth rate four years prior. Figure 1-2 reflects the population growth projection through 2045 in Sarasota County.

Figure 1-2 Population Projections for Sarasota County

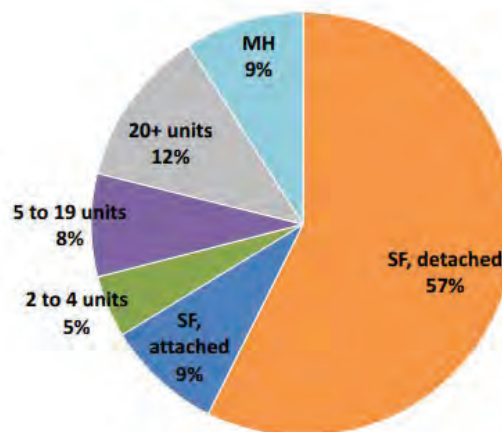


In addition, Sarasota County experiences a large influx of tourists and seasonal visitors throughout the County. According to Sarasota Planning Services, there are approximately 90,000 seasonal residents in Sarasota County.

HOUSING

There are an estimated 232,623 housing units in Sarasota County (U.S. Census Bureau, 2016). Nearly six out of 10 housing units in Sarasota County are detached single-family homes. In 2014, 90% of the residential building permits issued were for single-family detached units. Figure 1-3 shows the percent of housing unit by type. According to the Realtor Association of Sarasota and Manatee, the median prices for Sarasota single-family homes in 2016 was approximately \$250,000.

Figure 1-3 Housing Units by Type



Source: US Census Bureau, 2016

ECONOMY

The economy of Sarasota County is largely service-oriented, driven by the tourism and migration of retirees. Approximately half of all Sarasota County jobs are health care, retail trade, and hospitality related. Sarasota County's Office of Financial Management annually publishes economic reports that contain statistics for the County's labor force, including the top 10 industries, average wages, and

unemployment rates. According to these reports, the average annual wage for Sarasota County was \$42,884 in 2015 (Attachment 1).

NATIONAL FLOOD INSURANCE PROGRAM

The National Flood Insurance Program (NFIP) was approved by Congress in 1968 primarily to make flood insurance available to property owners with buildings located in Special Flood Hazard Areas (SFHA) identified on Flood Insurance Rate Maps (FIRM). To qualify for participation, a community develops and adopts a regulatory program designed to reduce exposure to flood damage and, at a minimum, that conform to the minimum participating requirements of the NFIP (44CFR, Part 60.3). If conforming, flood insurance is available to anyone that lives in that community. Sarasota County fulfills these requirements through the County's Floodplain Damage Prevention Ordinance and Land Development Regulations (Attachment 2). Sarasota County first adopted its Ordinance, including FEMA's Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRM), in December 1971. The FIS and FIRMs were last revised on November 4, 2016. There are nearly 40,000 NFIP insurance policies currently in force, representing more than \$10 billion of coverage.

COMMUNITY RATING SYSTEM

The NFIP's Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Sarasota County has participated in the CRS program since 1992. By implementing comprehensive floodplain management activities, Sarasota County has been rated as a Class 5 community under this program since 2007. This means that the NFIP insurance for Sarasota County property owners is discounted annually by 25% for high risk properties and 10% for medium to low risk policies. This represents a current savings of over \$7 million dollars to residents of Sarasota County every year.

2 PLAN ORGANIZATION AND DEVELOPMENT

This Floodplain Management Plan provides a comprehensive overview of best management practices adopted and implemented by the County to improve flood risk reduction and flood protection for its residents, and to support other County regulatory, preservation, conservation, social, and economic needs. Sarasota County developed and adopted the first Floodplain Management Plan in 1997.

The current plan was and continues to be updated by a committee consisting of Sarasota County staff as well as public stakeholders. The plan represents a collaboration of representatives from planning and development, emergency, building and engineering services; public and private sector agencies; and residences.

PLANNING COMMITTEE

The planning committee consists of four members from the County, along with six outside stakeholder members. Table 2-1 describes the committee members.

Table 2-1 Floodplain Management Plan Committee Members

Official Members		Representing
Kathy Croteau, kcroteau@scgov.net		Building Department
Donna Bailey, dabailey@scgov.net		Public Utilities CRS
Allen Parsons, aparsons@scgov.net		Planning and Development Services
Edward McCrane, emccrane@scgov.net		Emergency Services
Robert Laura, rlaura@scgov.net		Watershed Engineering
Stakeholder Members		Representing
John King, sales@ramparthomesinc.com		Rampart Homes, Construction Industry
Sal Depaolis, sdepaolis@wraengineering.com		ASCE Chapter President
Dawn Turner, Dawn.Turner@swfwmd.state.fl.us		Southwest Florida Water Management District
Arthur "Skip" Preece, skippreece@aol.com		Captiva Gardens HOA
James Linkogle, jlinkogle@longboatkey.org		Town of Long Boat Key
Todd Kerkering, Richard.Kerkering@sarasotagov.com		City of Sarasota

The committee meets regularly to develop and update the plan. Table 2-2 describes the committee meetings. Key topics during the committee meetings include:

- Plan organization
- Public involvement
- Assessment of flood hazards that affect Sarasota County
- Assessment of the problems brought about by the flood hazards
- Floodplain management goals
- Review of possible floodplain management activities
- Development of an action plan
- Plan adoption and update

Table 2-2 FMP Committee Meetings

Date	Discussion Topics
November 1, 2016	Organized the committee members; discussed goals and objectives for the FMP; discussed current Community Rating System status; reviewed FMP requirements and committee responsibilities; planned first public meeting to introduce the FMP.
December 20, 2016	Reviewed flood risk survey sent out to the public; discussed results of the first public meeting; reviewed current efforts for evaluating the repetitive loss areas; assessed the hazards.
February 21, 2017	Reviewed the flood hazards and assessed the problems; reviewed format for the FMP goals and activities.
March 21, 2017	Set goals, reviewed possible activities and existing County initiatives for floodplain management.
June 20, 2017	Reviewed draft plan.
August 15, 2017	Reviewed ISO comments.
December 19, 2017	Reviewed revised FMP and projects. Planned and scheduled the public meeting for comment on the FMP. Reviewed steps to adopt the plan.

Agendas, sign-in sheets, and meeting notes for the above meetings and subsequent meetings to update the plan are provided in the attachments that accompany this FMP (Attachment 3). All FMP committee meetings are advertised in newspapers and on the County's website, and are open to the public.

PUBLIC INVOLVEMENT

Sarasota County makes every effort to involve the public throughout development of this plan and other activities relating to flood risk. Sarasota County provides for public outreach through many public meetings. These meetings are sometimes conducted through neighborhoods or associations. Other avenues for public outreach also consist of public meetings conducted through watershed planning and public meetings to recognize capital improvement projects. Watershed management plans cover the entire of Sarasota County and provide an excellent means to reach out to residents about floodplain management activities, repetitive losses, and benefits of flood insurance.

PUBLIC MEETINGS

Public meetings were also conducted to solicit input on the plan. The first public meeting was held on December 7, 2016 in an open house format. The public meeting was announced in a variety of formats, including a press release to the newspapers, email blasts, and social media (Attachment 4). The meeting included a presentation to describe what a Floodplain Management Plan is, why the County is developing the plan, and its development process. County staff and other agencies were available to answer questions about the FMP, flood risk and the resources available at the county pertaining to flood risk.

Figure 2-1 FMP Public Meeting



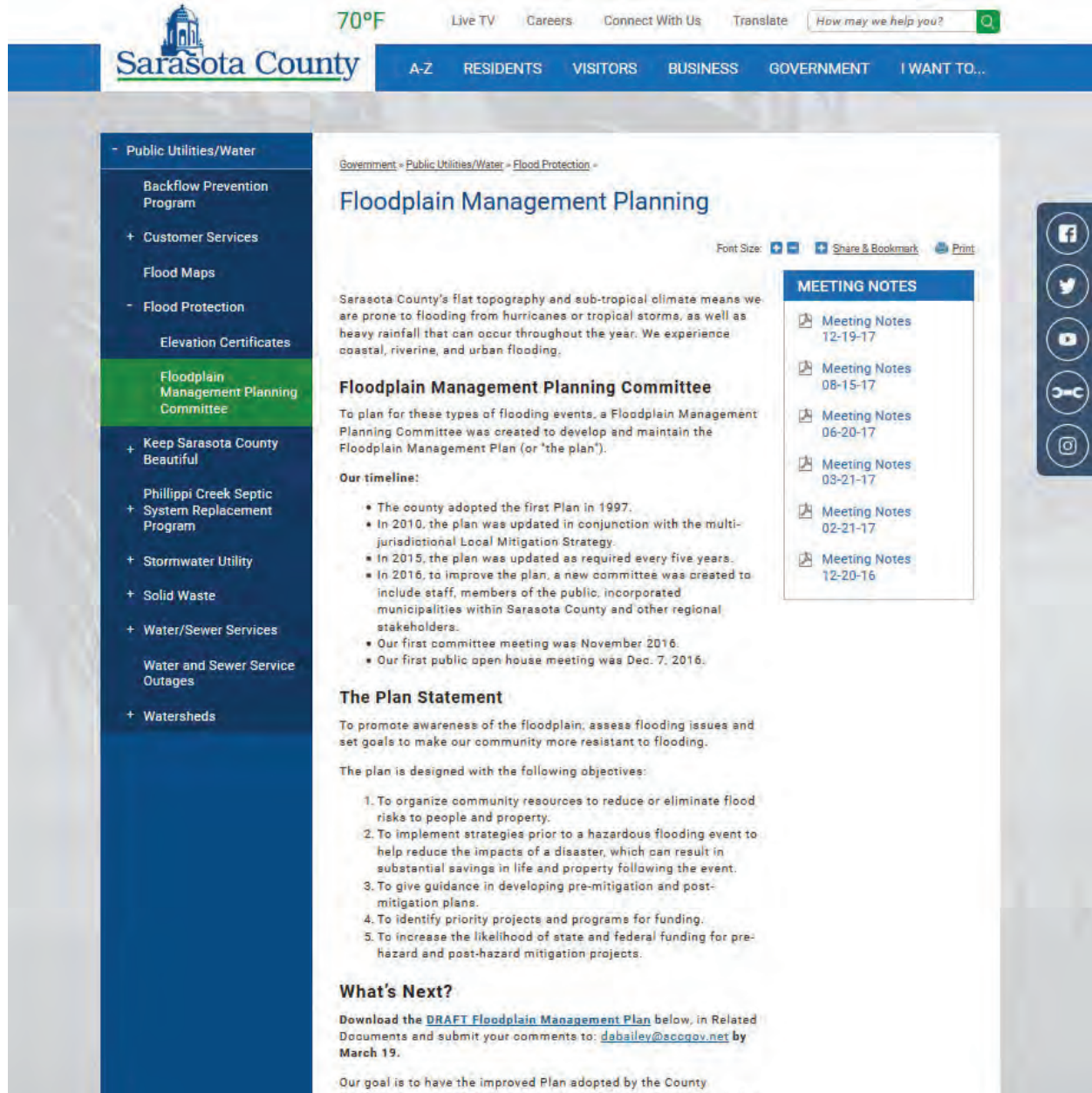
A public meeting was also held to present and get comments on the draft FMP on March 5, 2018 (Figure 2-1).

ADDITIONAL PUBLIC INFORMATION ACTIVITIES

As part of the development of this FMP, the County developed other initiatives to inform the public about the FMP and planning process and encourage input. These initiatives involve developing a County website, questionnaires, public workshops and other activities to connect with residents of Sarasota County. Examples of these activities include:

- County created a website to provide information about the plan to the public and encourage input. Figure 2-2 illustrates the County's FMP website. All FMP committee meetings are advertised in the newspapers and on the County's website, and are open to the public. The website also contains the meeting agendas, notes, and other applicable materials for the meetings, such as presentations.

Figure 2-2 Sarasota County Floodplain Management Plan Website



- Prior to the public meeting, Sarasota County also developed a survey website to solicit information regarding flood risk from residents throughout the County (Figure 2-3). The survey consisted of questions relating to history of flooding, causes and extent of flooding to property, structures, and roads, as well as insurance information. The survey was advertised through press release and flyers as well as electronic means via email, the County's website and social media.

Figure 2-3 Sarasota County Floodplain Management Survey Website

Sarasota County
Sarasota County Floodplain Management Survey

1. Please share with us your property address or location in Sarasota County.

2. How long have you lived at this address?

☐ 1-2 years
☐ 3-4 years
☐ 5-6 years
☐ 7-8 years
☐ 9-10 years
☐ 10 years +

3. Has your home, property and/or street ever flooded?

☐ Yes
☐ No
☐ I don't know

17%

Next

Powered by
SurveyMonkey
See how easy it is to [create a survey](#)

- Printed surveys were also made available during the public meetings for residents to fill out.
- County staff conducts outreach workshops throughout the year to educate the public about flood risks and the County's Floodplain Management Plan to solicit input. **Twenty-three workshops were scheduled for 2017 at various locations throughout the County** (Attachment 5).
- County staff periodically conducts Facebook posts to advertise the workshops and provide several means for the public to provide input, including links to the survey questionnaire, links to

the County's Flood Protection website where the FMP can be found, and a telephone number to contact County staff for more information about the FMP.

- County staff also periodically posts the information on Twitter.

COORDINATION

Many of the County's flood problems have been previously studied. The County has a watershed management program aimed at identifying flood problems and developing solutions that eventually become part of their capital improvement program, outreach efforts, and other initiatives for water quality and natural systems. Other communities in this region also face similar flooding issues and have developed their own plans to address the problem. While developing this plan, Sarasota County reviewed existing studies and plans, and contacted other agencies for information that may be relevant to floodplain management in this region.

REVIEW OF EXISTING STUDIES AND INFORMATION

Part of developing this FMP consisted of reviewing existing studies, plans, reports and other technical information. The information included the County's overall goals and strategies for various elements of floodplain management, emergency management, natural resource planning, capital improvement program, and other County functions. These plans include the County's Comprehensive Plan, Sarasota 2050, Native Habitat Land Cover Map and Risk Assessment, Environmentally Sensitive Lands Protection Program and Neighborhood Parkland Acquisition Program, Sarasota County Flood Warning and Response Plan, and various watershed management plans. Some of these plans are described below.

Sarasota County Comprehensive Plan

The Sarasota County Comprehensive Plan provides the policy direction used in framing land use decision and growth management initiatives. Chapter 1: Environment, Chapter 7: Future Land Use, and Chapter 12: Watershed Management include policy direction to support the NFIP and CRS programs and provisions to address the problems of development in the floodplain and protection of natural drainage features. Policies in the Environment chapter recognize the necessity to address stormwater management with consideration for natural drainage features. Policies in the Future Land Use chapter require new development to be consistent with master plans for drainage basins, as they are adopted, and prohibit development in floodplains that would adversely affect the function of the floodplain or degrade the water quality of associated water bodies.

The Watershed Management chapter adopted the Water Budget approach. Sarasota County's natural system restoration efforts are ultimately intended to restore a more natural freshwater flow regime from the watershed to their receiving estuaries and bays. The intended basis of measurement for success of these hydrologic restoration efforts are as follows:

- Quantify the existing water budget – existing monthly inflows and outflows to the estuary.
- Estimate the “predevelopment” or natural systems' water budget monthly inflows and outflows to the estuary.

In addition, the policy states that Sarasota County shall provide design standards for low impact development (LID) measures to mitigate the effect of impervious surfaces and stormwater pollutants on increased runoff volumes. LID design measures may include, but are not limited to, retention with bio-filtration, pervious pavement systems, green roofs, rainwater/stormwater harvesting, etc.

Sarasota County's Low Impact Development Guidance Document supports Sarasota County's goal of applying the LID concept and design where feasible to enhance existing stormwater management

measures and reduce the adverse impacts of land development projects on the County's natural resources

Sarasota 2050

This is a 50-year land use plan to manage and shape future growth in Sarasota County. Sarasota 2050's primary goals are preserving the county's natural, cultural and physical resources, and making all neighborhoods, old and new, more livable. Incentive-based and voluntary, not regulation-driven, this addition to the county's comprehensive plan grants density bonuses (increased number of dwelling units allowed) to landowners who preserve open space, agriculture and environmentally sensitive land and build new, compact, mixed use, walkable developments in appropriate areas.

Native Habitat Land Cover Map and Risk Assessment

Adopted in 2008, the plan reiterates the beneficial and natural functions of floodplains.

Environmentally Sensitive Lands Protection Program (ESLPP) and Neighborhood Parkland Acquisition Program

These plans are voter-approved and taxpayer-funded programs designed to acquire and protect natural lands and parklands. In March 1999, voters approved the ESLPP to protect native habitats by a 0.25 mil ad valorem tax collected through 2019. In November 2005, voters approved a second referendum extending the program through 2029, and expanding the county's land protection efforts to include neighborhood parkland acquisitions.

Sarasota County Repetitive Loss Area Analysis (RLAA)

In 2016, Sarasota County updated their Repetitive Loss Areas Analysis. This included a desktop evaluation of the potential repetitive loss areas, which include repetitive loss properties as defined by FEMA, and field investigations. Section 3 of this FMP describes the RLAA in more detail.

Watershed Management Plans

Sarasota County conducts a "holistic" approach to watershed planning, incorporating floodplain management planning, water quality and conservation. Watersheds are areas of land with waterways that flow to a common destination. These watershed management plans provide a tool to evaluate areas that are likely to flood, and develop best management practices to reduce the risks associated with flooding and improve the water quality and natural systems. The following descriptions highlight the characteristics of the watersheds.

The Dona and Roberts Bay Watershed spans a total of 97.4 square miles, 90% of which lies within Sarasota County. The area within the county, totaling 87.4 square miles, is the only portion of the watershed for which information is available on the Sarasota County Water Atlas. The watershed contains 24 named lakes/ponds, 16 named rivers/streams/canals and five (5) named bays/bayous. Drainage basins include: Cow Pen Slough; Fox Creek, Curry Creek; Donna/Roberts Bay Coastal; Hatchett Creek and Island of Venice.

The Lemon Bay Watershed spans a total of 74.5 square miles, 71% of which lies within Sarasota County. The area within the county, totaling 52.6 square miles, is the only portion of the watershed for which information is available on the Sarasota County Water Atlas. The watershed contains 82 named lakes/ponds, 12 named rivers/ streams/canals and 2 named bays/bayous. Drainage basins include: Ainger Creek; Alligator Creek; Forked Creek; Gottfried Creek; Lemon Bay Coastal and Woodmere Creek.

The Little Sarasota Bay Watershed is located within Sarasota County and spans 43.9 square miles. The watershed contains 34 named lakes/ponds, 8 named rivers/streams /canals and 4 named bays/bayous. Drainage basins include: Catfish Creek; Clower Creek; Elligraw Bayou; Holiday Bayou; Little Sarasota Bay Coastal; Matheny Creek; North Creek; and South Creek.

The Manatee River Watershed spans a total of 362.0 square miles, 2% of which lies within Sarasota County. The area within the county, totaling 8.9 square miles, is the only portion of the watershed for which information is available on the Sarasota County Water Atlas. The watershed contains 33 named lakes/ponds, 43 named rivers/streams /canals and 2 named bays/bayous. Drainage basins include: Cypress Strand; East Fork of the Manatee River; Gilley Creek; Lake Manatee; Lower Braden River; Lower Gamble Creek; Manatee River-Warner Bayou; North Fork Manatee River; and Upper Braden River.

The Myakka River Watershed spans a total of 593.8 square miles, 53% of which lies within Sarasota County. The area within the county, totaling 314.7 square miles, is the only portion of the watershed for which information is available on the Sarasota County Water Atlas. The watershed contains 17 named lakes/ponds, and 59 named rivers/streams/canals. Drainage basins include: Big Slough Canal; Curry Creek; Deer Prairie Creek; East Cocoplum Waterway; Harris Camp; Howard Creek; Lake Myakka; Lower Myakka River; Maple Creek; Mossy Island Slough; Mud Lake Slough; North Cocoplum Waterway; Oglegy Creek; Owen Creek; south Cocoplum Waterway; Tatum Sawgrass Swamp; Tippecanoe Bay; West Cocoplum Waterway; Wildcat Slough; and Wingate Creek.

The Sarasota Bay Watershed spans a total of 161.4 square miles, 60% of which lies within Sarasota County. The area within the county, totaling 96.4 square miles, is the only portion of the watershed for which information is available on the Sarasota County Water Atlas. The watershed contains 176 named lakes/ponds, 31 named rivers/streams /canals and 12 named bays/bayous. Drainage basins include: Hudson Bayou; Palma Sola Bay Frontal; Phillippi Creek; Roberts Bay Frontal; Sarasota Bay Coastal; and Whitaker Bayou.

The Gulf of Mexico Watershed spans a total of 3,242.9 square miles, 14% of which lies within Sarasota County. The area within the county, totaling 451.7 square miles, is the only portion of the watershed for which information is available on the Sarasota County Water Atlas. The watershed contains 1 named rivers/streams/canals and 2 named bays/bayous.

Other Plans and Data

Other plans and data reviewed include, but is not limited to:

- Sarasota County Capital Improvement Program
- Sarasota County Post-Disaster Redevelopment Plan
- Florida Report on Climate Change and Sea Level Rise
- Sarasota County Local Mitigation Strategy
- Pinellas County Local Mitigation Strategy
- City of North Port Floodplain Management Plan
- City of Sarasota Floodplain Management Plan
- City of Venice Floodplain Management Plan
- Town of Longboat Key Floodplain Management Plan
- Sarasota County Annual Economic Report

- State of Florida Enhanced Hazard Mitigation Plan
- City of Cape May Floodplain Management Plan
- Maricopa County Floodplain Management Plan
- FEMA Flood Insurance Study and DFIRM

These and other documents that were reviewed are provided along with this FMP in Attachment 6.

COORDINATION WITH OTHER AGENCIES AND ORGANIZATIONS

As part of the planning process and development of the FMP, the planning committee reached out to other communities and agencies for input into the plan. Contact with these agencies began with telephone and/or email correspondence. Eventually, these agencies were also able to participate in-person in some of the committee meetings to discuss the various topics of this FMP, including the organization of the plan, assessing the hazards and the problems, setting goals, and reviewing possible projects. They also provided comments on the FMP report.

The FMP report was also submitted to individuals inside and outside of the Sarasota County government for review. Staff from Watershed Engineering, floodplain outreach, planning and development review provided comments on the FMP. Outside individuals who were contacted and provided comments on the report include the agencies listed in Table 2-3.

Table 2-3 Telephone or In-Person Coordination with Other Agencies

Agency	Point of Contact
Southwest Florida Water Management District	J.P. Marchand
City of Bradenton	Kim Clayback (Engineer)
City of North Port	Elizabeth Wong (Stormwater Manager)
City of Venice	Gillian Carney (Engineer)
City of Sarasota	Buster Chapin (Senior Zoning Analyst)
Sarasota Memorial Hospital	Mike Klosterman (Compliance Coordinator) and Jim Bugyis (Director of Engineering)
Sarasota County Schools	Michael Andreas (Director of Security)
UF IFAS Extension	Lee Hayes Byron
Insurance Services Office	Sherry Harper (Planning Technical Coordinator)

Floodplain management activities by other communities were also reviewed and in-person meetings were conducted to gain information, and share ideas and strategies for implementing the FMP. These in-person meetings included:

- One Bay Resilient Communities Working Group
- Pinellas County Local Mitigation Strategy, consisting of 25 communities within Pinellas County (the LMS is used for the FMP element for these communities)

- Pinellas CRS Working Group

Table 2-4 describes the organizations that participated in these in-person meetings. FMP report comments and coordination activities/minutes are provided in Attachment 7.

Table 2-4 Workshop Participants

Agency	Point of Contact
City of St. Petersburg	Noah Taylor (CRS Coordinator)
Pinellas County	Lisa Foster (Floodplain Coordinator)
City of Clearwater	Sarah Kessler (CRS Coordinator)
Tampa Bay Regional Planning Council	Brady Smith
Florida Division of Emergency Management	Josh Overmyer
Town of Redington Shores	Steve Andrews
Florida Floodplain Managers Association	Cece McKiernan
Hillsborough County	Eugene Henry

3 ASSESSMENT OF FLOOD HAZARDS

This section describes the known flood hazards within Sarasota County, their history of occurrence, and areas that are likely to be impacted by those hazards. Sarasota County is a medium-sized coastal community characterized by low, flat topography and a high water table. These characteristics make the County highly susceptible to the effects of flood damage caused by hurricanes, tropical storms, and heavy rain. Since 1978, the NFIP has paid \$25 million in flood claims in Sarasota County. Figure 3-1 illustrates Federal Emergency Management Agency (FEMA) Special Flood Hazard Areas (SFHA) within the County.

In addition to the flood hazard areas identified on FEMA's maps, Sarasota County takes a proactive approach to identifying flood risks by developing and maintaining numerous Watershed Management Plans that, together, cover the entire County. **These plans identify other at-risk areas currently not mapped on FEMA's current Flood Insurance Rate Maps (FIRM).** Sarasota County refers to these at-risk areas identified by the Watershed Management Plans as the Community Flood Hazard Areas (CFHA).

The population in Sarasota County is projected to increase between 12% and 20% within the next 25 years. This will be accompanied by an increase in new developments and homes, placing more stressors for flooding in terms of increased runoff and location of structures in at-risk areas. To reduce the risk of damage due to flooding for these new developments, the County implements regulations that exceeds the minimum requirements of the NFIP. One of the ways that they accomplish this is, in addition to the SFHA, the County also regulates activities in the CFHA. Sarasota County continues to update the FEMA Flood Insurance Rate Maps (FIRM) with improved risk information based on newer and better data. During 2017, the County submitted three MT-2 request for physical map revisions to FEMA. These include updated flood risk data for Little Sarasota Bay, Phillippi Creek, and Dona Bay/Roberts Bay. One more study is under way (Lemon Bay), which will also be submitted to FEMA.

Flooding can be attributed to several types of natural hazards that may occur in this region, including coastal flooding, inland flooding due to frequent and heavy rains, tropical storms, and hurricanes. By nature of its location along the coast of the Gulf of Mexico, the County is continuously at risk of coastal flooding in conjunction with tropical storms, hurricanes, and heavy rain. High tide conditions increase the effects of storm surge and inland flooding due to high tailwater conditions. Outside of coastal areas, Phillippi Creek and Myakka River are prone to storm surge, high tailwater conditions and westerly winds.

This section summarizes the flood hazards that affect Sarasota County. Sarasota County is a StormReady community. Therefore, for many of these natural hazards, County staff coordinates with the National Weather Service to receive warnings regarding the source of flooding, warning times and expected depth of flooding. The County also maintains gages that provide additional information including rainfall amount, flow/velocities and depth.

Sarasota County maintains a Post-Disaster Redevelopment Plan that also describes in detail the threats and vulnerabilities related these flood hazards. The plan identifies policies, operational strategies, and roles and responsibilities for implementation that will guide decisions that affect long-term recovery and redevelopment of the community after a disaster. The plan can be found in the Attachment 8 provided along with this FMP.

COASTAL FLOODING

The Sarasota County coastline stretches 37 miles along the Gulf of Mexico, making the county extremely vulnerable to coastal flooding. Coastal flooding is usually the result of a severe weather system such as a

severe thunderstorm, hurricane, or tropical storm with high winds and intense rainfall. Water driven ashore by the wind, known as a storm surge, is the main cause of coastal flooding as well as low-lying barrier islands and canals subject to tidal surge. The damaging effects to structures in the beach areas are caused by a combination of higher levels of storm surge, winds, waves, rains, erosion, and battering by debris. Sea walls, jetties, and beach areas are affected by coastal flooding, and losses can occur over short or long periods.

Historically, the County has experienced a number of damaging coastal floods caused by wind-driven water associated with high tide. Significant occurrences of coastal flooding in the past include:

October 1921: An unnamed tropical storm originated in the western Caribbean Sea and made landfall in Florida north of Tarpon Springs. Flooding conditions were prolonged due to the slow forward movement of the storm. A combination of high tides (above 7 feet) with wave action resulted in heavy damage in Sarasota County.

June 1972: Hurricane Agnes originated on the northeastern tip of the Yucatan Peninsula and traveled westward. Although the center of the storm passed approximately 150 miles west of the Florida peninsula, it produced high tides of 3 feet above normal and precipitation of 5 inches in Sarasota County. The high tides caused damage to many homes, seawalls, revetments, and roads along the Sarasota coastline. In addition, wave action produced considerable erosion along the Sarasota County coast.

June 1982: Subtropical Storm One hit the Sarasota area with 60 mile-per-hour winds and 6 inches of rain with little warning. The storm and abnormally high tides caused considerable structural flood damage to properties.



Tropical storms and hurricanes can produce coastal flooding, although they are not the only conditions under which such flooding occurs. Other historical occurrences of coastal flooding in Sarasota County are described later in this section.

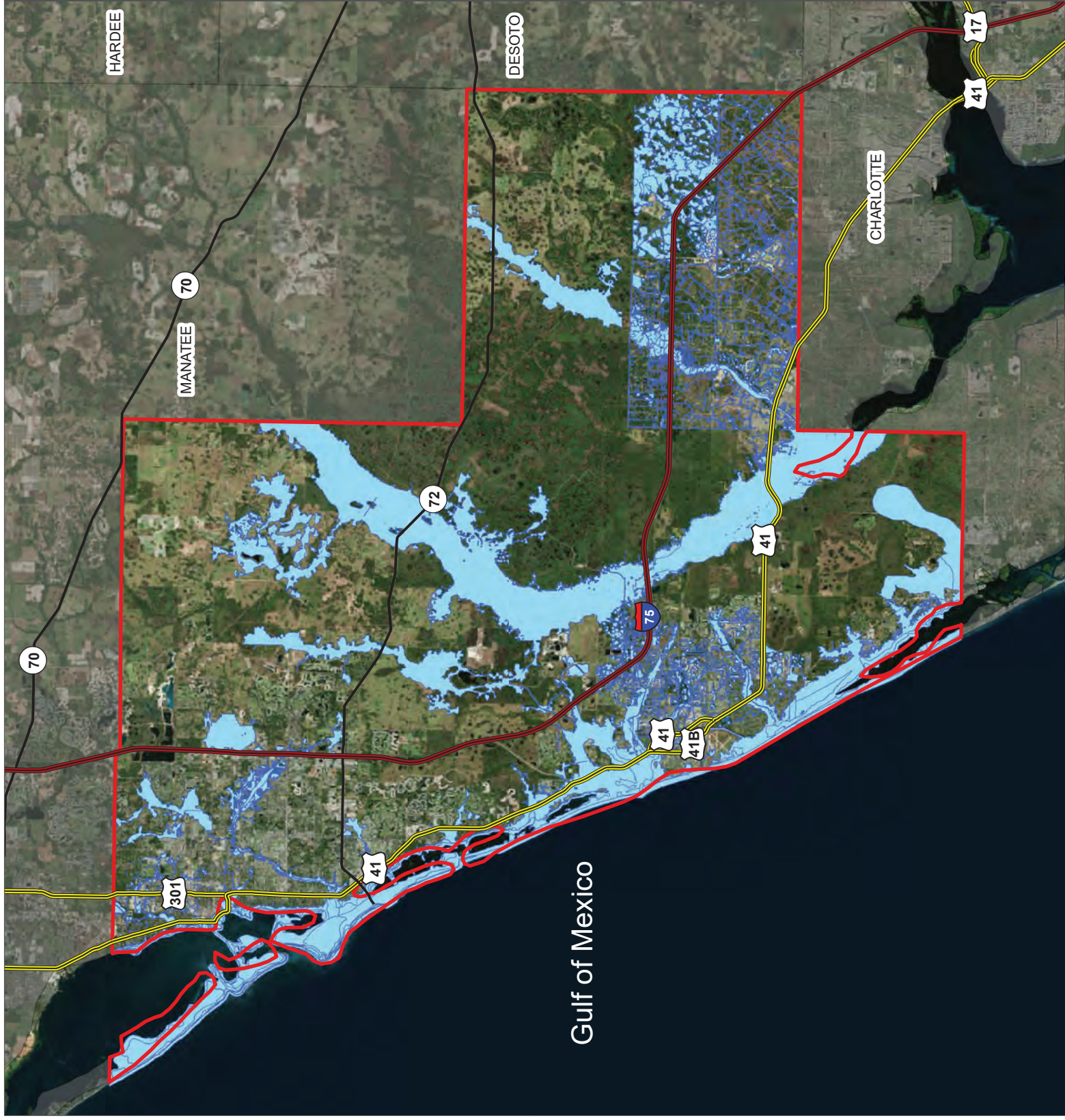
Figure 3-1

Special Flood Hazard
Areas within Sarasota
County

Sarasota County Floodplain
Management Plan



-  Sarasota Boundary
-  Special Flood Hazard Area



The probability of coastal flooding in the County is relatively high. This probability increases if the storm strikes the coastline during a high tide. Table 3-1 describes the frequency of occurrence of tidal water elevations based on a study conducted by the Coastal and Oceanographic Engineering Laboratory at the University of Florida.

Table 3-1 Probability of Tidal Water Elevations

Water Level above Mean Sea Level (MSL)	Frequency of Occurrence
3 feet or higher	Once in 3-5 years
4 feet or higher	Once in 20 years
5 feet or higher	Once in 25-30 years
6 feet or higher	Once in 30-50 years
7 feet or higher	Once in 60-90 years
8 feet or higher	Once in 90-100 years

Source: Coastal and Oceanographic Engineering Laboratory, University of Florida, 2016.

Residences along the Sarasota County coast and barrier islands are highly vulnerable to coastal flooding due to storm surge and/or high tide. The most vulnerable locations to storm surge are the barrier islands and areas along the Myakka River in the southern portion of the county. This often occurs because these areas are closest to the coast or are located along inland waterways and low-elevation areas. Using the County's latest Digital Terrain Model (DTM), County staff mapped the areas that would be inundated by certain water levels above the MSL. The DTM was developed using Light Detection and Ranging Technology (LiDAR) to more accurately capture the topography of the land. Figure 3-2 illustrates the areas potentially affected by coastal flooding.

INLAND FLOODING

Flooding has been the most frequently occurring natural hazard in Sarasota County, including inland flooding due to heavy rains, whether or not the rains are associated with tropical storms or hurricanes. Areas within the County are subject to flood depths that range from less than a foot up to 10 feet. Prolonged periods of rainfall have shown increased potential for causing damage to property and requiring residents to evacuate due to flooding. This problem can become more severe if the heavy rainfall occurs at the same time as a high tide, which prevents much of the rainwater from flowing through the drainage systems into the bays or Gulf of Mexico.

Sarasota County has experienced a number of damaging floods in recent history. Since 1950, 62 flood events have been recorded in Sarasota County by the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information. The types of events recorded include coastal flood, flash flood, flood, heavy rain, hurricane, storm surge/tide, tropical depression, and tropical storm.

Figure 3-2

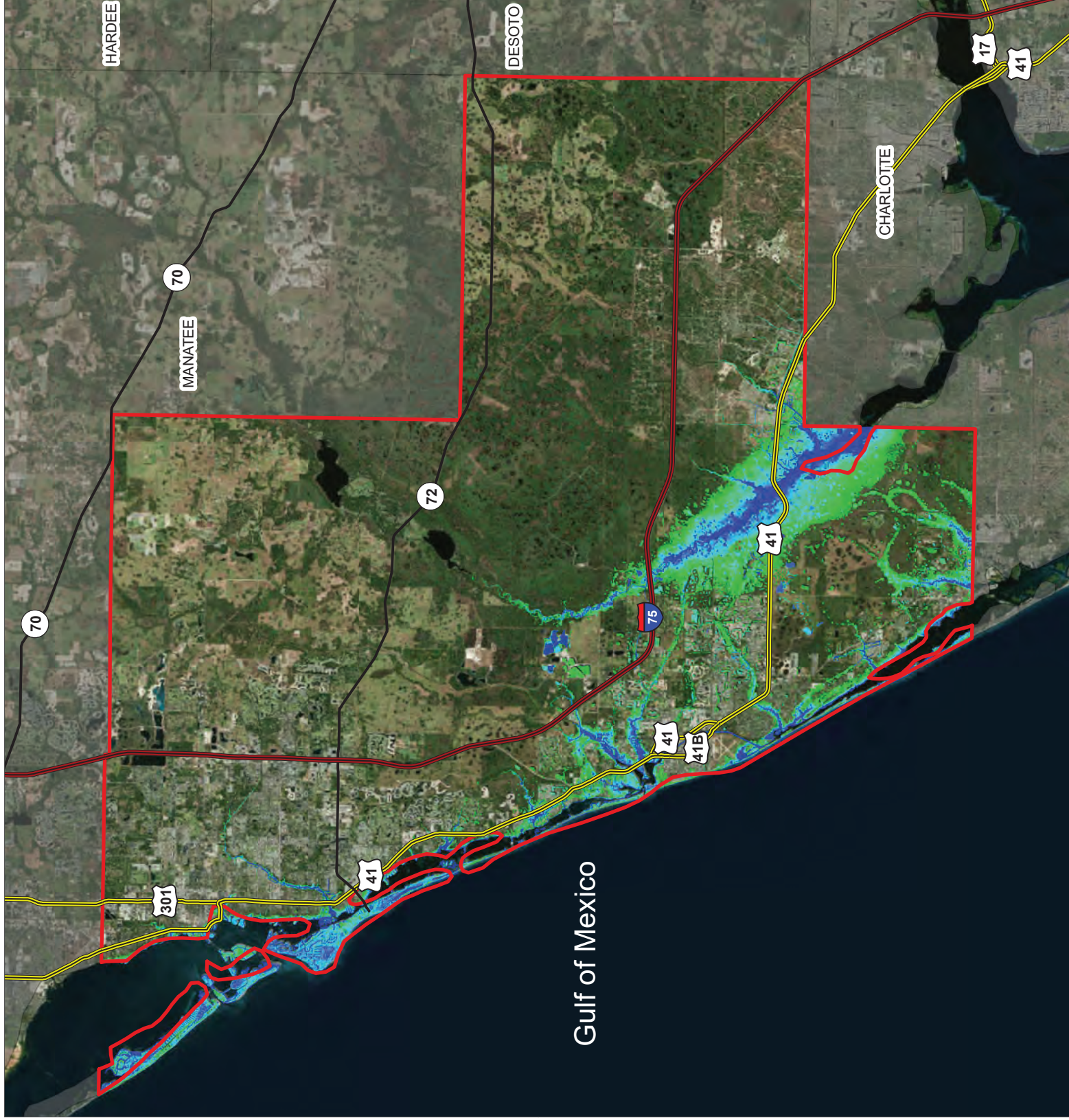
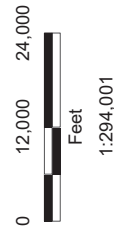
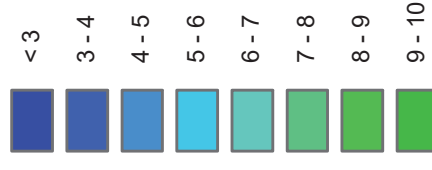
Areas Potentially Affected
by Coastal Flooding

Sarasota County Floodplain
Management Plan



 Sarasota Boundary

Water Level Above
Mean Sea Level
(MSL) in feet



Flood events that have affected Sarasota County include the following:

September 1962: Exceptionally heavy rains covered the Florida west coast area, including 5,000 square miles over six counties. The highest amount of precipitation reported in a 24-hour period was 14.5 inches measured at the Manasota Tower. Over 1,000 residences were flooded, many to depths of 3 feet or more. Automobiles, streets, and bridges were severely damaged. Numerous roads were underwater for several hours, and many were impassable. The greatest damages occurred in the residential area of Sarasota, which comprises much of the 57-square-mile drainage area of Phillippi Creek. In addition to urban areas, approximately 60,000 acres of ranch land sustained damages. Floods at Phillippi Creek and US Hwy 41 measured 6 feet in depth. Sarasota County suffered significant damages in the Phillippi Creek Basin, in addition to one death. An estimated 10,000 to 15,000 people were directly impacted.

June 1992: Tropical Depression One exceeded the 100-year storm conditions, dropping more than 20 inches of rain in northern Sarasota County. An estimated 3,000 structures countywide were flooded during this intense storm.

July 1995: Tropical Storm Dean dropped more than 11 inches of rain within a 15-hour period, resulting in structural flooding throughout the area.

October 1996: Heavy rainfall of 4 to 6 inches associated with rain bands from Tropical Storm Josephine caused flooding of several homes and streets.

November 1997: In less than 14 hours, more than 10 inches of rain fell in the Phillippi Creek Basin, located in the southern portion of the City of Sarasota, flooding about 190 structures. The rain fell on already saturated soils, causing runoff to flow shortly after the storm began, with water levels rising quickly in the County's Main A Canal.

August 2012: Tropical Storm Isaac crossed eastern Cuba on August 25 and moved northwest through the Florida Keys and into the eastern Gulf of Mexico. In Sarasota County, the Myakka River at Ramblers Mobile Home Park flooded its banks and caused minor flooding to several mobile homes. Water rose up to the doorsteps of several units and flooded parking lots and grassy areas.

Tropical storms and hurricanes can often produce inland flooding, although they are not the only conditions under which such flooding occurs. Other historical occurrences of inland flooding in Sarasota County are described later in this section.

Storm events can be described as the amount of precipitation that occurs over a given duration (e.g., 10 inches of rain over a 24-hour period). Typically, the probability of these storm events are categorized as follows, consistent with United States Geological Survey (USGS) and FEMA terminology:

- 100-year flood (1 percent chance per year)
- 50-year flood (2 percent chance per year)
- 25-year flood (4 percent chance per year)
- 10-year flood (10 percent chance per year)

These categories indicate a probability of occurrence (a 100-year flood has a 1-percent chance of occurrence in any given year). The smaller the chance of occurrence is, the more devastating the flood potential may be. Each of the flood categories is associated with a specific amount of rainfall over a given duration for a specific region. For Sarasota County, the 10-year flood is characterized as receiving

7 inches of rain within a 24-hour period, while the 100-year flood is associated with 10 inches of rain within a 24-hour period.

A high probability of flooding and continued development throughout the County make the entire County vulnerable to inland flooding. Most vulnerable are structures built before the county entered the NFIP in 1971 called pre-FIRM structures. Sarasota County has approximately 30,000 of these structures built prior to flood

mapping or regulations. Sarasota County has developed and maintained a comprehensive Watershed Management Plan for all watersheds within the County. These plans include stormwater models developed to describe the flooding potential for areas within the County. The plans were developed in coordination with the Southwest Florida Water Management District (SWFWMD), which oversees the management of the region's water resources and includes flood protection and issuing of permits to ensure that new developments do not cause flooding. The results of these plans help to identify those areas that are vulnerable to flooding from small storms or less frequent, larger storms. The following descriptions highlight the watersheds and the drainage systems that they contain.

The combination of the County's stormwater models, historical records, and repetitive loss area evaluations help identify those areas within the County that are susceptible to flooding, including areas not mapped within the FIRM. In addition, both the County and SWFWMD maintain a highwater mark database to track reported flooding issues.

Dona and Roberts Bay Watershed: Cow Pen Slough, Fox Creek, Curry Creek, Dona/Roberts Bay Coastal, Hatchett Creek, and Island of Venice.

Lemon Bay Watershed: Ainger Creek, Alligator Creek, Forked Creek, Gottfried Creek, Lemon Bay Coastal, and Woodmere Creek.

Little Sarasota Bay Watershed: Catfish Creek, Clower Creek, Elligraw Bayou, Holiday Bayou, Little Sarasota Bay Coastal, Matheny Creek, North Creek, and South Creek.

Manatee River Watershed: Cypress Strand, East Fork of the Manatee River, Gilley Creek, Lake Manatee, Lower Braden River, Lower Gamble Creek, Manatee River-Warner Bayou, North Fork of the Manatee River, and Upper Braden River.

Myakka River Watershed: Big Slough Canal, Curry Creek, Deer Prairie Creek, East Cocoplum Waterway, Harris Camp, Howard Creek, Lake Myakka, Lower Myakka River, Maple Creek, Mossy Island Slough, Mud Lake Slough, North Cocoplum Waterway, Ogle Creek, Owen Creek, South Cocoplum Waterway, Tatum Sawgrass Swamp, Tippecanoe Bay, West Cocoplum Waterway, Wildcat Slough, and Wingate Creek.

Sarasota Bay Watershed spans: Hudson Bayou, Palma Sola Bay Frontal, Phillippi Creek, Roberts Bay Frontal, Sarasota Bay Coastal, and Whitaker Bayou.

Gulf of Mexico Watershed: Coastal areas of Sarasota County.

The County also performs an **annual evaluation of repetitive losses** within its jurisdiction. Repetitive loss areas are described further in Section 5 of this report. The combination of the County's stormwater models, historical records, and repetitive loss area evaluations help identify those areas within the County that are susceptible to flooding. The County also maintains data describing locations that have flooded in the past. Figure 3-3 illustrates the community's flood hazard areas, including areas not mapped on the FIRM. Figure 3-4 illustrates the historical flooding complaints and issues within the County. Using a heat map, Figure 3-5 illustrates where the majority of these issues occur.

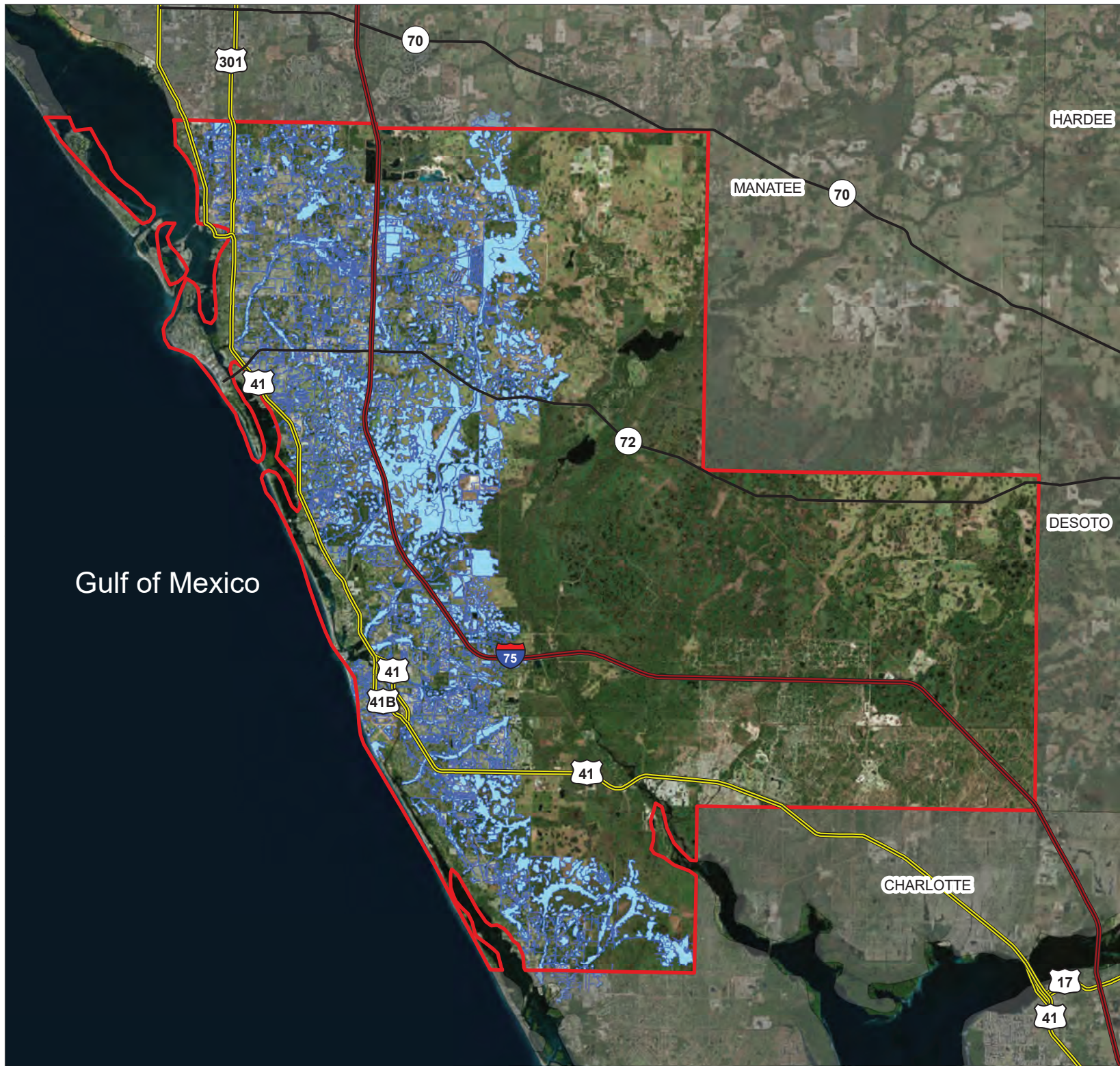
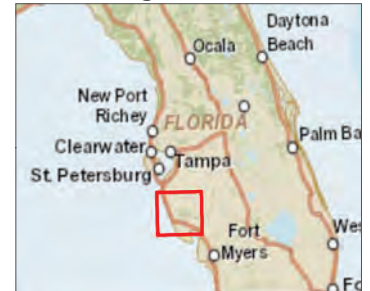


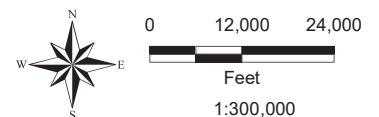


Figure 3-3
Sarasota County
Community Flood Hazard
Areas

**Sarasota County Floodplain
Management Plan**



-  Sarasota
Boundary
-  Community
Flood Hazard
Area



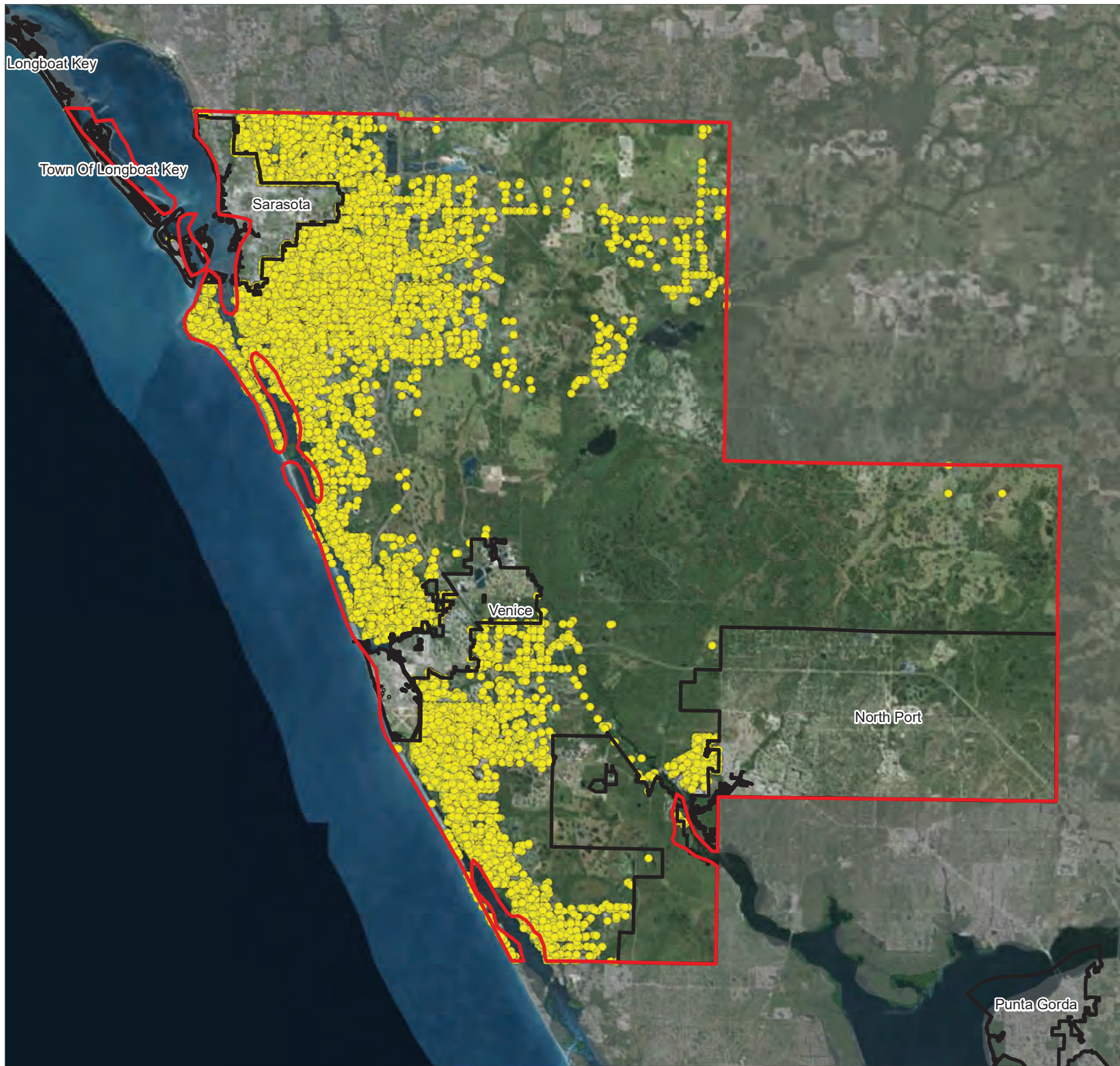
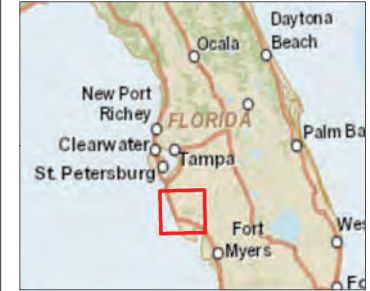





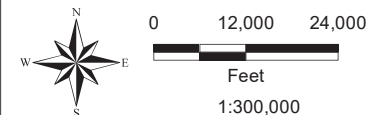
Figure 3-4

Sarasota County
Historical Flooding
Issues/Complaints

Sarasota County Floodplain
Management Plan



-  Sarasota Boundary
-  Cities/Towns
-  Historical Flooding Issue/Complaint



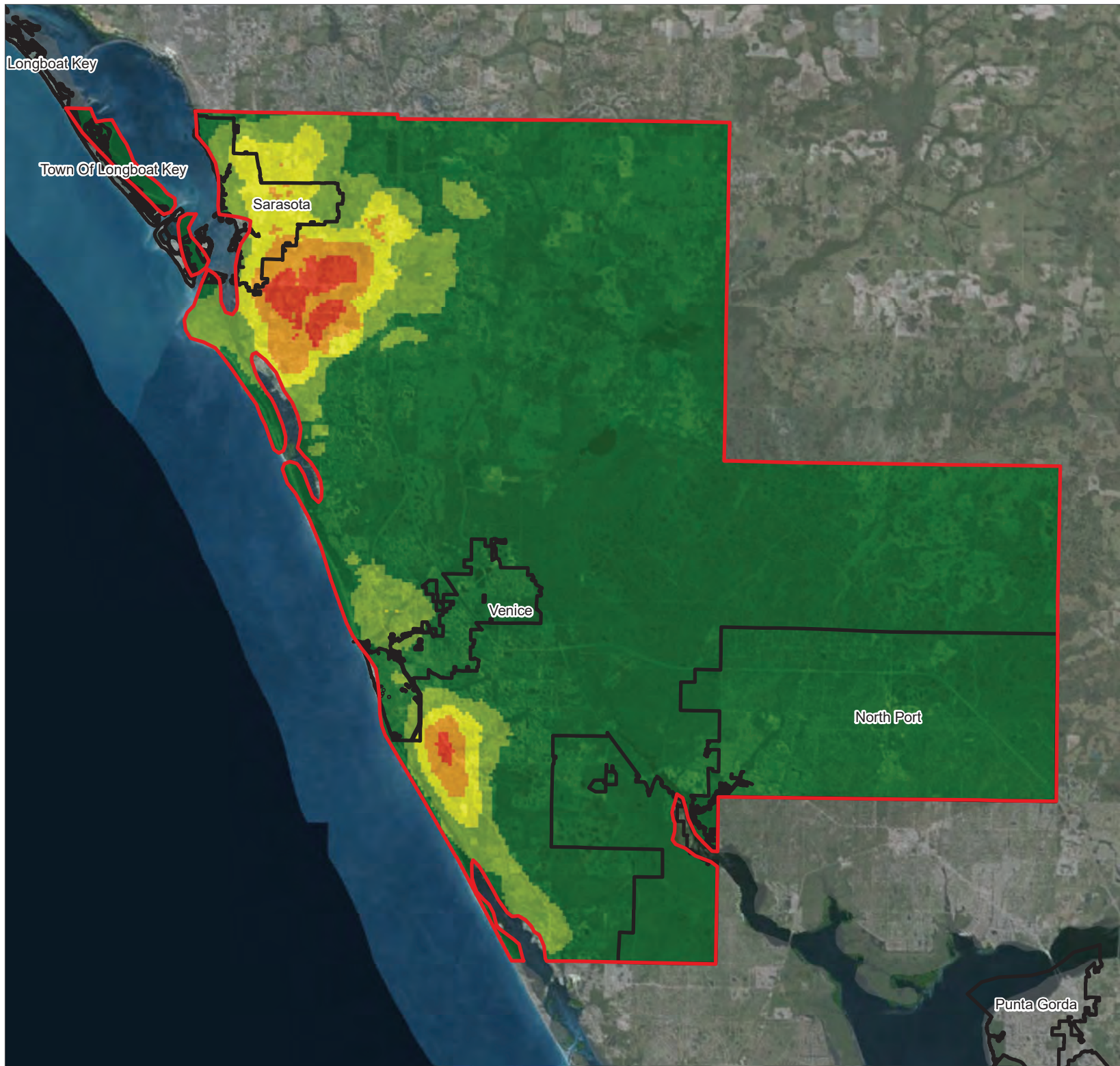
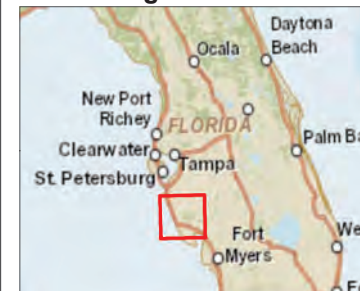




Figure 3-5
Sarasota County
Historical Flooding
Issues/Complaints
Heat Map
Sarasota County Floodplain
Management Plan

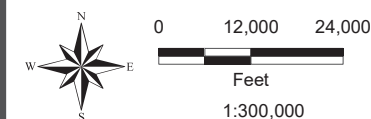


-  Sarasota Boundary
-  Cities/Towns

**Historical Flooding
Issues**

Density

-  Low
- 
- 
- 
-  High



TROPICAL STORM / HURRICANE

Tropical storms and hurricanes are large cyclonic storms with counterclockwise winds of 39 mph or greater. If the conditions are right, with warm ocean water and favorable high-altitude winds, the system could develop winds in excess of 155 miles per hour, with catastrophic results if it makes landfall in populated areas. The following are descriptions of the three general levels of development for tropical cyclones:

- Tropical depression: The formative stages of a tropical cyclone in which the maximum sustained surface wind is 38 mph or less.
- Tropical storm: A warm core tropical cyclone in which the maximum sustained surface wind ranges from 39–73 mph.
- Hurricane: A warm core tropical cyclone in which the maximum sustained surface wind is 74 mph or greater.

Hurricanes are categorized according to the Saffir-Simpson Hurricane Wind Scale (Table 3-2), which is based on estimates of potential property damage. Hurricanes rated Category 3 and higher are considered major hurricanes because of their potential for significant damage and loss of life. While less devastating, Category 1 and 2 hurricanes are still dangerous, and they, too, require preventative measures.

Table 3-2 Saffir-Simpson Hurricane Wind Scale

Category	Sustained Winds	Potential Damage
Tropical Storm	39 – 73 mph	Some
1	74 – 95 mph	Some
2	96 – 110 mph	Extensive
3	111 – 130 mph	Devastating
4	131 – 155 mph	Catastrophic
5	156 mph or higher	Catastrophic

NOAA describes the damage potential for each category as follows:

- **Category 1:** Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding, and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
- **Category 2:** Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
- **Category 3:** Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
- **Category 4:** Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

- **Category 5:** Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

Although hurricanes are categorized according to sustained wind speeds, they are often accompanied by heavy rains and storm surge that can cause flooding throughout Sarasota County. In addition, fallen trees and debris can obstruct water flow, contributing to flood damage to structures.

Sarasota County has experienced several tropical storms and hurricanes in recent years. In addition to the storms described previously in this section, other notable storms include:

September 1960: Hurricane Donna resulted in tidal heights approximately 3 feet above normal in Sarasota. Pre-storm rainfall of nearly 10 inches saturated the ground. That, combined with rainfall of 5 to 7 inches during the storm, caused extensive flood damage.

October 1968: Hurricane Gladys originated in the Caribbean Sea and entered the Florida Straits on October 18, 1968. Tides up to 5 feet above normal produced considerable damage in Sarasota County. The storm also caused erosion and the lowering of beach profiles throughout the County.

September 1985: Hurricane Elena's storm surge and wave action caused beach erosion and flooding along the barrier islands. Building on the effects of Elena, tropical storm Juan caused serious structural damage to shoreline areas of Sarasota County. Elena required the evacuation of 37,000 people, of whom about 6,500 stayed in shelters.

October 1987: Hurricane Floyd formed off the Yucatan Peninsula. Floyd brought heavy rains and strong winds, resulting in flooding.

November 1988: Tropical Storm Keith made landfall in Sarasota County at 65 mph. Damages resulted from storm surge and wave action.

September 2001: Hurricane Gabrielle made landfall in Venice, then quickly moved northeast across central Florida. The storm spawned tornadoes and caused heavy rain with significant flooding. Storm surge flooding and wave action occurred immediately southeast of where Gabrielle made landfall, including the Englewood coastline of Sarasota County.

August 2004: Hurricane Charley, which developed into a Category 4 storm, was forecast to remain just offshore of the west coast of Florida and make landfall near the mouth of Tampa Bay. However, the storm took an easterly turn and made landfall in the Punta Gorda area, about 50 miles south of Sarasota. It then proceeded northeast through Arcadia, Lake Wales, and Orlando before exiting the state between Daytona and Jacksonville. Because the storm was fast-moving and relatively compact, it made little impact on Sarasota County in the form of wind or rainfall.

September 5, 2004: Hurricane Frances was a very slow-moving Category 2 storm, with a diameter approximately the size of the state of Texas, that impacted virtually the entire state of Florida. The eye of the storm made landfall near Stuart, and then moved northwest across the state and entered the Gulf of Mexico near New Port Richey. The eye stayed northeast of Sarasota, but several inches of rainfall fell in Sarasota during the course of the storm, which resulted in some flooding of structures.

September 16, 2004: Hurricane Ivan, a strong Category 4 storm, made landfall near Gulf Shores, Alabama. The storm remained west of Sarasota, far enough in the Gulf of Mexico that the only

impact to Sarasota County was beach erosion and damage to some docks as a result of changing tides.

September 26, 2004: Hurricane Jeanne made landfall on the east coast of Florida near Stuart. The storm then moved northwest, but the eye remained northeast of Sarasota. During the course of the storm, up to 8 inches of rainfall in Sarasota County resulted in the flooding of some structures.

October 2005: Hurricane Wilma made landfall in Florida near Cape Romano and moved across the peninsula in less than 5 hours. The location of the landfall was southerly enough that winds and rain in Sarasota County were minimal.

June 2007: Tropical Storm Barry made landfall near Tampa, dropping a few inches of rain and creating high surf conditions along the west coast of Florida, including Sarasota.

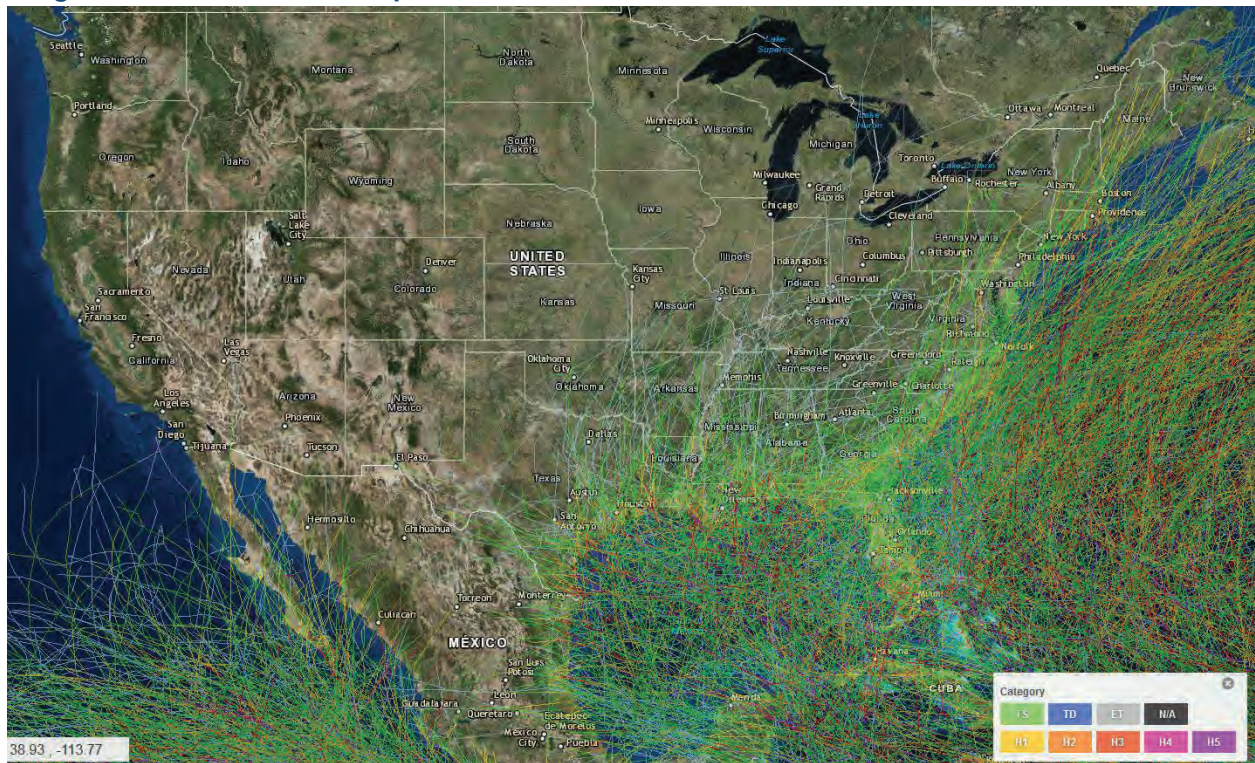
June 2016: Tropical Storm Colin stayed far offshore as it passed Sarasota, delivering intermittently heavy rainfall and causing erosion along the coast.

September 2016: Hurricane Hermine caused storm surges and erosion along the coast.

September 2017: Hurricane Irma entered Florida as a Category 4 hurricane. By the time it made it to the Sarasota area, it was still a Category 1 hurricane that brought substantial winds, flooding, downed power, and debris.

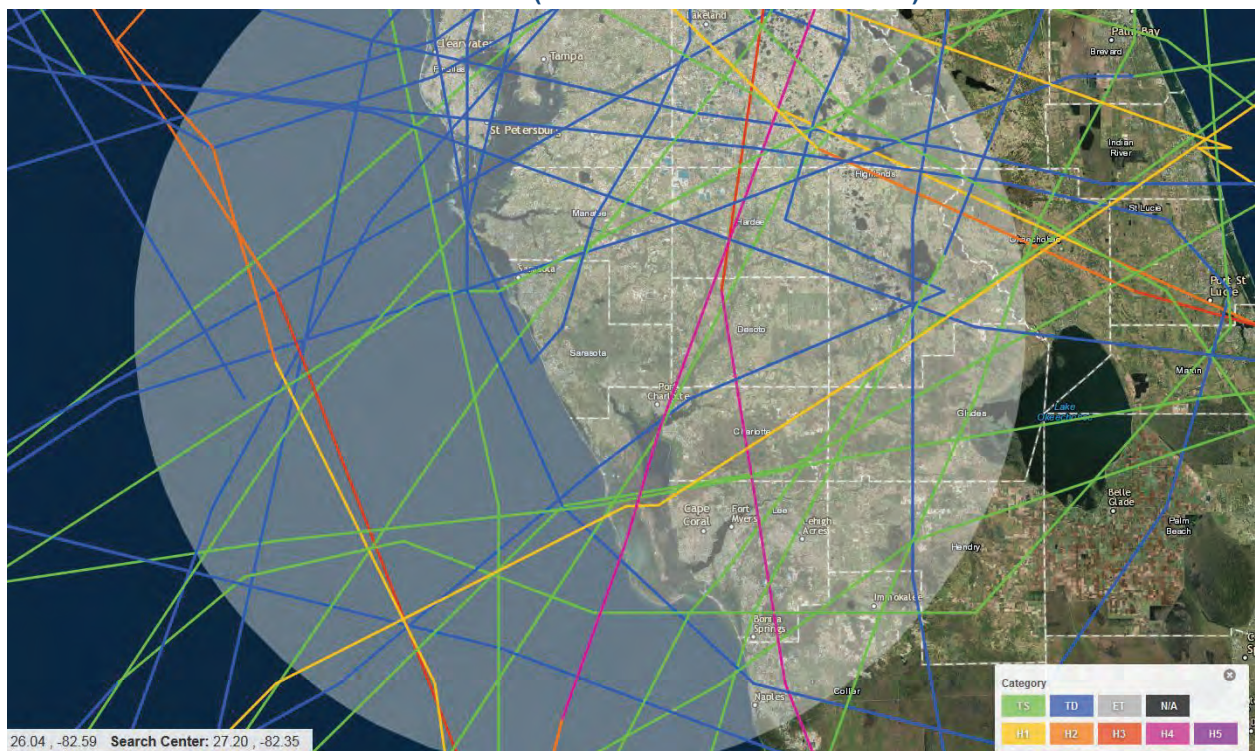
Every year the state of Florida is at risk of being impacted by tropical storms and hurricanes. Figure 3-6 illustrates the historical tropical storm and hurricane tracks for the United States from 1842 to 2015. Figure 3-7 illustrates the tropical storm and hurricane tracks since 1950 for the Sarasota area. Based on events recorded by the NOAA, 37 of these tracks were within 75 nautical miles of Sarasota County since 1950. On average, The Tampa Bay Region, which includes Sarasota County, sustains a hurricane every 4.5 years based on the National Hurricane Center's (NHC) historical assessment of tropical storms and hurricanes. Table 3-3 and Table 3-4 describe the frequency of occurrences of tropical storms and hurricanes in the Tampa Bay Region, which includes Sarasota County.

Figure 3-6 Historical Tropical Storm and Hurricane Tracks for the United States Since 1842



(National Oceanic and Atmospheric Administration, 2016).

Figure 3-7 Historical Tropical Storm and Hurricane Tracks for the Sarasota Area Since 1950 (within 75 nautical mile radius)



(National Oceanic and Atmospheric Administration, 2016).

Table 3-3 NHC Hurricane or Tropical Storms Return Intervals for the Tampa Bay Region

Number of Years	135
Number of Hurricanes and Tropical Storms	100
Mean Number of Occurrences per Year	0.74
Mean Recurrence Interval	1.35 Years

Table 3-4 NHC Hurricane Return Intervals for the Tampa Bay Region

Number of Years	135
Number of Hurricanes	30
Mean Number of Occurrences per Year	0.22
Mean Recurrence Interval	4.5 Years

Due to its geographic location in the subtropics, adjacent to the Gulf of Mexico, the entire County is vulnerable to damage caused by tropical storm and hurricane-force winds and related flooding. Vulnerability to hurricane related flooding is dependent upon the severity of storm surge, a general rise in sea level caused by the low pressure and strong winds around a hurricane's eye, and the amount of rain carried by the hurricane. Storm surge is influenced by the hurricane's velocity, and can rise 20 feet or more above normal sea level to cause massive flooding and destruction along shorelines in its path. During tropical storms and hurricanes, flooding due to heavy rainfall may extend over widespread areas of the County.

HISTORICAL CLAIMS AND REPETITIVE LOSS AREAS

The NFIP has paid over \$25.6 million in claims in Sarasota County. Of these paid losses, approximately \$19.9 million were for pre-FIRM structures, representing 1,660 claims while post-FIRM structures accounted for 548 claims totaling approximately \$5.7 million, illustrating the importance of maintaining accurate flood risk information and the benefits of Sarasota County floodplain management practices and regulations. Table 3-5 and Table 3-6 describe the policy and claim statistics for Sarasota County.

Table 3-5 Policy and Claim Statistics for Pre-FIRM Structures

Zone	Policies*	Number of Closed Paid Losses*	Closed Paid Losses*
A01-30, AE	9,644	1,069	\$11,740,220
A	242	207	\$3,425,560
AO	0	0	\$0
AH	0	0	\$0
AR	0	0	\$0
A99	0	0	\$0
V01-30, VE	528	173	\$2,137,250
V01-30, VE	0	0	\$0
D	2	42	\$405,490
B, C, X	2,548	169	\$2,222,122
Total	12,964	1,660	\$19,930,642

*As of 3/31/2017

Table 3-6 Policy and Claim Statistics for Post-FIRM Structures

Zone	Policies*	Number of Closed Paid Losses*	Closed Paid Losses*
A01-30, AE	12,392	211	\$1,894,063
A	789	199	\$1,984,073
AO	0	0	\$0
AH	0	0	\$0
AR	0	0	\$0
A99	0	0	\$0
V01-30, VE	301	11	\$121,673
V01-30, VE	0	0	\$0
D	36	2	\$77,032
B, C, X	13,503	125	\$1,609,642
Total	27021	548	\$5,686,483

*As of 3/31/2017

The County maintains insurance for facilities that it owns, including flood insurance for facilities that are shown to be at risk for flooding.

As described by Table 3-7, there are approximately forty thousand policies compared to the approximately thirty-seven thousand structures that are located in the SFHA (see Section 6 for an analysis of the residential and commercial buildings located in the SFHA). This high percentage is thanks to the outreach efforts and regular flood information workshops that the County conducts every year. As illustrated in Figure 3-8, the flood insurance policies cover more than just buildings along the coastal areas, but also cover much of the inland areas. Sarasota County is proactive in identifying areas with flooding issues by conducting watershed management plans throughout the County, and by conducting public meetings and workshops to educate residents about their risks.

Structures in the community are at risk for flooding whether or not structures are located within a designated SFHA. As illustrated by Table 3-5 and Table 3-6, nearly 17% of paid losses for Sarasota County are for structures outside of the SFHA. Overall, most of the policies in force are for single-family homes (26,146 policies). Most of the claims come from this group, representing approximately \$21.9 million in paid losses from 1,799 claims.

Table 3-7 Policy and Claim Statistics by Occupancy Type

Occupancy Type	Policies*	Closed Paid Losses*
Single-Family	26,146	\$21,881,591
2-4 Family	2,625	\$1,091,672
All Other Residential	10,310	\$1,210,115
Non-Residential	904	\$1,441,914
Total	39,985	\$25,625,292

*As of 3/31/2017

Sarasota County geocoded the historical claims data (Figure 3-9). This data was overlaid with other data, such as topographic information, FEMA flood zones, historical flooding complaints, and other information to identify areas within the County that are at risk for flooding. [The combination of policies and claims information that the County geocoded can help the County determine, not only where flood risk exists, but also where residents do not currently have flood insurance and are in high risk areas. Section 6 illustrates the use of this data to determine homes that the County can target for outreach.](#)

Sarasota County performed a repetitive loss areas analysis using the most recent repetitive loss properties data from FEMA, with the goal of reducing the number of repetitive loss properties (RLPs) within Sarasota County. A Repetitive Loss Structure is an NFIP-insured structure that has had at least two paid flood losses of more than \$1,000 each in any 10-year period since 1978. There are currently 253 RLPs for Sarasota County. A Severe Repetitive Loss (SRL) Structure is defined as a residential property that is covered under an NFIP flood insurance policy and (a) has at least four NFIP claim payments (including building and contents) over \$5,000 each, and the cumulative amount of such claims payments exceeds \$20,000; or (b) at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building. For both (a) and (b) above, at least two of the referenced claims must have occurred within any 10-year period, and must be more than 10 days apart. Sarasota County has twenty SRL properties. Eleven of these properties have since been mitigated either by demolition or by providing flood protection.

Sarasota County is deemed a Class C community in the Community Rating System program and is required to have a floodplain management plan or area analyses for its repetitive loss areas.

Stormwater Utility and the CRS Coordinator adhere to the data pertaining to SRLs and RLPs as protected under the Federal Privacy Act of 1974.

Sarasota County mapped the RLPs and evaluated nearby properties with the same potential for flooding. The repetitive loss areas include the properties on the repetitive loss list and all nearby properties that may experience similar flooding conditions. The repetitive loss areas were delineated based on compilation of the following data:

- Repetitive loss properties and data (e.g., number of losses and associated cost).
- LiDAR (elevation data, land slope).
- Conveyance system components (e.g., location and size of stormwater pipes, ditches, storage basins, work requests).
- Floodplains (e.g., WMP studies and FIRMs).
- Storm surge areas.
- Streetview.
- Historical flooding complaints.

Figure 3-10 illustrates the repetitive loss areas identified by the analysis. Flooding occurrences in these areas were due to significant storm events combined with structures located in or around water bodies. The terrain characteristics with respect to these structures can be described as low-lying areas with a high depth to the water table. Table 3-8 describes the causes of flooding for these repetitive loss areas as they relate to significant storms.

Sarasota County continually evaluates the repetitive loss areas, with the most recent evaluation and major update conducted in 2016/2017. The update consisted of a desktop evaluation of existing and potential new repetitive loss areas, and a field investigation of the properties. The RLAA memo describes the analysis process for evaluating the historical claims data and repetitive loss areas (Attachment 9).

Figure 3-8 Flood Insurance Policies in Unincorporated Sarasota County

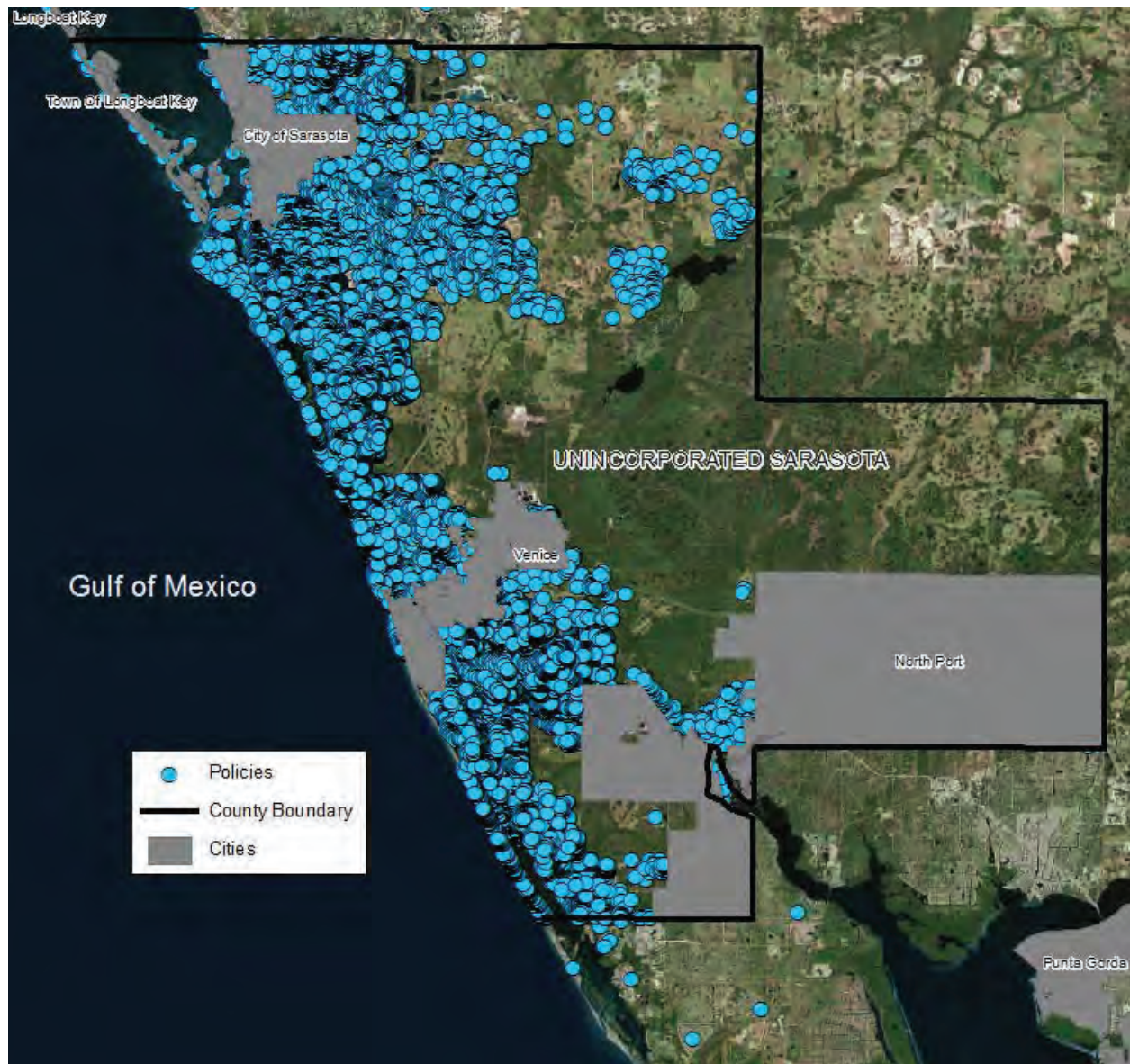


Figure 3-9 Flood Insurance Claims in Unincorporated Sarasota County

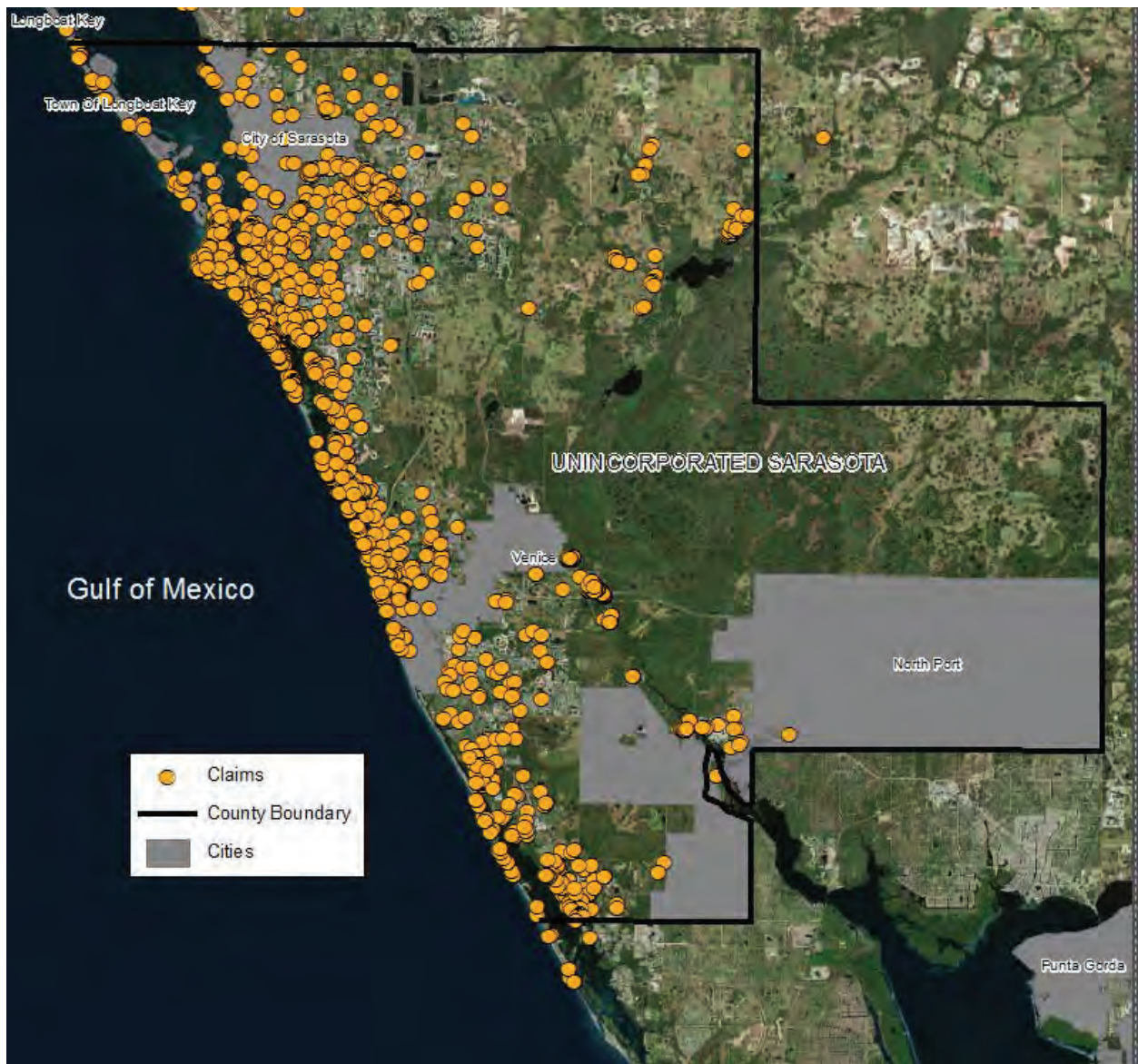


Figure 3-10 Repetitive Loss Areas Analysis

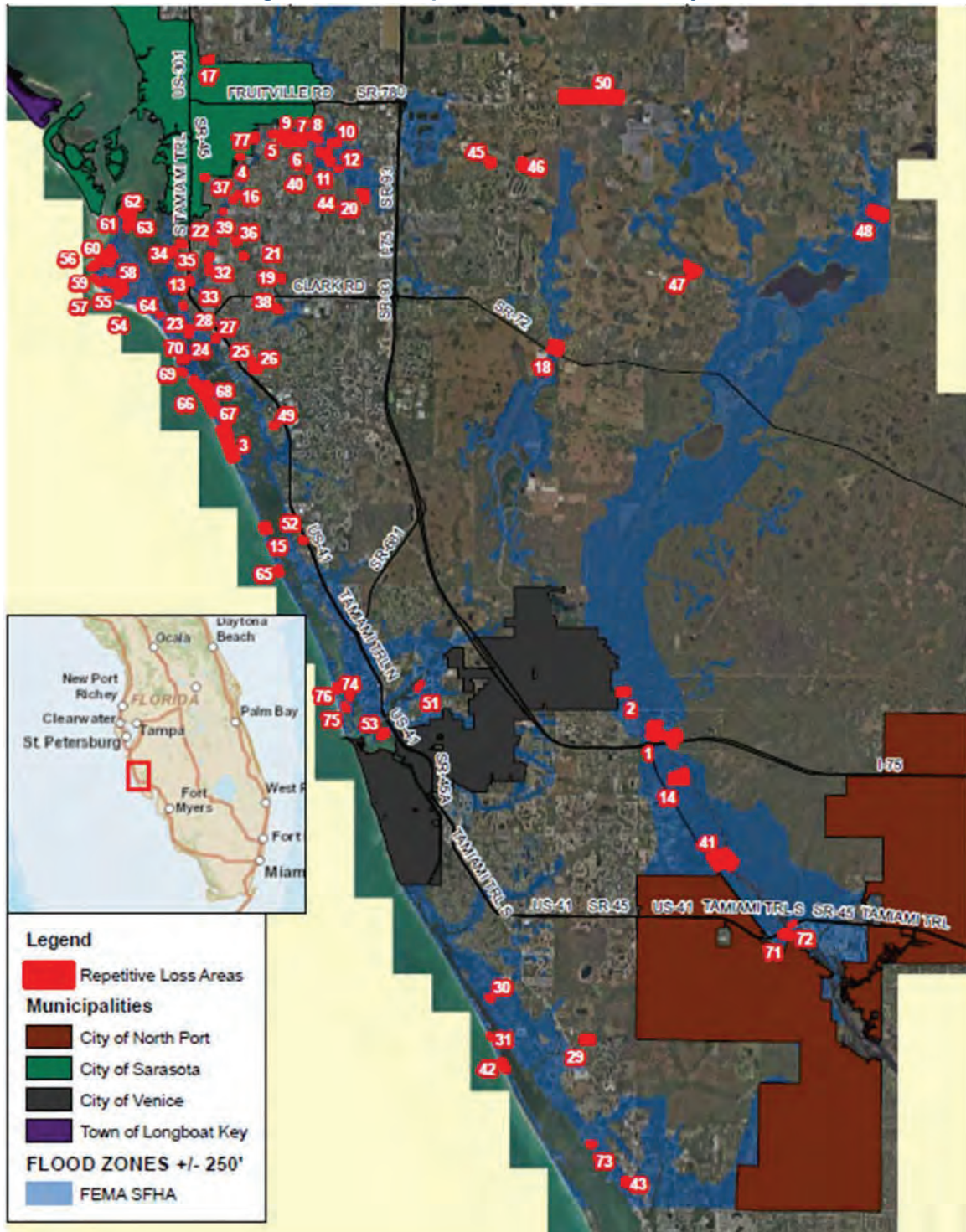


Table 3-8 Causes of Repetitive Flooding

Repetitive Loss Area Map ID	Building Count	Causes of Repetitive Flooding
1	61	Hurricane Gabrielle (2001): 5 to 10 inches of rainfall, storm surge, and wave action. Storms April through July (2003): 8 to 10 inches of rainfall. Waters did not recede for over 30 days in some parts of the County. Tropical Depression One (1992): Excess of 20 inches of rainfall.
2	49	Hurricane Gabrielle: 5 to 10 inches of rainfall, storm surge, and wave action. Tropical Depression One: Excess of 20 inches of rainfall.
3	171	Hurricane Gabrielle: 5 to 10 inches of rainfall, storm surge, and wave action. Tropical Storm Josephine
4	15	Tropical Depression One: Excess of 20 inches of rainfall.
5	42	Tropical Depression One: Excess of 20 inches of rainfall.
6	257	Storms April through July: 8 to 10 inches of rainfall. Waters did not recede for over 30 days in some parts of the County.
7	14	Storms April through July: 8 to 10 inches of rainfall. Waters did not recede for over 30 days in some parts of the County.
8	24	Tropical Depression One: Excess of 20 inches of rainfall.
9	11	Tropical Depression One: Excess of 20 inches of rainfall.
10	19	Tropical Depression One: Excess of 20 inches of rainfall.
11	38	Tropical Depression One: Excess of 20 inches of rainfall.
12	24	Tropical Depression One: Excess of 20 inches of rainfall. Tropical Storm Dean (1995): 9 to 11 inches of rainfall.
13	13	Subtropical Storm One (1982): Approximately 6 inches of rainfall, storm surge, and wave action.
14	36	Hurricane Gabrielle: 5 to 10 inches of rainfall, storm surge, and wave action. Storms April through July: 8 to 10 inches of rainfall. Waters did not recede for over 30 days in some parts of the County.
15	21	Subtropical Storm One: Approximately 6 inches of rainfall, storm surge, and wave action.
16	14	Tropical Depression One: Excess of 20 inches of rainfall.
17	13	Tropical Depression One: Excess of 20 inches of rainfall.
18	13	Tropical Storm Dean: 9 to 11 inches of rainfall.
19	14	Tropical Storm Dean: 9 to 11 inches of rainfall.
20	108	Tropical Depression One: Excess of 20 inches of rainfall. Tropical Storm Dean: 9 to 11 inches of rainfall.
21	23	Tropical Storm Dean: 9 to 11 inches of rainfall.
22	14	Tropical Depression One: Excess of 20 inches of rainfall. Tropical Storm Dean: 9 to 11 inches of rainfall.
23	13	Tropical Storm Dean: 9 to 11 inches of rainfall.
24	8	Tropical Depression One: Excess of 20 inches of rainfall.
25	9	Tropical Depression One: Excess of 20 inches of rainfall.
26	50	Tropical Depression One: Excess of 20 inches of rainfall.
27	9	Tropical Depression One: Excess of 20 inches of rainfall.

Repetitive Loss Area Map ID	Building Count	Causes of Repetitive Flooding
28	12	Tropical Storm Dean: 9 to 11 inches of rainfall.
29	12	
30	11	Tropical Depression One: Excess of 20 inches of rainfall.
31	10	
32	12	Tropical Storm Dean: 9 to 11 inches of rainfall.
33	18	Tropical Storm Dean: 9 to 11 inches of rainfall.
34	15	Tropical Depression One: Excess of 20 inches of rainfall.
35	21	Tropical Storm Dean: 9 to 11 inches of rainfall.
36	14	Tropical Storm Dean: 9 to 11 inches of rainfall.
37	15	Tropical Storm Dean: 9 to 11 inches of rainfall.
38	17	Tropical Storm Dean: 9 to 11 inches of rainfall.
39	5	Tropical Depression One: Excess of 20 inches of rainfall.
40	18	Storms April through July: 8 to 10 inches of rainfall. Waters did not recede for over 30 days in some parts of the County.
41	658	Storms April through July: 8 to 10 inches of rainfall. Waters did not recede for over 30 days in some parts of the County.
42	31	
43	21	
44	12	Tropical Depression One: Excess of 20 inches of rainfall.
45	16	Hurricane Gabrielle: 5 to 10 inches of rainfall, storm surge, and wave action.
46	15	Hurricane Gabrielle: 5 to 10 inches of rainfall, storm surge, and wave action.
47	14	
48	10	Storms April through July: 8 to 10 inches of rainfall. Waters did not recede for over 30 days in some parts of the County.
49	16	Tropical Storm Dean: 9 to 11 inches of rainfall.
50	60	
51	16	Tropical Depression One: Excess of 20 inches of rainfall.
52	16	Tropical Storm Dean: 9 to 11 inches of rainfall.
53	28	Tropical Depression One: Excess of 20 inches of rainfall.
54	10	Hurricane Elena (1985): Approximately 3 inches of rainfall, storm surge, and wave action.
55	156	Subtropical Storm One: Approximately 6 inches of rainfall, storm surge, and wave action. Hurricane Elena: Approximately 3 inches of rainfall, storm surge, and wave action. Hurricane Gabrielle: 5 to 10 inches of rainfall, storm surge, and wave action. Tropical Storm Dean: 9 to 11 inches of rainfall. Tropical Storm Josephine (1996)
56	8	Tropical Depression One: Excess of 20 inches of rainfall.
57	16	Tropical Depression One: Excess of 20 inches of rainfall.
58	17	Tropical Depression One: Excess of 20 inches of rainfall.
59	27	Hurricane Gabrielle: 5 to 10 inches of rainfall, storm surge, and wave action.

Repetitive Loss Area Map ID	Building Count	Causes of Repetitive Flooding
60	111	Hurricane Gabrielle: 5 to 10 inches of rainfall, storm surge, and wave action. Tropical Depression One: Excess of 20 inches of rainfall. Tropical Storm Dean: 9 to 11 inches of rainfall.
61	36	Subtropical Storm One: Approximately 6 inches of rainfall, storm surge, and wave action.
62	11	Tropical Storm Dean: 9 to 11 inches of rainfall.
63	40	Hurricane Elena: Approximately 3 inches of rainfall, storm surge, and wave action. Subtropical Storm One: Approximately 6 inches of rainfall, storm surge, and wave action. Tropical Storm Dean: 9 to 11 inches of rainfall. Tropical Storm Josephine
64	10	Hurricane Elena: Approximately 3 inches of rainfall, storm surge, and wave action. Tropical Depression One: Excess of 20 inches of rainfall.
65	17	Subtropical Storm One: Approximately 6 inches of rainfall, storm surge, and wave action.
66	54	Hurricane Elena: Approximately 3 inches of rainfall, storm surge, and wave action. Subtropical Storm One: Approximately 6 inches of rainfall, storm surge, and wave action. Tropical Depression One: Excess of 20 inches of rainfall. Tropical Storm Josephine
67	13	Tropical Depression One: Excess of 20 inches of rainfall. Un-named storm (1997): 10 inches of rainfall.
68	33	Hurricane Elena: Approximately 3 inches of rainfall, storm surge, and wave action.
69	11	Subtropical Storm One: Approximately 6 inches of rainfall, storm surge, and wave action.
70	51	Tropical Depression One: Excess of 20 inches of rainfall. Tropical Storm Dean: 9 to 11 inches of rainfall.
71	53	Hurricane Elena: Approximately 3 inches of rainfall, storm surge, and wave action. Hurricane Frances (2004): County experienced four back-to-back hurricanes between August and September 2004. Hurricane Gabrielle: 5 to 10 inches of rainfall, storm surge, and wave action. Tropical Storm Josephine Tropical Storm Keith (1988): 1 to 3 inches of rainfall, storm surge, and wave action.
72	4	Hurricane Elena: Approximately 3 inches of rainfall, storm surge, and wave action. Hurricane Frances: County experienced four back-to-back hurricanes between August and September 2004. Hurricane Gabrielle: 5 to 10 inches of rainfall, storm surge, and wave action. Tropical Storm Josephine Tropical Storm Keith: 1 to 3 inches of rainfall, storm surge, and wave action.

Repetitive Loss Area Map ID	Building Count	Causes of Repetitive Flooding
73	16	Tropical Depression One: Excess of 20 inches of rainfall.
74	17	Tropical Depression One: Excess of 20 inches of rainfall.
75	14	Storms April through July: 8 to 10 inches of rainfall. Waters did not recede for over 30 days in some parts of the County. Tropical Storm Dean: 9 to 11 inches of rainfall.
76	19	Storms April through July: 8 to 10 inches of rainfall. Waters did not recede for over 30 days in some parts of the County. Tropical Storm Dean: 9 to 11 inches of rainfall.
77	27	Tropical Depression One: Excess of 20 inches of rainfall. Tropical Storm Dean: 9 to 11 inches of rainfall.

4 LESS FREQUENT FLOOD HAZARDS AND OTHER TYPES OF HAZARDS

This Section describes other, less frequent, hazards that may affect Sarasota County, including dam or levee failure and coastal erosion.

Dam or levee failure can take several forms, including a collapse of or breach in the structure. These failures can result from any one, or a combination, of the following causes:

- Prolonged periods of rainfall and flooding, which cause most failures.
- Inadequate spillway capacity, resulting in excess overtopping of the embankment.
- Internal erosion caused by embankment or foundation leakage or piping.
- Improper maintenance, including failure to remove trees, repair internal seepage problems, or maintain gates, valves, and other operational components.
- Improper design or use of improper construction materials.
- High winds, which can cause significant wave action and result in substantial erosion.
- Earthquakes, which typically cause longitudinal cracks at the tops of the embankments, leading to structural failure.

DAM FAILURE

According to the US Army Corps of Engineers (USACE) National Inventory of Dams, as shown in Figure 4-1, only one dam exists in Sarasota County. The Hi-Hat Ranch Pond is an earthen dam. The area is surrounded by rural and agricultural lands. Failure of this dam is not likely to have a major impact on the surroundings.

No recorded failures of dams have caused significant flooding in the community.

LEVEE FAILURE

A levee failure is defined as a break in the water-retaining earthwork, allowing water to flood the land that the levee was designed to protect. There are no certified levees for Unincorporated Sarasota County. Two non-certified levees exist that may affect Sarasota County: the Peace River/Manasota Regional Water Supply Authority (PRMRWSA) Reservoir and the Bahia Vista Flood Reclamation Project.

The PRMRWSA Reservoir is a non-certified levee in the neighboring DeSoto County. Failure of this levee may affect Sarasota County and/or one of its incorporated municipalities. Depending on the location of the failure and water level of the reservoir, residents within the inundation area could experience water depths from 2 to 4 feet. The levee failure could impact non-elevated homes and temporarily impact critical facilities that directly support these homes.

The PRMRWSA Reservoir is located in a rural part of town, with some population residing in the potential impact area. There is minimal impact to the economy and major employers. However, flooding from a levee failure could damage property, and may cause drowning and/or injury to residents in the potential impact area. There is an Emergency Action Plan for this levee. The PRMRWSA has a reverse-911 system to alert and advise nearby property owners and residents in the event of an emergency condition at the reservoir.

The Reservoir is bounded by 4 miles of highly engineered earthen embankment. The embankment was designed to withstand a Category 5 hurricane and a simultaneous 48-hour, 60-inch rainfall event. The probability of a levee failure at the Reservoir is low.

Approximately 3,942 properties exist within the potential impact area and are vulnerable to the levee failure. PRMRWSA analyzed several breach scenarios and mapped the affected areas. The PRMRWSA performed a breach analysis to evaluate the impacts of a failure during extreme rain events. Attachment 10 contains inundation maps resulting from a Probable Maximum Precipitation condition along with a failure of the levee.

The Bahia Vista Flood Reclamation Project in Sarasota County is designed to alleviate flooding along a roadway and surrounding structures (see Attachment 11). The majority of stormwater management facilities in the County have an operation and maintenance plan by which the control structures are inspected periodically for structural integrity. In addition, many are designed to the 100-year flood event. Therefore, the probability of structure failure is relatively low.

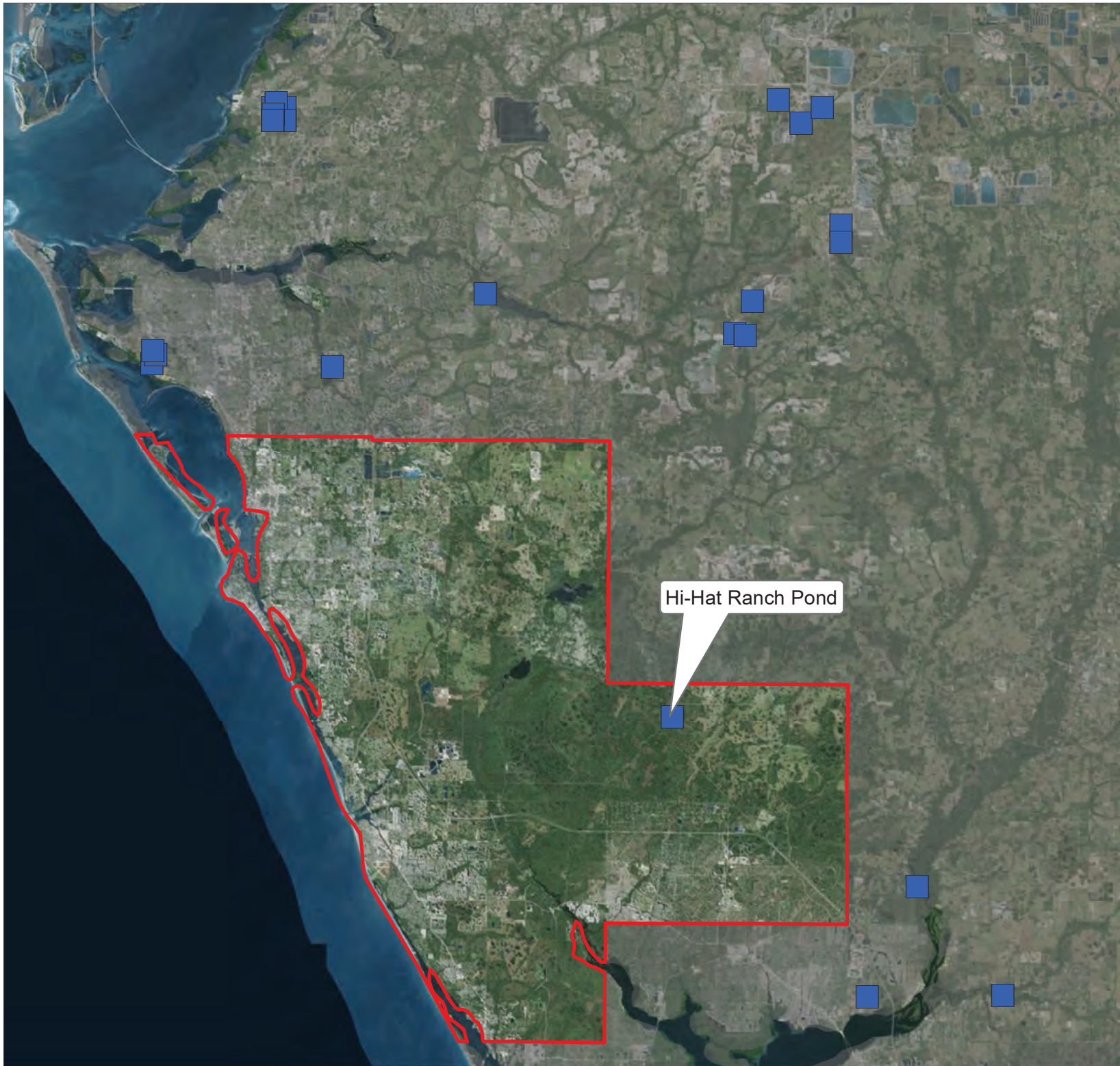
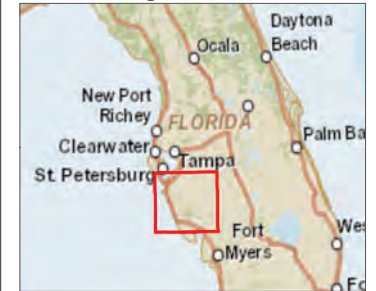


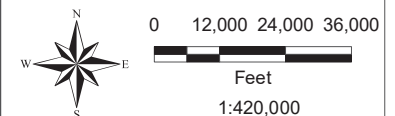


Figure 4-1
National Dam Inventory
for Sarasota County
and Surrounding Areas

**Sarasota County Floodplain
Management Plan**



-  Dam
-  Sarasota Boundary



COASTAL EROSION

Coastal erosion is the wearing away of land and the removal of beach or dune sediments by wave action, tidal currents, wave currents, drainage, or high winds. Waves generated by coastal storms or hurricanes cause coastal erosion, which may take the form of long-term losses of sediment and rocks, or merely the temporary redistribution of coastal sediments. Erosion in one location may result in accretion nearby.

The beaches and inland waterways of Sarasota County will continue to shift and change over time, presenting an identifiable hazard. Whether or not coastal erosion takes place over a long period of time or by a single incident, coastal erosion is a continued hazard.

Sarasota County has 37 miles of Gulf beach shoreline. Approximately 23 of these miles stretch along several barrier islands. The vast majority of privately owned properties on the County's barrier islands have been developed, while the publicly held properties are predominantly used as natural area parks, including Siesta Key Public Beach, Caspersen Public Beach, and Blind Pass Park. As land values have increased, redevelopment of the finite number of privately owned, previously developed coastal properties has become common. Observed trends include the conversion of commercial marinas to condominiums, and the teardown and reconstruction of single-family residences with larger structures and, often, additional ancillary features such as pools, garages, docks, and patios. These trends have placed new demands and threats on coastal resources, which are being managed with regulatory and public educational programs. These trends can also have a positive result: for example, redevelopment results in modernized structures that comply with improved building codes, better enabling the structures to withstand the adverse effects of hurricanes and coastal erosion. These improvements will enhance public health, safety, and general welfare and will reduce the need for Bay and Gulf-front coastal armoring.

Coastal erosion and/or accretion occur in various parts of Sarasota County's coastline and inland waterways throughout the year. The erosion and accretion rates within Sarasota County are dynamic between the barrier islands and at different locations on the same island. The bay waters shaped by these dynamic features include Sarasota Bay, Little Sarasota Bay, Dona/Roberts Bays, and Lemon Bay. Changes in barrier island shorelines are a direct result of the energy associated with winds, waves, currents, and tides.

All coastal structures as well as the critical facilities that support these structures could be impacted by coastal erosion. The State Enhanced Hazard Mitigation Plan (2013) references specific areas of coastal erosion and has identified four critical areas as defined by the Florida Department of Environmental Protection (with 11.4 miles at risk) and one non-critical area (with 0.4 miles at risk). Erosion is "critical" if there is a threat to or loss of one of four specific interests – upland development, recreation, wildlife habitat, or important cultural resources. Table 4-1 summarizes the critical erosion areas for Sarasota County.

Table 4-1 Sarasota County Coastal Erosion

Erosion Location	Description	Critical Miles
Big Sarasota Pass	Critical Inlet	0.4
Siesta Key North	Critical	0.5
Siesta Key South	Critical	2.4
Casey Key	Critical	3.7
Manasota Key	Critical	4.4
Caspersen Beach	Non-critical	0.4

Events that have resulted in significant erosion of the Sarasota County coast include:

September 1926: The “Great Miami” hurricane originated in the Atlantic Ocean near Cape Verde Island. It landed in South Florida near Perrine, 15 miles south of Downtown Miami. It swiftly crossed the southern portion of Florida before making landfall near Perdido Beach, Alabama. This was one of the most destructive storms of the 20th century. Wave action resulted in considerable erosion along the Sarasota Coast.

August 2008: Tropical Storm Fay caused significant coastal beach erosion.

June 2012: Tropical Storm Debby developed from a trough of low pressure in the central Gulf of Mexico and made landfall near Steinhatchee, Florida. Initial predictions anticipated the storm to move towards Louisiana or Texas, but instead the storm moved northeast across Florida. Up to 10 inches of rain fell in Sarasota County and flooded many secondary roads. The Lido Beach parking lot was flooded due to surf and high tide conditions. In addition, the Myakka River reached flood stage on June 27 from heavy rains and flooding continued through the end of the month, resulting in over one foot above flood stage.

Based on historical trends, coastal erosion occurs in Sarasota County several times each year with an average erosion rate of -0.8 ± 0.9 meters per year (*National Assessment of Shoreline Change: Part 1 Historical Shoreline Changes and Associated Coastal Land Loss along the US Gulf of Mexico*, pg 27, USGS 2004). This rate is considered low, and results from relatively low wave energy along the Gulf Coast. The Bureau of Beaches and Coastal Systems develops and publishes annually the *Critically Eroded Beaches Report*. The data from this report is gathered from a set of monitoring locations along Florida’s coastlines. Data from these stations is compiled into a GIS database for modeling and analysis. The continual reporting and analysis is combined with historical data for detailed records about the status of Florida beaches. Erosion is a constantly changing issue as development continues on the beaches and in the inlets. Erosion can also be instantly changed by a large storm or a hurricane.

Sarasota County on the Gulf Coast is lined mostly with fine, white sandy beaches. These beaches, a main tourist attraction, are highly vulnerable to erosion from coastal events. These events can cause considerable loss of the beachfront and widespread damage to structures that line those beaches. .

OTHER HAZARDS

Sarasota County has adopted a Local Mitigation Strategy (LMS) that encompasses an all-hazards approach to mitigation. The LMS is a comprehensive plan aimed at reducing or eliminating risks associated with natural or man-made hazards. The plan considers the impacts of these hazards to life and safety of residences, properties, critical facilities, as well as the economy. The plan also considers activities that will reduce or eliminate these impacts, and provides a guideline for implementing programs and projects within the communities. A committee consisting of Sarasota County, incorporated cities and towns within the county, as well as other public stakeholders, develops and regularly updates the plan.

In addition to the hazards described here in this Floodplain Management Plan, the LMS also considers other, less frequent, hazards that may affect the county. These other hazards include:

HAIL STORM

Hail is a form of precipitation that occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into balls of ice. Hail can damage aircraft, homes, and cars, and can be deadly to livestock and people. Hail is usually pea-sized to marble-sized, but big thunderstorms can produce big hail. Hailstorms usually accompany thunderstorms, which are common occurrences in Sarasota County. However, instances of hailstorms are low in Sarasota County.

Since 1969, the largest recorded hail in Sarasota County was 1.75 inches. According to NOAA, Sarasota County and its jurisdictions have experienced 42 hailstorm events during the period from January 1, 1950 to November 1, 2016. The probability of hailstorm occurrence is low since the freezing level – the elevation at which freezing temperatures occur – in a Florida thunderstorm is so high that hailstones typically melt before they reach the ground.

LIGHTNING

Lightning is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a “bolt” when the buildup of charges becomes strong enough. This flash of light usually occurs within clouds or between clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000° Fahrenheit. Florida is the most lightning-prone area in the United States, with about 90 thunderstorm days per year. Because of this, Florida experiences more lightning deaths than any other state. In fact, in Florida lightning kills more people than do all other weather hazards combined. In the Florida Peninsula, thunderstorm season generally has two periods. Historically, the most dangerous months for lightning strikes are June, July, and August. NOAA has recorded lightning in Sarasota County 24 times since 1950 that resulted in deaths, injuries and/or damages. Structural damage resulting from lightning in these recorded events has totaled over \$1.13 million, for an average of \$51 thousand per event. Lightning was attributed to at least one death in Sarasota County and another in nearby Manatee County in 2016.

FREEZE

A freeze is weather marked by temperatures at or below the freezing point (0° Celsius or 32° Fahrenheit) for a significant period. Freezing temperatures can damage agricultural crops and burst water pipes in homes and buildings. Frost, often associated with freezes, can increase damaging effects. Frost is a layer of ice crystals that is produced by the deposit of water from the air onto a surface that is at or below freezing. The damage that can result from a freeze is typically associated with the agriculture industry, and does not often affect persons, structures, or associated property directly. During extended periods of low temperatures, individuals can suffer hypothermia and frostbite. Sarasota County is most susceptible to freeze events from December through February. Freeze warnings for Sarasota County occur every few years, but severe freezes have occurred statewide. In 1985 and 1989, the freeze was so severe that it wiped out entire groves across the state, killing both mature and young citrus trees. These freezes caused a significant economic impact on the citrus industry.

TORNADO

Tornadoes are cyclonic windstorms that usually accompany thunderstorms and hurricanes. While relatively short-lived in duration, tornadoes are intensely focused, making them one of the most destructive natural hazards. The weather conditions that tend to generate this phenomenon are unseasonably warm and humid earth surface air, cold air at the middle atmospheric levels, and strong upper-level jet stream winds. Waterspouts are weak tornadoes that form over warm water and occasionally move inland to become tornadoes. Florida has two tornado seasons. The summer tornado season runs from June to September and has the highest frequencies of occurrences, with usual intensities of EF0 or EF1 on the Enhanced Fujita Scale. The spring tornado season runs from February to April and is characterized by fewer, but more powerful tornadoes on the Enhanced Fujita Scale. Sarasota County has experienced 78 tornado and 12 waterspout events between March 1950 and June 2013. Several tornadoes have caused \$500,000 or more in damage per incident.

LAND SUBSIDENCE / SINKHOLES

Land subsidence is the lowering of a portion of the earth’s crust and can occur naturally or through human activity. Natural subsidence may occur when limestone, which is easily carved by underground

water, collapses, leaving sinkholes on the surface, or due to earthquakes along fault lines. Human activities such as mining or the extraction of oil, gas, or water may also lead to land subsidence. Sinkholes are a common feature of Florida's landscape due to land subsidence.

Sinkholes are only one of many kinds of karst landforms, which include caves, disappearing streams, springs, and underground drainage systems, all of which occur in Florida. Sinkholes form in karst terrain principally from the collapse of surface sediments into underground cavities in the limestone bedrock. Slightly acidic groundwater slowly dissolves cavities and caves in the limestone over a period of many years. When a cavity enlarges to the point that its ceiling can no longer support the weight of overlying sediments, the earth collapses into the cavity, forming a sinkhole. Sinkhole probability in Sarasota County is considered by the Florida Geologic Survey to be uncommon, but deep collapse types and small subsidence sinkholes are possible. Since July 1981, Sarasota County has recorded seven sinkhole events, each less than 10 feet in diameter and centered on a single property.

WILDFIRES

A wildfire is an intense fire that is usually in an uninhabited or sparsely habited area. Sarasota County has experienced a number of wildfires each year of varying degrees of scale. This is a major concern for all the jurisdictions, directly or indirectly, within the County because over 75% of the County is vulnerable to wildfires. While the Town of Longboat Key is the only jurisdiction not directly vulnerable to wildfires within its jurisdiction, it may be indirectly affected by the smoke and other associated hazards. The fire departments located within the County do work closely with outside fire suppression agencies on fire mitigation and controlled burns, and recently instituted a local Firewise Communities Program.

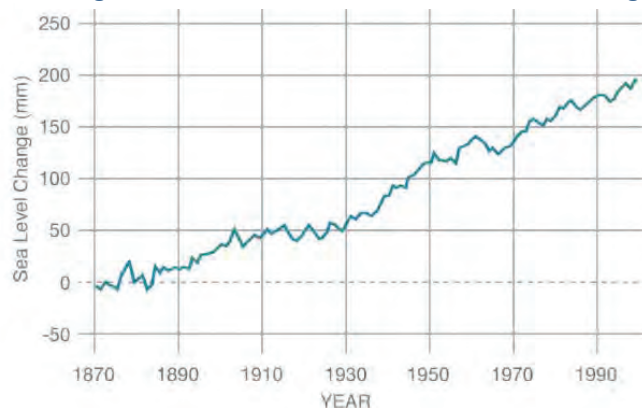
5 FUTURE FLOODING

CLIMATE CHANGE AND SEA LEVEL RISE

Global sea level has been rising over the past century, and the rate has increased in recent decades. The two major causes of global sea level rise (SLR) are thermal expansion caused by warming of the ocean and the increased melting of land-based ice, such as glaciers and ice sheets. Figure 5-1 shows the estimated amount of global sea level change from 1870 to 2000 (NOAA, 2016).

As sea level rises, low-lying coastal areas will be increasingly prone to coastal and inland flooding, especially during spring and fall high tides and during storm surge due to seaward storms, strong onshore winds, and other causes. Storm surge and wave heights during hurricanes will increase as coastal water depths increase with sea level rise, amplifying the damage potential of hurricanes. Because stormwater drainage systems rely mainly on gravity, sea level rise may reduce their effectiveness and potentially result in sunny day tidal flooding, as well as exacerbated inland flooding during rain events, especially in low-lying interior floodplains. Climate change can potentially increase the impact and frequency of flooding events.

Figure 5-1 Estimated Global Sea Level Change

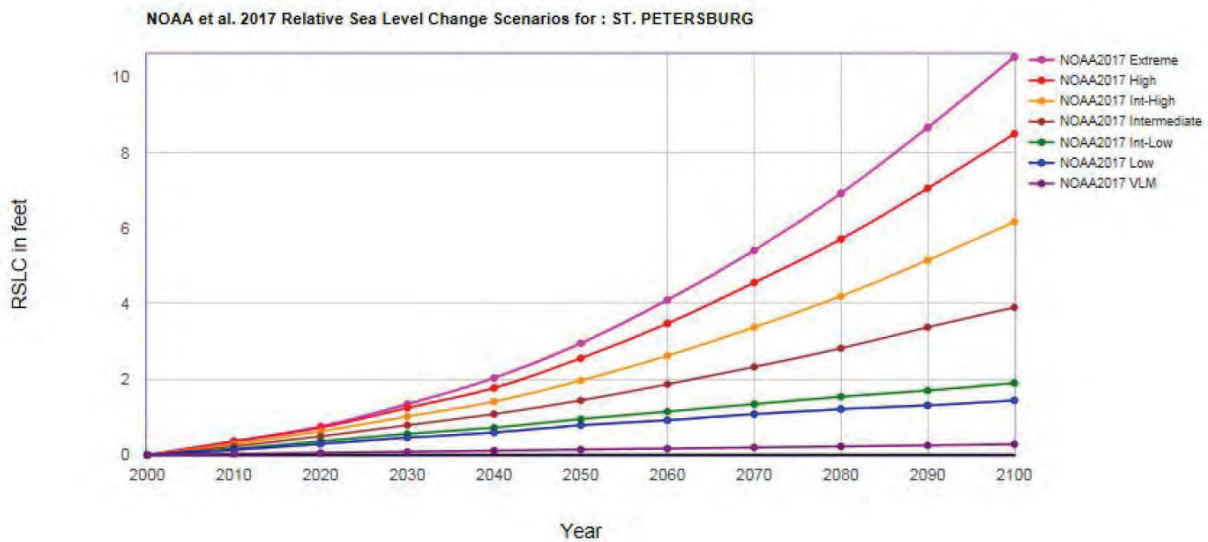


Continued sea level rise will exacerbate erosion. Rising sea level may shift the beach profile. New inlets can cut through barrier islands by waves superimposed on storm surges. When barrier island dune elevations are reduced to a threshold that allows complete inundation during storms, the overland flow of water can cut a channel that connects the ocean and estuary. The threshold may be reached due to increasing surge elevations, rising sea level, or the progressive eroding and lowering of dune elevations.

According to NOAA, the pace of global sea level rise almost doubled from 1.7 mm/year throughout most of the 20th century to 3.2 mm/year since 1993. The USACE developed the Sea Level Change Curve Calculator to provide guidance in evaluating future coastal projects with respect to changes in sea level.

The U.S. Interagency Sea Level Rise Task Force developed the rise scenarios for the United States and now provides six scenarios. Estimates for the non-climate attributed vertical land movement (VLM) were also developed to describe natural subsidence processes of the land. Figure 5-2 illustrates the Relative Sea Level Change (RSLC) Scenarios for St. Petersburg, Florida, as calculated using the NOAA projections and regional corrections (NOAA, 2017). Based on these projections, this region may experience from 1.7 inches to 2.95 feet of rise by year 2050, and from 3.5 inches to over 10 feet by year 2100.

Figure 5-2 Relative Sea Level Change Projections – Gauge: 8726520, St. Petersburg, FL

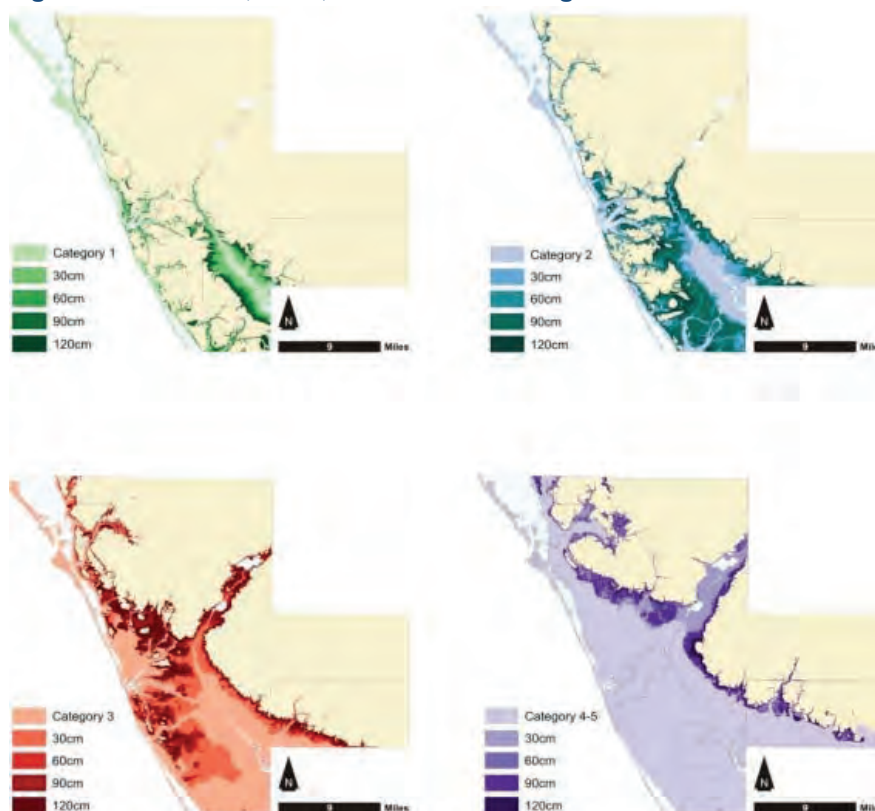


The sea level rise scenarios represent different likelihoods based on several models that take into account probabilistic estimates of contributions from ocean, cryospheric, geological, and anthropogenic processes.

As sea level rises, coastal communities now vulnerable to flooding are likely to flood more frequently, whereas other communities not currently subjected to coastal flooding are likely to be at gradually increased risk of flooding. Consequently, the risk of flood damage to coastal infrastructure is likely to increase in parallel with sea level rise (U.S. Global Change Research Program, 2009). Infrastructure such as beach facilities, roads, bridges, residential properties, and other structures that must be located at or near the water line are very likely to be at gradually increased risk of damage from flooding, hydrodynamic pressure from storm surge, and wave impact because of sea level rise. Sea level rise will stress infrastructure physically, since salinity changes may affect the structural integrity and/or functionality of physical materials that compose the features of roads, ports, airports, and rail systems. Even roads farther inland may be threatened because road drainage systems become less effective as sea levels rise. Many roads in Sarasota County were built lower than the surrounding land, so reduced drainage capacity will further increase their susceptibility to flooding during rainstorms. Even if coastal and riverside properties themselves are elevated enough not to flood, the roads and infrastructure leading to them could be inundated on a regular basis in the future.

In 2010, the USGS and Penn State University performed a comprehensive vulnerability assessment of Sarasota County to hurricanes and storm surge, taking into account sea level rise. The assessment provides guidelines for implementing scientific and community-based actions to mitigate impacts from sea level rise, hurricanes, and storm surge. Figure 5-3 illustrates the flooding extent of each hurricane category in combination with sea level rise at increments of 30 cm, 60 cm, 90 cm, and 120 cm. Sea level rise can increase the impact of storm surge the equivalent of a full category or more of a hurricane. For example, a category 1 hurricane may have the same impact of a category 2 or 3 hurricane, depending on the amount of sea level rise.

Figure 5-3 Sea, Lake, and Overland Surges from Hurricane Model



FUTURE DEVELOPMENT IN THE WATERSHED

As Sarasota County recovers from the recent economic downturn, the next 5-year period indicates an increased growth rate with almost 24,000 new residents projected from 2015 to 2020, at an average annual increase of approximately 1.2% per year. Long-term projections indicate that the County could reach nearly a half-million residents by 2040. The County takes proactive measures to reduce flooding impacts due to new developments that arise in conjunction with population growth. These measures include conducting and regularly updating the watershed management plans that identify areas at risk for flooding beyond what is shown on the FEMA maps. These plans also help prioritize projects that may be implemented to prevent or reduce the effects of flooding. Sarasota County also implements regulations that take into account, not only the FEMA flood zones, but also areas that the County has identified to be at risk. In addition, County regulations for development go above and beyond what is required by the NFIP.

Sarasota County is characterized by several land use categories shown on the Future Land Use Map (Figure 5-4) which reflects the projected growth of Sarasota County through time. By law, all land use regulations and capital improvements must be consistent with the Future Land Use Map.

Figure 5-4 FUTURE LAND USE MAP

SARASOTA COUNTY
NOVEMBER 2014



0 1 2 4 Miles

LEGEND

FUTURE LAND USE

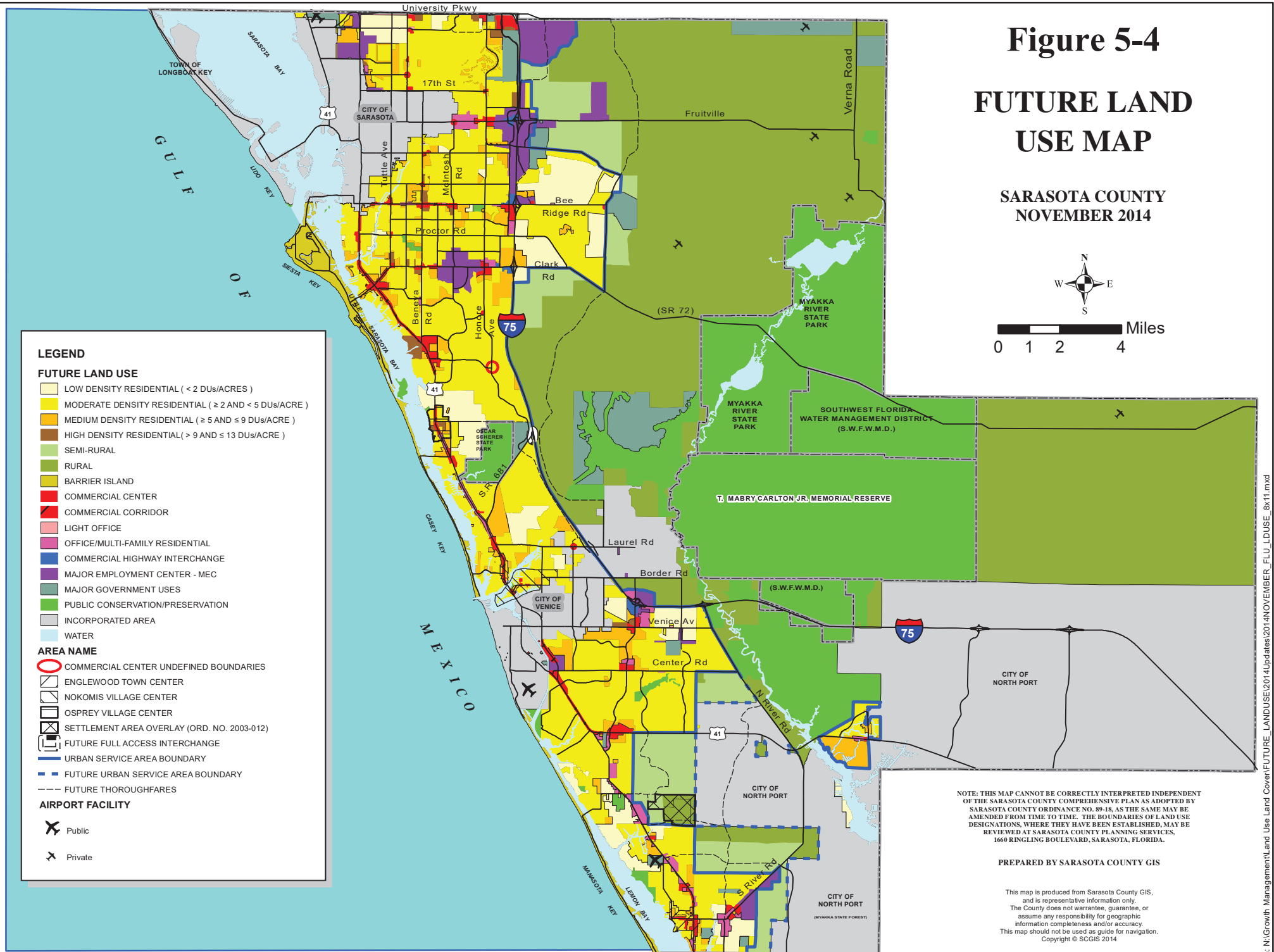
- LOW DENSITY RESIDENTIAL (< 2 DUs/ACRE)
- MODERATE DENSITY RESIDENTIAL (≥ 2 AND < 5 DUs/ACRE)
- MEDIUM DENSITY RESIDENTIAL (≥ 5 AND ≤ 9 DUs/ACRE)
- HIGH DENSITY RESIDENTIAL (> 9 AND ≤ 13 DUs/ACRE)
- SEMI-RURAL
- RURAL
- BARRIER ISLAND
- COMMERCIAL CENTER
- COMMERCIAL CORRIDOR
- LIGHT OFFICE
- OFFICE/MULTI-FAMILY RESIDENTIAL
- COMMERCIAL HIGHWAY INTERCHANGE
- MAJOR EMPLOYMENT CENTER - MEC
- MAJOR GOVERNMENT USES
- PUBLIC CONSERVATION/PRESERVATION
- INCORPORATED AREA
- WATER

AREA NAME

- COMMERCIAL CENTER UNDEFINED BOUNDARIES
- ENGLEWOOD TOWN CENTER
- NOKOMIS VILLAGE CENTER
- OSPREY VILLAGE CENTER
- SETTLEMENT AREA OVERLAY (ORD. NO. 2003-012)
- FUTURE FULL ACCESS INTERCHANGE
- URBAN SERVICE AREA BOUNDARY
- FUTURE URBAN SERVICE AREA BOUNDARY
- FUTURE THOROUGHFARES

AIRPORT FACILITY

- Public
- Private



Geographically, the unincorporated County is bisected by the Urban Service Boundary (USB), which is the County's demarcation for more "urban" types of development west of the USB, and more "rural" types of development east of the USB. East of the USB, a large percentage of property is devoted to Public Conservation and Preservation. Many of these areas already provide natural floodplain functions and the focus of the future land use planning is to preserve these areas. These properties include the Myakka River State Park, the T. Mabry Carlton Jr. Memorial Reserve, and a number of properties acquired, or under the control of, the SWFWMD. Over 68,000 acres Countywide are devoted to Public Conservation and Preservation uses. Outside of the Public Conservation and Preservation lands, the majority of lands east of Interstate 75 (I-75) – over 104,000 acres – are currently designated as Rural. The optional 2050 overlay of the Future Land Use Map allows for village-style development on some of these eastern lands.

The lands to the west of the USB can be characterized as urban and suburban in nature, with most areas suburban. A very high percentage of the lands are designated for Moderate Density Residential uses. This designation recognizes the pattern of existing development at densities between two and four dwelling units per acre in the unincorporated County.

Based on the Future Land Use Map, approximately 18 percent of Sarasota County is in the Moderate Density Residential land use category. Pockets of Low Density, Medium Density, and High Density Residential designated lands are dispersed throughout the County, but none approach the overall percentage of land area covered by the Moderate Density Residential classification.

Several land use categories in the County provide opportunities for economic development. Major Employment Centers clustered along I-75, arterial roadways, and at other locations around the County offer the most land for economic diversification at just under 6,000 acres. Commercial Centers, primarily located at or adjacent to major roadway intersections, continue to be popular for development and redevelopment opportunities. Commercial Corridors, which predominantly recognize areas of historic commercial zoning along arterials, are located mainly along US Hwy 41 (US-41), with a few areas located along Bee Ridge Road and Clark Road. The Commercial Highway Interchange designation covers property at the interchanges of I-75. As noted in the Future Land Use chapter of the County's Comprehensive Plan, these areas are located in one or both of the quadrants on the west and south sides of I-75. Limited land in the unincorporated County is devoted to office-type uses. The Light Office designation is mainly located along the southern side of the University Parkway corridor. The Office/Multi-Family Residential designation applies to a few concentrated areas throughout the County.

Changes in future development will influence the peak discharge of floods by modifying how rainfall is stored on and/or run off the land into tributaries. In undeveloped areas such as forests and grasslands, rainfall is collected and stored on vegetation, in the soil column, and in surface depressions. When this storage capacity is filled, runoff flows slowly over land or as subsurface flow. In contrast, urban areas have less capacity to store rainfall, since much of the urban land surface is covered by roads and buildings. Construction of these roads and buildings often involves removing vegetation, soil, and depressions from the land surface. The permeable soil is replaced by impermeable surfaces such as roads, roofs, parking lots, and sidewalks that store little water, reduce infiltration of water into the ground, and accelerate runoff to ditches and streams. Even in suburban areas, where lawns and other permeable landscaping may be common, rainfall can saturate thin, compressed soils and produce overland flow, which runs off quickly. Dense networks of ditches and culverts in cities reduce the distance that runoff must travel overland or through subsurface flow paths to reach streams and rivers.

Changes in the future development as described above, in conjunction with the projected increase in population, have the potential to put more homes and lives at risk due to flooding. Some of these areas are in existing Special Flood Hazard Areas. Future land use planning takes into account existing Special Flood Hazard Areas, as well as areas known to exhibit flooding not identified on the FEMA maps. Many areas that provide natural floodplain functions, including existing Special Flood Hazard Areas, are

preserved. For urbanized areas, in order to prevent and reduce loss due to flooding, the County has taken proactive steps to identify risk, develop projects to prevent or reduce damages, and plan for future flooding scenarios. As early as 1981, the County took the first step towards developing a stormwater program by creating the Stormwater Management Division. Around that time, the County implemented its first Land Development Regulation (LDR), requiring stormwater controls to be designed for a 25-year storm. The Sarasota County Stormwater Environmental Utility (SEU) was established in 1989 to implement the plan. By early 1990, the Sarasota County SEU initiated a countywide basin master planning project to develop hydrologic and hydraulic models to identify problematic flooding areas by quantifying excessive runoff volumes for all of the County's major watersheds. These models are used to explore possible drainage improvements to the County's stormwater system. The SEU continues to maintain the model by updating it periodically. The updated model is made available to developers so that proposed projects will not affect neighboring areas. By the mid-1990s the regulations were modified to require stormwater systems be designed for a 100-year storm. These efforts by the County aim to reduce the probability of flooding due to future developments.

Sarasota County has several areas designated for redevelopment, including the downtown area and Englewood. The goal of the redevelopment projects is to revitalize the areas and improve the quality of life for residents. In addition to requiring new buildings to meet the current building standards (for hurricane, fire, wind, etc.), these projects undergo the same reviews for flooding impact and are governed by the same regulations that aim to prevent losses due to flooding.

In addition, during LDR reviews Sarasota County environmental staff work with developers to avoid and minimize impacts to wetlands and preserve wetlands and wetland buffers as much as possible. In most cases where minimal impacts to wetlands are allowed, on-site mitigation is preferred. These natural wetlands or mitigated features provide valuable stormwater attenuation, among other values to our developed spaces.

Although the County took a proactive approach in requiring new developments to control stormwater for a 100-year storm, there are areas within the County that are still susceptible to flooding. These areas may consist of older neighborhoods that may lack sufficient drainage features or may be located adjacent to creeks and other water bodies. The County continually maintains its watershed management plans to identify these areas of risk.

FUTURE CONDITIONS MODEL

Sarasota County is revising their existing watershed management studies to incorporate future conditions and sea level rise (SLR). This includes evaluating the impact of future conditions for multiple storm events, including the 100-year storm. The County is modeling the effects of future land use conditions if no additional stormwater management facilities were considered for new developments.

Tailwater conditions will also be revised to account for effects of SLR. The CRS encourages communities to model, at minimum, the projected intermediate-high relative sea level change (RSLC) for year 2100. According to the recent NOAA 2017 projections, this value is currently 6.17 using the St. Petersburg gage that is applicable for this area. Communities may use other projections provided that they are equal to or greater to NOAA's intermediate-high projection for 2100. Since these values are subject to change, the County plans to evaluate the watersheds to reflect RSLC values of 2, 4, 6.17, 8 and 10 feet so that the County will have a planning tool that will allow region-specific solutions.

6 ASSESSMENT OF IMPACTS DUE TO HAZARDS

Coastal and inland flooding, tropical storms, and hurricanes are among the costliest hazards for Sarasota County. These hazards often occur simultaneously as tropical storms or hurricanes can bring heavy rain, affecting both coastal and inland communities.

Major flooding in the County would have a significant impact on the population, causing threats to property, the economy, and potentially human life. In addition, floodwaters could cause wastewater treatment facilities to shut down, contaminate local water supplies, and disrupt utilities. Floodwaters could also submerge portions of I-75, US-41 and other highways. The loss of these transportation networks would hinder evacuation and relief efforts, making it difficult to provide emergency response services. Furthermore, impact to non-elevated structures could cause a temporary disruption to critical facilities such as hospitals, schools, and shelters.

The three major hazards produced by a hurricane are storm surge, high winds, and rainfall. Storm surge typically poses the greatest threat to life and property located within surge-prone areas. The more intense the hurricane, and the more perpendicular its track is in relation to the coastline, the higher the potential storm surge and resulting destruction. Also impacting the height of storm surge is the depth of the water along a threatened coastline. Because of the high shoaling factor – shallow water and gradually sloping Gulf bottom – off the central west coast of Florida, Sarasota County receives higher surges than those indicated in the generalized Saffir/Simpson Hurricane Scale.

High winds can render segments of the population particularly vulnerable to a passing hurricane. Throughout Sarasota County, mobile and manufactured homes will be unable to withstand hurricane-force winds. High winds also impact the timing of an evacuation order, since winds hit the coastline several hours before the eye of the storm makes landfall. All evacuation activities must be completed prior to the arrival of sustained gale-force winds (40 mph with significantly higher gusts).

This section describes the impact to life, safety, health, critical facilities and infrastructure, economy and buildings within Sarasota County from these flood hazards. Additional descriptions of the vulnerabilities and impacts from these hazards can also be found in Sarasota County's Post-Disaster Redevelopment Plan (provided in Attachment 8).

LIFE SAFETY

In Florida, common hazards to life safety include coastal and inland flooding, tropical storms, hurricanes, and lightning. Deep, fast flowing, or rapidly rising floodwaters can cause physical injury and loss of life. A mere 6 inches of moving water can sweep a person away. The risk for drowning and physical injury increases when floodwaters carry debris. Floodwaters can also hide other hazards for wading pedestrians, such as manhole openings where the covers have been lifted by flood flow. Vehicles, too, can be moved by 6 inches of flowing water. Roads can be washed away. Downed power lines or other energized systems in the water can cause electrocution. In addition, stresses to gas lines can lead to a natural gas leak, further putting lives at risk. Flooding from rainfall itself will not warrant an emergency evacuation of many residents and visitors. However, residents along the many tributaries within Sarasota County may be evacuated as result of rising floodwater overflow.

Storm surge associated with tropical storms or hurricanes poses the greatest threat to life. A Category 3 hurricane could potentially inundate Sarasota County's barrier islands, all of which are below 18 feet. Surges can be especially dangerous because water levels can rise quickly and flood large areas. This leaves no time to take action and poses a significant threat of drowning. During the peak of a storm surge, it is unlikely that emergency responders will be able to respond to a call for help. Therefore, it is

very important for residents and visitors to heed early warnings from officials. A tropical storm or hurricane can leave thousands of homes and businesses without power. Power outages can also result in injuries or death from fires. Storm surge inundation describes the water height above sea level. In Sarasota County, storm surge inundation is explained through heights known as hurricane evacuation zones. The heights range from ground level up to a height of 32 feet. The evacuation zones are classified with letters A through E, with A being lower than E. Attachment 12 illustrates Sarasota County's evacuation zones.

Flooding is one of the most devastating natural disasters in the world. Having a warning system and evacuation plan will reduce injuries and loss of life. A specific evacuation procedure, including zones, routes, shelters, and means of communication helps reduce confusion for residents and visitors, and provide a smooth evacuation out of high-risk areas. Sarasota County is a StormReady community and has several programs to better prepare the community for these events. A StormReady community must:

- Establish a 24-hour warning point and emergency operations center
- Have more than one way to receive severe weather warnings and forecasts and to alert the public
- Create a system that monitors weather conditions locally
- Promote the importance of public readiness through community seminars
- Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises

In addition, Sarasota County uses the CodeRED Notification System to notify residents, businesses and property owners in cases of emergencies such as tropical storms, hurricanes and other major flooding issues.

Table 6-1 describes the potential impacts to life safety of these and other identified hazards for Sarasota County.

Table 6-1 Potential Impacts on Life Safety in Sarasota County

Hazard	Probability of Occurrence	Potential Impact
Coastal Flooding	Low to Moderate	Major coastal flooding as result of storm surge and/or high tide in the County can pose a threat to human life.
Inland Flooding	Low to Moderate	Floodwaters have the potential to cause drowning. The risk for drowning and physical injury is increased if floodwater is carrying debris. Floodwaters can also hide other hazards for wading pedestrians, such as manhole openings where the covers have been lifted by flood flow.
Tropical Storm / Hurricane	Low to Moderate	Storm surge or flooding from tropical storms and hurricanes can be extremely dangerous, since water levels can rise quickly and flood large areas, potentially causing drowning. Additional dangers include flying debris, falling trees, and electrocution from downed power lines.
Dam Failure	Low	Potential impact of a dam failure is low.
Levee Failure	Low	A breach of the PRMRWSA Reservoir or the Bahia Vista levee could cause drowning or injury to residents in the affected areas.
Coastal Erosion	High	Coastal erosion accompanying tropical storms or hurricanes has a higher potential to cause injury or drowning.

In the event of a community emergency, Sarasota County has 20 emergency shelters for residents and visitors available as a last resort, including five dog and cat-friendly shelters. Sarasota County provides a shelter program for those residents requiring special medically related care. Special needs shelters will be available for persons requiring more skilled medical care than available in a public shelter but not requiring an acute care facility such as a hospital. Contact information that may be important during these emergencies are listed in Table 6-2. A listing of the shelters are provided in Attachment 12.

Table 6-2 Important Contact Information

Entity	Contact Information
Sarasota County Contact Center	941-861-5000 www.scgov.net
Evacuation Information	941-861-5000
TTY-Deaf Communications	941-861-1833
Special Needs Registry	941-861-5000
American Red Cross SW Florida Chapter	941-379-9300

Suncoast Communities Blood Banks

1760 Mound Street, Sarasota, FL 34236

539 Us Hwy 41 Bypass North
Venice, FL 34285

1731 Lakewood Ranch Blvd.
Lakewood Ranch, FL 34211

For more information,
Call toll free
1-866-97-BLOOD or visit
www.scbb.org

Catholic Charities	941-355-4680
Friendship Volunteer Center	941-953-5965
Salvation Army	941-954-4673
United Way	941-366-2686
Animal Services	941-861-9500
Florida Power And Light	800-468-8243
Highway Patrol	941-492-5850
Sheriff	941-861-5800
Solid Waste	941-861-5000
NOAA Weather Radio	Freq 162.40 Mhz FIPS Code 012115

Entity	Contact Information
Radio Stations	<p>Radio AM WLSS 930 WTMY 1280 WWPR 1490 WSDV 1450 WSRQ 1220 WBRD 1420 WENG 1530</p> <p>Radio FM WJIS 88.1 WSMR 89.1 WLTQ 92.1 WHPT 102.5 WSRQ 106.9 WKZM 104.3 WTZB 105.9 WCTQ 106.5 WSRZ 107.9 WSLR 96.5</p>

Note: Do Not Call 9-1-1 For Hurricane Information

PUBLIC HEALTH

Of all hazards, flooding presents the most prevalent risk to public health. Floodwater is generally contaminated by various pollutants such as sewage, human and animal feces, pesticides and insecticides, fertilizers, oil, asbestos, rusting building material, and others. Prolonged flooding also provides breeding grounds for mosquitoes. Flooded homes are exposed to mold and mildew and can cause flood victims to contract upper respiratory diseases and trigger cold-like symptoms. Molds can grow in as little as 24 to 48 hours in wet and damp areas of buildings and homes that have not been cleaned after flooding. They can be caused by water infiltrating through walls, floors, carpets, toilets, and bathrooms.

Floodwaters can also contain dangerous animals such as alligators or snakes. These animals are often found in rivers, creeks and ponds in Sarasota County. Flooding can bring these animals onto normally dry land. Residences and visitors need to be careful, as these animals may be hard to see in the floodwaters.

Flooding resulting from a tropical storm or hurricane can compromise the safety of water supplies and the integrity of sewage disposal, leading to threats of foodborne and waterborne illness. Power line damage and power outages increase the risk of foodborne illness and electrocution. Medical care can be disrupted as the result of a storm; a major storm can leave victims isolated without water and medicines. Restoring medical care for individuals who were injured in the storm or whose care for chronic conditions lapsed when they were cut off from services is a public health priority.

A flood can also cause both emotional and physical stress. Exposure to extreme disaster events, including loss or injury of loved ones, home damage, or home destruction can pose a long-term

psychological impact on victims. Vulnerable populations such as seniors, the disabled, or those with long-term illnesses are less able than others to cope with floods.

CRITICAL FACILITIES AND INFRASTRUCTURE

The services and functions provided by critical facilities are essential to a community during and after a disaster. Typical critical facilities include hospitals, fire stations, police stations, emergency operation centers, and similar facilities. All of the hazards identified here have the potential to affect critical facilities. However, in Florida, these facilities are most often affected by flooding and/or high winds associated with tropical storms, hurricanes, and heavy rain. Flooding at these critical facilities can render such facilities powerless or inaccessible, thus posing a threat to the delivery of vital services. In Sarasota County, floodwaters could also submerge portions of I-75, US-41 and other highways. Storm surges could submerge bridges connecting the barrier islands to the mainland. The loss of these transportation networks would hinder evacuation and relief efforts, making it difficult to provide emergency response services. In addition, floodwaters could cause wastewater treatment facilities to shut down, contaminate local water supplies, and disrupt utilities. Flooding of electricity substations can result in a loss of power supply over the affected area. Communications and access can be severed in hard-hit areas and compromise the process of assessing and prioritizing needs for aid. Sarasota County maintains an inventory and list of contact points for critical facilities including fire stations, hospitals, nursing homes, and other types of facilities that may need to be contacted during times of emergency. Certain facilities are also required to maintain comprehensive emergency management plans. These plans are reviewed by Sarasota County Emergency Management Services.





Based on historical events, floodwaters in Sarasota County typically range from one to two feet. Impacts to non-elevated structures historically have caused temporary disruptions to critical facilities. Figure 6-1 illustrates the critical facilities within Sarasota County. Many of these facilities are located in the SFHA (Table 6-3). The County is currently reviewing the flood insurance policies for all County owned buildings to ensure all structures are properly insured.

Figure 6-1

Critical Facilities
(Unincorporated County)

Sarasota County Floodplain
Management Plan



-  Sarasota Boundary
-  Cities/Towns
-  Critical Facilities
-  Special Flood Hazard Area

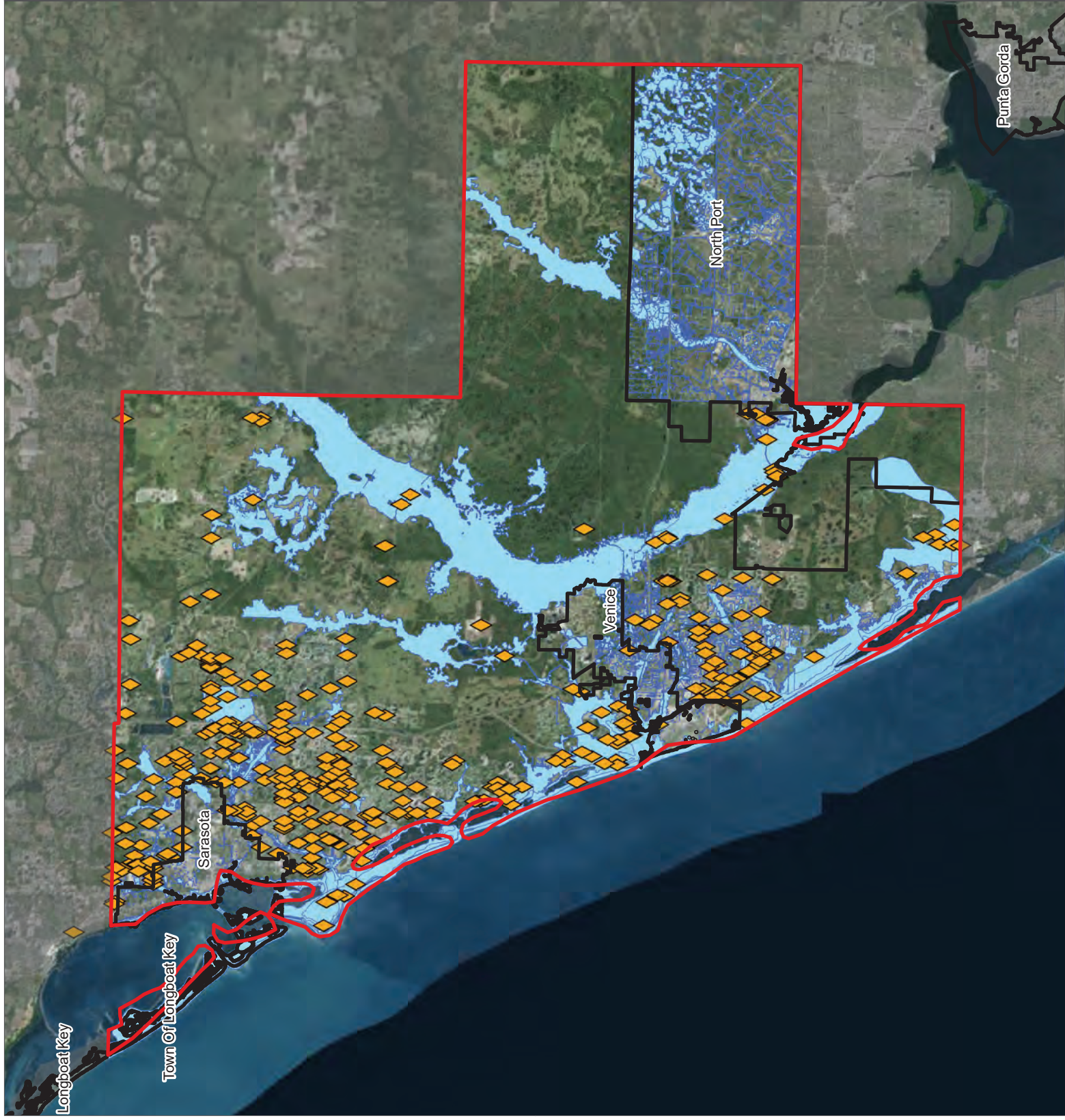


Table 6-3 Critical Facilities in the SFHA

Facility Type	Count
Emergency Operations Center	1
Hospice	1
Intermediate Care Facility for the Developmentally Disabled	1
Hospital	6
Solid Waste Facility	15
Ambulatory Surgical Center	17
Electric Substation	21
Nursing Home	22
Emergency Medical Service	26
Fire Station	27
Assisted Living Facility/Adult Care Center	53
Public School	65
Public Water Supply	163
Hazardous Materials	213

ECONOMY AND MAJOR EMPLOYERS

Flooding is the costliest natural hazard in the United States. The closure of roads and public transportation services can prevent employees from getting to work and employers from providing goods and services. The closure of businesses can affect the economy due to loss of revenue, fixed costs, replacement costs, and other expenses.

The top three public employers for Sarasota County are Sarasota County School Board, Sarasota County Board of County Commissioners, and Sarasota County Sheriff and Jail with 5,968, 2,232, and 926 employees respectively. The top three private employers for Sarasota County are SMH Health Care, Publix Supermarkets, and PGT Industries with 4,871, 3,514, and 1,912 employees respectively. Facilities serving these industries are located throughout the County. These services can quickly be disrupted by tropical storms, hurricanes and flooding.

Many visitors come to Sarasota County to enjoy the Gulf Coast beaches. Businesses along the coast cater to local residents and tourists year-round. These areas are vulnerable to many hazards, including coastal erosion, storm surge, heavy rains, and high winds from tropical storms and hurricanes. The economy of the coastal community would be significantly impacted due to loss of business in such events. In addition, long-term erosion and sea level rise represent significant economic risk given their potential impacts.

Impacts of these occurrences can be minimized through proper planning and flood mitigation projects identified in the Sarasota County Watershed Management Plans, Emergency Services and other plans.

RESIDENTIAL AND COMMERCIAL BUILDINGS

Flooding and wind damage from tropical storms, hurricanes, and heavy rain can cause major losses to residential and commercial buildings. Flooding, in particular, can cause severe damage to property. Floodwaters can cause structural damages as well as damage to wood furniture, upholstery, electronics,

household appliances, and plumbing equipment. Floodwaters can increase the risk of mold, which is expensive to remediate. Structures on the County's barrier islands are particularly susceptible to flooding.

Throughout Sarasota County, mobile and manufactured homes will be unable to withstand hurricane-force winds. Strong wind sends debris, signs, roofing material, and items left outside flying, which causes damage to residential and commercial structures. Water can also breach through windows and doors, resulting in mold and mildew.

Significant wave action along the coastal areas can result in structure failure, as well as damage to utilities, enclosures, and accessory structures. Buildings with first-floor elevation lower than the currently required minimum as identified in the Flood Insurance Rate Maps or the County's CFHA could sustain more damage from wave action, debris impact, and floodwaters.

Average individual property flood claims for unincorporated Sarasota County are over \$11,600 for the period 1978-2016. Flood losses from a major event can potentially reach tens of millions of dollars for Sarasota County. Tropical storms and hurricanes can exponentially increase that amount to over \$100 million depending on the severity of the storm.

Sarasota County maintains its building structure outlines in GIS. These GIS features can be used to analyze the potential impact to buildings due to flooding. Figure 6-2 illustrates the building outlines overlaid against the County's SFHA. Figure 6-3 and Table 6-4 describe the distribution of buildings in the SFHA.

A review of damaged buildings / historical claims indicate that there are areas that have potential to improve flood insurance coverage. Section 3 of this report described how the County mapped the historical claims and flood insurance policies within the Unincorporated Sarasota County. This data provided valuable information about which structures had flood insurance claims, as well as whether structures in the area had NFIP flood insurance policies in place or not. Figures Figure 6-4 through Figure 6-9 illustrate examples of areas that may benefit from additional outreach regarding flood insurance. These areas are in or close to floodplains and contain buildings that may not carry flood insurance. Some of these areas had previous flood insurance claims and therefore, there exists a real risk of flooding for buildings in the same area without flood insurance. Using this information the County can determine which addresses may be at risk of flooding and may not have flood insurance.

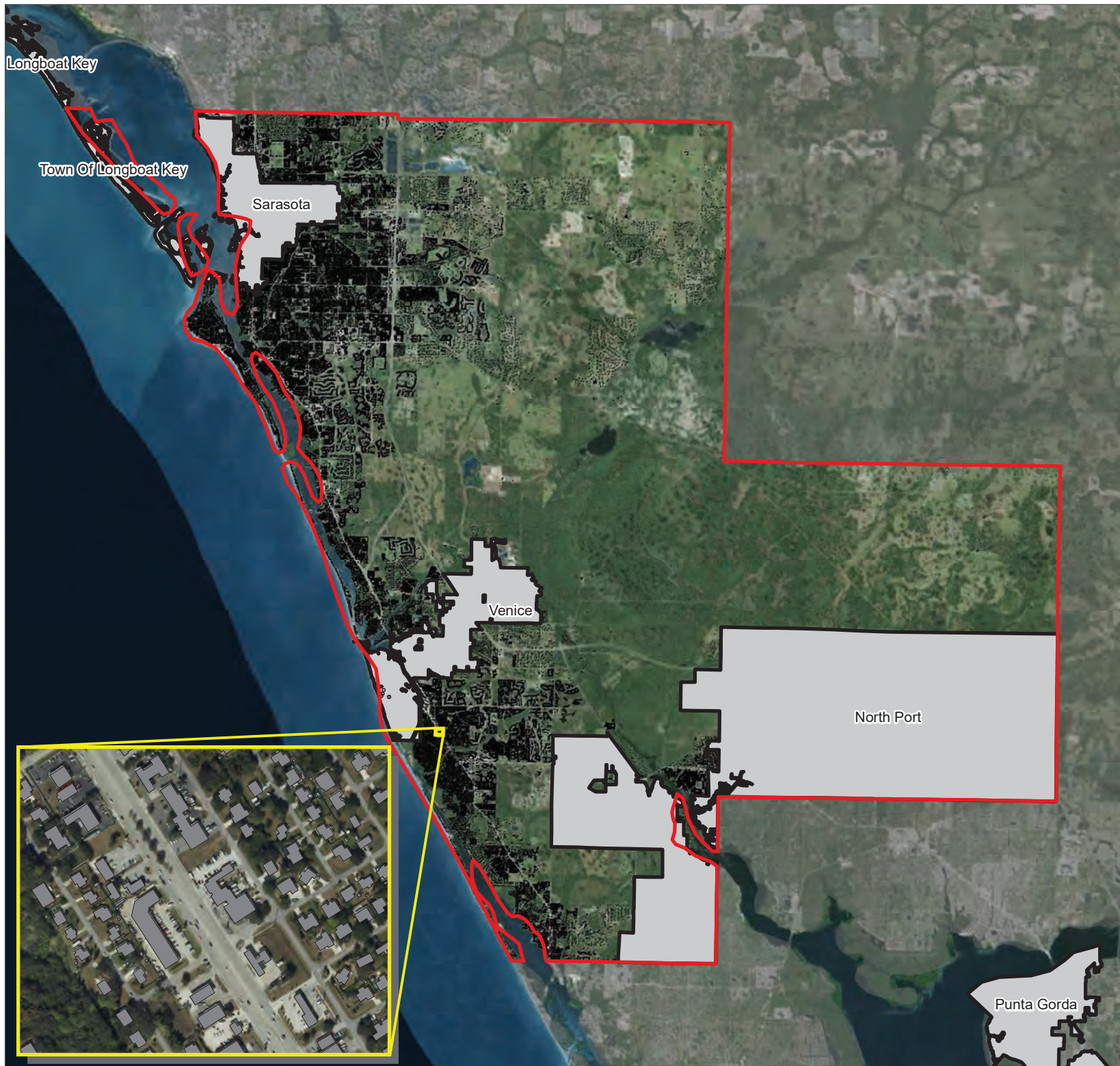
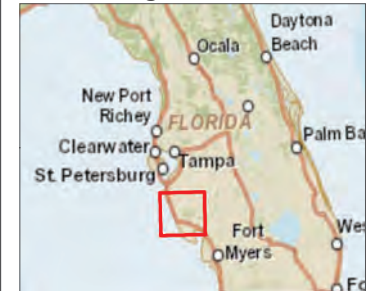





Figure 6-2

Sarasota County Building Outlines

Sarasota County Floodplain Management Plan



-  Sarasota Boundary
-  Cities/Towns
-  Building Outline

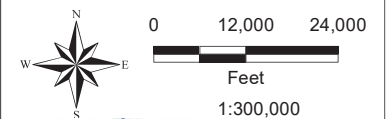
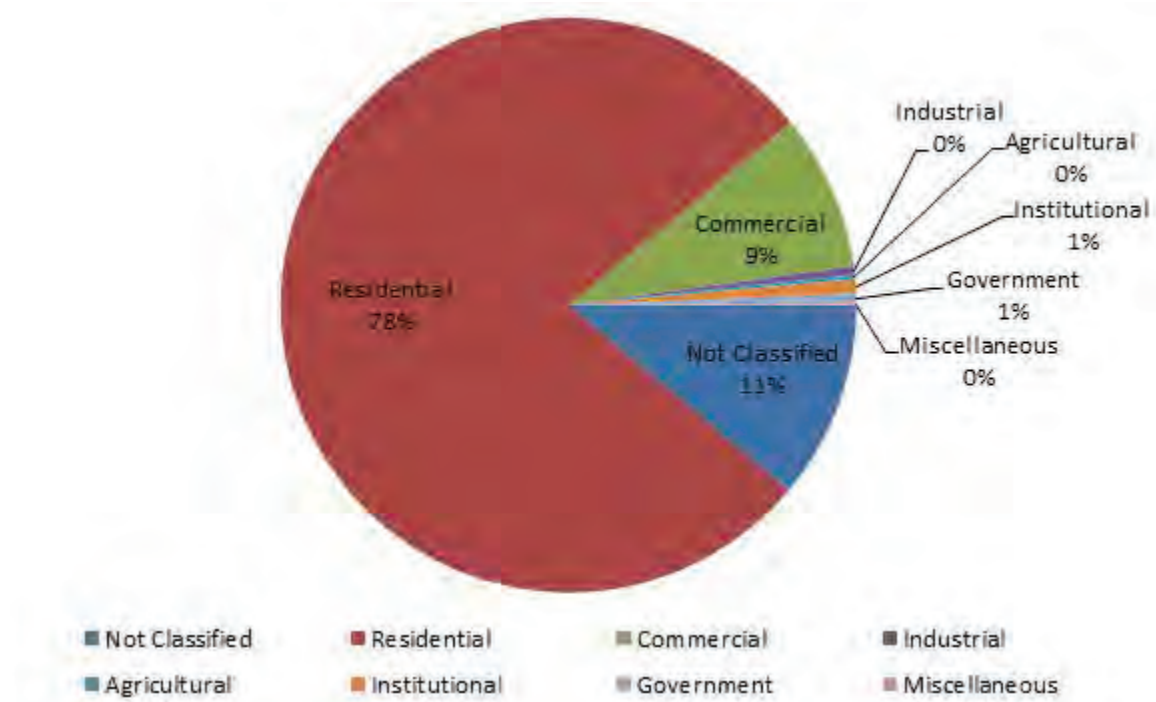


Figure 6-3 Buildings in the SFHA



*Source: Sarasota County building footprints and property appraiser parcel data

Table 6-4 Building Types in the SFHA

Classification	Count	Percent
Not Classified	4,130	11.17%
Residential	28,804	77.91%
Commercial	3,235	8.75%
Industrial	180	0.49%
Agricultural	88	0.24%
Institutional	300	0.81%
Government	183	0.49%
Miscellaneous	53	0.14%
Total	36,973	

Figure 6-4 Potential Flood Insurance Coverage Improvement for Buildings - Area 1



Figure 6-5 Potential Flood Insurance Coverage Improvement for Buildings - Area 2

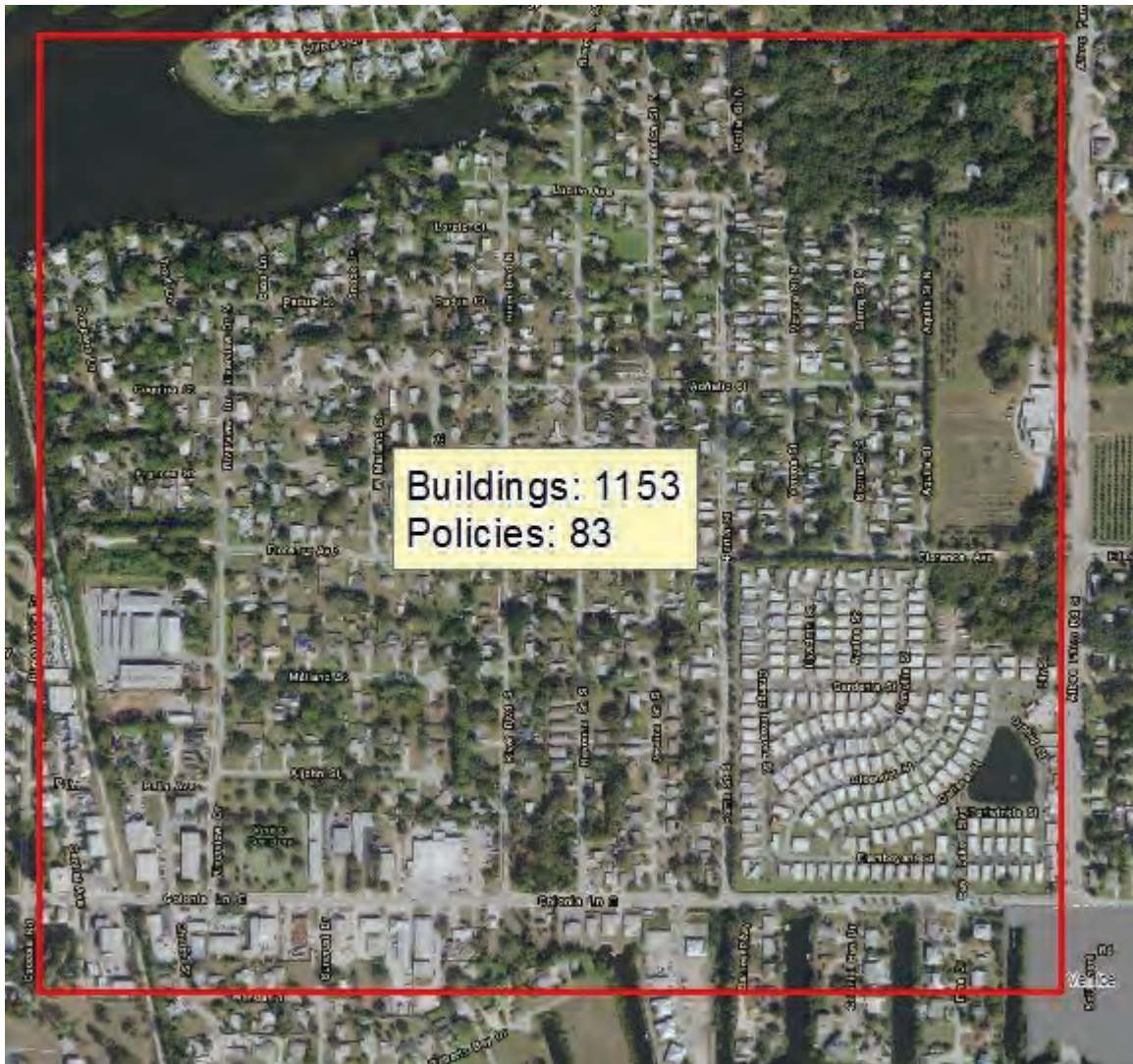


Figure 6-6 Potential Flood Insurance Coverage Improvement for Buildings - Area 3

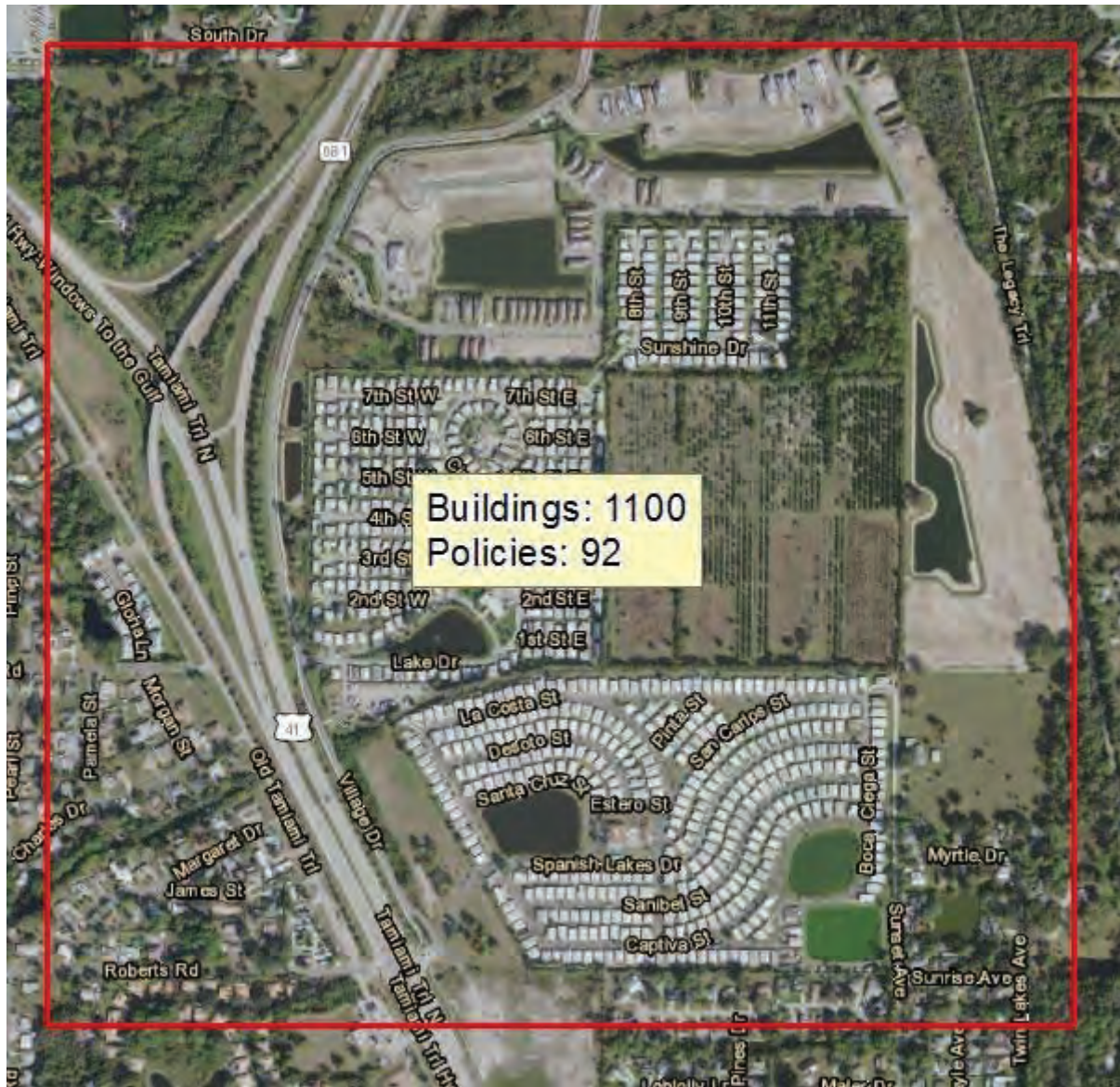


Figure 6-7 Potential Flood Insurance Coverage Improvement for Buildings - Area 4

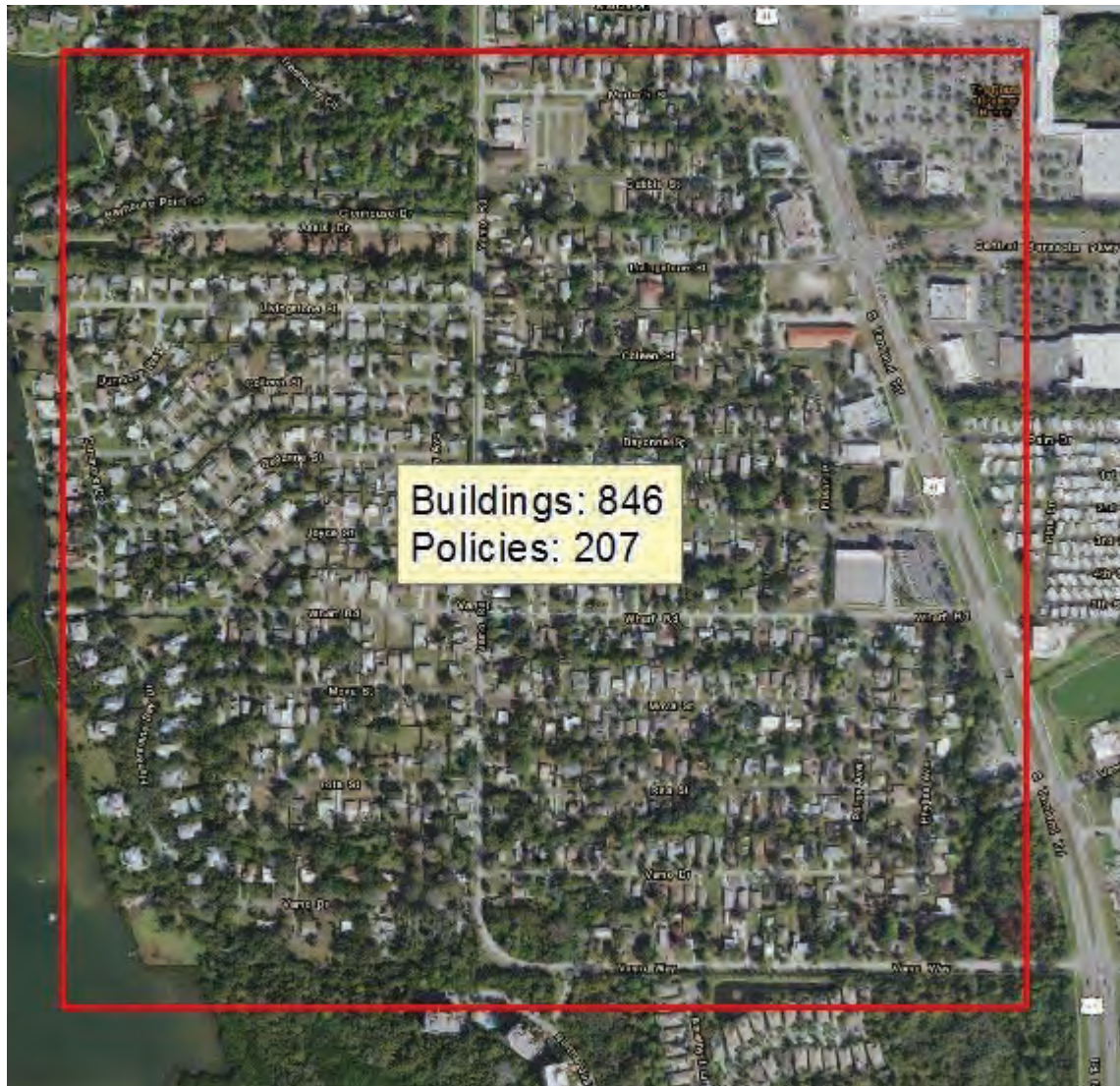


Figure 6-8 Potential Flood Insurance Coverage Improvement for Buildings - Area 5



Figure 6-9 Potential Flood Insurance Coverage Improvement for Buildings - Area 6



7 NATURAL FLOODPLAIN FUNCTIONS

Floodplains are low areas of land adjacent to rivers, lakes, marshes and oceans that periodically experience flooding during high water events. Floodplains left intact, perform many natural functions including providing flood and erosion control, recharging our aquifers, improving surface water quality and protecting ecologically sensitive areas. They support diverse populations of flora and fauna, providing outdoor areas to educate residents on the importance of protecting this valuable natural resource. In addition, they provide recreation and economic benefits to the community.

BENEFICIAL RESOURCES AND FUNCTIONS OF NATURAL FLOODPLAINS

NATURAL FLOOD STORAGE AND EROSION CONTROL

Floodplains (such as the Celery Fields shown in Figure 7-1) provide areas to spread water out and temporarily store floodwater. This helps to reduce peak flood stages. In addition, the broad storage area diminishes the velocity of water flow, thus reducing erosion caused by fast moving water. In urbanized areas, natural floodplains can provide storage and/or result in less runoff that can be carried overland and lead to flooding in streets and neighborhoods.

Due to the relatively flat topography in Sarasota County, flood attenuation is an important function of the floodplain in urbanized and rural areas. This attenuation is particularly important in low-lying areas that can experience flooding during even relatively small storms. One acre of floodplain flooded a foot deep holds 330,000 gallons of water. Vegetated floodplains are especially advantageous due to the plants' structure hindering water movement, thus slowing the rate of flow that reaches the main water body. The diminished velocity provides erosion protection and stability to the banks of channels and lakes. Vegetation also reduces coastal shoreline erosion.

Figure 7-1 Celery Fields



The Celery Fields in Sarasota County provide multiple benefits, such as flood storage, wildlife habitat, and recreation.

WATER QUALITY AND AQUIFER RECHARGE

Natural floodplain not only provides runoff storage, but also serves to improve water quality by reducing the amount of contaminants including chemicals and unnatural levels of nutrients from reaching the main water bodies. In the process of suppression of water flow, vegetative floodplains allow sediments and debris to sink and settle within the floodplain. In natural floodplain areas outside of a main channel system, the water flow is slowed, giving more time to seep into the ground where it can help replenish the groundwater. As the water slowly seeps into the soil, natural purification of the water takes place as well.

FISH AND WILDLIFE HABITAT

Natural Floodplains support a wide variety of plants and animals. Natural floodplain habitats vary in the vegetation, with some having aquatic grasses and others being forested. What they have in common is that they are ephemeral, meaning there is a wet and dry period. The length of period in which they are

wet also fluctuates. Floodplains and associated wetlands provide food and cover for both terrestrial and aquatic wildlife. The areas where water and land converge are generally more biologically diverse than the surrounding uplands. Natural floodplains are a critical habitat for several imperiled species such as the wood stork and piping plover.

RECREATION

Most of the natural floodplains and surrounding natural areas of Sarasota provide many recreational opportunities including hiking, bicycling, fishing, boating and wildlife viewing. Several commercial and game fish utilize these areas as hatcheries. Preserving these natural resources is critical for the fishing industry's economy.

ECONOMIC BENEFIT

Not only does the fishing industry bring money into the area, but so does the ecotourism. Sarasota is well known for its natural beauty and great birding opportunities, bringing people from around the world to visit. Natural floodplains also have an economic value in the reduction of flood and storm damage to infrastructure.

PROTECTING OUR NATURAL FLOODPLAINS

Poor planning and development in floodplains can result in degradation of water quality, loss of habitats, loss of valuable property, erosion, and increase in severity and frequency of flood losses. The Sarasota County Comprehensive Plan provides strategies to address the protection of natural floodplains. The County's Water Quality Management Plans identify locations and projects on public lands that enhance the County's natural systems, including natural floodplains. These enhancements provide a diversity of benefits, such as increasing wildlife habitat quality, attenuating stormwater flows, enhancing downstream water quality, and reducing erosion and sediment loading.

Sarasota County implements these measures through a variety of ways, including development of the water quality management plans, policies intended to protect environmentally sensitive lands, as well as regulations aimed at protecting wetlands (Chapter 54, Article XII (Earthmoving), Section 54-346 of the Sarasota County Code of Ordinances: Requirements for natural resource protection).

Sarasota County maintains an inventory of wetlands and parks that provide the natural functions and benefits described earlier in this section. Figure 7-2 illustrates the wetlands inventory for Sarasota County. In addition to regulating development in wetlands, Sarasota County maintains an inventory of parks and natural lands throughout the county (Figure 7-3) with the objective of managing and preserving these natural resources and their beneficial functions for the community. Table 7-1 describes the parks that are managed and the types of natural assets they contain. Sarasota County's Comprehensive Plan, Land Management Master Plan, and Parks, Preserves and Recreation Strategic Master Plan all aim to develop policies, management practices and implementation strategies to maintain the County's precious natural resources. These and other plans can be found in the reference documents that accompany this FMP (Attachment 6).

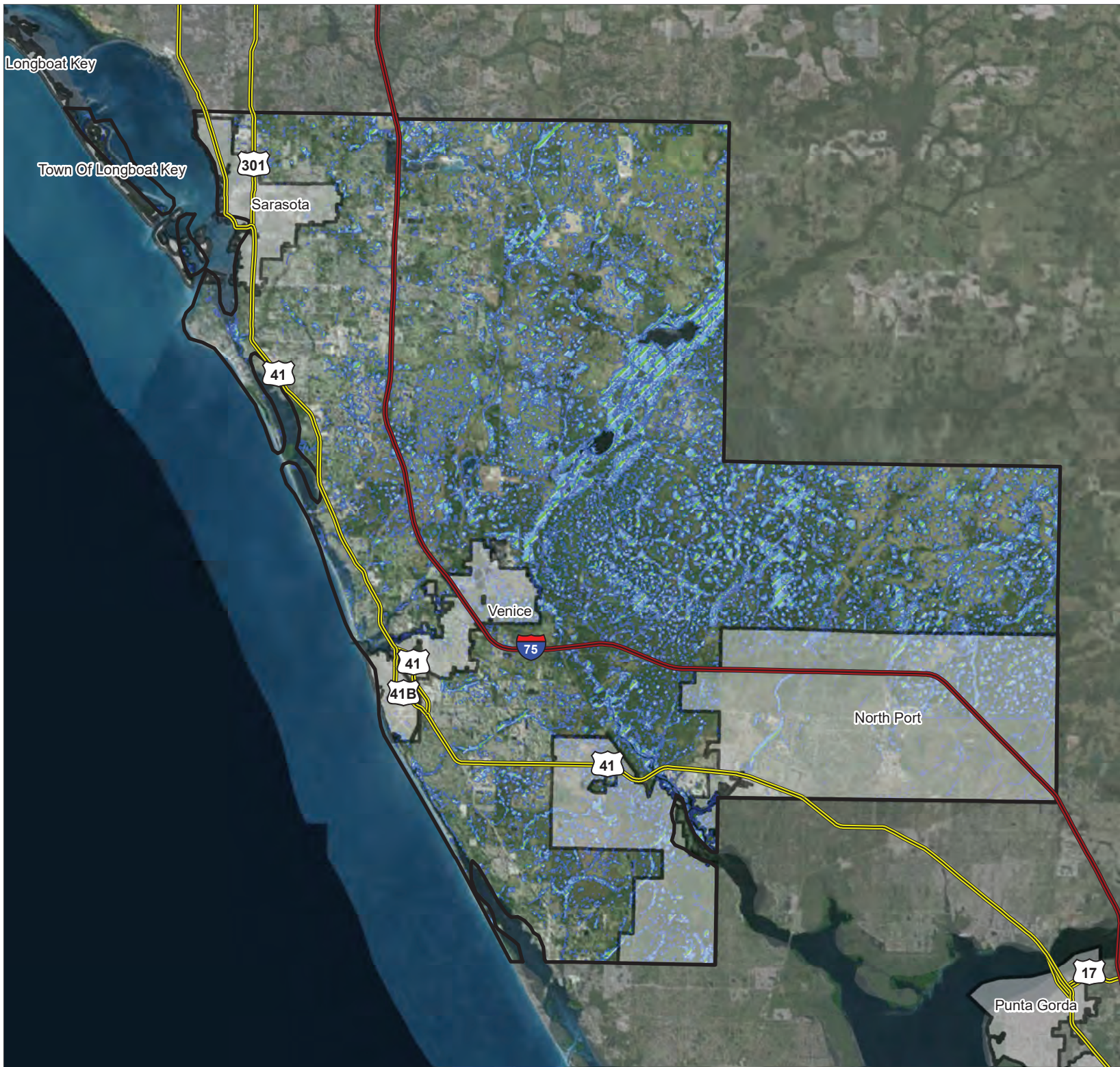
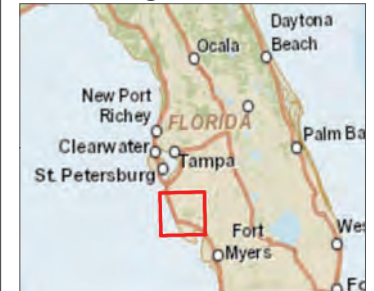


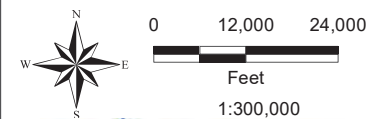
Figure 7-2

Sarasota County Wetlands Inventory

Sarasota County Floodplain Management Plan



- Interstates
- US Highways
- Sarasota County Boundary
- Cities/Towns
- Wetlands



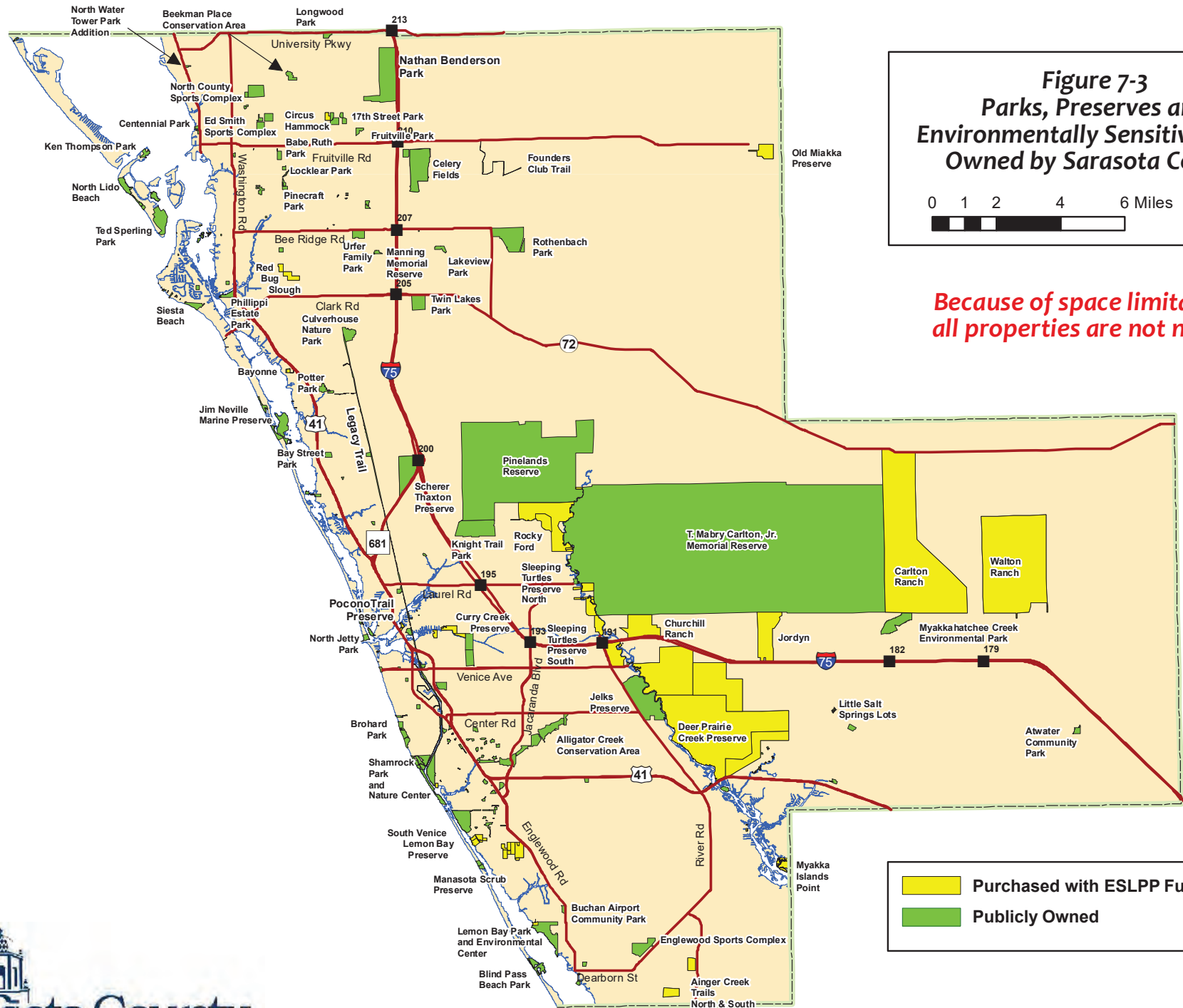


Table 7-1 Parks and Natural Lands

Park Name	Latitude	Longitude	Natural Functions Asset
17th Street Park and Paw Park	27.34943	-82.47874	Emergent Aquatic Vegetation; Freshwater Marshes; Reservoirs; Wetland Forested Mixed
Ackerman Park	27.33157	-82.44202	Reservoirs
Ainger Creek	26.96423	-82.31004	Riverine Wetlands, Hammock & Pine Flatwoods
Ainger Creek Trails North	26.9642	-82.30602	Riverine Wetlands, Hammock & Pine Flatwoods
Ainger Creek Trails South	26.95164	-82.31658	Riverine Wetlands, Hammock & Pine Flatwoods
Alligator Creek Conservation and Recreation Area	27.06261	-82.3898	Freshwater Marshes; Mixed Rangeland; Reservoirs; Stream And Lake Swamps (Bottomland)
Alligator Creek Site (Woodmere Park Addition)	27.05761	-82.40688	Pine Flatwoods; Stream And Lake Swamps (Bottomland)
Bay Point Park	27.11989	-82.46124	Bays And Estuaries
Bay Street Park	27.19796	-82.48378	Freshwater Marshes; Pine Flatwoods; Reservoirs; Wetland Forested Mixed
Bayonne	27.23542	-82.50484	Shrub And Brushland
Beekman Place Preservation Area	27.36735	-82.49773	Wetland Forested Mixed
Bird Colony Islands	27.2946	-82.54449	Bays And Estuaries; Mangrove Swamps
Blackburn Point Park	27.17913	-82.49037	Bays And Estuaries; Mangrove Swamps; Pine Flatwoods

Park Name	Latitude	Longitude	Natural Functions Asset
Blind Pass Beach	26.96442	-82.38193	Bay & Gulf Shoreline, Beach, Dune, Mangroves, Coastal Hammock, Sea Turtle Nesting
Blind Pass Beach Addition	26.9612	-82.38249	Bay & Gulf Shoreline, Beach, Dune, Mangroves, Coastal Hammock, Sea Turtle Nesting
Caspersen Beach Park	27.04822	-82.43694	Bays And Estuaries; Mangrove Swamps; Shrub And Brushland; Stream And Lake Swamps (Bottomland)
Celery Fields	27.3268	-82.43589	Emergent Aquatic Vegetation; Freshwater Marshes; Reservoirs
Christopher Wheeler Park	27.25346	-82.53197	Bays And Estuaries
Circus Hammock	27.34951	-82.48146	Wetland Forested Mixed
Colonial Oaks Park North	27.31103	-82.46276	Emergent Aquatic Vegetation
Colonial Oaks Park South	27.30919	-82.46295	Reservoirs; Stream And Lake Swamps (Bottomland)
Colonial Oaks Preserve	27.31744	-82.46917	Freshwater Marshes; Pine Flatwoods; Stream And Lake Swamps (Bottomland)
Deer Prairie Creek - Churchill Ranch	27.12067	-82.33394	Lakes; Pine Flatwoods; Wet Prairies
Deer Prairie Creek Preserve	27.07504	-82.30523	Bay Swamps; Bays And Estuaries; Cypress; Emergent Aquatic Vegetation; Freshwater Marshes; Lakes; Mixed Rangeland; Pine Flatwoods; Saltwater Marshes; Shrub And Brushland; Stream And Lake Swamps (Bottomland); Streams And Waterways; Upland Coniferous Forest; Wet Prairies; Wetland Coniferous Forests; Wetland Forested Mixed
Downs East	27.18172	-82.35281	Freshwater Marshes; Pine Flatwoods; Shrub And Brushland; Stream And Lake Swamps (Bottomland); Streams And Waterways
Eastern Ranchlands - Carlton Ranch Fee Parcel	27.13774	-82.18386	Emergent Aquatic Vegetation; Freshwater Marshes; Herbaceous; Mixed Rangeland; Pine Flatwoods; Shrub And Brushland; Stream And Lake Swamps (Bottomland); Upland Coniferous Forest; Wet Prairies

Park Name	Latitude	Longitude	Natural Functions Asset
Edwards Islands (Big and Little)	27.29551	-82.54847	Bays And Estuaries; Mangrove Swamps; Upland Hardwood Forests - Part 1
Fox Creek	27.15013	-82.43481	Emergent Aquatic Vegetation; Pine Flatwoods; Reservoirs; Streams And Waterways
Indian Mound Park	26.95687	-82.36309	Bay Shoreline, Shell Mound
Island - Myakka River	27.04298	-82.28686	Bays And Estuaries; Saltwater Marshes
Jelks Preserve	27.08114	-82.32774	Cypress; Emergent Aquatic Vegetation; Freshwater Marshes; Intermittent Ponds; Mixed Rangeland; Pine Flatwoods; Saltwater Marshes; Shrub And Brushland; Stream And Lake Swamps (Bottomland); Streams And Waterways; Wet Prairies; Wetland Coniferous Forests
Jim Neville Marine Preserve	27.21246	-82.50779	Bays And Estuaries; Mangrove Swamps; Salt Flats; Saltwater Marshes
Knight Trail Park	27.16293	-82.41928	Freshwater Marshes; Pine Flatwoods; Shrub And Brushland
Legacy Trail	27.14689	-82.45123	Bays And Estuaries; Mixed Rangeland; Pine Flatwoods; Stream And Lake Swamps (Bottomland); Wetland Forested Mixed
Lemon Bay Park and Environmental Center	26.98183	-82.38012	Scrub, Spoil Mounds, FL Scrub-Jays
Lemon Bay Preserve - A Miller	27.04865	-82.41842	Saltwater Marshes
Lemon Bay Preserve - Griifis	27.04937	-82.43112	Stream And Lake Swamps (Bottomland)

Park Name	Latitude	Longitude	Natural Functions Asset
Lemon Bay Preserve - Pitts	27.04893	-82.4308	Stream And Lake Swamps (Bottomland)
Locklear Park	27.32686	-82.50463	Lakes
Lyons Bay Park	27.11561	-82.46303	Bays And Estuaries
Manasota Beach Park	27.01175	-82.41246	Bays And Estuaries; Mangrove Swamps
Manasota Scrub Preserve	27.01773	-82.39868	Pine Flatwoods; Stream And Lake Swamps (Bottomland)
Myakka Prairie	27.18859	-82.29803	Bay Swamps; Freshwater Marshes; Pine Flatwoods; Shrub And Brushland; Stream And Lake Swamps (Bottomland); Wet Prairies
Myakka River State Park	27.26277	-82.28386	Bay Swamps; Cypress; Emergent Aquatic Vegetation; Freshwater Marshes; Lakes; Mixed Rangeland; Pine Flatwoods; Reservoirs; Shrub And Brushland; Stream And Lake Swamps (Bottomland); Streams And Waterways; Wet Prairies; Wetland Forested Mixed
Myakka State Forest	27.03333	-82.27942	Bays And Estuaries; Freshwater Marshes; Pine Flatwoods; Reservoirs; Saltwater Marshes; Shrub And Brushland
Myakka State Forest Addition - E Schwartz	27.02688	-82.27695	Saltwater Marshes
Myakka State Forest Addition - Mayer	27.02442	-82.27723	Pine Flatwoods
Myakka State Forest Addition - Schaub	27.02443	-82.27676	Pine Flatwoods
Nokomis Beach Park	27.12453	-82.47016	Bays And Estuaries; Mangrove Swamps
Nokomis Community Park	27.11591	-82.44477	Stream And Lake Swamps (Bottomland)

Park Name	Latitude	Longitude	Natural Functions Asset
North Borrow Pit	27.22036	-82.3953	Emergent Aquatic Vegetation; Freshwater Marshes; Herbaceous; Pine Flatwoods; Reservoirs; Shrub And Brushland; Stream And Lake Swamps (Bottomland); Wet Prairies; Wetland Forested Mixed
North Jetty Park	27.11465	-82.46734	Gulf Shoreline, Beach, Dune, Mangrove
Old Miakka Preserve	27.3289	-82.26408	Pine Flatwoods
Oscar Scherer State Park	27.16877	-82.47291	Bays And Estuaries; Freshwater Marshes; Pine Flatwoods; Reservoirs; Saltwater Marshes; Shrub And Brushland; Stream And Lake Swamps (Bottomland); Wet Prairies; Wetland Forested Mixed
Osprey Fishing Pier	27.19769	-82.49338	Bays And Estuaries
Palmer Point Beach Park	27.20575	-82.50835	Bays And Estuaries; Mangrove Swamps; Salt Flats; Saltwater Marshes; Shrub And Brushland; Upland Hardwood Forests - Part 1
Phillippi Creek Levee Trail	27.32449	-82.50365	Bays And Estuaries
Phillippi Estate Park	27.27011	-82.53473	Bays And Estuaries; Mangrove Swamps
Phillippi Shores Park	27.27596	-82.53419	Reservoirs
Pinecraft Park	27.31842	-82.50389	Bays And Estuaries; Reservoirs
Pinelands Reserve	27.1816	-82.36851	Cypress; Freshwater Marshes; Herbaceous; Mixed Rangeland; Pine Flatwoods; Reservoirs; Shrub And Brushland; Stream And Lake Swamps (Bottomland); Streams And Waterways; Wet Prairies; Wetland Coniferous Forests; Wetland Forested Mixed
Pocono Trail Preserve	27.11967	-82.449	Bays And Estuaries; Stream And Lake Swamps (Bottomland)

Park Name	Latitude	Longitude	Natural Functions Asset
Rattlesnake Island	27.117	-82.4651	Bays And Estuaries; Mixed Rangeland; Stream And Lake Swamps (Bottomland)
Rocky Ford - Collett	27.15239	-82.36376	Stream And Lake Swamps (Bottomland); Streams And Waterways
Rocky Ford - Green	27.15322	-82.36379	Stream And Lake Swamps (Bottomland); Streams And Waterways
Rocky Ford - Myakka River Trust	27.15698	-82.37122	Riverine Wetlands, Oak Hammock, Pine Flatwoods, Florida Panther
Rocky Ford - Schmidt Hines	27.18025	-82.35845	Stream And Lake Swamps (Bottomland); Streams And Waterways
Rocky Ford - Venice Minerals	27.16736	-82.37299	Pine Flatwoods; Stream And Lake Swamps (Bottomland)
Rothenbach Park	27.29341	-82.38572	Freshwater Marshes; Mixed Rangeland; Reservoirs; Stream And Lake Swamps (Bottomland); Wet Prairies
Sand Islands	27.03163	-82.27463	Bays And Estuaries, Mangrove Swamps, Pine Flatwoods, Saltwater Marshes, Stream And Lake Swamps (Bottomland)
Senator Bob Johnson's Landing	27.04452	-82.29532	Bays And Estuaries; Saltwater Marshes; Stream And Lake Swamps (Bottomland); Streams And Waterways
Shamrock Park Addition	27.04718	-82.43313	Bays And Estuaries; Mangrove Swamps; Stream And Lake Swamps (Bottomland)
Shamrock Park and Nature Center	27.05207	-82.43545	Pine Flatwoods; Shrub And Brushland; Stream And Lake Swamps (Bottomland)
Shamrock Park Submerged	27.04427	-82.42984	Bays And Estuaries; Mangrove Swamps; Shrub And Brushland; Stream And Lake Swamps (Bottomland)
Shoreland Park	27.17028	-82.48139	Bays And Estuaries

Park Name	Latitude	Longitude	Natural Functions Asset
Siesta Beach Park	27.26612	-82.55086	Shrub And Brushland; Upland Hardwood Forests - Part 1
Siesta Key Access Givens St	27.28382	-82.56469	Beach, Dune, Shrub And Brushland
Siesta Key Beach Access 2	27.27624	-82.56919	Beach, Dune, Shrub And Brushland
Siesta Key Beach Access 1	27.29887	-82.55967	Beach, Dune, Shrub And Brushland
Siesta Key Beach Access 10	27.26903	-82.55829	Beach, Dune, Shrub And Brushland
Siesta Key Beach Access 11	27.26756	-82.5558	Beach, Dune, Shrub And Brushland
Siesta Key Beach Access 12	27.25064	-82.53604	Beach, Dune, Shrub And Brushland
Siesta Key Beach Access 13	27.24706	-82.53504	Beach, Dune, Shrub And Brushland
Siesta Key Beach Access 3	27.2744	-82.5677	Beach, Dune, Shrub And Brushland
Siesta Key Beach Access 3B	27.27355	-82.56651	Beach, Dune, Shrub And Brushland
Siesta Key Beach Access 4	27.27318	-82.56556	Beach, Dune, Shrub And Brushland
Siesta Key Beach Access 5	27.27252	-82.56448	Beach, Dune, Shrub And Brushland
Siesta Key Beach Access 7	27.27132	-82.5621	Beach, Dune, Shrub And Brushland
Siesta Key Beach Access 7 Additions	27.27064	-82.56315	Beach, Dune, Shrub And Brushland
Siesta Key Beach Access 7 Additions	27.27151	-82.56249	Beach, Dune, Shrub And Brushland
Siesta Key Beach Access 7 Additions	27.27131	-82.56231	Beach, Dune, Shrub And Brushland
Siesta Key Beach Access 8	27.27053	-82.56056	Beach, Dune, Shrub And Brushland
Siesta Key Beach Access 9	27.27013	-82.55998	Beach, Dune, Shrub And Brushland
Skiers Island	27.28763	-82.54894	Bays And Estuaries; Mangrove Swamps; Upland Hardwood Forests - Part 1

Park Name	Latitude	Longitude	Natural Functions Asset
Sleeping Turtles North - Embry	27.1355	-82.35485	Freshwater Marshes; Pine Flatwoods; Stream And Lake Swamps (Bottomland); Streams And Waterways
Sleeping Turtles Preserve North	27.12617	-82.35374	Emergent Aquatic Vegetation, Freshwater Marshes, Hardwood Conifer Mixed, Pine Flatwoods, Reservoirs, Stream And Lake Swamps (Bottomland), Streams And Waterways
Sleeping Turtles Preserve South	27.1048	-82.34193	Emergent Aquatic Vegetation, Freshwater Marshes, Hardwood Conifer Mixed, Pine Flatwoods, Reservoirs, Stream And Lake Swamps (Bottomland), Streams And Waterways
Snake Island	27.11321	-82.46333	Bays And Estuaries
Snook Haven	27.10063	-82.33403	Stream And Lake Swamps (Bottomland); Streams And Waterways
Snook Haven Addition	27.10033	-82.33531	Streams And Waterways
South River Road	27.0735	-82.3222	Freshwater Marshes; Pine Flatwoods; Saltwater Marshes; Shrub And Brushland; Stream And Lake Swamps (Bottomland); Wetland Forested Mixed
South Venice Lemon Bay Preserve	27.03185	-82.42136	Bays And Estuaries; Cypress; Emergent Aquatic Vegetation; Freshwater Marshes; Lakes; Mangrove Swamps; Pine Flatwoods; Saltwater Marshes; Shrub And Brushland; Wetland Forested Mixed
South Venice Park 6	27.06478	-82.42037	Wetland Forested Mixed
South Venice Park 13	27.06444	-82.40181	Reservoirs
South Venice Park 16	27.0598	-82.4096	Wetland Forested Mixed
South Venice Park 18	27.05827	-82.40619	Stream And Lake Swamps (Bottomland)
South Venice Park 19	27.05823	-82.41015	Stream And Lake Swamps (Bottomland)
South Venice Park 21	27.05168	-82.43382	Stream And Lake Swamps (Bottomland)
South Venice Park 22	27.04475	-82.41767	Reservoirs
South Venice Park 29	27.03483	-82.40441	Wetland Forested Mixed
South Venice Park 30	27.03205	-82.40986	Stream And Lake Swamps (Bottomland)
South Venice Park 32	27.03063	-82.40822	Reservoirs
South Venice Park 33	27.02794	-82.41358	Wetland Forested Mixed
South Venice Park 34	27.02903	-82.40798	Stream And Lake Swamps (Bottomland)
South Venice Park 35	27.0285	-82.39992	Reservoirs; Wetland Forested Mixed
South Venice Park 36	27.02759	-82.40695	Stream And Lake Swamps (Bottomland)
Spice Islands	27.04186	-82.28325	Bays And Estuaries; Saltwater Marshes
T. Mabry Carlton, Jr. Memorial Reserve	27.14488	-82.35267	Cypress; Emergent Aquatic Vegetation; Freshwater Marshes; Pine Flatwoods; Reservoirs; Shrub And Brushland; Stream And Lake Swamps (Bottomland); Streams And Waterways; Wet

Park Name	Latitude	Longitude	Natural Functions Asset
			Prairies; Wetland Coniferous Forests; Wetland Forested Mixed
Turtle Beach Park and Campground	27.21964	-82.51739	Bays And Estuaries; Shrub And Brushland
Venetian Waterway Park	27.05155	-82.43729	Bays And Estuaries; Pine Flatwoods; Shrub And Brushland; Stream And Lake Swamps (Bottomland)
Venice Area Audubon Rookery	27.04619	-82.40084	Pine Flatwoods; Reservoirs
Warm Mineral Springs	27.05861	-82.26159	Vacant Lots Along Creek
Warm Mineral Springs Creek - Baltzer	27.05081	-82.27166	Vacant Lots Along Creek
Warm Mineral Springs Creek - Culpepper	27.05043	-82.27243	Vacant Lots Along Creek
Warm Mineral Springs Creek - Dailey	27.05205	-82.26974	Vacant Lots Along Creek
Warm Mineral Springs Creek - Egner	27.05179	-82.26952	Vacant Lots Along Creek
Warm Mineral Springs Creek - Fiedosewicz	27.05658	-82.26285	Vacant Lots Along Creek
Warm Mineral Springs Creek - Fraser	27.05253	-82.27	Vacant Lots Along Creek

Park Name	Latitude	Longitude	Natural Functions Asset
Warm Mineral Springs Creek - Hordienko	27.05684	-82.26297	Vacant Lots Along Creek
Warm Mineral Springs Creek - Mischena	27.05506	-82.26502	Vacant Lots Along Creek
Warm Mineral Springs Creek - Mityanski, O	27.0572	-82.2632	Vacant Lots Along Creek
Warm Mineral Springs Creek - Mityanski, V	27.05705	-82.26311	Vacant Lots Along Creek
Warm Mineral Springs Creek - Red Rock Investments	27.05444	-82.26711	Vacant Lots Along Creek
Warm Mineral Springs Creek - Skelly	27.05223	-82.2699	Vacant Lots Along Creek
Warm Mineral Springs Creek - Trappman	27.0507	-82.27187	Vacant Lots Along Creek
Warm Mineral Springs Creek - Zinchuk	27.05734	-82.26329	Vacant Lots Along Creek
Warm Mineral Springs Parcels	27.05875	-82.26842	Bays And Estuaries; Freshwater Marshes
Warm Mineral Springs Parcels	27.0519	-82.2703	Bays And Estuaries; Freshwater Marshes

Park Name	Latitude	Longitude	Natural Functions Asset
Warm Mineral Springs Parcels	27.05244	-82.26971	Bays And Estuaries; Freshwater Marshes
Warm Mineral Springs Parcels	27.05019	-82.27322	Bays And Estuaries; Freshwater Marshes
Warm Mineral Springs - Holst-Jensen	27.05467	-82.26665	Vacant Lots Along Creek
Warm Minerals Springs Creek Hamrich	27.05238	-82.27016	Vacant Lots Along Creek
Wharf Road Park	27.22197	-82.50231	Bays And Estuaries
Woodmere Park and Paw Park	27.05737	-82.3982	Freshwater Marshes; Reservoirs; Shrub And Brushland; Stream And Lake Swamps (Bottomland)

8 FLOODPLAIN MANAGEMENT PLAN GOALS AND ACTIVITIES

GOALS

The goals of the Sarasota County's Floodplain Management Plan are to:

1. Minimize the loss of life and property due to flood hazards.
2. Protect public health and safety.
3. Improve identification of high flood risk areas.
4. Increase public awareness of risks associated with flooding.
5. Improve the County's emergency response to flood hazards.

These goals include developing activities to address the flood-related hazards through preventative measures, property protection, natural resource protection, emergency services, structural projects, and public information activities.

REVIEW OF POSSIBLE FLOODPLAIN MANAGEMENT ACTIVITIES

Sarasota County has identified various activities to achieve the goals of the floodplain management plan. Depending on available resources, the County will develop a prioritized action plan to implement these activities. The types of activities implemented at the County includes the following:

Preventative Activities

The most beneficial and cost-effective approach to reduce damage due to flood is to identify and implement measures to prevent or reduce the risk before the event happens. Sarasota County achieves this through their watershed management plans, development review process using the County's CFHA and detailed watershed models, and regulatory standards that exceed the minimum NFIP criteria. Sarasota County's codes and ordinances were recently evaluated to address flood risk and ensure that building codes meet NFIP requirements or higher. As a result, these floodplain regulations were revised and formally adopted by the Board of County Commissioners on September 2016. In addition, the County requires development to consider the 100-year storm event impacts by reviewing proposed developments against the County's stormwater models. Permits received by the County are reviewed by building officials who are also Certified Floodplain Managers. These permits are also reviewed by County stormwater engineers using the County's most up-to-date stormwater model for the area of interest.

These regulations and measures, in conjunction with the requirement of new developments to be consistent with the County's Future Land Use Map, help the County ensure that developments do not exacerbate existing flood issues or lead to problems related to future conditions.

One of the initiatives for Sarasota County for 2017-2018 is to develop a Unified Development Code that updates and brings together the County's Land Development Regulations and Zoning Regulations, while making sure that they align with the County's Comprehensive Plan. This plan is adopted by the Sarasota County Commission to guide development of land and other activities to provide the quality of life, health and safety for residents of the county. One of the goals of this effort will be to remove inconsistencies and make the regulatory code easier to read, understand and interpret. The outcome will also simplify the ability to find significant regulatory information applicable to any given piece of property.

Additionally, Sarasota County will continue to implement preventative measures that will reduce the risk of flood damage to life and property through activities such as:

- Conducting activities consistent with the County's Comprehensive Plan.

- Developing and maintaining watershed management plans.
- Periodic evaluation and maintenance of major drainage systems.
- Proper planning and zoning to reduce flood risks.
- Preservation of open space through acquisition and zoning ordinances.
- Regulating building and development in the floodplain.

Property Protection

Property protection activities help reduce the risk of damage to structures and land property through activities such as:

- Acquiring high-risk land, particularly if the lands also represent environmentally sensitive lands or natural systems that can be preserved.
- Elevating structures.
- Retrofitting.
- Maintaining proper insurance on structures.

Sarasota County staff also provide outreach to educate residences about ways to protect their property. This includes information on the County website as well as personal contact with existing homeowners or potential buyers. Residents may contact Sarasota County for a property consultation or site visit to evaluate drainage and retrofitting options.

Natural Resource Protection

Natural floodplains help provide storage for surface runoff, recharge our aquifers, improve water quality, support a biologically diverse population, and many other functions. Protecting these natural resources is an essential element of a successful floodplain management plan. Activities to protect natural resources include:

- Adopting and implementing floodplain management policies that reduce impact to natural systems.
- Preserving natural areas.
- Restoring natural areas.
- Protecting wetlands.
- Preventing pollution of natural systems.
- Improving water quality.
- Preventing erosion and sedimentation in water ways.

Sarasota County also protects natural resources through acquisition of land as well as implementing capital improvement projects aimed at improving the water quality and protecting the water resources within the County. An example of this is the Dona / Roberts Bay Water Quality Management Plan projects currently underway.

Sarasota County's Environmentally Sensitive Lands Protection Program (ESLPP) and Neighborhood Parkland Acquisition Program (NPP) are voter-approved and taxpayer-funded programs designed to acquire and protect natural lands and parklands. Sarasota County's protected lands provide valuable natural floodplain functions as well as safe habitats for many threatened and native species including

gopher tortoises, Florida scrub-jays, bobcats, eagles and migrant birds. Acquisition and protection of these lands ensures that their environmentally sensitive nature and habitats will be there for future generations.

Emergency Services

Sarasota County Emergency Services coordinates the overall response to hazards, including major flood events that can result from hurricanes, tropical storms and other major weather occurrences. The Sarasota County Emergency Operations Center coordinates warning and response activities with other municipalities within the County.

Emergency Services activities conducted by Sarasota County include:

- Developing a flood warning system
- Developing a flood response plan
- Developing a monitoring system or plan for collecting data describing rainfall, stage and discharge
- Developing a plan for coordinating with local municipalities and agencies during emergencies
- Updating and maintaining evacuation plans
- Protecting critical facilities
- Performing routine emergency exercises

Sarasota County utilizes the CodeRED Notification System - an ultra high-speed telephone communication service - for emergency notifications. This system allows us to send critical communications to all or targeted areas within the county in case of a situation that requires immediate action. This system is capable of dialing the entire county within minutes. It delivers a recorded message from Sarasota County describing the situation and any instructions for immediate or future action.

These and other activities conducted by the Sarasota County Emergency Services Department will be an integral part of the FMP as the committee evaluates the best strategies for protecting Sarasota County residents.

Structural Projects

Sarasota County has a Capital Improvement Program that includes construction of improvements that reduce the risk of flooding or damage from flooding. Such projects in the program include:

- Constructing or maintaining seawalls
- Constructing or maintaining stormwater management facilities
- Making channel modifications

These projects will be evaluated and incorporated into the FMP.

Public Information

Public information activities advise residents, property owners, potential property owners, and visitors about the hazards, ways to protect people and property from the hazards, and the beneficial functions of natural floodplains. Sarasota County implements these activities using a variety of mediums, including electronic, audio/visual, and printed media. Activities identify target audiences and deliver specific messages about the risks that affect them. These audiences include residents, as well as managers of local, state, and federal agencies. Public information activities include:

- Flyers / door hangers
- Real estate disclosure programs
- Map information
- Education programs
- Mailings
- Social media
- News media
- Public outreach events
- Technical assistance

Sarasota County currently implements the above types of activities that aim to protect the life, safety, health and property of its residents. The County reviews possible floodplain management activities on a regular basis through periodic evaluations of this Floodplain Management Plan, the County's Comprehensive Plan, and other initiatives related to flood protection and preservation of natural systems. The review process begins with evaluating existing projects and initiatives. It is important to know what the County is currently doing for floodplain management in order to effectively plan for future projects. This can indicate areas or goals that are lacking that this committee should address. The review includes evaluating whether the projects meet the specific goals of the FMP and if they can be updated, for example, to be more efficient or provide consistent messaging of floodplain management topics. Table 8-1 describes existing activities that were reviewed that aim to reduce the risk associated with flooding in the County. Overall, Sarasota County implements activities that cover all of the major activity types and goals set forth in this FMP. Many of the activities are ongoing or were recently completed. However, some of the activities should be periodically revisited or updated, and there will be opportunities to improve a study, streamline the information about flood risk, or better protect the health, safety and property of residents in Sarasota County.

Activities to monitor and consider for future update include:

1. Local Mitigation Strategy – The LMS and this FMP should be monitored for consistency in flood topics, goals and activities.
2. Codes & Ordinances – The codes and ordinances need to be periodically reviewed for changes in building codes, NFIP and CRS requirements.
3. Drainage Maintenance – There may be opportunities here to streamline or integrate requirements for NPDES and CRS. This can also be potentially improved through better GIS integration.
4. Flood Warning and Response Plan – This plan should be updated based on lessons learned from flooding events.
5. Watershed Management Plans – The detailed studies are periodically updated to address changes that occur over the years. The County can consider incorporating effects of sea level rise or mapping less frequent storms (i.e., 500-year floodplains) during the next update of these plans.

In addition to the projects identified above to evaluate and monitor, the FMP committee also reviewed other possible floodplain management activities that can be implemented. Table 8-2 describes the possible activities to implement as they relate to the types of activities and goals set in this FMP.

Table 8-1 Review of Existing Floodplain Management Activities

Item	Title	Description	Activity Type						FMP Goal					Year Completed or Anticipated Completion Date
			Preventative	Property Protection	Natural Resource Protection	Emergency Services	Structural Projects	Public Information	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5	
A-1	Comprehensive Plan	The Sarasota County Comprehensive Plan provides the policy direction used in framing land use decision and growth management initiatives. The plan includes policy direction to support programs that address the problems of development in the floodplain and protection of natural drainage features.	x		x	x			x	x				2016
A-2	Codes & Ordinances	Sarasota County's codes and ordinances were evaluated to address flood risk and ensure that building codes meet NFIP requirements or higher. Floodplain regulations were revised and formally adopted by the Board of County Commissioners on September, 2016.	x						x	x				2016
A-3	Sarasota 2050	A 50-year land use plan to manage future growth in Sarasota County. Sarasota 2050's primary goals are preserving the county's natural, cultural and physical resources.	x		x				x					2013

Table 8-1 Review of Existing Floodplain Management Activities

Item	Title	Description	Activity Type						FMP Goal					Year Completed or Anticipated Completion Date
			Preventative	Property Protection	Natural Resource Protection	Emergency Services	Structural Projects	Public Information	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5	
A-4	Post Disaster Redevelopment Plan	The plan identifies policies, operational strategies, and roles and responsibilities for implementation that will guide decisions that affect long - term recovery and redevelopment of the community after a disaster.	x			x			x	x				2015
A-5	Local Mitigation Strategy Plan	Multi-jurisdiction plan developed by the county and incorporated municipalities to reduce and or eliminate the risks associated with natural and man-made hazards	x						x	x			x	2016
A-6	Capital Improvement Program	A plan for capital expenditures to be incurred each year, including for projects that aim to identify and reduce flood risks within the County.					x		x	x				Ongoing
A-7	Automated Rain Monitoring Sensors (ARMS)	Sarasota County has fifty-four rainfall sensors, with real-time data and historical rainfall information.	x					x	x			x		Ongoing

Table 8-1 Review of Existing Floodplain Management Activities

			Activity Type					FMP Goal						
Item	Title	Description	Preventative	Property Protection	Natural Resource Protection	Emergency Services	Structural Projects	Public Information	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5	Year Completed or Anticipated Completion Date
A-8	Environmentally Sensitive Lands Protection Program and Neighborhood Parkland Acquisition Program	Programs designed to acquire and protect natural lands and parklands.			x				x	x				Ongoing
A-9	Drainage Maintenance	Sarasota County uses the Maximo asset management system to inspect and maintain drainage systems throughout the County.	x						x					Ongoing
A-10	Repetitive Loss Areas Analysis	Perform site evaluations to evaluate flood risk.	x					x			x	x		2017
A-11	Sarasota County Flood Response Plan	Emergency Response Plan for before, during and after flood events.	x			x							x	2016
A-12	Dona Roberts Bay Watershed Management Plan	Detailed study to identify flood risks and update flood maps.	x					x			x	x		2018
A-13	Little Sarasota Bay Watershed Management Plan	Detailed study to identify flood risks and update flood maps.	x					x			x	x		2017
A-14	Lemon Bay Watershed Management Plan	Detailed study to identify flood risks and update flood maps.	x					x			x	x		2018

Table 8-1 Review of Existing Floodplain Management Activities

Item	Title	Description	Activity Type						FMP Goal					Year Completed or Anticipated Completion Date
			Preventative	Property Protection	Natural Resource Protection	Emergency Services	Structural Projects	Public Information	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5	
A-15	Box Turtle Circle Drainage Improvements	Design, permit and construct drainage improvements to the Turtle Creek II subdivision drainage system.					x		x					2018
A-16	North County/Phillippi Creek Stormwater Water Quality Program	Projects may include stormwater reuse, stormwater retrofits, LID techniques, habitat creation and restoration, and others as identified. Park amenities will be incorporated into the design where feasible.	x		x		x		x	x				2021
A-17	South County/Alligator Creek Stormwater Water Quality Program	Projects may include stormwater reuse, stormwater retrofits, LID techniques, habitat creation and restoration, and others as identified. Park amenities will be incorporated into the design where feasible.	x		x		x		x	x				2021
A-18	Alfred Park Stormwater Rehabilitation	Rehabilitate 3,200 linear feet of 18" to 48" pipes.					x		x	x				2017
A-19	10th St. Boat Basin Inlet Structure Improvements	Clean out and rehabilitate existing stormwater inlets.					x		x	x				2017

Table 8-1 Review of Existing Floodplain Management Activities

Item	Title	Description	Activity Type						FMP Goal					Year Completed or Anticipated Completion Date
			Preventative	Property Protection	Natural Resource Protection	Emergency Services	Structural Projects	Public Information	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5	
A-20	Asset & Infrastructure Management System Program	Stormwater program to replace or rehabilitate aging infrastructure Countywide.	x				x		x					Ongoing
A-21	Canal 4-86 Rehabilitation	This project will rehabilitate the existing stormwater drainage canal between Webber Street and Cattlemen Road, canal 4-112, and canal 4-115 in the Colonial Cables neighborhood. Rehabilitation to reestablish the slopes and stabilize canal banks include regrading side slopes.					x		x	x				2019
A-22	Catfish Creek Basin Regional Facility	Conveyance improvements and construction of a 24-acre flood storage pond.					x		x	x				2017
A-23	Cow Pen Slough Stormwater Rehabilitation	Rehabilitate or replace the infrastructure that was constructed as part of the Cow Pen Slough Channel Improvements.	x				x		x					2017

Table 8-1 Review of Existing Floodplain Management Activities

Table C-1 Review of Existing Floodplain Management Activities			Activity Type					FMP Goal						
Item	Title	Description	Preventative	Property Protection	Natural Resource Protection	Emergency Services	Structural Projects	Public Information	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5	Year Completed or Anticipated Completion Date
A-24	Dona Bay Watershed Hydrology Enhancements and Conveyance System	Activities associated with, but not limited to a surface water storage facility, historic flood plain restoration, water budget restoration, and control structure construction.			x		x		x	x				2018
A-25	Downtown Sarasota Stormwater Rehabilitation	Rehabilitate and/or replace existing stormwater infrastructure including pipes and drainage structures.	x				x		x	x	x			2017
A-26	Englewood Village Stormwater Rehabilitation	Rehabilitate or replace deficient pipes and structures.					x		x	x				2017
A-27	Gottfried Creek Roadway Culvert Improvements	Assess the condition of and rehabilitate and/or replace existing stormwater infrastructure including pipes and drainage structures along the flow line of the Gottfried Creek west of SR 776.	x				x		x	x	x			2017
A-28	Greenwich Stormwater Rehabilitation	Rehabilitate and/or replace existing stormwater infrastructure including pipes and drainage structures.					x		x	x				2017

Table 8-1 Review of Existing Floodplain Management Activities

Table C-1 Review of Existing Floodplain Management Activities			Activity Type					FMP Goal						
Item	Title	Description	Preventative	Property Protection	Natural Resource Protection	Emergency Services	Structural Projects	Public Information	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5	Year Completed or Anticipated Completion Date
A-29	Gulf Gate Stormwater Rehabilitation	Rehabilitate and/or replace existing stormwater infrastructure including 6400 linear feet of 18" - 60" pipes, and other drainage structures within the Gulf Gate area.					x		x	x				2017
A-30	Honore Ave. Pipe Stormwater Rehabilitation	Rehabilitate 800 linear feet of 48" by 76" diameter RCP conveying runoff under Honore Avenue.					x		x	x				2017
A-31	North of Whitaker Bayou Inlet Improvements	Clean out and rehabilitate existing stormwater inlets with minimal pipe rehabilitation.					x		x	x				2017
A-32	North Water Tower Park Stormwater Rehabilitation	Rehabilitate and/or replace existing stormwater infrastructure including pipes, and drainage structures.					x		x	x				2017
A-33	Paver Park Inlet Structure Improvements	Clean out and rehabilitate existing stormwater inlets with minimal pipe rehabilitation.					x		x	x				2017
A-34	Red Bug Slough Restoration	Wetland restoration.			x				x					2017

Table 8-1 Review of Existing Floodplain Management Activities

Table C-1 Review of Existing Floodplain Management Activities			Activity Type					FMP Goal					Year Completed or Anticipated Completion Date	
Item	Title	Description	Preventative	Property Protection	Natural Resource Protection	Emergency Services	Structural Projects	Public Information	Goal #1	Goal #2	Goal #3	Goal #4		Goal #5
A-35	Sapphire Shores Stormwater Improvements	Rehabilitate and or replace existing stormwater infrastructure including pipes and drainage structures.					x		x	x				2017
A-36	Saralake Estates Stormwater Rehabilitation	Rehabilitate and or replace existing stormwater infrastructure including pipes and drainage structures.					x		x	x				2017
A-37	Sediment Abatement and Stabilization Program	Reshape stormwater conveyance systems to more gentle slopes, and stabilize them with vegetation, erosion control matting, or other material to prevent erosion throughout the County.			x		x		x					2021
A-38	South Gate East Stormwater Improvements	Rehabilitate and or replace existing stormwater infrastructure including pipes and drainage structures.					x		x	x				2017
A-39	South Gate Stormwater Improvements	Rehabilitate and or replace existing stormwater infrastructure including pipes and drainage structures.					x		x	x				2017
A-40	U.S. 41 Canal Rehabilitation	Rehabilitate existing stormwater infrastructure including an upland cut drainage canal west of U.S. 41.					x		x	x				2018

Table 8-1 Review of Existing Floodplain Management Activities

Table C-1 Review of Existing Floodplain Management Activities			Activity Type					FMP Goal					Year Completed or Anticipated Completion Date	
Item	Title	Description	Preventative	Property Protection	Natural Resource Protection	Emergency Services	Structural Projects	Public Information	Goal #1	Goal #2	Goal #3	Goal #4		Goal #5
A-41	Phillippi Creek Watershed Management Plan	Detailed study to identify flood risks and update flood maps	x					x			x	x		2018
A-42	Coastal Fringe Phase I	Detailed study to identify flood risks and update flood maps	x					x			x	x		2015
A-43	Coastal Fringe Phase II	Detailed study to identify flood risks and update flood maps	x					x			x	x		2015
A-44	Coastal Fringe Phase III	Detailed study to identify flood risks and update flood maps	x					x			x	x		2015
A-45	Alligator Creek Watershed Management Plan	Detailed study to identify flood risks and update flood maps; SWFWMD lead; currently on FEMA maps	x					x			x	x		2012
A-46	Hudson Creek Watershed	Detailed study to identify flood risks and update flood maps	x					x			x	x		2015
A-47	Whitaker Bayou	Detailed study to identify flood risks and update flood maps	x					x			x	x		2015
A-48	Big Slough	Detailed study to identify flood risks and update flood maps	x					x			x	x		2015

Table 8-1 Review of Existing Floodplain Management Activities

Item	Title	Description	Activity Type						FMP Goal					Year Completed or Anticipated Completion Date
			Preventative	Property Protection	Natural Resource Protection	Emergency Services	Structural Projects	Public Information	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5	
A-49	Isle of Venice	Detailed study to identify flood risks and update flood maps	x					x			x	x		2009
A-50	Roberts Bay	Detailed study to identify flood risks and update flood maps	x					x			x	x		2016
A-51	Flood Zone Workshops	Flood workshops at various locations throughout the County to inform residents of risk, the FMP process, and gain input about flooding in the area.						x				x		Ongoing
A-52	Alligator Creek Phase 1 & 2	Pipe and swale improvements					x		x					2015
A-53	Country Woods	Rehabilitate existing drainage					x		x					2015
A-54	Colonial Gables	Rehabilitate existing drainage					x		x					2015

Table 8-2 Review of Possible Floodplain Management Activities

			Activity Type					FMP Goal					
Item	Title	Description	Preventative	Property Protection	Natural Resource Protection	Emergency Services	Structural Projects	Public Information	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5
B-1	County Flood Protection Web Site	Update website for content and organization. This activity is appropriate for the community because residents need a centralized location to get and/or learn about flood risks. Right now, the information is dispersed and not consistent.						x				x	
B-2	Program for Public Information (PPI)	Create a PPI committee that will meet periodically to develop outreach projects that will deliver the CRS messages. This will benefit the County by ensuring that flood risk topics and messages are consistent. The public can easily be confused if the topics and messages are not delivered consistently.			x			x	x	x	x	x	x
B-3	Flood Insurance Improvement Plan	Evaluate flood insurance coverage in Sarasota County and educate public about flood risk and insurance. Residents need to know what their options are for protecting their assets. This is especially important given how frequently floods occur, and rising insurance rates.	x					x	x			x	

Table 8-2 Review of Possible Floodplain Management Activities

			Activity Type					FMP Goal					
Item	Title	Description	Preventative	Property Protection	Natural Resource Protection	Emergency Services	Structural Projects	Public Information	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5
B-4	Englewood Interstate Connector	Raise road bed; add traffic lanes for evacuation route. This is appropriate for reducing potential for structural damage while also allowing for more efficient emergency evacuation procedures when a natural disaster such as flooding, hurricanes, tornados, or wildfires occur.					x		x				
B-5	Beach Road Drainage Improvements	Rehabilitate existing drainage. This is appropriate for reducing flood damage.					x		x				
B-6	Fire Station 9	Construct new building to withstand natural hazards and provide added service capacity in times of emergency.		x		x	x		x				x
B-7	Fire Station 12	Remove and replace current fire station to better withstand multiple natural hazards, including flood, fire, hurricane and severe weather. Will also ensure continuation of service during times of emergency.		x		x	x		x				x
B-8	Fire Station 14	Remove and replace current fire station to better withstand multiple natural hazards, including flood, fire, hurricane and severe weather. Will also ensure continuation of service during times of emergency.		x		x	x		x				x

Table 8-2 Review of Possible Floodplain Management Activities

			Activity Type					FMP Goal					
Item	Title	Description	Preventative	Property Protection	Natural Resource Protection	Emergency Services	Structural Projects	Public Information	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5
B-9	Fire Station 16	Remove and replace current fire station to better withstand multiple natural hazards, including flood, fire, hurricane and severe weather. Will also ensure continuation of service during times of emergency.		x		x	x		x				x
B-10	Fire Station 17	Construct new building to withstand natural hazards and provide added service capacity in times of emergency.		x		x	x		x				x
B-11	Fire Station 19	Remove and replace current fire station to better withstand multiple natural hazards, including flood, fire, hurricane and severe weather. Will also ensure continuation of service during times of emergency.		x		x	x		x				x
B-12	North Beach Road	Public Access and Shore Line Protection. This is appropriate for protecting the County's natural resources while reducing the potential for damage due to flood and erosion for landward structures.			x		x		x				
B-13	Oak Street Drainage Improvements	Increase capacity of conveyance systems to alleviate roadway flooding and standing water.		x			x		x	x			

Table 8-2 Review of Possible Floodplain Management Activities

			Activity Type					FMP Goal					
Item	Title	Description	Preventative	Property Protection	Natural Resource Protection	Emergency Services	Structural Projects	Public Information	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5
B-14	Montana Avenue	Expand existing pond and increase outfall capacity to alleviate roadway and structural flooding in the area.		x			x		x	x			
B-15	Sea Level Rise Vulnerability Assessment	Assess impact on critical structures, public health and safety, natural systems and economy from affects of sea level rise. This is appropriate for planning/preparing for future conditions.	x						x		x	x	
B-16	Coastal Erosion GIS Mapping	Mapping of coastal profile. This is appropriate for the County as a means to help identify potential flood/erosion issues and ways to mitigate existing and future problems.	x		x						x		
B-17	Cooper Creek	Detailed study to identify flood risks and update flood maps.	x					x			x	x	
B-18	Flood Flyer	Informational flyer to highlight CRS topics and available resources at the County. This is appropriate to deliver consistent messaging as part of the County's Program for Public Information.						x	x	x	x	x	

Table 8-2 Review of Possible Floodplain Management Activities

			Activity Type					FMP Goal					
Item	Title	Description	Preventative	Property Protection	Natural Resource Protection	Emergency Services	Structural Projects	Public Information	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5
B-19	Flood Flyer (Spanish)	Informational flyer to highlight CRS topics and available resources at the County translated to Spanish. This is appropriate because there is a significant Spanish-speaking population in Sarasota County.						x	x	x	x	x	
B-20	Flood Information Story Map	Esri Storymap providing user-friendly and easy-to-understand approach for finding out about flood hazards. This is appropriate to deliver consistent messaging as part of the County's Program for Public Information.						x	x	x	x	x	
B-21	Property Appraiser Flood Information Section	Provide flood information as part of the property appraiser data. This is appropriate for getting the information about flood risk out to the public because the property appraiser data and website is well known and used by many residents and businesses.						x	x	x	x	x	

INTEGRATION WITH SARASOTA COUNTY POST-DISASTER REDEVELOPMENT PLAN

As part of the annual review of the FMP, activities will be developed in coordination with the County's Post-Disaster Redevelopment Plan (PDRP). The committee will review the policies and procedures of the PDRP, as well as mitigation activities.

INTEGRATION WITH SARASOTA COUNTY LOCAL MITIGATION STRATEGY

As part of the annual review of the FMP, activities will be developed in coordination with the County's Local Mitigation Strategy. Action items identified under this plan will be coordinated with projects identified in the LMS. The FMP committee will meet with the LMS committee to evaluate and share information. As a result, many of the action items identified in this plan will also be updated in the pertinent sections of the LMS plan. In addition, the LMS plan contains information and activities related to other hazards that this committee has reviewed and provided recommendations for action items.

9 FLOODPLAIN MANAGEMENT ACTION PLAN

The FMP Committee reviewed the activities in Table 8-1 and Table 8-2. These activities included preventative, property protection, natural resource protection, emergency services, structural projects, and public information. Some of these activities were previously completed, while others are still ongoing. In reviewing the projects, the committee updated the list and considered recommendations for new projects as well as updating existing projects. Examples of updates include re-evaluating watershed management plans to incorporate new developments that have occurred since the development of the original study.

The FMP committee sets priorities for each of the recommended projects. The committee considered factors that included the benefits to the community, the audience the project can reach, whether the project was a one-time effort or would require periodic monitoring and/or maintenance, the amount of effort and resources the project will require, and the availability of staff and funds to implement the project. Projects that offer high benefits and are relatively inexpensive to implement received a high priority rating while others may receive either a medium or low rating if it did not offer a large benefit or reached a smaller audience. Projects that may qualify for grants or cooperative funding from the Southwest Florida Water Management District, regional, state or federal agencies also ranked higher.

Attachment 13 summarizes the priorities for the projects considered. Projects were scored based on the following:

- Number of CRS Activities Affected – the activities are described in Section 8.
- Size of the Audience – whether the affected audience was at the local level, watershed-wide or regional level, or countywide.
- Require Period Updates – whether the project requires an annual update, be updated every several years, or only implemented once.
- Funding Available – whether the County has allocated funding for the project.
- Cooperative Funding Potential – the project may have joint funding opportunities with the Southwest Florida Water Management District, other municipalities or agencies.
- Implement for current cycle – whether the project will be or is currently being implemented.
- Comment – describes why the project is currently not implemented. It may be due to availability of funding, high cost, ineffectiveness, etc. These comments will also serve to provide information to future evaluators who may decide to implement the projects in the future.

Table 9-1 describes the action plan for the activities to implement. These include structural projects, such as removing and replacing fire stations that were implemented to reduce damage from not only flood risks, but also other hazards such as fire, hurricane, wind, and severe weather.

Projects will note who the responsible party is and are assigned a contact person and the source of funding. The FMP committee will also keep a running status of the project. The committee periodically evaluates and updates this project list, which is provided in Attachment 13.

COORDINATION WITH OTHER COUNTY INITIATIVES

As part of this FMP's action plan, it will be necessary to coordinate the efforts of this committee with those of other County strategies and plans to ensure consistency. The committee will evaluate potential

conflicts with other County initiatives as well as identify activities that complement each other. This includes evaluating the County's Post-Disaster Redevelopment Plan as it contains many of the related activities that will need to be considered and/or updated. These include policies and procedures that may be affected by decisions and projects identified under this FMP and committee. The Post-Disaster Redevelopment Plan addresses the flood hazards described in this FMP as well as other hazards, such as wild fires and tornadoes.

The FMP committee will also regularly coordinate with the Sarasota County LMS committee to evaluate potential updates to the LMS or this FMP based on decisions and projects identified between these initiatives. Many of the committee members serve on both the FMP and LMS committees. In addition to this FMP being incorporated as an appendix to the LMS, the FMP committee will also evaluate and make recommendations for action items for mitigation of other types of hazards that are described in the LMS.

Table 9-1 Floodplain Management Action Plan

Note: Attachment 13 contains expanded information for each project, including who is responsible for the project, funding, schedule and other information.

Item	Title	Description	Resource Requirement / Availability of Funds	Priority
A-2	Codes and Ordinances	Sarasota County's codes and ordinances were evaluated to address flood risk and ensure that building codes meet NFIP requirements or higher. Floodplain regulations were revised and formally adopted by the Board of County Commissioners on September, 2016.	Codes and ordinances can be reviewed and updated by in-house staff.	High. This is a high priority because the current floodplain regulations should be reviewed for consistency with the new Florida building standards that exceed the minimum requirements of the NFIP. This affects residences, developers, builders throughout Sarasota County.
A-5	Local Mitigation Strategy Plan	Multi-jurisdiction plan developed by the county and incorporated municipalities to reduce and or eliminate the risks associated with natural and man-made hazards	FMP and LMS committee members overlap and can facilitate cross-sharing of information between the two plans.	High. This is a high priority because the two plans overlap in their goals to mitigate flood risks and changes in one plan need to be consistent with the other in order to move projects forward and provide maximum benefits to residents of Sarasota County.
B-1	County Flood Protection Web Site	Update website for content and organization.	County has in-house GIS staff capable of developing the site.	High. This is a high priority because the County flood information pages need to be consistent with NFIP and CRS objectives and improve the information. This will benefit all residents of Sarasota County.
B-2	Program for Public Information (PPI)	Create a PPI committee that will meet periodically to develop outreach projects that will deliver the CRS messages.	County has in-house staff and partners committed to implement the program.	High. This is a high priority because outreach initiatives are currently ongoing, but need to be better coordinated through a committee and provide consistent messaging to audiences. This will benefit all residents of Sarasota County.

Table 9-1 Floodplain Management Action Plan

Note: Attachment 13 contains expanded information for each project, including who is responsible for the project, funding, schedule and other information.

Item	Title	Description	Resource Requirement / Availability of Funds	Priority
B-3	Flood Insurance Improvement Plan	Evaluate flood insurance coverage in Sarasota County and educate public about flood risk and insurance.	County has in-house GIS staff to develop the information.	Medium. This is medium priority because, although not critical to County operations, this is an opportunity to target specific audiences for maximum chances of improving flood insurance coverage. GIS and policy statistics are readily available to move this project forward.
B-4	Englewood Interstate Connector	Raise road bed; add traffic lanes for evacuation route	Estimated cost is \$30M. Funds have not been budgeted.	High. This is a high priority because it impacts the immediate safety of residents during a disaster event. This will improve the evacuation route to better serve residents during hurricanes, tropical storms, or other natural hazards. Will be dependent on funding availability.
B-5	Beach Road Drainage Improvements	Rehabilitate existing drainage	CIP budget.	High. This is a high priority because this project will improve conditions to alleviate flooding and has the potential for cooperative funding.
B-6	Fire Station 9	Construct new building	Estimated cost is \$4.5M. Funds have not been budgeted.	Medium. This is a medium priority because it is an add-on structure and is not critical to operations. However, it will improve an existing site to maintain or enhance services to the community. Will depend on funding availability.

Table 9-1 Floodplain Management Action Plan

Note: Attachment 13 contains expanded information for each project, including who is responsible for the project, funding, schedule and other information.

Item	Title	Description	Resource Requirement / Availability of Funds	Priority
B-7	Fire Station 12	Remove and replace current fire station	CIP budget.	High. This is a high priority because it is a critical facility that needs to be better protected from structural damage due to natural hazards. Natural hazards include flood, hurricane winds and fire.
B-8	Fire Station 14	Remove and replace current fire station	CIP budget.	High. This is a high priority because it is a critical facility that needs to be better protected from structural damage due to natural hazards. Natural hazards include flood, hurricane winds and fire.
B-9	Fire Station 16	Remove and replace current fire station	CIP budget.	High. This is a high priority because it is a critical facility that needs to be better protected from structural damage due to natural hazards. Natural hazards include flood, hurricane winds and fire.
B-10	Fire Station 17	Construct new building	Estimated cost is \$4.3M. Funds have not been budgeted.	High. This is a high priority because the County needs this station to accommodate expanding development in the community.
B-11	Fire Station 19	Remove and replace current fire station	CIP budget.	High. This is a high priority because it is a critical facility that needs to be better protected from structural damage due to natural hazards. Natural hazards include flood, hurricane winds and fire.
B-12	North Beach Road	Public Access and Shore Line Protection	CIP budget.	High. This is a high priority because this project will improve conditions to alleviate flooding and protect the shoreline from damage due to natural hazards.
B-13	Oak Street Drainage Improvements	Increase capacity of conveyance systems to alleviate roadway flooding and standing water.	CIP budget.	High. This is a high priority because this project will improve conditions to alleviate flooding and has the potential for cooperative funding.

Table 9-1 Floodplain Management Action Plan

Note: Attachment 13 contains expanded information for each project, including who is responsible for the project, funding, schedule and other information.

Item	Title	Description	Resource Requirement / Availability of Funds	Priority
B-14	Montana Avenue	Expand existing pond and increase outfall capacity to alleviate roadway and structural flooding in the area.	CIP budget.	High. This is a high priority because this project will improve conditions to alleviate flooding and has the potential for cooperative funding.
B-15	Sea Level Rise Vulnerability Assessment	Assess impact on critical structures, public health and safety, natural systems and economy from affects of sea level rise.	CIP budget.	High. This project is a high priority because it will help identify areas that are at risk for flooding and is necessary for areas that may require additional planning for resiliency. Storm surge combined with high tide conditions are an increasing concern for communities like Sarasota County. This project has the potential for cooperative funding or grant from FDEM.
B-16	Coastal Erosion GIS Mapping	Mapping of coastal profile.	County has in-house GIS staff capable of developing the information.	Medium. This project is a medium priority because, although not critical to the mission of flood risk reduction, this project can help monitor and identify areas that are at risk for erosion.
B-17	Cooper Creek	Detailed study to identify flood risks and update flood maps	Detailed studies may range from \$200K to >\$1M. Funds have not been budgeted.	High. This is a high priority because this project will help identify areas that are at risk for flooding and it also has the potential for cooperative funding.
B-18	Flood Flyer	Informational flyer to highlight CRS topics and available resources at the County.	County has in-house communications staff that can develop the flyer.	High. This is a high priority because the public needs to have access to information about flood risk and the County needs to maintain consistent messaging for flood topics. This will help avoid confusion about where to go for help.

Table 9-1 Floodplain Management Action Plan

Note: Attachment 13 contains expanded information for each project, including who is responsible for the project, funding, schedule and other information.

Item	Title	Description	Resource Requirement / Availability of Funds	Priority
B-19	Flood Flyer (Spanish)	Informational flyer to highlight CRS topics and available resources at the County translated to Spanish.	County has in-house communications staff that can develop the flyer.	High. This is a high priority because the public needs to have access to information about flood risk and the County needs to maintain consistent messaging for flood topics. This will help avoid confusion about where to go for help. This is also important because a significant portion of the population speaks Spanish.
B-20	Flood Information Story Map	Esri Storymap providing user-friendly and easy-to-understand approach for finding out about flood hazards.	County has in-house GIS and communications staff that can develop the story map.	High. This is a high priority because the public needs a way to find out about flood hazards in a way that is easy to understand and navigate. The current flood information is buried within several different sites. This will benefit the entire community and provide tools for residents, realtors and other agents that should be aware of the flood risks in the community.
B-21	Property Appraiser Flood Information Section	Provide flood information as part of the property appraiser data.	County has in-house GIS staff that can develop the information. Will require willingness and coordination from property appraiser.	Medium. This project is a medium priority because it is not critical, but will provide another means to reach audiences and describe the flood hazards associated with a property. Many people refer to the property appraiser data, including realtors, lenders and buyers.

10 PLAN ADOPTION, IMPLEMENTATION, EVALUATION AND REVISION

This FMP serves as an appendix to Sarasota County's LMS, which is a state-approved multi-jurisdictional, multi-hazard plan, and which was adopted by Sarasota County in January 2016. A copy of the resolution is provided in Attachment 14.

This FMP was made available for review and comments at a public open house in March 2018. The plan was also sent to other stakeholders for review and comment, and made available on the County's website.

The FMP committee will meet quarterly each year to evaluate progress of the projects as described in Sections 7 and 8, and make updates to the plan where necessary. Potential revisions may include updates to GIS information and statistics, addition of new County staff and public stakeholders to the committee, and development of new projects and/or revisions to existing projects.

To implement and update the FMP:

1. The County's CRS Specialist will review the FMP to evaluate what sections and data require update for that year.
2. The CRS Specialist will be responsible for coordinating with the contact person for each project to get its status.
3. After the status information is gathered, the CRS Specialist prepares a summary of required changes to the FMP and project updates for review by the FMP Committee.
4. The FMP Committee will conduct a meeting (noticed and open to the public) to review the progress and recommend additional changes to the FMP.
5. The CRS Specialist assigns the revision items to members of the committee or other designated County support staff.
6. The FMP Committee will conduct a meeting (noticed and open to the public) to review the document.
7. The updated plan will be posted on the County website and flood-related outreach activities will present and educate the public about the revised FMP.

An annual evaluation report will be submitted with the County's annual CRS recertification to indicate progress of the plan implementation. The plan itself will be updated at least every five years.

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2020

Annual
Floodplain
Management Plan
Evaluation
Report

Prepared by:
Sarasota County
Floodplain Management Plan Committee

Table of Contents

ANNUAL EVALUATION REPORT OF THE FLOODPLAIN MANAGEMENT PLAN..... 1

 BACKGROUND 1

 THE FLOODPLAIN MANAGEMENT PLAN 2

 ORIGINAL COMMITTEE MEMBERS 3

2020 FLOODPLAIN MANAGEMENT PLAN ANNUAL EVALUATION REPORT 4

 FLOODPLAIN MANAGEMENT PLAN MAINTENANCE..... 4

 FLOODPLAIN MANAGEMENT PLAN GOALS AND ACTIVITIES 5

 FLOODPLAIN MANAGEMENT PLAN ACTIVITY TYPES..... 5

PROJECT LIST 6

 SECTION A: CURRENT PROJECTS 6

 SECTION B: POTENTIAL PROJECTS 14

 SECTION C: COMPLETED PROJECTS 15

 SECTION D: DELETED PROJECTS 20

MEETING NOTES- SIGN-IN SHEETS.....21

ANNUAL EVALUATION REPORT OF THE FLOODPLAIN MANAGEMENT PLAN

As part of the Community Rating System (CRS) associated with the National Flood Insurance Program (NFIP), Sarasota County must provide an Annual Evaluation Report for its Floodplain Management Plan.

“An annual evaluation report on progress towards plan implementation must be prepared at least once each year and submitted with the community’s annual CRS recertification. The report must be submitted to the governing body, released to the media, and made available to the public.”
2017 CRS User Manual

BACKGROUND

The CRS program is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Activities implemented in the CRS program provide credit scores, which are summarized through a regular audit process. Scores are formally accepted by FEMA and when compared to prerequisites are used to give a community their classification. The possible classifications range from Class 10 with the least credit points to Class 1 with the most credit points. Sarasota County has participated in the CRS program since 1992. By implementing comprehensive floodplain management activities, Sarasota County has been rated as a Class 5 community since 2007. The result of this classification means NFIP insurance for Sarasota County property owners is discounted annually by 25% for high risk properties and 10% for medium to low risk policies, representing a savings of \$7.2 million dollars to residents of Sarasota County every year.

The Floodplain Management Plan provides a comprehensive overview of best management practices adopted and implemented by Sarasota County to improve flood risk reduction and flood protection for its residents, and to support other county regulatory, preservation, conservation, social and economic needs. Development and implementation of a Floodplain Management Plan is a requirement of participation in the CRS program. The Sarasota County Floodplain Management Plan was originally created and adopted in 1999 by Resolution 99-128, dated May 25, 1999. The plan was updated and adopted, as required by the CRS program, in 2004, 2010, and 2016.

Sarasota County’s CRS program is recertified annually by Insurance Services Office (ISO)/Verisk through the Florida Department of Emergency Management. A full Verification Audit of our program is performed on a 3-year cycle. In the 2015 Verification Audit, the Floodplain Management Plan scored 149 credit points out of a possible 382.

In June 2016, the Floodplain Management Plan was reviewed by staff of Sarasota County’s Stormwater Environmental Utility (SEU), who concluded the plan should be redeveloped to better align with the 2013 CRS manual and with County goals and strategies. In order to maximize CRS credit for maintaining these important discounts on NFIP flood insurance policies, Sarasota County staff formed a Floodplain Management Plan committee to redevelop the Floodplain Management

Plan. This committee included appropriate departments and public, and at least one-half of the members represented public or community stakeholders.

In 2018 the redeveloped plan was submitted to ISO for a courtesy review and scored 325 points out of a possible 382 points for the 2018 CRS audit. This plan was adopted by Resolution 2019-016 on January 29, 2019. The Floodplain Management Plan is an annex to the Unified Local Mitigation Strategy (LMS). To coordinate update scheduling with the LMS, the plan will update early with the LMS in 2021. The updates will continue every five years thereafter as required by the CRS program.

THE FLOODPLAIN MANAGEMENT PLAN

The plan was designed with the following objectives:

1. Organize community resources to reduce or eliminate flood risks to people and property.
2. Implement strategies prior to flooding events to help reduce the impacts of a disaster, which can result in substantial saving of life and property.
3. Give guidance in developing pre- and post-mitigation plans.
4. Identify priority projects and programs for funding.
5. Increase the likelihood of state and federal funding.

The original Floodplain Management Plan Committee was chaired by Kathy Croteau and Allen Parsons, Planning and Development Services Sarasota County.

The Floodplain Management Plan committee member changes are updated as follows:

Previous Members

Allen Parsons, Planner
Gillian Carney, City of Venice
Gerald 'Buster' Chapin, City of Sarasota
J.P. Marchand, SWFWMD
Scott Letasi, SWFWMD
Arthur 'Skip' Preece, Shareholder
John King, Stakeholder

New Members

Michele Norton, Sr. Mgr.
Kathryn Harring, City of Venice
Cynthia Cahill, City of Sarasota
Nicole Mytyk, SWFWMD
Terese Power, SWFWMD

ORIGINAL COMMITTEE MEMBERS

Official Members	Representing
Kathy Croteau, kcroteau@scgov.net	Planning and Development Services, Building Dept.
Donna Bailey, dabailey@scgov.net	Public Utilities, CRS
Ed McCrane, emccrane@scgov.net	Emergency Services
Allen Parsons, aparsons@scgov.net	Planning and Development Services
Stakeholder Members	Representing
John King, sales@ramparthomesinc.com	Rampart Homes, Construction Industry
Elizabeth Wong, ewong@cityofnorthport.com	City of North Port
Kathleen Weeden, kathleen.weeden@venicegov.com	City of Venice
Gillian Carney, Gcarney@venicegov.com	City of Venice
James Linkogle, jlinkogle@longboatkey.org	Town of Long Boat Key
Buster Chapin, gerald.chapin@sarasotagov.com	City of Sarasota
Todd Kerkerling, Richard.Kerkerling@sarasotagov.com	City of Sarasota
Sal Depaolis, sdepaolis@wraengineering.com	ASCE Chapter President
Norm Robertson, Norman.Robertson@atkinsglobal.com	ASCE Chapter Vice President
Dawn Turner, Dawn.Turner@swfwmd.state.fl.us	SWFWMD
J. P. Marchand, jp.marchand@swfwmd.state.fl.us	SWFWMD
Scott Letasi, scott.letasi@swfwmd.state.fl.us	SWFWMD
Michael Andreas, michael.andreas@sarasotacountyschools.net	Sarasota County Schools
Arthur "Skip" Preece, skippreece@aol.com	Captiva Gardens HOA
Additional Resource Staff	Representing
Tammi Canelli, tcanelli@scgov.net	SC Emergency Services
Kelly Westover, kwestover@scgov.net	Public Utilities CRS
Pat Haire, phaire@scgov.net	Communications
Susan Gray, sgray@scgov.net	Stormwater Administration Assistant
Bob Laura, rlaura@scgov.net	Public Utilities Stormwater
Additional Attendees - For additional hospitality count	Representing
Khan Bouphe, kbouphe@jonesedmunds.com	Jones Edmunds

The annual Floodplain Management Plan Evaluation Report is required with the community's annual recertification and gives the community a framework for monitoring the plan's effectiveness and the community's progress in implementing it.

The Floodplain Management Plan committee reviewed the annual evaluation report on the progress in implementing the plan and prepared a summary of those updates incorporated herein, to activities Integrated in the current plan.

Attached:

Annual Report on the Floodplain Management Plan, dated _____xx, 2020

2020 FLOODPLAIN MANAGEMENT PLAN ANNUAL EVALUATION REPORT

ADOPT, IMPLEMENT, EVALUATE AND REVISE

Summary: Monitoring and Evaluation

FLOODPLAIN MANAGEMENT PLAN MAINTENANCE

The Floodplain Management Plan was originally monitored through the Sarasota County Stormwater Environmental Utility Department. The CRS program moved with the Stormwater Division into the Public Works Department on October 1, 2018. The Floodplain Management Plan will be monitored by the Public Works and the Planning and Development Services Departments as part of the regular status report procedures. The Public Works Department will also be responsible for overseeing the implementation of the action plan activities regarding developing and monitoring the necessary budgets, developing and monitoring potential structural mitigation projects and monitoring the progress of the Floodplain Management Plan Committee.

The Floodplain Management Plan Committee will continue to meet quarterly to review, monitor and evaluate implementation of the Plan. As a result, the Floodplain Management Plan will be updated annually by the County Planner, the CRS Specialist, the Building Official (County Floodplain Manager), and the Floodplain Management Plan Committee members. The Plan will be submitted and reviewed by appropriate county departments and corresponding Local Mitigation Strategy Working Group Committee members as appropriate. The update will include an overview of the current Floodplain Management Plan and provide status reports on projects and any revisions to the plan. Any recommendations or changes will be included in an annual evaluation report to the Sarasota County Board of County Commissioners and made available to the public prior to May 1 each year. The annual report will be available to the public and released to the media. The entire plan will be updated every five years in concurrence with the Local Mitigation Strategy Plan with the next update expected in 2021.

Sarasota County, the City of Sarasota, the City of Venice, the City of North Port, and the Town of Longboat Key received the preliminary coastal RISK Flood Maps from FEMA in January 2020. The flood maps include the coastline and flood studies for the following watersheds:

- Phillippi Creek
- Little Sarasota Bay
- Lemon Bay watershed

These maps are scheduled for public review and will become effective in 6-18 months after the review and appeal process. Details on the status of this map update will be outlined in the formal update of the FMP in 2021.

FLOODPLAIN MANAGEMENT PLAN GOALS AND ACTIVITIES

The goals of the Sarasota County's Floodplain Management Plan are to:

1. Minimize the loss of life and property due to flood hazards
2. Protect public health and safety
3. Improve identification of high flood risk areas
4. Increase public awareness of risks associated with flooding
5. Improve the County's emergency response to flood hazards

FLOODPLAIN MANAGEMENT PLAN ACTIVITY TYPES

Activity types include developing activities/projects to address the flood-related hazards through the following measures:

1. Preventive Measures
2. Property Protection
3. Natural Resources Protection
4. Emergency Services
5. Structural Projects
6. Public Information activities

The project list are projects from the 2019 FMP adopted plan and additional projects identified and described. To better define the projects from the 2019 FMP adopted plan, all projects have been combined into one project list and categorized as follows:

- **Section A: Current**

Existing projects that were reviewed and aim to reduce the risk associated with flooding in the county. Overall, Sarasota County implements projects that cover all the major activity types and goals set forth in the FMP.

- **Section B: Proposed**

Describes the possible projects to implement as they relate to the types of activities and goals set in the FMP.

- **Section C: Completed**

Those projects that have been completed and the year of completion shown.

- **Section D: Deleted**

Projects that have been determined unfeasible with the reason noted.

These listed projects were reviewed by the FMP committee and recommendations were given and incorporated into this Evaluation Report. All updates are highlighted in red.

The Revised Project List follows:

Item	Title	Description	Preventative	Property Protection	Natural Resource Protection	Emergency Services	Structural Projects	Public Information	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5	Year Completed or Anticipated Completion Date	2020 Evaluation Report Recommendations
SECTION A: CURRENT PROJECTS															
A1	Comprehensive Plan	The Sarasota County Comprehensive Plan provides the policy direction used in framing land use decision and growth management initiatives. The plan includes policy direction to support programs that address the problems of development in the floodplain and protection of natural drainage features.	X		X	X			X	X				UPDATED FROM 2016 TO Ongoing	Continue to review the comprehensive plan and update as necessary.
A2	Codes & Ordinances	Sarasota County's codes and ordinances were evaluated to address flood risk and ensure that building codes meet NFIP requirements or higher. Floodplain regulations were revised and formally adopted by the Board of County Commissioners on September, 2016.	X						X	X				UPDATED FROM 2016 TO Ongoing	Educate contractors and the public as to any changes in the FBC and Amendments with emphasis on flood protection techniques and requirements by including in annual outreach meetings.
A3	Sarasota 2050	A 50-year land use plan to manage future growth in Sarasota County. Sarasota 2050's primary goals are preserving the county's natural, cultural and physical resources. East of I-75 focus.	X		X				X					UPDATED FROM 2013 TO Ongoing	Continue to monitor the plan and its alignment with the CRS program. Update as necessary.
A4	Post Disaster Redevelopment Plan	The plan identifies policies, operational strategies, and roles and responsibilities for implementation that will guide decisions that affect long term recovery and redevelopment of the community after a disaster.	X			X			X	X				UPDATED FROM 2015 TO Ongoing	Work closer with staff to ensure activities developed remain in coordination with the PDRP and mitigation activities are reviewed annually.
A5	Local Mitigation Strategy Plan	Multi-jurisdiction plan developed by the county and incorporated municipalities to reduce and or eliminate the risks associated with natural and man-made hazards	X						X	X			X	UPDATED FROM 2016 TO Ongoing	Continue involvement with coordination between Sarasota County and the LMS plan. Continued participation in the LMS Working Group reaching goals and objectives identified by the group. The next LMS update due 2021.
A6	Capital Improvement Program	A plan for capital expenditures to be incurred each year, including for projects that aim to identify and reduce flood risks within the County.					X		X	X				Ongoing	Continue to monitor, review and revise the list of projects. Projects become implemented as funding becomes available.
A7	Environmentally Sensitive Lands Protection Program and Neighborhood Parkland Acquisition Program	Programs designed to acquire and protect natural lands and parklands.			X				X	X				Ongoing	Continue to review lands acquired for their protection of Natural Functioning Floodplains and open space and how it pertains to the CRS program.

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A8	Drainage Maintenance Program	Sarasota County uses the Maximo asset management system to inspect and maintain drainage systems throughout the County.	X						X					Ongoing	Continue to track maintenance of the drainage system through the Maximo asset management system. Provide reports for the CRS program as needed. Train staff as needed.
A9	Repetitive Loss Areas Analysis and Plan	Perform site evaluations to evaluate flood risk and provide appropriate mitigation options to property owners.	X					X			X	X		UPDATED FROM 2017 TO Ongoing	The report is expected to go to the Board for adoption in 2020. Continue to review the repetitive loss data from FEMA annually and update the RLAA as necessary. Evaluate insurance data and make recommendations to property owners for mitigation. Continue to protect the data that qualifies under Federal Privacy Act of 1974 provision.
A10	Dona Roberts Bay Watershed Management Plan	Detailed study to identify flood risks and update flood maps	X					X			X	X		UPDATED FROM 2018 TO 2020	Follow the required procedures for FEMA Map updates and perform coordinated map update outreach as needed.
A11	North County/Phillippi Creek Stormwater Water Quality Program	Projects may include stormwater reuse, stormwater retrofits, LID techniques, habitat creation and restoration, and others as identified. Park amenities will be incorporated into the design where feasible.	X		X		X		X	X				UPDATED FROM 2021 TO Ongoing	Continue to review possible opportunities for funding for these projects.
A12	South County/Alligator Creek Stormwater Water Quality Program	Projects may include stormwater reuse, stormwater retrofits, LID techniques, habitat creation and restoration, and others as identified. Park amenities will be incorporated into the design where feasible.	X		X		X		X	X				Ongoing	Ongoing. Continue to review possible opportunities for funding for these projects.
A13	Asset & Infrastructure Management System Program	Stormwater program to replace or rehabilitate aging infrastructure Countywide.	X				X		X					Ongoing	Ongoing. Continue to search for additional funding through grants.
A14	Dona Bay Watershed Hydrology Enhancements and Conveyance System	Activities associated with, but not limited to a surface water storage facility, historic flood plain restoration, water budget restoration, and control structure construction.			X		X		X	X				UPDATED FROM 2018 TO 2024	Phase 2 completion expected in 2024. Continue to review possible grant funding opportunities.
A15	Sediment Abatement and Stabilization Program	Reshape stormwater conveyance systems to more gentle slopes, and stabilize them with vegetation, erosion control matting, or other material to prevent erosion throughout the County.			X		X		X					UPDATED FROM 2021 TO Ongoing	Continues throughout the County.

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A16	Sea Level Rise Vulnerability Assessment	Assess the impact of sea level rise on critical structures, public health and safety, natural systems and economy from the effects of sea level rise. This is appropriate for planning/preparing for future conditions.	X	X		X	X	X	X	X	X	X	X	Ongoing	MOVED FROM PROPOSED TO CURRENT. Continue to review the progress and ensure FEMA's CRS future conditions criteria is incorporated into the assessment.
A17	Sarasota Bayfront Basin Master Plan	Detailed study to evaluate floodplain level of service issues, alternative analysis to address issues, develop conceptual plans for capital improvements and present results at public meetings.	X	X			X	X	X	X	X	X		2020	NEW PROJECT. This project is scheduled for 2020. Review scope and see if the developed CIP project will positively impact any repetitive loss areas.
A18	Whitaker Bayou Alternative Analysis	Detailed study to evaluate the floodplain level of service issues and water quality issues, alternative analysis to address issues, develop conceptual plans for capital improvements and present results at public meetings.	X	X			X	X	X	X	X	X		2020	NEW PROJECT. Review scope and see if the project will positively impact any repetitive loss areas. If repetitive loss areas are involved, reach out to residents within the area to notify them.
A19	Harbor Acres Alternative Analysis	Detailed study to evaluate floodplain level of service issues, alternative analysis to address issues, develop conceptual plans for capital improvements and present results at public meetings.	X	X			X	X	X	X	X	X	X	2020	NEW PROJECT. Review scope and see if the project will positively impact any repetitive loss areas. If repetitive loss areas are involved, reach out to residents within the area to notify them.
A20	Phillippi Creek Watershed Model Maintenance	Detailed study to identify flood risks and update flood maps.	X	X				X	X	X	X	X		UPDATED FROM 2018 TO 2020	Review scope and see if the project will positively impact any repetitive loss areas. If repetitive loss areas are involved, reach out to residents within the area to notify them of the public meeting.
A21	Cooper Creek Watershed Model Maintenance	Detailed study to identify flood risks and update flood maps.	X	X			X	X	X	X	X	X	X	2023	MOVED FROM PROPOSED TO CURRENT. Review scope and see if the project will positively impact any repetitive loss areas. If repetitive loss areas are involved, reach out to residents within the area to notify them of the public meeting.

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A22	Lyons Bay Basin Update	Detailed study to identify flood risks and update flood maps.	X	X			X	X	X	X	X	X	X	2023	NEW PROJECT. Review scope and see if the project will positively impact any repetitive loss areas. If repetitive loss areas are involved, reach out to residents within the area to notify them of the public meeting.
A23	Sarasota Bay Watershed Management Plan	Detailed study to evaluate floodplain level of service issues and water quality issues, alternative analysis to address issues, develop conceptual plans for capital improvements and present results at public meetings	X	X			X	X	X	X	X	X	X	2022	NEW PROJECT. Review scope and see if the project will positively impact any repetitive loss areas. If repetitive loss areas are involved, reach out to residents within the area to notify them of the public meeting
A24	Development Review - FEMA Regulations and Standards	Sarasota County continues to enforce FEMA regulations and standards through its development review process and local ordinances and includes provisions for compliance with the National Flood Insurance Program (NFIP).	X	X	X			X	X	X	X	X		Ongoing	NEWLY IDENTIFIED PROJECT. Monitor status of the Florida Building Codes and potential adoption of International Codes. Continue with the annual public outreach and education programs for understanding of all applicable local, state and federal codes as they pertain to floodplain management principles.
A25	FEMA FIRM Maintenance	Sarasota County continues to maintain FEMA Flood Insurance Rate Map (FIRM) information for the public. Sarasota County developed a GIS based flood zone locator application SarcoFlood that displays digitized FEMA FIRM maps. These maps show the Special Flood Hazard Area (SFHA) determined by FEMA as well as local flood studies shown as the Community Flood Hazard Area (CFHA). Sarasota County regulates the Community Flood Hazard Area (CFHA) per Article XVI, Section 54-516.	X	X			X	X	X	X	X			Ongoing	NEWLY IDENTIFIED PROJECT. Continue to monitor the FEMA Risk Map updates for the local flood study preliminary maps expected in December 2019. Follow the required procedures for FEMA Map updates and perform coordinated map update outreach as needed
A26	Community Rating System (CRS) 3-Yr Cycle Verification Audit	Sarasota County continues to participate in the NFIP/CRS program. Staff completed the 3-year CRS Verification process in May 2019. ISO confirmed a total audit score of 3,605 points which would qualify for a higher classification with specific prerequisites met. A confirmation letter from FEMA maintaining our Class 5 community is expected by May 2020. Maintaining this class will provide for a total of up to 25% discount to NFIP flood insurance holders.	X	X	X			X	X	X	X	X		Ongoing	NEWLY IDENTIFIED PROJECT. Staff recommends a revision to the Uniform Development Code (UDC) to address and implement the Class 4 prerequisite in development needed to move to a higher classification.

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A27	Sarasota County Unified Development Code (UDC)	Sarasota County is currently working on the Unified Development Code update which brings together the County's Land Development Regulations and Zoning Regulations, while making sure they align with the County's Comprehensive Plan.	X	X	X			X	X	X	X	X		Ongoing	NEWLY IDENTIFIED PROJECT. Continue to update and monitor for consistencies and make the regulatory code easier to read, understand and interpret. This update should simplify the ability to find significant regulatory information applicable to any given piece of property.
A28	Building Code Effectiveness Grading Scale (BCEGS)	Sarasota County continues to participate in the BCEGS program. Senate Bill 7000 (SB7000) and House Bill 901 (HB901) were introduced in 2017 with the intent of limiting Nationally approved changes to the base building code used in Florida. The implications are noted by the Florida Floodplain Managers Association as follows: Potential retroversion of the BCEGS rating for the Building Department, and thus a retroversion of the CRS Classification rating resulting in a potential to increase flood insurance premium payments by more than \$60 million for Florida policy holders in 95 communities (currently offset by the National Flood Insurance Program's Community Rating System) Potential loss or reduction in post-disaster funding through the Federal Emergency Management Agency's (FEMA's) Public Assistance program.	X	X				X	X	X				Ongoing	NEWLY IDENTIFIED PROJECT. Monitor status of the SB7000 and HB901. Continue with public outreach and education programs for understanding of all applicable local, state and federal codes as they pertain to floodplain management principles.
A29	Southwest Florida Water Management District (SWFWMD) Partnership	Sarasota County continues to work with the SWFWMD to identify projects to collaborate on and grants to use for project implementation. SWFWMD continues to be the state review for local flood map studies. Identify projects to collaborate on and grants to use for project implementation.						X	X					ongoing	NEWLY IDENTIFIED PROJECT. Continue collaborations and using SWFWMD for state review of FEMA flood map projects. Investigate opportunities for additional project funding for activities in the CRS manual, identify additional opportunities to coordinate projects.
A30	Sarasota County School Board Partnership	Sarasota County continues to work with the Sarasota County School Board to identify projects to collaborate on and grants to use for project implementation.						X						Ongoing	NEWLY IDENTIFIED PROJECT. Continue our relationship with the Sarasota County School Board. Investigate opportunities for additional project funding for activities outlined in the CRS manual, identify additional opportunities to coordinate natural floodplain functions projects

Item	Title	Description	Preventative	Property Protection	Natural Resource Protection	Emergency Services	Structural Projects	Public Information	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5	Year Completed or Anticipated Completion Date	2020 Evaluation Report Recommendations
A31	Sarasota Bay Estuary Program (SBEP) Partnership	Sarasota County is a member and provides financial support to the Sarasota Bay Estuary Program to enhance the preservation and/or creation of the local floodplains and wetlands.			X			X	X					Ongoing	NEWLY IDENTIFIED PROJECT. Continue current support, investigate opportunity for restoration and protection of wetlands, Natural Beneficial Functions of the Floodplains and preservation of Open Space. Identify additional opportunities to coordinate natural floodplain functions outreach and water quality outreach projects.
A32	University of South Florida (USF) Extension Program Partnership	Sarasota County continues to work with the USF Extension Program to identify projects to collaborate on and grants to use for project implementation.						X	X					Ongoing	NEWLY IDENTIFIED PROJECT. Continue our relationship with the USF Extension Program. Investigate opportunities for additional project funding for activities outlined in the CRS manual, identify additional opportunities to coordinate natural floodplain functions projects.
A33	Coastal and Heartland National Estuary Partnership (CHNEP)	Sarasota County is a member and provides financial support to the CHNEP to enhance preservation and water quality throughout the watersheds within this area. The CHNEP mission includes water quality improvement, hydrologic restoration, fish, wildlife and habitat protection, and public engagement.			X			X	X	X				Ongoing	NEWLY IDENTIFIED PROJECT. Continue to support the program to protect our watersheds. Continue to foster water quality projects throughout our watersheds.
A34	Neighborhood Environmental Stewardship Team (NEST) Program Partnership	Sarasota County developed the NEST program, recognizing that one way to achieve comprehensive watershed management is to involve the community or homeowners. This creates awareness that what we do on the land impacts our water resources. The NEST program operates at the neighborhood-level to improve watershed-scale resources. Collaborate with the CRS program when able for outreach.						X						Ongoing	NEWLY IDENTIFIED PROJECT. Continue to support the NEST program and community involvement in environmentally friendly projects to protect and restore our shared water resources. Continue to focus on both education and hands-on activities that improve neighborhoods and enhance watersheds. Continue to support the program to protect our watersheds. Continue to foster water quality projects throughout our watersheds.

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A35	Enhancement of the evacuation program for residents, including special needs residents	The Special Needs Evacuation lists are updated annually at the county level.	X			X		X	X	X				Ongoing	NEWLY IDENTIFIED PROJECT. Monitor progress of improvements and maintenance of evacuation routes through participation in the monthly Metropolitan Planning Organization and Fla. Dept. of Transportation. Maintain lists on an annual basis.
A36	Flood Information Story Map	StoryMap format for flood prevention information website. This StoryMap will include links to our flood zone locator map and FEMA links.	X	X				X	X	X	X	X		Ongoing	MOVED FROM PROPOSED TO CURRENT. Developed and will be hosted by Water Atlas. We expect it to go 'live' in March or April 2020.
A37	Flood Zone Workshops	Flood workshops at various locations throughout the County to inform residents of risk, the FMP process, and gain input about flooding in the area.						X				X		Ongoing	NEWLY IDENTIFIED PROJECT. Additional dates were added for evening and weekends. Additional workshops for information on FEMA grants were also added.
A38	Outreach - Education of Repetitive Loss Area Property Owners	Annual outreach through Sarasota County Notification Letters. A notification letter is mailed annually to each property identified in a repetitive loss area. The mailing for 2020 will be completed by February 2020. Included in the letter is a list of mitigation measure options and a flyer listing free local flood workshops and FEMA Grant workshops.	X	X				X	X	X	X	X		Ongoing	NEWLY IDENTIFIED PROJECT. Continue to improve the Sarasota County formal outreach program to inform Repetitive Loss property owners of options for mitigation and funding. Continue to include updated information about the free local flood workshops and FEMA Grant workshops available.
A39	Floody the Frog, Children's Flood Outreach Initiative	Creation of a flood mascot for children's flood outreach. An interactive website is being developed that will link to posters for download and to various activity pages from FEMA. A frog costume was purchased and Floody the Frog appears at various events throughout the year for additional outreach. Floody was first introduced through the NEST calendar coloring contest. The NEST calendar theme this year (2019) was water quality and flooding.	X		X			X	X	X		X		Ongoing	NEW PROJECT. Flood posters have been developed to give the messages of flood protection and safety in a non-threatening manner. Continue to work on flood messaging to children and continue to identify events that would give us the opportunity for flood outreach and Floody the Frog.
A40	Catfish Creek Basin Regional Facility and Conveyance Improvements	Modifications to retention pond and make improvements to infrastructure to get water to it	X	X	X		X	X	X	X		X		UPDATED FROM 2017 TO Ongoing	Project just started.
A41	Honore Ave. Pipe Stormwater Rehabilitation	Rehabilitate 800 linear feet of 48" by 76" diameter RCP conveying runoff under Honore Avenue.					X		X	X				UPDATED FROM 2017 TO 2020	Expected completion date of 2020.

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A42	Ocean Blvd. / Higel Ave. Flood Protection Project	2019 FEMA Hazard Mitigation Grant Program (HMGP) project for flood protection. In 2018 Stormwater applied for funding to address flooding level of service issues on Siesta Key near Ocean Blvd. and Higel Ave. September 2019, the Florida Department of Environmental Management (FDEM) approved the application and forwarded it to FEMA for their review (not yet complete).	X	X		X	X	X	X	X	X			2022	NEW PROJECT. Continue working with FEMA and FDEM to respond to requests for additional information and receive the grant monies to implement and complete the project. Investigate additional areas where flood protection and level of service issues are needed. Investigate additional opportunities for grant funding as it becomes available.
A43	Alligator Creek Stream Restoration	Restoration of approximately 40 acres of Alligator Creek corridor. It will include removal of nuisance/invasive vegetation, planting of native and/or Florida-friendly vegetation, reshaping of banks, and enhancement of historical wetlands.	X	X	X		X	X	X	X	X			2024	NEW PROJECT. Develop scope for design and solicit proposals.
A44	Dona Bay Phase 4 - King's Gate Weir Replacement	To replace and relocate (upstream) the weir on Cow Pen Canal near King's Gate Mobile Home Park in Venice, FL.	X	X		X		X	X						NEW PROJECT. Restore funding. Structural analysis pending.
A45	Midnight Pass Stormwater Improvements	Address flooding Level of Service and drainage issues in the 8100 block.	X	X		X	X	X	X	X					NEW PROJECT. In-house design ongoing. In-house construction anticipated.
A46	Bahia Vista Levee Improvements	Attain 44 CFR 65-10 Certification.	X	X		X	X		X	X		X			NEW PROJECT. Will go out for solicitation 2020.
A47	Site Visits	CRS Staff provides individual reviews of flooding issues, identifying current, proposed drainage and potential remedies for homeowners as requested.	X	X					X	X	X	X			NEWLY IDENTIFIED PROJECT. Continue to provide this service for the residents of Sarasota County.
A48	Fire Station 9 (To be renamed Fire Station 8)	Construct a new building to withstand natural hazards and provide added service capacity in times of emergency.	X	X		X	X		X	X			X	2020	MOVED FROM PROPOSED TO CURRENT. Currently under construction. Once complete it will be renamed Fire Station #8.
A49	Fire Station 8 (To be renamed Fire Station 9)	Construct a new building to withstand natural hazards and provide added service capacity in times of emergency. Bee Ridge Rd. Fuel Site replacement.	X	X		X	X		X	X			X	2021	MOVED FROM PROPOSED TO CURRENT. Currently in design. Anticipated construction in May 2020. Once completed it will be renamed Fire Station #9.
A50	Fire Station 13	Construct a new building to withstand natural hazards and provide added service capacity in times of emergency. Siesta Key.	X	X		X	X		X	X			X	2021	MOVED FROM PROPOSED TO CURRENT. Currently in design. Anticipated construction in April 2020.

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A51	Englewood Interstate Connector (River Rd.)	Raise roadbed; add traffic lanes for evacuation route. This is appropriate for reducing potential for structural damage while also allowing for more efficient emergency evacuation procedures when a natural disaster such as flooding, hurricanes, tornados,	X	X			X	X	X	X			X	2021	NEW PROJECT. The 6-mile portion of River Road from I-75 to US 41 (a portion of the Englewood Interstate Connector), Sarasota County is currently completing ROW acquisition (by Spring 2020) and the FDOT is slated to begin Design-Build activity in Winter 2021. Construction start is scheduled for Spring/Summer 2021 with estimated roadway widening completion in early 2023. Funding sources have been identified in the County CIP and FDOT Work Programs.
SECTION B: POTENTIAL PROJECTS															
B1	Flood Insurance Improvement Plan	Evaluate flood insurance coverage in Sarasota County and educate the public about flood risk and insurance. Residents need to know what their options are for protecting their assets. This is especially important given how frequently floods occur and rising insurance rates.	X	X				X	X	X			X		Remains as a future project. The PPI Committee is reviewing ways to create a flood insurance improvement plan for the entire county. As determinations are made on the most effective way to conduct this activity, the federal privacy act of 1974 must be maintained in order to remain compliant in the NFIP program, making this activity more complex.
B2	Dona Bay WQMP	Identify water quality and natural systems improvements and flood protection CIPs.	X		X			X			X	X			Continue to look for funding sources such as grants for this project.
B3	U.S. 41 Canal Rehabilitation	Rehabilitate existing stormwater infrastructure including an upland cut drainage canal west of U.S. 41.					X		X	X					Delayed to 2020. Continue to review funding opportunities.
B4	Sapphire Shores Stormwater Improvements	Rehabilitate and or replace existing stormwater infrastructure including pipes and drainage structures.					X		X	X					Continue to look for funding sources such as grants for this project.
B5	Canal 4-86 Rehabilitation	existing stormwater drainage canal between Webber Street and Cattlemen Road, canal 4-112, and canal 4-115 in the Colonial Cables neighborhood. Rehabilitation to reestablish the slopes and stabilize canal banks include regrading side slopes.					X		X	X					MOVED FROM CURRENT TO PROPOSED. Continue to search for additional funding through grants.
B6	Beach Road Drainage Improvements	Rehabilitate existing drainage. This is appropriate for reducing flood damage.	X	X			X	X	X	X					Investigate funding source opportunities for this project, such as grants.

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B7	North Beach Road	Public access and shoreline protection. This is appropriate for protecting the County's natural resources while reducing the potential for damage due to flood and erosion for landward structures.	X	X	X			X	X	X		X			Investigate funding source opportunities for this project, such as grants.
B8	Oak Street Drainage Improvements	Increase capacity of conveyance systems to alleviate roadway flooding and standing water.	X	X		X	X	X	X	X		X			Investigate funding source opportunities for this project, such as grants.
B9	Montana Avenue	Expand existing pond and increase outfall capacity to alleviate roadway and structural flooding in the area.	X	X	X	X	X	X	X	X		X			Investigate funding source opportunities for this project, such as grants.
B10	DOC Center for BOB Building	Harden an area of the BOB Building or locate a building to house our DOC Center for this area.		X		X		X	X	X					NEW PROPOSED PROJECT. Investigate funding source opportunities for this project, such as a FEMA BRIC grant.
B11	Fire Station 19	Remove and replace current fire station to better withstand multiple natural hazards, including flood, fire, hurricane and severe weather. This building will also ensure continuation of service during times of emergency.	X	X		X	X		X	X			X		Investigate funding source opportunities for this project, such as grants. Not scheduled for replacement in the immediate future.
SECTION C: COMPLETED PROJECTS															
C1	Little Sarasota Bay Watershed Management Plan	Detailed study to identify flood risks and update flood maps	X					X			X	X		2017	MOVED FROM CURRENT TO COMPLETED. Continue to monitor the FEMA Risk Map updates for the local flood study preliminary maps expected in December 2019. Follow the required procedures for FEMA Map updates and perform coordinated map update outreach as needed.
C2	Lemon Bay Watershed Management Plan	Detailed study to identify flood risks and update flood maps	X					X			X	X		2018	MOVED FROM CURRENT TO COMPLETED. Continue to monitor the FEMA Risk Map updates for the local flood study preliminary maps expected in December 2019. Follow the required procedures for FEMA Map updates and perform coordinated map update outreach as needed.
C3	Box Turtle Circle Drainage Improvements	Design, permit and construct drainage improvements to the Turtle Creek II subdivision drainage system.					X		X					2018	COMPLETED. Continue to monitor effectiveness and perform any required maintenance necessary.

Item	Title	Description	Preventative	Property Protection	Natural Resource Protection	Emergency Services	Structural Projects	Public Information	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5	Year Completed or Anticipated Completion Date	2020 Evaluation Report Recommendations
C4	10th St. Boat Basin Inlet Structure Improvements	Clean out and rehabilitate existing stormwater inlets.					X		X	X				2018	COMPLETED. Continue to monitor for maintenance
C5	Catfish Creek Basin Regional Facility	Conveyance improvements and construction of a 24-acre flood storage pond.					X		X	X				2017	Completed. Continue monitoring for maintenance.
C6	Cow Pen Slough Stormwater Rehabilitation	Rehabilitate or replace the infrastructure that was constructed as part of the Cow Pen Slough Channel Improvements.	X				X		X					2017	Continue to monitor for maintenance.
C7	Downtown Sarasota Stormwater Rehabilitation	Rehabilitate and/or replace existing stormwater infrastructure including pipes and drainage structures.	X				X		X	X	X			2017	Completed. Continue to monitor for maintenance.
C8	Englewood Village Stormwater Rehabilitation	Rehabilitate or replace deficient pipes and structures.					X		X	X				2017	Completed. Continue to monitor for maintenance.
C9	Gottfried Creek Roadway Culvert Improvements	Assess the condition of and rehabilitate and/or replace existing stormwater infrastructure including pipes and drainage structures along the flow line of the Gottfried Creek west of SR 776.	X				X		X	X	X			2017	Completed. Continue to monitor for maintenance.
C10	Greenwich Stormwater Rehabilitation	Rehabilitate and/or replace existing stormwater infrastructure including pipes and drainage structures.					X		X	X				2017	Completed. Continue to monitor for maintenance.
C11	Gulf Gate Stormwater Rehabilitation	Rehabilitate and/or replace existing stormwater infrastructure including 6400 linear feet of 18" - 60" pipes, and other drainage structures within the Gulf Gate area.					X		X	X				2017	Completed. Continue to monitor for maintenance.
C12	Sarasota County Flood Response Plan	Emergency Response Plan for before, during and after flood events.	X			X							X	2016	Continue to investigate further opportunities for improvements to and use of latest technologies for communications and early warning coordination. Coordinate with other agencies and ensure requirements can be met to provide for opportunity to continue eligibility for CRS Activity 610 reporting. Continue to support the Automated Rain Monitoring System (ARMS) rain gage tracking system through the Water Atlas.
C13	Alfred Park Stormwater Rehabilitation	Rehabilitate 3,200 linear feet of 18" to 48" pipes.					X		X	X				2017	Complete. Continue to monitor for maintenance.
C14	North of Whitaker Bayou Inlet Improvements	Clean out and rehabilitate existing stormwater inlets with minimal pipe rehabilitation.					X		X	X				2017	Completed. Continue to monitor for maintenance.

Item	Title	Description	Preventative	Property Protection	Natural Resource Protection	Emergency Services	Structural Projects	Public Information	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5	Year Completed or Anticipated Completion Date	2020 Evaluation Report Recommendations
C15	Phillippi Creek Watershed Management Plan	Detailed study to identify flood risks and update flood maps	X					X			X	X		2018	COMPLETED. Study was completed and sent to FEMA 2018 as an MT-2 application. We are waiting to have it incorporated into the updated RISK flood maps.
C16	Coastal Fringe Phase I	Detailed study to identify flood risks and update flood maps	X					X			X	X		2015	Completed.
C17	Coastal Fringe Phase II	Detailed study to identify flood risks and update flood maps	X					X			X	X		2015	Completed.
C18	Coastal Fringe Phase III	Detailed study to identify flood risks and update flood maps	X					X			X	X		2015	Completed.
C19	Alligator Creek Watershed Management Plan	Detailed study to identify flood risks and update flood maps; SWFWMD lead; currently on FEMA maps	X					X			X	X		2012	Flood maps were updated in 2016 incorporating this study. Continue to identify changes in flood maps from development and update when funding allows.
C20	Hudson Creek Watershed Model	Detailed study to identify flood risks and update flood maps	X					X			X	X			Flood maps were updated in 2016 incorporating this study. Continue to identify changes in flood maps due to development and update when funding allows.
C21	Whitaker Bayou Model	Detailed study to identify flood risks and update flood maps	X					X			X	X			Flood maps were updated in 2016 incorporating this study. Continue to identify changes in flood maps due to development and update when funding allows.
C22	Big Slough Model	Detailed study to identify flood risks and update flood maps	X					X			X	X			Flood maps were updated in 2016 incorporating this study. Continue to identify changes in flood maps due to development and update when funding allows.
C23	Isle of Venice Model	Detailed study to identify flood risks and update flood maps	X					X			X	X			Flood maps were updated in 2016 incorporating this study. Continue to identify changes in flood maps due to development and update when funding allows.

Item	Title	Description	Preventative	Property Protection	Natural Resource Protection	Emergency Services	Structural Projects	Public Information	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5	Year Completed or Anticipated Completion Date	2020 Evaluation Report Recommendations
C24	Roberts Bay Model	Detailed study to identify flood risks and update flood maps	X					X			X	X			Continue to monitor the FEMA RISK Map updates for the local flood study preliminary maps expected in December 2019. Follow the required procedures for FEMA map updates and perform coordinated map update outreach as needed.
C25	Alligator Creek Phase 1 & 2	Pipe and swale improvements					X		X					2015	Completed. Continue to monitor for maintenance.
C26	Country Woods	Rehabilitate existing drainage					X		X					2015	Completed. Continue to monitor for maintenance.
C27	Colonial Gables	Rehabilitate existing drainage					X		X					2015	Completed. Continue to monitor for maintenance.
C28	Coastal Erosion GIS Mapping	Mapping of the coastal profile. This helps identify potential flood/erosion issues and ways to mitigate existing and future problems.	X	X	X			X	X	X	X	X		2018	Completed. Continue to monitor the GIS layer for updated FDEM data and perform maintenance when necessary.
C29	Flood Flyer	Informational flyer to highlight CRS topics and available resources at the County. This is appropriate to deliver consistent messaging as part of the County's PPI program.						X	X	X	X	X		2017	Completed. Continue to monitor for necessary updates.
C30	Flood Flyer in Spanish	Informational flyer to highlight CRS topics and available resources at the County. This is important as there is a significant Spanish-speaking population in Sarasota County.						X	X	X	X	X		2018	Completed. Continue to monitor for necessary updates and continue to review other in-house developed documentation that can be translated to Spanish.
C31	Property Appraiser Flood Information Display	Provide flood information as part of the property appraiser data. This is appropriate for getting the information about flood risk out to the public. The property appraiser data and website is well known and used by many residents, businesses, and potential residents.						X	X	X	X	X		2018	Completed. Flood data is displayed on the property appraiser website and property record cards. The data includes a link to the flood zone locator mapping application. Continue to update flood data on this website as the flood insurance rate maps are updated.
C32	County Flood Protection Website	Centralized web pages with information on various local flood hazards and how to protect yourself and your property. Currently it is hosted on the USF Water Atlas website with links to the Sarasota County Flood Zone Locator mapping application and various appropriate FEMA web pages.						X	X	X	X	X		2018	Continue to update the flood protection website. Continue to contract with USF Water Atlas for them to host the website.

Item	Title	Description	Preventative	Property Protection	Natural Resource Protection	Emergency Services	Structural Projects	Public Information	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5	Year Completed or Anticipated Completion Date	2020 Evaluation Report Recommendations
C33	Multi-Jurisdictional (Unified) Program for Public Information (PPI)	Sarasota County has a separate multi-jurisdictional (Unified) Program for Public Information (PPI) plan for outreach. The plan includes the City of Sarasota, the Town of Longboat Key, the City of North Port, and the City of Venice, as well as various stakeholders. The plan and is reviewed and updated annually by a working PPI Committee that includes each municipality as well as various stakeholders. The Multi-Jurisdictional PPI committee meets quarterly. They review and recommend coordinated outreach projects. This plan is an annex to the FMP						X	X	X	X	X	X	2019	COMPLETED. Continue to meet quarterly. Continue to review, evaluate, and revise the PPI plan as necessary and implement outreach projects as necessary. Additionally, the PPI committee provides participating communities in the Community Rating System a platform for coordinating the updating of the FEMA Flood Insurance Rate Maps and Risk Map Analysis initiative.
C34	Future Floodplain Mapping	Identify flood risks and floodplain due to future conditions hydrology and sea level rise.	X	X				X	X	X	X			2019	Review the CRS requirements for future conditions modeling and ensure the criteria is incorporated into the modeling.
C35	Paver Park Inlet Structure Improvements	Clean out and rehabilitate existing stormwater inlets with minimal pipe rehabilitation.					X		X	X				2017	Completed. Continue to monitor for maintenance.
C36	Red Bug Slough Restoration	Wetland restoration.			X				X					2017	Completed. Continue to monitor the health of the wetland features.
C37	Saralake Estates Stormwater Rehabilitation	Rehabilitate and or replace existing stormwater infrastructure including pipes and drainage structures.					X		X	X				2017	Completed. Continue to monitor the health of the wetland features.
C38	South Gate East Stormwater Improvements	Rehabilitate and or replace existing stormwater infrastructure including pipes and drainage structures.					X		X	X				2017	Completed. Continue to monitor for maintenance.
C39	South Gate Stormwater Improvements	Rehabilitate and or replace existing stormwater infrastructure including pipes and drainage structures.					X		X	X				2017	Completed. Continue to monitor for maintenance.
C40	Automated Rain Monitoring Sensors (ARMS)	Sarasota County has fifty-four rainfall sensors, with real-time data and historical rainfall information.	X					X	X			X		Ongoing	Continue contracting with USF to display real-time rainfall data on the WaterAtlas website. Ensure the gages/sensors are continuously monitored and are working properly.
C42	Fire Station 12	Remove and replace current fire station to better withstand multiple natural hazards, including flood, fire, hurricane and severe weather. This building will also ensure continuation of service during times of emergency.	X	X		X	X		X	X			X	2016	Completed.
C43	Fire Station 14	Remove and replace current fire station to better withstand multiple natural hazards, including flood, fire, hurricane and severe weather. This building will also ensure continuation of service during times of emergency.	X	X		X	X		X	X			X	2016	Completed.

Item	Title	Description	Preventative	Property Protection	Natural Resource Protection	Emergency Services	Structural Projects	Public Information	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5	Year Completed or Anticipated Completion Date	2020 Evaluation Report Recommendations
C44	Fire Station 16	Remove and replace current fire station to better withstand multiple natural hazards, including flood, fire, hurricane and severe weather. This building will also ensure continuation of service during times of emergency.	X	X		X	X		X	X			X	2015	Completed.
C45	Fire Station 17	Construct a new building to withstand natural hazards and provide added service capacity in times of emergency.	X	X		X	X		X	X			X	2016	Completed.
SECTION D: DELETED PROJECTS															
D-1	North Water Tower Park Stormwater Rehabilitation	Rehabilitate and/or replace existing stormwater infrastructure including pipes and drainage structures					X		X	X				2017	Project deleted. Unable to procure property needed for the project.

NOTES

SARASOTA COUNTY FLOODPLAIN MANAGEMENT PROGRAM

April 16, 2019 @ 3:00 p.m. – 4:00 p.m.

Sarasota County Emergency Operations Center

6050 Porter Way, Sarasota, FL 34232

Call in number: (866) 727-3527 toll-free or (941) 861-6000 local

Conference ID: 82847552; Conference Passcode: 6732

Members	Attended
Kathy Croteau, kcroteau@scgov.net	Planning and Development Services, Bldg Dept.
Donna Bailey, dabailey@scgov.net	Public Works, CRS
Ed McCrane, emccrane@scg.ov.net	Emergency Services
Stakeholder Members	Representing
Elizabeth Wong, ewong@cityofnorthport.com	City of North Port
Kathleen Weeden, kweeden@venicegov.com	City of Venice
Kat Harring, kharring@venicegov.com	City of Venice
James Linkogle, jlinkogle@longboatkey.org	Town of Longboat Key
Todd Kerkering, richard.kerkering@sarasotagov.com	City of Sarasota
Sal Depaolis, sdepaolis@wraengineering.com	ASCE Chapter President
Dawn Turner, dawn.turner@swfwmd.state.fl.us	SWFWMD
Paul Semenec, psemenec@scov.net	Public Works, Stormwater
Khan Bouphe, kbouphe@jonesedmunds.com	JEA
Additional Resource Staff	Representing
Robert Laura, rlaura@scgov.net	Public Works, Stormwater

Meeting Objective: FMP score review and procedures

Introductions

- Review ISO score - 325
- Review FMP after adoption requirements / evaluate, and revise:
 - Look at projects, compare to the CIP
 - We should review this list annually and note any changes.
 - Flood studies and Coastal Risk Map update
 - These updates will be summarized in the FMP
 - Tracking storms (Ed and Todd)
 - Todd – for all storms affecting our stormwater system located within the City of Sarasota.
 - Can Todd and Ed send me anything they have for Hurricane Irma. I'll keep a file on what we need to update.
 - Vulnerability Assessments: JEA, Lee Hayes Byron status
 - As these assessments become completed, we will summarize them in the FMP.
- Long Term Actions:
 - Re-adopt the plan in 2021 with the LMS
 - We will have an update to the Board at the end of the year, for our overall CRS program that will include the FMP.
 - The full update of the FMP is due with the LMS in 2021. We will coordinate the update and review/comment on the update mid to late next year in preparation of the 2021 update.

- Public meeting with citizen input prior to re-adoption
 - We will schedule the meeting around October 2020
- Schedule Future FMP meetings following the LMS meeting – 3rd Tuesday of quarterly month
 - July 16, 2019
 - October 15, 2019

SARASOTA COUNTY FLOODPLAIN MANAGEMENT PLAN (FMP)

Committee Meeting

April 16, 2019 - 3:00 p.m. - 4:00 p.m.

Sarasota County Emergency Operations Center (EOC), Room 147
6050 Porter Way, Sarasota, FL 34232



FMP COMMITTEE SIGN-IN SHEET

MEMBER OR ALTERNATE	REPRESENTING	SIGNATURE
Kathy Croteau	Planning and Development Services, Bldg. Dept.	
Donna Bailey	Public Works, CRS	
Ed McCrane	Emergency Services	Todd Kerkering in place of
Des Companion	Public Works, CRS	
John King	Rampart Homes, Construction Industry	
Elizabeth Wong	City of North Port	on telephone
Kathleen Weeden	City of Venice	on telephone
Kat Harring	City of Venice	Kathleen Weeden
James Linkogle	Town of Longboat Key	James K. Linkogle
Todd Kerkering	City of Sarasota	
Sal Depaolis	ASCE Chapter President	
Dawn Turner	SWFWMD	on telephone
J.P. Marchand	SWFWMD	
Paul Semenec	Public Works, Stormwater	
Skip Preece	Captiva Gardens HOA	
Khan Boupaha	JEA	on telephone

SARASOTA COUNTY FLOODPLAIN MANAGEMENT PLAN (FMP)

Committee Meeting

April 16, 2019 - 3:00 p.m. - 4:00 p.m.

Sarasota County Emergency Operations Center (EOC), Room 147
6050 Porter Way, Sarasota, FL 34232



FMP COMMITTEE SIGN-IN SHEET

MEMBER OR ALTERNATE	REPRESENTING	SIGNATURE
Tammi Canelli	Emergency Services	
Robert Laura	Public Works, Stormwater	<i>Robert Laura</i>
Michael Andreas	Sarasota County Schools	
Scott Letasi	SWFWMD	

Nichole Norton Sarasota County *Michael West*

NOTES

SARASOTA COUNTY FLOODPLAIN MANAGEMENT PROGRAM COMMITTEE

July 16, 2019 @ 3:00 p.m. – 4:00 p.m.

Sarasota County Emergency Operations Center

6050 Porter Way, Sarasota, FL 34232

Call in number: (866) 727-3527 toll-free or (941) 861-6000 local

Conference ID: 82435866; Conference Passcode: 3646

Members	Attended
Martin Duran, Alternate for Kathy Croteau	Planning and Development Services, Bldg Dept.
Donna Bailey, dabailey@scgov.net	Public Works, CRS
Ed McCrane, emccrane@scg.ov.net	Emergency Services
Stakeholder Members	Representing
Elizabeth Wong, ewong@cityofnorthport.com	City of North Port
Kat Harring, kharring@venicegov.com	City of Venice
James Linkogle, jlinkogle@longboatkey.org	Town of Longboat Key
Todd Kerkering, richard.kerkering@sarasotagov.com	City of Sarasota
Cindy Cahill, Cynthia.Cahill@sarasotaFL.gov	City of Sarasota
Sal Depaolis, sdepaolis@wraengineering.com	ASCE Chapter President
Dawn Turner, dawn.turner@swfwmd.state.fl.us	SWFWMD
Paul Semenec, psemenec@scov.net	Public Works, Stormwater
Khan Bouphe, kbouphe@jonesedmunds.com	JEA
Additional Resource Staff	Representing
Robert Laura, rlaura@scgov.net	Public Works, Stormwater

Meeting Objective: Review FMP Evaluation Report & FMP Formal Update Processes

INTRODUCTIONS – Welcome Cindy Cahill, Flood Zone Specialist for the City of Sarasota

- ISO Audit finished
 - Score received from auditor
 - Notification letter from FEMA May 2020
- ❖ *We reviewed the final FMP score of 325 points. Dawn asked how many points were available for the FMP.*
- ❖ *We discussed briefly the total points and why we didn't pursue all the points available.*
- **PROPOSED 2021 FORMAL FMP UPDATE:**
 - Mtg Date: 1-21-20 Review FMP pages 1-59 (Sections 1-5)
 - Mtg Date: 4-20-20 Review FMP pages 60-90 (Sections 6,7)
 - Mtg Date: 7-21-20 Review FMP pages 91-120 (Sections 8-10)
 - Mtg Date: 10-20-20 Review FMP and finalize updated product
- Early September the updated product will be sent to committee members for final review and comments before the next meeting.
- The FMP update will be placed on our website with requests for comments.

- Public Meeting for citizen review and input: **TBD**
- LMS & FMP Board update 2021: **TBD**
- Maps will be updated through our GIS – I'll create a service ticket at the end of this year for their assistance during our process next year.
- After this update – the next update will be 2026

❖ *We reviewed the proposed schedule for updating the FMP no comments were made.*

- **2019 FMP UPDATE:**

- **REVIEW ANNUAL EVALUATION REPORT (October 15, 2019 meeting):**

- Annual review of goals, and projects (today's handout)
 - Send comments and recommendations via email before the meeting
 - Board Memo outlining the CRS program including the FMP evaluation report
 - Press release with FMP evaluation report link to our website

- ❖ *The committee discussed the requirements for the evaluation report.*
- ❖ *Donna will send the Section 8 of the FMP along with the notes of this meeting to the committee members for comments/recommendations before the next meeting.*
- ❖ *James asked if it would be feasible to have a unified FMP. Donna stated she wasn't sure what it would entail and would look at the requirements if he was interested.*
- ❖ *Todd noted that with different communities it would require the Boards for each participating community to agree with each other and it might become very complicated. After additional discussion it was agreed to shelve this idea and revisit it after the next CRS manual comes out in 2022.*

- **ADDITIONAL FMP UPDATE DETAILS:**

- Flood studies and Coastal Risk Map update 2020
 - These updates will be summarized in the 2021 FMP update
 - We expect a product to take to the public by the end of this year. We are coordinating efforts for public outreach through our PPI.

❖ *No comments made.*

- Tracking storms (Ed and Todd)
 - Todd – for all storms affecting our stormwater system located within the City of Sarasota.
 - Can Todd and Ed send me anything they have for Hurricane Irma. I'll keep a file on what we need to update.

❖ *No comments made.*

- Repetitive Loss Area Analysis:
 - Should have it completed to send to ISO for a courtesy review by September 17, 2019. Once approved by ISO, it will go to the Board for adoption. This will be an annex to the LMS and will be updated every cycle verification (3-years).

❖ *No comments made.*

- **ACTION ITEMS:**2019 - Create annual evaluation report
 - Submit with CRS recertification May 1, 2020

❖ *Donna will send Section 8 of the FMP for the committee to review with the notes.*

- ❖ *Members will submit comments/recommendations via email before the next meeting in October.*
- ❖ *Donna will create the evaluation report for everyone's review and discussion for the next meeting. It will be sent with the agenda the Friday before the meeting (October 11, 2019).*
 - 2020 - Re-adopt (Formal Update) the plan in 2021 with the LMS
 - Public meeting with citizen input prior to re-adoption November – December 2020
- **NEXT FMP MEETING:** (Follows the LMS meeting)
 - October 15, 2019

SARASOTA COUNTY FLOODPLAIN MANAGEMENT PLAN (FMP)

Committee Meeting

July 16, 2019 - 3:00 p.m. - 4:00 p.m.

Sarasota County Emergency Operations Center (EOC), Room 147

6050 Porter Way, Sarasota, FL 34232



FMP COMMITTEE SIGN-IN SHEET

MEMBER OR ALTERNATE	REPRESENTING	SIGNATURE
Kathy Croteau / M. Duran	Planning and Development Services, Bldg. Dept.	
Donna Bailey	Public Works, CRS	
Ed McCrane	Emergency Services	
Des Companion	Public Works, CRS	
John King	Rampart Homes, Construction Industry	
Elizabeth Wong	City of North Port	on telephone
Kathleen Weeden	City of Venice	
Kat Harring	City of Venice	
James Linkogle	Town of Longboat Key	
Todd Kerkerling	City of Sarasota	
Sal Depaolis	ASCE Chapter President	
Dawn Turner	SWFWMD	on telephone
J.P. Marchand	SWFWMD	
Paul Semenec	Public Works, Stormwater	
Skip Preece	Captiva Gardens HOA	
Khan Boupouha	JEA	on telephone

CINDY CAHILL

CITY OF SARASOTA

Cindy Cahill

SARASOTA COUNTY FLOODPLAIN MANAGEMENT PLAN (FMP)

Committee Meeting

July 16, 2019 - 3:00 p.m. - 4:00 p.m.

**Sarasota County Emergency Operations Center (EOC), Room 147
6050 Porter Way, Sarasota, FL 34232**



FMP COMMITTEE SIGN-IN SHEET

MEMBER OR ALTERNATE	REPRESENTING	SIGNATURE
Tammi Canelli	Emergency Services	
Robert Laura	Public Works, Stormwater	<i>Robert Laura</i>
Michael Andreas	Sarasota County Schools	
Terese Power	SWFWMD	
Michele Norton	Planning & Development SC	

NOTES

SARASOTA COUNTY FLOODPLAIN MANAGEMENT PROGRAM (FMP) COMMITTEE

October 15, 2019 @ 2:45 p.m. – 4:00 p.m.

Sarasota County Emergency Operations Center

6050 Porter Way, Sarasota, FL 34232

Conference Room - MACC 113

Call in number: (866) 727-3527 toll-free or (941) 861-6000 local

Conference ID: 82751050; Conference Passcode: 4352

Attending Members	Representing
Kathy Croteau, kcroteau@scgov.net Marty Duran for Kathy Croteau	Planning and Development Services, Bldg Dept.
Donna Bailey, dabailey@scgov.net	Public Works, CRS
Ed McCrane, emccrane@scg.ov.net	Emergency Services
Michele Norton, mnorton@scgov.net	Planning and Development Services
Des Companion, dcompani@scgov.net	Public Works, CRS
Stakeholder Members	Representing
Kat Harring, kharring@venicegov.com	City of Venice
James Linkogle, jlinkogle@longboatkey.org	Town of Longboat Key
Cindy Cahill, Cynthia.Cahill@sarasotaFL.gov	City of Sarasota
Sal Depaolis, sdepaolis@wraengineering.com	Senior Engineer
Paul Semenec, psemenec@scov.net	Public Works, Stormwater
Nicole Mytyk, Nicole.Mytyk@swfwmd.state.fl.us	SWFWMD

Meeting Objective: Review and comment - Projects List & FMP Evaluation Report

CALL TO ORDER / INTRODUCTIONS

Objective:

- **REVIEW AND APPROVE PROJECTS LIST UPDATE** – Section 8 of the FMP
 - Review and record comments/revisions
 - *The projects list was reviewed by the committee. Comments were received via email by members and the list was revised accordingly.*
- **REVIEW FMP EVALUATION REPORT FOR 2020**

Discuss Evaluation Report and due date

We discussed the evaluation report and when it was due (2020). All members were good with the layout of the report. No changes noted. We will work on getting a date to send to the Board for review so we can do a press release and get it up on our website. It was noted that the timing will coincide with the preliminary flood maps being released and may delay this process a little.
- **FMP NEXT STEPS:**
 - ◆ Submit to Board
 - ◆ Press release
 - ◆ FMP evaluation report link on our website

■ **2020 SCHEDULE PROPOSED 2021 FORMAL FMP UPDATE REVIEW:**

- ◆ Mtg Date: 1-21-20 Review FMP pages 1-59 (Sections 1-5)
 - ◆ Mtg Date: 4-20-20 Review FMP pages 60-90 (Sections 6,7)
 - ◆ Mtg Date: 7-21-20 Review FMP pages 91-120 (Sections 8-10)
 - ◆ Mtg Date: TBD Review FMP and finalize updated product
-
- Early September 2020 the updated product will be sent to committee members for final review and comments before the next meeting.
 - The FMP update will be placed on our website with requests for comments.
 - Public Meeting November – December 2020 for citizen review and input: **TBD**
 - LMS & FMP Board update 2021: **TBD**
 - Maps will be updated through our GIS – I'll create a service ticket at the end of this year for their assistance during our process next year.
 - After this update – the next formal update will be 2026
- *This process was reviewed and there were no questions or concerns.*

■ **ADDITIONAL FMP UPDATE DETAILS:**

◆ **Flood studies and Coastal Risk Map update 2020**

- These updates will be summarized in the 2021 FMP update
- We expect a product to take to the public by the end of this year. We are coordinating efforts for public outreach through our PPI.

◆ **Tracking storms (Ed and Todd)**

- Todd – for all storms affecting our stormwater system located within the City of Sarasota.
- Can Todd and Ed send me anything they have for Hurricane Irma? I'll keep a file on what we need to update.

◆ **Repetitive Loss Area Analysis:**

- Once approved by ISO, it will go to the Board for adoption.
- This will be an annex to the LMS and will be updated every cycle verification (3-years).

◆ **ACTION ITEMS:**

- 2019 – Add comments/revisions to the FMP Evaluation Report
- Submit with CRS recertification May 1, 2020

SARASOTA COUNTY FLOODPLAIN MANAGEMENT PLAN (FMP)

Committee Meeting

October 15, 2019 - 2:45 p.m. - 4:00 p.m.

Sarasota County Emergency Operations Center (EOC), MACC Center
6050 Porter Way, Sarasota, FL 34232



FMP COMMITTEE SIGN-IN SHEET

MEMBER OR ALTERNATE	REPRESENTING	SIGNATURE
Kathy Croteau <i>M. Duran</i>	Planning and Development, SC	<i>[Signature]</i>
Donna Bailey	Public Works, CRS	<i>[Signature]</i>
Ed McCrane	Emergency Services	<i>[Signature]</i>
Des Companion	Public Works, CRS	<i>[Signature]</i>
John King	Rampart Homes, Construction Industry	
Elizabeth Wong	City of North Port	
Kathleen Weeden	City of Venice	
Kat Harring	City of Venice	<i>Kath Harring</i>
James Linkogle	Town of Longboat Key	
Todd Kerkering	City of Sarasota	
Sal Depaolis	ASCE Chapter President	on phone
Dawn Turner	SWFWMD	
J.P. Marchand	SWFWMD	
Paul Semene	Public Works, Stormwater	<i>[Signature]</i>
Skip Preece	Captiva Gardens HOA	
Cindy Cahill	City of Sarasota	<i>Cindy Cahill</i>
Khan Boup	JEA	

Nicole Mytyk

SWFWMD

SARASOTA COUNTY FLOODPLAIN MANAGEMENT PLAN (FMP)
Committee Meeting
October 15, 2019 - 2:45 p.m. - 4:00 p.m.
Sarasota County Emergency Operations Center (EOC), MACC Center
6050 Porter Way, Sarasota, FL 34232



FMP COMMITTEE SIGN-IN SHEET

MEMBER OR ALTERNATE	REPRESENTING	SIGNATURE
Tammi Canelli	Emergency Services	
Robert Laura	Public Works, Stormwater	
Michael Andreas	Sarasota County Schools	
Terese Power	SWFWMD	
Martin Duran	Planning & Development, SC	
Michele Norton	Planning & Development, SC	<i>Michele Norton</i>

Annex E

Town of Longboat Key Floodplain Management Plan

Table of Contents:

Section	Page
Introduction	1
ORGANIZE, INVOLVE PUBLIC, COORDINATE ACTIVITIES	1
Planning	1
Floodplain Management Plan Committee	3
ASSESS HAZARD, ASSESS PROBLEM	4
Risk Assessment	4
Life Safety	6
Critical Facilities	7
Property Damages	7
Repetitive Loss Area Analysis	8
Natural Resource Protection	10
Development Trends	11
Local Hazards	11
Hazard Analysis	11
Populations Vulnerable to Each Hazard	13
Known Flood Hazards	14
SET GOALS, REVIEW POSSIBLE ACTIVITIES	18
Goals and Objectives	18
Mitigation Strategy	18
Preventive Activities	19
Property Protection Activities	19
Protect the Natural and Beneficial Functions of the Floodplain	20
Emergency Services	20
Public Outreach	22
Pre- and Post- Disaster Redevelopment Planning	23
ACTION PLAN	26
Action Plan	26
Current Activities	26
Preventive Strategies	27
Property Protection	29
Natural Resource Protection	31
Police and Fire Departments Emergency Services	33
Structural Projects/Capital Improvements	34
Public Information	35
ADOPT, IMPLEMENT, EVALUATE AND REVISE	35
Summary: Monitoring and Evaluation	35
Plan Maintenance	35

TOWN OF LONGBOAT KEY

2020

FLOODPLAIN MANAGEMENT PLAN

Coordinated with Sarasota County Local Mitigation Strategy

INTRODUCTION

The Town of Longboat Key is a Coastal Barrier Island located along the Gulf of Mexico within southwestern portion of Manatee County, and the northwestern portion of Sarasota County. The community occupies approximately 4.92 square miles. The Town of Longboat Key was incorporated as a Township in 1955. The Town has experienced a steady growth rate with the largest occurring between the early 1970's through the early 1990's. The Town's full time population according to the 2019 Census (Population Estimates Program) was listed as 7,296. The Town of Longboat Key experiences as most coastal communities in Florida, an increase in population during the winter months, and the population can swell to 20,000 plus including resorts, hotels and rental unit population. The Town has, according to the previous census, 8,814 residential units, with 5,224 listed as vacant properties, or rental units, updates are anticipated via the 2020 census when available.

Situated in a subtropical climate, the Town experiences a distinct wet and dry season. The wet season extends from June through September. During this period, the Town receives approximately two-thirds of its average annual rainfall. Topography in the area is generally flat and low with elevations ranging from sea level to 11 feet North American Vertical Datum (NAVD) 1988. The average island elevation is approximately 6 feet NAVD.

ORGANIZE, INVOLVE PUBLIC, COORDINATE ACTIVITIES

PLANNING

The Town completed the process of updating the Comprehensive Plan in December of 2007 and updates to the Comprehensive Plan were done in 2017 and 2019 to encourage the redevelopment of older pre-firm properties. These processes offered the community with many opportunities to provide input into the new comprehensive plan. The Town also held meetings with representatives from outside agencies related to issues and concerns including long term comprehensive plan goals and objectives. The Comprehensive Plan includes elements of goals and objectives utilized in this Floodplain Management Plan and vice versa.

The Town of Longboat maintains a Hurricane and Emergency Management and Response Plan, which is updated yearly. The Town coordinates its disaster management practices with both Manatee and Sarasota County Emergency Operation Center functions, Comprehensive Emergency Management Plans and Continuity of Government Plans. The Town also participates in both County Local Mitigation Strategy (LMS) working groups. The purpose of the LMS is to coordinate mitigation efforts with participating jurisdictions, identify, score, rank and prioritize projects and initiatives that are mitigating in nature. Since flooding is a risk associated with all participating communities the related elements of the mitigation projects are focused towards reducing natural hazard impacts to the communities. Both Manatee and Sarasota County and all municipalities within the Counties have a participation in the approval process of the LMS plans and the submitted mitigation projects. The Local Mitigation Strategies were all

used as resources for the participating communities to develop and secure individual local Floodplain Management Plans for accreditation under the Community Rating System. Current updates of the LMS are underway in both counties, Manatee County to be completed by fall of 2020 and Sarasota County by spring of 2021.

The Town also coordinates planning efforts with the Tampa Bay Regional Planning Council.

In October 2013 the Town had a community study done by the Urban Land Institute (ULI). The ULI Advisory Services Panel report did an analysis of the existing conditions in the Town and its future. The ULI study made the following recommendations in regards to climate adaptation and coastal resiliency:

“As a coastal community, Longboat Key is faced with the challenge of rising sea levels brought about by climate change. Rising sea levels exacerbate the frequency, intensity, and scope of devastation caused by natural hazards— particularly flooding, wave forces, and storm surges. With Longboat Key being a narrow strip of land surrounded by water, even modest sea-rise projections portend a formidable future, absent an appropriate long-term climate adaptation and coastal resiliency strategy. Seasonal flooding already affects low-lying coastal neighborhoods on the key, and completely washed out a beach on the island’s northern end. Thorough implementation of proper adaptation and resiliency strategies will help not only preserve, but also protect the community’s economy, habitat, people, and infrastructure. Continued development along the coast exposes the town to more risk and will cause the cost of natural hazards to grow worse. An appropriate climate adaptation and coastal resiliency plan to protect the town minimizes flooding costs, lowers insurance premiums, and drives down the cost of doing business in the city—all while enhancing economic development and improving quality of life. Preservation and protection of the waterfront means future generations can enjoy the town locals take pride in and visitors have come to love. To minimize the impact of sea-level rise, the town must look to strategies focused on flooding, wave forces, and storm surges.”

Recommendations:

1. Research and understand new insurance.
2. Reestablish, maintain, and promote native vegetation along the coastline.
3. Implement planning management tools such as setbacks and buffers, and zoning plus development regulations and incentives.
4. Improve access to education and information, particularly through coastal monitoring systems, advisory notice, and evacuation plans.
5. Coordinate neighborhood plans with city and regional strategies.
6. Link outcomes of site analysis, vulnerability assessment, and resilience enhancement to the waterfront planning process.

A follow-up ULI study committee has discussed the recommendations and how they will be implemented to minimize flooding costs, lower insurance premiums and lowering the cost of doing business in the Town.

To progress the floodplain planning process, the Town Manager has staff representatives of the Planning, Zoning, and Building, which include the Town Planner and Building Official, Public Works, Public Works Project Manager, Police and Fire Departments, which represent the Emergency Management staff. All staff combined have expertise and experience in preventive

measures, property protection, emergency services, structural flood control projects, and public information. The staff members also participate with the Sarasota and Manatee County Local Mitigation Strategy (LMS) Working Groups and coordinated effort for Programs for Public Information and Outreach strategies, Early Flood Warning capabilities, flood disaster preparedness, post disaster recovery efforts and potential mitigation grant opportunities.

FLOODPLAIN MANAGEMENT PLAN COMMITTEE (FMP)

In order to improve the effectiveness of floodplain management, the Town Manager appointed a Floodplain Management Plan Committee in March of 2020, to provide a broad spectrum of experience and perspective in order to update the Floodplain Management Plan (FMP). The following members are currently serving on the FMP:

FMP Committee Members:

1. Town of Longboat Staff:

Planning & Zoning – Maika Arnold, AICP, Senior Planner. Ms. Arnold is a Certified Planner. She currently chairs the FMP.

- Public Works - James Linkogle, CFM, Project Manager. Mr. Linkogle is a Certified Floodplain Manager since 2001, serves as the Town's CRS Coordinator and served in 2015-2016 as the Chairman of the Florida Floodplain Managers Association, a State Chapter of the national Association of State Floodplain Managers. He serves as staff liaison to the FMP.
- Building – Patti Fige, CBO, CFM, LEED AP, Deputy Building Official (DBO) & Building Plans Examiner. Served as the Plans Examiner since 2017 & recently added as the DBO in the absence of the Building Official.

2. Public Sector Members:

Flood Insurance –Sandra Smith, Secure-All Insurance.

Building Industry – Clyde Alstrom, Blue Water Construction.

Business - Neil Fleet, LCAM, CMCA, Advanced Management, Inc. Mr. Fleet manages over 9 Homeowners Associations on Longboat Key. All of which are located within the floodplain. He has been managing properties on Longboat Key for over 14 years.

Property Owners/Real Estate –Steve Schield, AICP, ASLA, CFM, and former Town Planner

Mr. Schield is a certified planner, Landscape Architect, Building Plan examiner, Certified Floodplain Manager and licensed Real Estate Agent.

Property Manager – Gretchen Stricker, Property Manager Association Chair.

The following is a result of the current Floodplain Management Plan Committee process.

The Committee meeting minutes and exhibits are included in the appendices to this plan.

ASSESS HAZARD - ASSESS PROBLEM

RISK ASSESSMENT

Flooding results from two major sources, rain fall events that exceed the 25-year 24-hour threshold, (particularly when coinciding with lunar high tides), and Tropical Storms, especially when they reach Hurricane intensity. Longboat Key's coastal areas are subject to storm surge and tidal action from the Gulf of Mexico and the adjacent bay side shoreline. Upland areas and lower, flatter areas, which have tidally influenced drainage systems, are subject to more repetitive flooding, including lunar "King" tides. Land development that has increased runoff volume can and occasionally overwhelms the natural influences associated with tides and elevated water tables, limited and manmade drainage systems. Effects of rainfall and storm surge can be dramatic even if the passage of hurricanes or tropical storms are as far as 200 miles of the community.

The Town of Longboat Key's municipal storm water system was initially installed in the late 1950's through mid-1960's as a swale and ditch system with conveyance to inlet boxes with pipe and or culvert conveyance to outfalls in the canals and adjacent bays. As part of the original development, some drainage canals and "Mosquito Ditches" were constructed in the existing lower Mangrove sloughs and outlets to Sarasota Bay. Most of the newer development in mid-1970 through 1980's included curb and gutter systems on Town paved streets, again with conveyance to adjacent canals and bays. From the mid 1980's, most development was required to provide some level of storm water retention and/or treatment and remains privately owned. Since the 1990's, design criteria has been based on a 25 year 24 hour level of service. As the Town grew, the storm-water systems were installed or upgraded to meet the demands of permitting requirements current with the time of application. Although in most areas the systems are successful, localized flooding may occur, especially in the older developments on the northern areas of the island. The majority of the National Flood Insurance Program identified Repetitive Loss Properties are located in the northern half of the island, with the exception of the Mobile Home Parks located at Mid-Key. These areas are identified in the Local Flood Hazard Map, required for Community Rating System review, and Repetitive Area Loss Analysis included in this plan.

The Town of Longboat Key has adopted Ordinances to establish minimum standards and requirements for land management, building standards, and control measures in order to minimize flood damage to public and private property.

Natural Hazards cannot be eliminated, but it is possible to determine what the potential hazards are, where the hazards may be most severe, and identify local actions that can be taken to reduce the potential impacts of the hazard. For example: we know hurricanes are frequent in Florida, that flooding and wind damage are most severe along the coast, that low intensity storms occur more frequently than high intensity storms, and the level of coastal flooding is fairly predictable for a given magnitude of storm. Given this knowledge, local as well as state and federal construction standards exist to control development along the coast in areas that have been identified as high risk to coastal storms. Coastal High Hazard Areas and Velocity Zones are examples. Furthermore, there are incentives to develop to higher standards, which may offset insurance rates and mitigate towards potential damages.

1. Costs to Communities:

Hazards have real costs to businesses and residents. Businesses in high hazard areas can suffer when damaged or isolated by storms. Loss of revenues during recovery periods can have negative and even devastating results. Residents, who build in flood prone areas, are subject to evacuation, damage to their homes, potential higher costs and extended time frames of recovery, as well as higher insurance premiums. Increased costs for design construction and maintenance of critical facilities, utilities and major government buildings placed in high hazard areas become more relevant because the functions these facilities provide are too valuable to be ignored, especially during times of disaster recovery. Finally, the value of community health, safety and welfare could be considered inestimable.

2. Costs to Local Government:

Community infrastructure such as roads, drainage structures, sewer lines, electric lines, telephone lines that are built in high hazard areas are subject to frequent damage and can be extremely costly to repair. If a local government belongs to the National Flood Insurance Program (NFIP) and allows development in the floodplain without proper elevation and construction techniques, the federal government can withdraw the community's access to federal flood insurance for both public and private structures. Furthermore, a local government, even when eligible for Federal disaster recovery assistance, is responsible for as much as 12.5 percent of their local public costs of damages from a declared event. The local government is also responsible for 100 percent of any damage from events that do not meet the criteria of a Presidential Declaration.. These costs, typically not included in budget development, can put a significant strain on the local government finances.

LIFE SAFETY

For Life safety and property protection the Town of Longboat Key utilizes an emergency telephone notification system called Alert Longboat Key powered by Everbridge®. The Alert Longboat Key® Emergency Telephone Calling System is an extremely high-speed telephone communication service available for emergency notifications. Alert Longboat Key® employs a one-of-a-kind Internet mapping capability for geographic targeting of calls, coupled with a high-speed telephone calling system capable of delivering customized pre-recorded emergency messages directly to homes and businesses at the rate of up to 60,000 calls per hour. Alert Longboat Key® subscribers control their emergency broadcasts from anywhere in the world via a secure Internet Portal. Residents are encouraged to contact the Town via annual public outreach and via the Town's Website to make sure that their phone number is current and correct.

The annually published Town Summer Newsletter contains a section instructing residents of evacuation procedures and how to prepare for a hurricane. How to secure property, develop plans, what to take during an evacuation, and where to go during an evacuation are covered. The newsletter also informs residents of the National Flood Insurance Program and Flood Insurance policy information and how to apply for coverage.

Local evacuation information is broadcast on local cable channels: Government Access TV Channel 19, ABC Channel 7, and SNN Channel 6. Radio broadcasts are on WENG 1530 AM, and Clearchannel 1230 AM. Information can also be received on a weather radio that can be purchased at telecommunication stores.

Additional evacuation information can be found on the Internet through:

Town of Longboat Key	https://www.longboatkey.org/residents/hurricane-information/general-information
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Additional Links to:

Florida Division of Emergency Management	https://www.floridadisaster.org/state-eoc/
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Sarasota County	https://www.scgov.net/government/departments/emergency-services
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Manatee County	https://www.mymanatee.org/departments/public_safety/emergency_management
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Those with special needs and health considerations for assistance with evacuations are encouraged to register with the Town at (941) 316-1999, Sarasota County at (941) 861-5000, and Manatee County at (941) 749-3500. Evacuation maps can be found on the Internet at the above listed web sites, Town Hall (501 Bay Isles Road), in the local phone book and at the respective County facilities.

CRITICAL FACILITIES

Critical facilities are defined as those structures from which essential services and functions for victim survival, continuation of public safety actions, and disaster recovery are performed or provided.

The Town of Longboat Key critical facilities and infrastructures include and are not limited to:

- Town Hall
- Fire Stations
- Police Station
- Public Works Complex
- Waste Water Lift Stations and system:
 - Lift Station D (the final discharge station to Manatee County)
- Utilities Department Water Storage Tank locations and distribution:
 - Mid-Key Water Plant
 - South Key Water Plant

Privately owned facilities on Longboat Key may be included:

- U.S. Post Office – Fed. Government Facility
- Publix Supermarket – Post event food/water distribution site
- CVS Pharmacy – Post event medical needs
- Mobil Gas Station – Fuels distribution
- Ace Hardware - Supplies

Commercial Properties: Post event critical offices

- Bank of America – Financial
- SunTrust Bank Complex- Financial, Insurance, Property Management
- Chase Bank - Financial
- First Bank of Florida - Financial
- Marinas – Vessel recovery, fuel distribution
- Mediterranean Plaza – Property Management and Insurance

PROPERTY DAMAGES

The Town of Longboat Key is a community that has experienced structural damages and losses due to flooding, some of which have experienced multiple losses and are identified as Repetitive Loss Properties (RLP = those that have had two or more claims paid by the National Flood Insurance Program (NFIP) of \$1000 or more within a 10-year period.). The Federal Emergency Management Agency (FEMA) as of September 2018 report, has identified 98 records of such RLP structures within Town limits, Of those 98 identified, 15 have been mitigated by demolition and or new construction to current code and elevation for a current net of 83 RLP properties. Of those, 8 are included and considered Severe Repetitive Loss, (SLR= those 1-4 family dwelling properties that have had four or more claims of more than \$5000.00 each.) The Town has determined that within the areas of the community reporting repetitive losses, there are 574 additional structures of similar construction and or elevation and are at risk of experiencing

damages from floods. These areas are identified in the Local Flood Hazard Map required for Community Rating System review and documentation.

Flood insurance in Florida can be obtained through communities that participate in the National Flood Insurance Program (NFIP). In order to maintain compliance with the Code of Federal Regulations requirements involved with the NFIP, the Town has adopted and implemented a new Flood Control Ordinance, Chapter 154 of the Town Code, effective March 17th, 2014. This floodplain management Ordinance also meets the credit criteria requirements for the Community Rating System (CRS). Participation in the CRS program gives homeowners discounts on flood insurance. The Town of Longboat Key has a current Community Rating of a Category Six (6), with ten being the worst rating, and one being the best. This rating allows residences who purchase flood insurance through the NFIP program to receive a 20% discount if their property meets all of the qualifications of the Homeowners Flood Insurance Affordability Act of 2014.

REPETITIVE LOSS AREA ANALYSIS

As part of the process for updating and renewing the Floodplain Management Plan, the Floodplain Management Plan Committee has reviewed the flood insurance loss data as listed above and in the table below for the analysis of the respective areas of reported flood losses.

NFIP POLICY TOTALS FOR LONGBOAT KEY 9/19		Policies per FIRM Zones	Number of Losses Paid per FIRM Zones	Percentage of Losses Pre – vs - Post Firm
Policies In Force	9,908			
PRE - FIRM A/AE Zones		4,578	567	73%
PRE - FIRM VE Zones		<u>207</u>	<u>169</u>	<u>22%</u>
Sub-totals		4,785	738	95%
Post-FIRM A/AE Zones		5,020	37	4.5%
Post-FIRM VE Zones		<u>103</u>	<u>5</u>	<u>.5%</u>
Sub-totals		5,123	42	5%
Total Percentage of losses –vs- Policies = 7.1%		9,908	780	100%
Total PREMIUMS	\$7,712,999			
AVERAGE PREMIUM*	\$778.50			
CRS Class 6 20 % Discount				
Average Discount Per Policy**	\$155.70			

Total Discount for Community	\$1,542,600			
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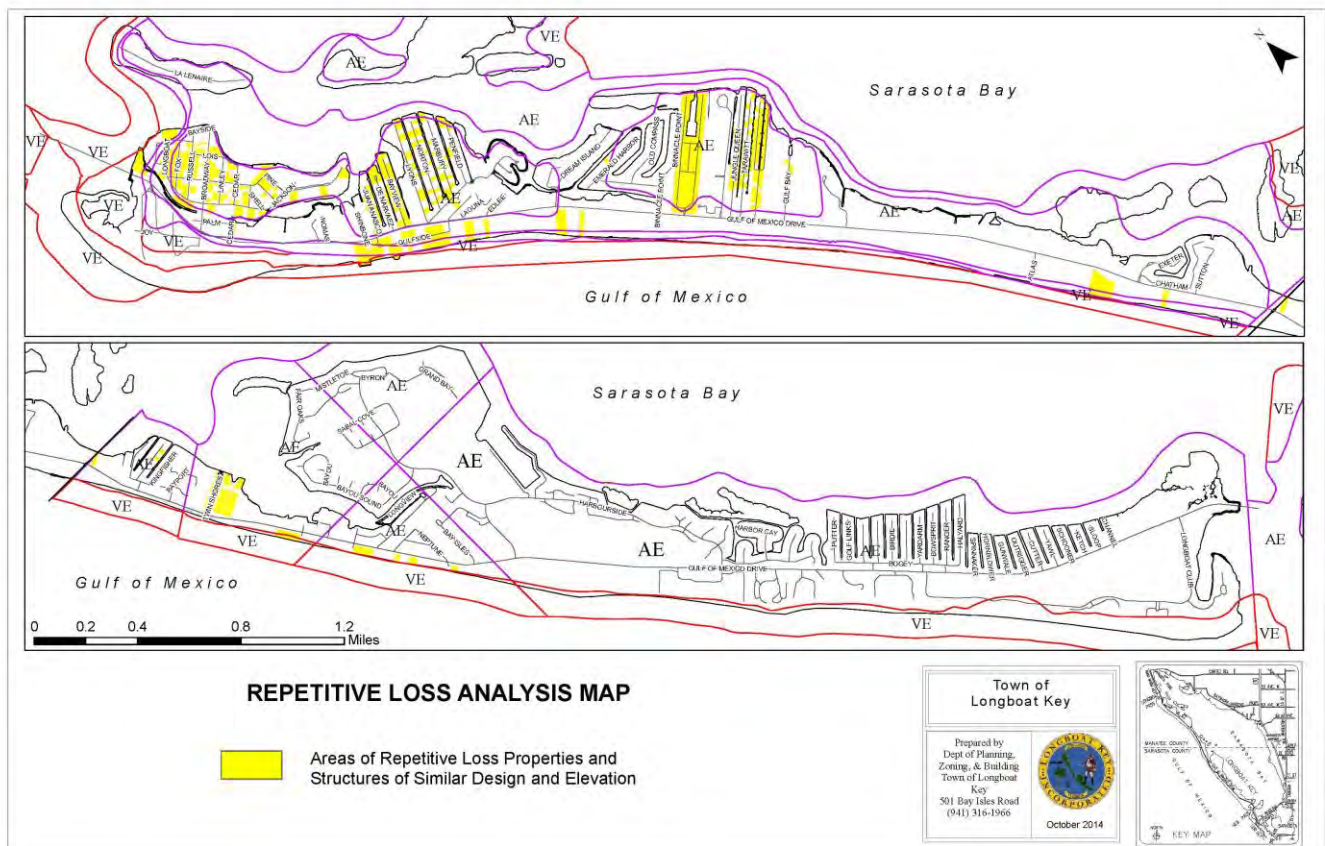
* Calculated by dividing value of policies in force ("Total Premiums") by the number of policies in force.

** Calculated by dividing the total amount of discounts ("Total Discount for Community") provided by the total number of policies.

In review of the reported NFIP Flood Insurance policies within the Town it is noted that approximately 51% of active NFIP Policies are for PRE-FIRM structures. Additionally, fully 95% of flood losses suffered are for PRE-FIRM structures. Number of losses paid includes the Repetitive and Severe Repetitive loss properties.

Please find below map of the Repetitive Loss Area Analysis.

Areas highlighted yellow indicate locations of historical flood losses per NFIP Policy data table above, and or areas that have structures of similar construction and elevations as those structures that have suffered flood losses. Analysis of current available data indicates there is no change to those areas identified in the map below.



Flood losses in the areas identified are typically a result of the natural elevations of the adjacent grades within the development, and the general age of development. Typically, most structures within the areas identified in the map were constructed prior to adoption of a Flood Insurance

Rate Map (FIRM), and do not meet required Base Flood Elevations (BFE). The majority of the structures in these areas are identified as PRE-FIRM structures.

NATURAL RESOURCE PROTECTION

Wetlands, as defined in Chapter 9J-5.003(149) of the Florida Administrative Code, can be found in a variety of the Towns jurisdictional areas. The Town works in coordination with the Florida Department of Environmental Protection, the Southwest Florida Water Management District and the Sarasota Bay Estuary Program, to protect the wetlands in Town limits. The Town has categorized areas designated as wetlands identified on land use maps, some of which are permanently protected as Jurisdictional Wetlands by the Florida Department of Environmental Protection agency.

In the Inter-Coastal Waterway, and the adjacent coastal shoreline slow speed areas protect the Florida Manatee. The ICW connects to bays that are important for marine food source, fish habitat, and waterfowl nesting areas.

Mangroves can be found along water areas throughout the Town of Longboat Key. The mangroves provide erosion protection, water buffering, and they also filter upland pollutants. Mangroves are specifically protected though the Florida Department of Environmental Protection and local Ordinances

The Town's beach and sand dune system is very important for the protection of upland infrastructure and buildings, and also to support our tourist economy. These dune and beach areas are also habitat for several varieties of protected Shore Bird and Sea Turtles species very common along our coastal areas. The Town works diligently with the Florida Fish and Wildlife Commission, Mote Marine, and other agencies and non-profit organizations to protect the endangered species, while maintaining a reasonable level of service and access to our residents and visitors through education and code enforcement. The 2019 Comprehensive Beach Management Plan incorporates all of these elements for continued monitoring and preservation.

Along the Intracoastal Waterway (ICW) where the U.S. Army Corps of Engineers performed the original dredging of the waterway system, are a series of dredge material spoil islands. Some of these islands have significant areas of upland habitat, especially on Sister Keys. This island was acquired by the Town in 1990. It includes additional wet lands created as a 2008, 2-acre wetland mitigation project, as mitigation for offsite development impacts, and also includes a gopher tortoise habitat. Also, Joan M. Durante Park has over 30 acres of land dedicated and developed as a permanent passive park, and many segments are visited by endangered species of waterfowl. Educational plaques can be found along the well maintained and marked trails.

Quick Point Nature Preserve, a 34-acre park on the south end of the island adjacent to New Pass is also a prime example of a coastal restoration and wetland protection project. Tidal lagoons, mangrove fringe and recovered coastal fringe provide a premier habitat for varieties of

fish and water fowl. This preserve is also an outstanding place for educational and recreational opportunities for visitors.

DEVELOPMENT TRENDS

The Town of Longboat Key is primarily a residential retirement community. According Census (Quick Facts), the median household income for 2014-2018 (in 2018 dollars) is \$104,825, and the median value of owner-occupied housing is \$720,700. The Town collects ad valorem taxes through a millage rate and in fiscal year 2020 the total assessed value was estimated at \$6,108,392,031.

The Town of Longboat Key is 90% built out, and has relatively strict density limitations compared to other jurisdictions. Due to the development constraints, the Town has not the equivalent category of considerable growth.

The population of the Town of Longboat Key is currently 7,296. It is expected, that the population may decrease slightly in the future. The Town is relatively densely developed and mostly comprised of residential property. Some residential re-development and commercial development is expected to occur in the next five to ten years. Some projects that were approved for re-developments prior to the recent down turn in the economy and market are have already initiated or have intent of commencing construction in the near future. As this process begins and current plans come in, they will be carefully reviewed for negative impact on the watershed, natural resources and natural floodplain since all of the Town of Longboat Key lies within what is called a, "Special Flood Hazard Area", according to the FEMA Flood Insurance Rate maps, (FIRM).

LOCAL HAZARDS

The Town of Longboat Key's most expected natural hazards are hurricanes, beach erosion, tornadoes, storm surge and flooding. Beach erosion commonly occurs during summer tropical storms and hurricanes, however historical trends also indicate significant erosion and southern transfer of sand is known to occur during winter cold front storms. Beach re-nourishments have been conducted since 1993 on a cyclical basis and were primarily completed and or planned in areas of severe erosion. They are designed to the maximum extent practicable to protect property and resources as well as to protect the safety of citizens at risk. The most recent island wide full beach nourishment project was completed in 2016, with an interim re-nourishment including new groins is planned for the North End section in 2020-21. The next re-nourishments are planned for 2020-2021 in the remaining high erosion areas of the Island.

Severe thunderstorms, tropical storms and hurricanes can spawn tornadoes and extremely strong wind bursts. Although shorter in duration these events can produce wind speeds in excess of those expected during hurricanes and tropical storms

HAZARD ANALYSIS

The Town has exposure to several different types of hazards.

I. Tropical Cyclone Events

1. Probability: Low to High
2. Impact: Low to High
 - a. Planning Assumptions:
 1. A gulf coast landfall is one of the three most likely Florida hurricane tracks as based on planning models. Hurricane season is from June through November. Among the hazards analyzed in this section, hurricane activities pose the greatest threat to the broadest population in Longboat Key.
 - b. Concerns Include:
 1. Injured and/or entrapped persons and the loss of life.
 2. Mass traffic congestion and other evacuation related issues, especially due to bridges.
 3. Temporary and long-term sheltering needs.
 4. Personal property loss, especially related to flooding.
 5. Damage to the infrastructure, and structures due to wind and floods.
 6. Lost business revenue, with accompanying unemployment and loss of tax revenue.
 7. Fires, hazardous material (HAZMAT) releases, search and rescue operations related to the storm activity.
 8. Looting and increased crime due to economic conditions created by long term recovery.
 9. Potential loss of water and/or sewer service.
 10. Electrical shortage/outages.
 11. Fuel shortage/outages.
 12. Communications disrupted.

II. Floods

1. Probability: Low to Moderate
2. Impact: Low to Moderate
 - a. Planning Assumptions:
 1. The Town's experiences seasonal flooding as do many areas of Florida. Areas located near the coast, adjacent to bays, inlets, or the Intracoastal Waterway are more prone to flooding. The Town as a coastal barrier island is much more susceptible to flooding than the mainland.
 - b. Concerns Include:
 1. Possible evacuation of residents in the flooded areas.
 2. Temporary shelter.
 3. Evacuation traffic and traffic related to road closures.
 4. Property and infrastructure damage.
 5. Loss of business revenue.
 6. Possible search and rescue operations.
 7. Possible shutdown of water treatment facilities.
 8. Possible contamination of water systems.
 9. Possible wastewater system overload.

III. Severe Weather (Cold Fronts – Thunderstorms)

1. Probability: Low to Moderate
2. Impact: Low to High
 - a. Planning Assumptions:
 1. Heavy rains, winds and other storm action can be common in Florida.
 2. Longboat Key does not have a high incidence of tornado activity.
 3. Tornadoes are common occurrences with thunderstorms. Florida has the second highest record of tornadoes in the United States.
 - b. Concerns Include:
 1. Possible area evacuation.
 2. Road blockage from debris.
 3. Temporary sheltering of small numbers of persons whose residences became significantly damaged by the storm or winds.
 4. The possible loss of water and/or sewer service.
 5. Power outages.

IV. Critical Infrastructure Disruption

1. Probability: Low to High
2. Impact: Low to High
 - a. Planning Assumptions:
 1. All components of infrastructure are vulnerable to damage and/or disruption.
 2. Outages of power, water, communications, and transportation should be anticipated.
 - b. Concerns Include:
 1. Lack of mobility due to blockage of streets.
 2. Priorities of repair crews for electric and communications.
 3. Back-up of computer systems.
 4. Call-back of employees for damage control.

V. Environmentally Sensitive Areas:

1. All federal and state lands are considered environmentally sensitive by the Florida Department of Environmental Protection, as are areas continuous with bays, canals, beaches, wetlands, and harbors.

VI. Flood Prone Areas:

1. For planning purposes, all of the Town of Longboat Key is considered flood prone by both Manatee and Sarasota Counties Departments of Emergency Management and lies within a Special Flood Hazard Area designated by FEMA FIRM maps, those areas subject to a 1% chance of a flood in any given year.

POPULATIONS VULNERABLE TO EACH HAZARD

I. Tropical Cyclone Events

1. The entire population of Longboat Key would be at risk. A category 3 hurricane would cause flooding of the most heavily populated portions of

the Town. A category 4 or 5 hurricane could cause severe flooding over the entire island and significant impacts from waves and storm surge.

II. Floods

1. The circumstances for Longboat Key are substantially different than mainland communities due to lower natural elevation, finished floor elevations of older pre-FIRM structures, and infrastructure at lower elevations.
2. Excessive flooding and standing water continue to add to the deterioration of Town streets. The Town's original storm water drainage system was not designed for any particular frequency of flooding. The Town is addressing existing flooding issues through planned studies as needed for storm water management.

III. Severe Weather

1. The entire population of Longboat Key is at risk.

KNOWN FLOOD HAZARDS

Storm Surge from Gulf of Mexico is the primary historical flood hazard. Tidal influence can affect areas along the beach, Sarasota Bay, Longboat Pass and New Pass. The Bay, Intracoastal Waterway (ICW) and nearby canals and tidal areas can also be impacted by the higher tide events. Most of the repetitive flood areas are along the northern reaches of the island and impact older slab on grade constructed houses, and especially those constructed prior to the Town entering into the national Flood Insurance Program in 1975. Depth of flooding depends on the strength of the tropical storm or hurricane, the effects of concurrent lunar tides, and the direction the storm as it impacts the region. Recent Tropical Storms of 2008, 2010, and 2012 caused tides recorded in some areas as much as 2 to 3 feet above normal high tide with the eye of the storm over 200 miles away. Along with these higher tides, six to seven foot breaking waves caused over-wash of the beach dune system, and resulted in flooding of some streets on the northern end of the island.

Hurricane and tropical storm watches are issued up to 72 hours in advance allowing residents, visitors and commercial property owners plenty of time to prepare if they take heed of them.

FLOOD HISTORY

October 24, 1921	Storm that originated in the western Caribbean Sea, produced high tides (approximately 7 feet) and wave action resulted in heavy damage throughout Sarasota County.
September 19, 1926	Unnamed hurricane resulted in flood damage of more than \$1 million. This was a 10-year storm in which it rained 8 inches in 24 hours.
June 26, 1943	7.48 inches of rain fell in 24 hours.
June 23, 1945	10.80 inches of rain fell in 24 hours.

September 10, 1960	Hurricane Donna resulted in flooding throughout the county. Tides ran more than 3 feet above normal, and rains totaled between 5 to 7 inches, and pre-storm rainfall of almost 10 inches contributed to flooding.
September 21, 1962	7.37 inches fell in 24 hours. Total storm rainfall over the three-day period was 13.83 inches. The storm caused flood damage to houses in Sarasota County.
October 1968	Unnamed storm that caused considerable flood damage.
June 18, 1972	Hurricane Agnes caused flood damage due to high tides and 5 inches of rain.
June 18, 1982	The "No Name Storm" brought 6 inches of rain and 60 mph winds to Sarasota County with little warning. The storm created high tides and structural flood damage.
Aug. 28 - Sept. 4, 1985	Hurricane Elena hovered over the west coast of Florida for six days and brought rainfall over 11 inches and required the evacuation of 37,000 people.
October 28, 1985	Hurricane Juan caused 25 to 35 foot swells in the Gulf and subsequent coastal flooding.
November 20, 1988	Tropical Storm Keith created tidal surges 4 feet above normal, rain and strong winds resulting in flood damage.
June 23, 1992	11 to 23 inches of rain fell within a 15-hour period throughout the county causing approximately 3,000 structures to suffer flood damage countywide.
June 23-26, 1993	Rain exceeded the 100-year, 24-hour storm event, 11.82 inches of rain falling in a 24-hour period.
July 18, 1995	Approximately 9 inches of rain fell within a 15-hour period and caused minor flood damage.
September 7, 1995	Rainfall of approximately 2 to 3 inches in one hour caused localized flooding. (NOAA National Climatic Data Center)
Nov./Dec. 1997	El Nino event caused 10 to 12 inches of rain to fall within 24 hours causing flooding throughout Sarasota County

August 12, 2000	Rainfall of 4 to 6 inches over 6 hours caused localized flooding of low roads.
September 15, 2001	Tropical Storm Gabrielle created storm surge and localized street flooding.

2004 season with 4 storms:

August 13, 2004:	Hurricane Charley, a Category 4 storm, strikes Punta Gorda. Due to the compact nature of the storm and the quick course change, the rain and wind impacts to the Town were minimal.
September 5, 2004:	Hurricane Frances, a very large, slow moving Category 2 storm. Although the eye did not impact the Town directly, several inches of rainfall caused some flooding and wind impacts within the island.
September 16, 2004:	Hurricane Ivan, a strong Category 4 storm, made landfall near Gulf Shores, Alabama. Although the storm remained west of the Town of Longboat Key, tidal influence topped several portions of the beach dune berm and beach erosion was experienced.
September 26, 2004:	Hurricane Jeanne caused minor flooding impacts due to rainfall and tidal influence although the landfall was on the East coast near Stuart.
October 24, 2005	Hurricane Wilma made landfall in Florida near Cape Romano and moved across the peninsula in less than 5 hours. The location of the landfall was far south of Longboat Key although due to winds, storm related waves and tidal influence Longboat Key suffered beach severe localized erosion on the southern end of the island.
June 2, 2007	Tropical Storm Barry made landfall near Tampa, dropping a few inches of rain and creating high surf conditions along the west coast of Florida, including Longboat Key.
August 19, 2008	Tropical Storm Fay made landfall in Florida south of Naples and moved northeast with rainfall amounts in excess of 20 inches on the east coast. Because of the path of the storm, there was minimal impact in Longboat Key.
June 26, 2012	Tropical Storm Debbie caused downed trees, localized flooding primarily on the northern end of Longboat Key and due to storm tides and wind driven waves cause significant erosion along major portions of the island.

June 7, 2016	Tropical Storm Colin skirted the west coast of Florida and caused heavy rain, high tides and wind driven waves causing overlapping of the coastal dune and erosion, causing impact and delays to the Town Truck Haul beach re-nourishment project.
September 1, 2016	Hurricane Hermine impacted the west coast of Florida, causing local impacts of wind driven debris removal, and coastal erosion to the degree the State and Town qualified for Federal Disaster Declaration. The Town was in progress of the New Pass Dredging project to place sand on the southern template of the island and had to initiate a Change Order to the contract for restoration of damages caused by the storm which qualified for FEMA re-imbursement.
September 10, 2017	Hurricane Irma entered Florida as a Category 4 storm on the west coast, south of Longboat Key, and caused severe damages for a Disaster Declaration for Florida. The Town ordered a mandatory evacuation for residents. The storm tracked up the middle of the state causing major power outages due to high winds and downed trees causing extensive debris removal. Heavy rain fall caused street flooding, however due to the track of the storm, only minor impacts occurred to the beach dune system.

SET GOALS, REVIEW POSSIBLE ACTIVITIES

GOALS AND OBJECTIVES

◆ Goals: Operating Principles

Goals have been established to guide the selection of specific flood protection activities that are recommended in this Plan.

- Protect lives and health
- Protect critical facilities and utilities
- Protect property from the hazards of flood, wind, storm surge, and rainfall.
- Minimize flood insurance costs to Town and property owners
- Flood damage prevention activities should be used to improve the environment, water quality, economic vitality and stability, and aesthetic quality of the Town.
- Protect the Natural and Beneficial Functions of the Town's floodplain.

These Floodplain Management Plan goals are supplemented by relevant goals from the Local Mitigation Strategy (LMS) as well as the Town of Longboat Key Comprehensive Plan, and Emergency Response Plans.

MITIGATION STRATEGY

The Town of Longboat Key participates with both Sarasota and Manatee Counties to prepare a Local Mitigation Strategy (LMS). The purpose of the countywide LMS is to establish a mitigation plan to reduce all types of disaster losses that may impact the Counties and their municipalities. The LMS process includes a working group of staff from various disciplines of each community to form a working group. This group compares scores and rank mitigation projects submitted. This list combines pre-disaster and post-disaster mitigation projects. All types of mitigation projects are covered, and not limited to flooding. For the purpose of the Floodplain Management Plan, only flood related goals and objectives within Town limits will be addressed.

Goal 1: Reduce Structural Flooding

Objective 1.1: The Town will assess repetitive loss areas and find ways to decrease the impact of coastal flooding through public outreach projects.

Goal 2: Reduce Flooding on Major Roadways and streets.

Objective 2.1: The Town will investigate opportunities to consider projects that reduce flooding to streets major roadways and evacuation routes.

Goal 3: Preserve natural habitats

Objective 3.1: The Town will undertake projects that reduce impacts to natural habitats while controlling flooding.

PREVENTIVE ACTIVITIES

The Town adopted a new Flood Control Ordinance, Chapter 154 Town Code on March 17, 2014, that specifies rules for development under the 2010 Florida Building Code. The Ordinance adopts by reference the most current Flood Insurance Rate Maps (FIRM). The Flood Control ordinance enforces permitting, certification and building requirements in order to avoid future repetitive losses and includes provisions for one foot of freeboard in all A Zones with 3 feet of freeboard required in all mapped flood zones seaward of the Coastal Construction Control Line.

All Town areas seaward of the Coastal Construction Control Line (CCCL) as approved by the state on July 18, 1978 are designated as Coastal High Hazard Areas and are required to meet regulations enforced by the Florida Department of Environmental Protection, National Flood Insurance Program (NFIP) as well as those of the new Flood Control Ordinance. The Coastal Zone Protection Act of 1985 and the Town Zoning Code dictates the set-back distance that structures are required to be from the established Erosion Control Line. Town Code also requires 3 feet of freeboard for construction within the Coastal Construction Control Line and development in the Coastal High-Hazard Areas, or as established by the "V" zones as defined by the Flood Insurance Rate Map (FIRM). New Digital FIRM (DFIRM) maps were adopted for Manatee County as part of the new Flood Control Ord. Chapter 154, and the Sarasota County portion of island DFIRM were adopted in November 2016.

Any construction permits that require an approved Environmental Resource Permit or Storm water Permit from the Southwest Florida Water Management District (SWFWMD) must have a Storm water Site Drainage Plan certified by a Professional Engineer. All sites are required by these permits to provide a yearly or bi-annual site inspection report completed and certified by a Professional Engineer. This inspection ensures that the stormwater system is being properly maintained. Any site that is neglected or not in compliance are reported to SWFWMD and if remain non-compliant can additionally be brought to the Town's code enforcement board.

All construction must conform to the latest adopted Flood Control Ordinance, Florida Building Code Standards, Subdivision Regulations, and Town Code Zoning standards. These regulations include required elevation, setback requirements, special infrastructure design, and prohibited uses.

Open space preservation is addressed in the Town's 2017 Comprehensive Plan. In the Plan's Goals, Objectives and Policies, it is states that the Town will maintain a minimum amount of open space within developments.

PROPERTY PROTECTION ACTIVITIES

Property protection and flood insurance awareness activities are achieved through public information notices. Annually, a Summer Newsletter is mailed to all residents within the Town Zip Code informing them of the flood hazard in the area and encouraging flood insurance purchase. All properties in the repetitive loss areas are also notified via an annual letter of their

options for flood insurance, retrofit, mitigation grant assistance and flood preparation. Individual property assistance is provided upon request.

PROTECT THE NATURAL AND BENEFICIAL FUNCTIONS OF THE FLOODPLAIN

Wetlands are reviewed as part of the construction plan process implemented by the Planning, Zoning and Building Department. The process ensures mitigation and confirms if other agency or Corps of Engineers permits are required and obtained. In 2008-09 the Town exercised an agreement with a local developer to create a two-acre wetlands project on Sister Keys and continues to maintain the island to a natural state.

EMERGENCY SERVICES

Hurricanes are the most common large-scale emergency situations that the Town must prepare for. The Sarasota and Manatee County Department of Emergency Management are the responsible authorities for developing and administering hurricane preparedness planning through the *Comprehensive Emergency Management Plans*. The plans establish uniform policy and procedures for coordination throughout the counties and all local governments in county limits. Select officials from the Town of Longboat Key are stationed at both Manatee and Sarasota County Emergency Operations Center (EOC) during emergencies. The Manatee and Sarasota County EOC's operate through a variety of technologically advanced systems, have access to on-line meteorological services, are equipped with an emergency satellite communication system, and can deliver television feeds to area communities. In May of 2020, the Town entered into Interlocal Agreements with Sarasota and Manatee Counties to base the Town's coordination of disaster response and recovery solely through Sarasota County. Additionally, the Town is partner in a Statewide Mutual Aid Agreement for Catastrophic Disaster Response and Recovery. If mutual aid is deemed necessary, the Town Manager will review, and he or the Town Commission will authorize specific requests. Mutual aid can also include cooperation from Federal entities.

Depending on the seriousness of the emergency, the Town of Longboat Key Incident Commander may choose a site for the Emergency Operations Center. The site may be a Mobile EOC (from where the incident is first managed), Mobile Command Vehicles (command post using VHF radio, cell phones and conference stations), a Primary (Fixed) EOC (at the Police Station), or Alternate (Fixed) EOC (at another critical facility). One of these options would be more likely for a localized rain event rather than a countywide hurricane event.

Prior to the arrival of a storm, the Town of Longboat Key Fire and Police Departments coordinate with the Sarasota and Manatee County Emergency Operations Centers and are charged with notification and orderly evacuation of citizens and visitors in the affected areas, and with establishing and monitoring evacuation routes. The Town Manager makes the decision whether or not to activate the Alert Longboat Key® system at this time as well, notifying residents and visitors of evacuations. Alerts are also sent to and issued by the National Weather Service and NOAA weather radio alerts. Residents and visitors that are told to evacuate are encouraged to find the shortest route to the closest open public shelter.

In the event that there is proper warning time before a storm, the Public Works department stocks sandbags. These sandbags are made available to the public, and depending on the state of emergency, these bags are prefilled by Utilities and Public Works employees and are available at the Broadway Beach Access overflow parking area.

Sarasota County Emergency Management Department utilizes an ARMS System, a virtual weather system that is linked to a satellite system and ultimately provides a picture of how much rain will fall in a specific area. There are 53 gauges in the network. The gauges function as an early warning system for storm related coastal surges and flooding. In 2009 the Town completed installation of a new SCADA system monitoring the Waste Water and Potable Water System. It also includes rainfall monitoring in three locations on the island, north, mid, and south, as well as a tide monitoring station in the mid-section on the bayside. This enables Public Works staff to utilize cell based smart phones to access current rainfall amounts with current tide event information in order to activate response procedures and provide earlier response initiatives to these events.

The Town has the capability to interact with our own and other agencies though an 800 MHz Trunk Radio System. With this system in place, communication between Town police, public works utilities, and emergency vehicles are possible. All Town department directors, supervisors and critical staff also carry smart cell phones and are able to communicate via e-mail and text as long as towers are still standing.

PUBLIC OUTREACH

Annually a letter is mailed to all Repetitive Loss Properties and other “like” properties within the areas to educate residents on flooding, the federal flood insurance program, flood safety, and possible grant funding opportunities.

The annual newsletter that is mailed to residents includes hurricane information that explains the evacuation process, flood safety and insurance, emergency numbers, and a list of supplies that should be stocked. This same information is included on the Town web site, and also includes links to other governmental emergency agencies that can provide additional information.

FEMA Flood Insurance Rate Maps (FIRM) are available in the Building Department. The flood zone boundaries can enable property owners, residents, developers, and insurance agents to determine what flood zone a specific property is located in. They can view these maps in person, or call and ask staff for information.

The Town is participating in the FEMA Risk Assessment Mapping and Planning Partners (RAMMP) program. It will include additional new survey, surge modeling data, and information to assist the Town in efforts to identify and reduce additional flood risk. The study will also include updated Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model data. The SLOSH model includes mapping that shows hurricane surge limits for all community residents.

Every year prior to hurricane season, the Town of Longboat Key, along with cooperation from the local Chamber of Commerce and news media, conducts a free hurricane seminar open for all residents to attend. The seminar is also announced to all residents via telephone as part of the Alert Longboat Key® test. Presenters included are the Sarasota and Manatee County Directors of Emergency Management, Town Manager and Town staff related to Hurricane preparedness and response, and typically a guest speaker relevant to the past Hurricane season impacts, response and recovery.

The Town also participates in the Sarasota County Floodplain Management Plan (FMP) committee to assist in restructuring the plan to better align with the current and future CRS manual requirements. The Town also has our own FPM Planning Committee and has an adopted 5-year effective Floodplain Management Plan of 2015, which will be required for updating in 2020. For additional CRS credit the Program for Public Information (PPI) was also implemented per the 2017 CRS manual.

Both the FMP and the PPI have been reviewed and scored by the Insurance Services Office (ISO) and approved as meeting requirements of the CRS manual. The documents will be an annex to the Unified Multi-Jurisdictional Local Mitigation Strategy (LMS). As part of the LMS, the documents will be re-adopted in 2021 based on the 5-year re-adoption schedule.

The Multi-Jurisdictional PPI Committee is comprised of government staff from all municipalities within Sarasota County including Longboat Key, unincorporated Sarasota County, the Sarasota Bay Estuary Program, and a cross-section of citizen stakeholders throughout the County

including realtors, insurance agents, mortgage lenders, Mote Marine, and other private citizens. These meetings are advertised through the Sarasota County calendar and all meetings are open to the public. A copy of the PPI is available through the Town Clerk's office.

◆ **Pre- and Post- Disaster Redevelopment Planning**

The projections made by the National Oceanic and Atmospheric Administration for hurricane activity through the next decade continue to indicate more activity expected in the eastern and western Gulf of Mexico than in years past. This makes the need for both preparedness and post-disaster redevelopment plans even more critical. As exhibited by the 2004 Hurricane Season through the 2014 Hurricane Season, flooding from both the large amounts of rain generated by the storms and especially storm surge, are recognized as the leading cause of property damages and deaths related to these catastrophic events. In the third week of August 2008, Tropical Storm Fay dumped over 30 inches of rain in several regions of Florida alone. During the 2012 storm season the Town was impacted by the passing of Tropical Storm Debbie (which struck the northeast as a hurricane) and received significant losses of beach sand erosion and dune over-wash. These types of storm events and rainfall related impacts can add to the quantity of property and infrastructure damages significantly above and beyond those caused by wind.

Additionally, recent data from international studies has suggested that due to Climate Change or other natural cyclical events, sea elevation rise has become a topic of critical concern, especially for long range planning purposes for coastal communities such as Longboat Key.

The Town continues to update all of its departmental policies and procedures for pre- and post-disaster planning and operations. Included in the primary objectives of these procedures is to prepare and respond to flooding events.

The Town annually conducts a complete review and update of all of its Emergency Preparedness and response plans including the Continuity of Operations, Continuity of Government, and incorporates National Incident Management System training of staff required by Presidential Order.

In support of the Town's pre- and post- disaster planning, it submitted revisions to its Comprehensive Plan to the Department of Economic Opportunity and received notice of compliance of the Plan formally adopted per Ordinance 2016-09 on July 5, 2017 and 2016-10 on December 5, 2016. This notice meets the provisions of Sections 163.3184, 163.3187, and 163.3189 of the Florida Statutes.

Included are the following items from the 2017 Comprehensive Plan, Conservation and Coastal Management Elements that pertain to Floodplain Management Planning:

◆ Conservation and Coastal Elements

Objective 3.1

The Town will reduce the potential for damage to structures within the Coastal High Hazard Area (CHHA).

Strategy 3.1.2.1

The Land Development Code shall encourage the relocation, removal, or replacement of existing non-compliant structures in V-Zones, or seaward of the CCCL to safer locations.

Strategy 3.1.2.3

The Town will collaborate with federal, state and other agencies to inform property owners of buy-out programs for structures subject to repetitive damage.

Strategy 3.1.1.2

Encourage property owners to retrofit structures with storm resistant materials. Ensure that the Land Development Code and other codes do not unreasonably impede the retrofitting of structures for storm resistance.

Strategy 3.3.1.1

The Long-Term Post-Disaster Redevelopment Plan shall require that reconstructed properties be brought into compliance with the Florida Building Code, FEMA requirements and the Land Development Code to the extent practicable.

Strategy 3.1.2.1

The Land Development Code shall encourage the relocation, removal, or replacement of existing non-compliant structures in V-Zones, or seaward of the CCCL to safer locations.

Strategy 3.1.2.2

The Land Development code shall require that existing structures damaged in excess of 50% of value may rebuild only in accordance with local, state and federal regulations.

Objective 3.3

Prepare and maintain post-disaster redevelopment plans and programs.

Policy 3.2.3

Develop, Maintain, and apply a Short-Term Post-Disaster Redevelopment Plan.

Strategy 3.2.3.2

The Short-Term Post-Disaster Redevelopment Plan shall facilitate and accelerate short term recovery efforts to repair and restore structures and facilities that are potential public health, safety or welfare hazards.

Policy 3.3.1

Develop and maintain a Long-Term Post-Disaster Plan.

Strategy 3.3.1.3

The Land Development Code shall specify that legally nonconforming structures, buildings and uses that are substantially damaged by natural disaster or involuntary action by more than 50%, may be reconstructed to the same number of units in existence prior to the casualty.

Policy 3.2.1

Collaborate with Sarasota County, Manatee County, municipalities, and other public and private entities to identify safe shelters during hurricane events.

Objective 2.1

Invest in infrastructure that supports land uses and intensities prescribed by the Future Land Use Element.

Policy 2.1.3

Minimize public infrastructure investment in the federally designated FEMA V-Zone.

Strategy 2.1.3.1

Limit capital expenditures for roads, potable water, wastewater, stormwater and other public infrastructure in the FEMA V-Zone.

Strategy 2.1.3.2

Public infrastructure within the FEMA V-Zone, that is deemed necessary, shall be sited to avoid potential breach areas.

Strategy 2.1.3.3

Prohibit new infrastructure seaward of the state CCCL except where expressly permitted by the FDEP.

Strategy 2.1.3.4

Expend funds for the protection, replacement or renewal of existing public infrastructure in accordance with the Comprehensive Beach Management Plan.

Included is the following item from the 2017 Comprehensive Plan, Future Land Use Elements that pertain to Floodplain Management Planning:

◆ Future Land Use Element

- Policy 1.2.1 Proposals for development within the floodplains will be approved only if significant alteration of the functions of the floodplain will not occur (i.e., no increase in flood hazards should be permitted) and if the proposed development is consistent with the regulations of the appropriate agencies regulating development within floodplain areas.

ACTION PLAN

The Floodplain Management Plan contains an Action Plan that identifies those mitigation actions appropriate to the community's resources, flood hazards, and vulnerable properties. These are incorporated with the goals and initiatives associated with the Local Mitigation Strategy.

◆ **Current Activities**

These activities were originally reported to the Town Commission September 15, 2014 Regular Workshop Meeting and have been incorporated through the Floodplain Management Plan Committee process in 2015, the final submitted plan was adopted by the Town Commission via Resolution on October 5th 2015. The current updates to the adopted strategies are referenced herein for the 2020 updates to the Floodplain Management Plan, and will be reported on annually to the Commission for progress. The Floodplain Management Plan Committee will meet quarterly to review, monitor and evaluate implementation of the Plan changes for inclusion in the annual reports.

Preventive Strategies

- Development Review – Planning Zoning Building Department (PZB): The Town continues to enforce FEMA regulations and standards through its building and zoning departments and local ordinances.
 - STATUS: The Town adopted a revised Flood Ordinance recommended by the State of Florida for concurrence with the 2017 Florida Building Code. This Town Ordinance, No. 2013-25 replaced the Town Code Chapter 154, Flood Protection Ordinance in entirety and was adopted taking effect March 17, 2014. This adoption process was concurrent with the NFIP compliance review and formal adoption of the FEMA Digital Flood Insurance Rate Map for the Manatee County portion of the island effective the same date. Per Town Code of Ordinances Chapter 150.01, the current version of the adopted 2017 Florida Building Code includes provisions for National Flood Insurance Program (NFIP).
 - The Town adopted Ordinance 06-09, Reconstruction of Non-conformities, to require that all structures be brought into compliance with the State of Florida Building Code, FEMA requirements, and local flood control regulations.
 - RECOMMENDATIONS: Monitor status of 2020 Florida Building Code (effective January 1, 2021) changes and potential adoption of International Codes. Continue with the annual public outreach and education programs for understanding of all applicable local, state and federal codes as they pertain to floodplain management principals.

Long Range Planning – (PZB): The Town has adopted by Resolution 2011-13 a Vision Plan. The following are specific goals relating to floodplain management.

- Develop and participate in sustained policy efforts at state and federal levels to develop property and disaster insurance alternatives for coastal communities that help those communities remain economically viable.
- Increase public education and information on public safety, particularly disaster issues
- Maintain the high level of readiness for disaster response
- Continue to participate with other governments in cooperative efforts to protect and restore Sarasota Bay

- Periodically examine the beach management program as needed, including regional cooperation
 - Seek opportunities to purchase open space for public use, with public input, as to features, uses, and costs
- STATUS: The Town's plan is in process, including potential amendments to the Town's Comprehensive Plan.

In October 2013 the Town had a community study done by the Urban Land Institute (ULI). The ULI Advisory Services Panel report did an analysis of the existing conditions in the Town and its future. The ULI study made the following specific listed recommendations in regards to climate adaptation and coastal resiliency:

- Research and understand new flood insurance.
 - Reestablish, maintain, and promote native vegetation along the coastline.
 - Implement planning management tools such as setbacks and buffers, and zoning plus development regulations and incentives.
 - Improve access to education and information, particularly through coastal monitoring systems, advisory notice, and evacuation plans.
 - Coordinate neighborhood plans with city and regional strategies.
 - Link outcomes of site analysis, vulnerability assessment, and resilience enhancement to the waterfront planning process.
 - Adopted revisions to the Comprehensive Plan including Coastal Conservation Elements, Recreational Open Space and new Sustainability Elements to be accomplished by the spring of 2016.
- RECOMMENDATIONS:
- Follow through with the adopted Vision Plan and recommendations of the ULI Study.
 - Track progress quarterly on an annual basis. Continue to look for opportunities for conserving open space within the Town's boundaries through its land use and zoning regulations.
- Local Mitigation Strategy (LMS) – All Participating Town Departments: The Town continues to participate in the LMS process for hazard mitigation initiatives and projects.
- STATUS: Staff continues participation in scheduled meetings with both Sarasota and Manatee counties. The Sarasota LMS Working Group includes the area jurisdictions of the cities of Sarasota, Northport, Venice, The Town of Longboat Key, and Sarasota County. The Manatee County LMS Working Group includes the county, Anna Maria, Holmes Beach, Bradenton Beach, Bradenton, Palmetto, Longboat Key and the Tampa Bay Regional Planning Council. One purpose of the LMS is to provide consistency of flood-plain management issues within participating communities. The LMS also provides participating communities in the Community Rating System, a platform for coordinating the updating of the FEMA Flood Insurance Rate Maps and Risk Map Analysis initiative.

- **RECOMMENDATIONS:** Continue Town involvement with coordination between the Town and the two county LMS plans. Continued participation in LMS Working Group with reaching goals and objectives identified by the group. The process of updating each county LMS is anticipated to be completed by the spring of 2021
- Community Rating System (CRS) – PZB – Public Works Dept. (PW): The Town continues to participate in the NFIP/CRS program.
 - **STATUS:** Staff completed the process of the previous 5-Year CRS Verification Visit by ISO and received the results of the Verification Visit on November 23, 2015, with an upgrade from Class 6 to a Class 5 Community based on the then effective CRS Coordinators Manual of 2014. The final score under that review was 2550 points. Policies effective May 1, 2016, provided for a total 25% discount to all applicable NFIP flood insurance policy holders until May 1, 2020. The Town recently completed the 3rd year Cycle Verification (required as a Class 5), in June of 2019. The Town of Longboat Key score was 2106 points, a one class retrograde to a Class 6. The reduced scoring was based on the 2017 CRS Coordinators Manual, and reductions were primarily due to revisions in two activity scoring opportunities; Activity 450 Stormwater Management and Activity 540 Drainage System Maintenance. Policies in effect from May 1, 2020 to current date receive a 20% discount as a Class 6 Community.

The Town is currently responding to an ISO/CRS, nationwide, initiative to reduce flood losses in manufactured home parks. As a result, the Town will need to consider modifying the current Town Flood Protection Ordinance, Chapter 154, to eliminate the exemption of manufactured home elevations at three feet above adjacent grade. The modification would require elevations to follow Town-established Freeboard, +1-foot to +3-feet above Base Flood Elevations, established by effective FIRM, Florida Building Code, or Coastal Construction Control Line requirements, enforced by Florida Department of Environmental Protection.

- **RECOMMENDATIONS:** Staff continue to work with Insurance Service Office and FEMA Region IV to maintain Town's CRS rating and required activities. Staff will also bring a recommendation to the Town Commission in regards to necessary or desired modifications to Town Flood Protection Ordinance, Chapter 154.

■ Property Protection

- Education of Repetitive Loss Property Owners – PW-PZB: Annual outreach through Town newsletter.
 - **STATUS:** An educational outreach letter to each repetitive loss property is mailed out annually. Information included are any changes in NFIP policy status and notice of funding for Grant programs, including Repetitive Loss and Severe Repetitive Loss properties. Additionally, the Town mails an annual Summer Newsletter, prior to the hurricane season, to all addresses within the Town Zip Code. Information included

flood awareness, flood safety, property protection methods, and hurricane preparedness and response information.

The Town also participates in the Sarasota County Floodplain Management Plan (FMP) committee to assist in restructuring the plan to better align with the current and future CRS manual requirements. The Town also has our own FPM Planning Committee and has an adopted 5-year effective Floodplain Management Plan of 2015, which will be required for updating in 2020. For additional CRS credit the Program for Public Information (PPI) was also implemented per the 2017 CRS manual.

Both the FMP and the PPI have been reviewed and scored by the Insurance Services Office (ISO) and approved as meeting requirements of the CRS manual. The documents will be an annex to the Unified Multi-Jurisdictional Local Mitigation Strategy (LMS). As part of the LMS, the documents will be re-adopted in 2021 based on the 5-year re-adoption schedule.

The Multi-Jurisdictional PPI Committee is comprised of government staff from all municipalities within Sarasota County including Longboat Key, unincorporated Sarasota County, the Sarasota Bay Estuary Program, and a cross-section of citizen stakeholders throughout the County including realtors, insurance agents, mortgage lenders, Mote Marine, and other private citizens. These meetings are advertised through the Sarasota County calendar and all meetings are open to the public. A copy of the PPI is available through the Town Clerk's office.

- **RECOMMENDATIONS:** Continue to improve the Town's formal outreach program to inform Repetitive Loss property owners of options for mitigation and funding. Continue to include updated information about the NFIP Insurance.
- Enforcing New Construction and Renovation Standards – PZB
Continuously enforce the current 2017 Florida Building Code edition as adopted by State Statute. The 2020 Florida Building Code will go into effect on January 1, 2021.
 - **STATUS:** Building inspectors and plans examiners continue their review of the current Florida Building Code (FBC) and any Amendments. Staff attends scheduled opportunities to maintain Continuing Education requirements for Building Officials, Building Inspectors, Plans Examiners, Code Enforcement and Certified Floodplain Managers.
 - **RECOMMENDATIONS:** Educate contractors and the public as to any changes in the FBC and Amendments with emphasis on flood protection techniques and requirements by including in annual outreach meetings.
- Conduct public outreach programs – PZB – PW.
 - **STATUS:** Every year prior to hurricane season, the Town of Longboat Key, along with cooperation from the local Chamber of Commerce and news media, conducts a

free hurricane seminar open for all residents to attend. The seminar is also announced to all residents via telephone as part of the Alert Longboat Key® test. Presenters included are the Sarasota and Manatee County Directors of Emergency Management, Town Manager and Town staff related to Hurricane preparedness and response, and typically a guest speaker relevant to the past Hurricane season impacts, response and recovery.

- **RECOMMENDATIONS:** Continue to hold at minimum annual basis public forums and investigate opportunities for additional public outreach and utilize the local press to educate the public. Support the required maintenance of the Floodplain Management Plan Committee (Quarterly).

■ **Natural Resource Protection**

- Sarasota Bay Estuary Program – PZB-PW

The Town is a member and provides financial support to the Sarasota Bay Estuary Program to enhance the preservation and/or creation of the local floodplains and wetlands.

- **STATUS:** Continuing to support wetland protection in Sarasota Bay.
- **RECOMMENDATIONS :** Continue current support, investigate opportunity for restoration and protection of wetlands, Natural Beneficial Functions of the floodplains and preservation of Open Space. Continue Town representation at regularly scheduled meetings on the Policy, Technical and Citizen Committees for the Sarasota Bay Estuary Program.

- Town Wetlands Protection and Restoration – PZB-PW

- Durante Park, Phase Four project
- Sisters Key Restoration Project
- Lyons Lane Restoration Project
- Quick Point Nature Preserve
- Greer Island

- **STATUS:** The wetland mitigation project on Sister Keys Completed in August 2008 has completed the five-year permit required monitoring and maintenance program.
- **RECOMMENDATIONS:** Continue to monitor restoration projects efforts in all Parks and on Sisters Key. Investigate additional opportunities for Public Outreach and Education as to Natural and Beneficial Functions of the floodplain and preservation of open space at minimum on an annual basis, or at quarterly Floodplain Management Plan committee meetings.

- Beach Renourishment Projects – PW

- In the summer of 2006, the Town completed an island-wide major beach renourishment project, which provided additional shoreline and dune protection.

- STATUS:
 - ◆ Most recent island wide Beach Restoration was completed in November 2016. This project included placing sand in the central sections of the island by way of truck-haul and the north and south sections by dredging Longboat Pass and New Pass, respectively.
 - ◆ The Town updated the Comprehensive Beach Plan on October 1, 2019.
 - ◆ Two Permeable Adjustable Groins were constructed at the Islander Club in 2009-10. An Interim renourishment was completed for the North end, Reach 1, of the island in July of 2011. The Town has obtained permits and is initiating a project, in the fall of 2020, to supplement protection to the north end of the island with five additional rock revetment groins, including placement of additional sand.
 - ◆ The Town is in process of additional island-wide renourishment projects in 2021-2022.
- RECOMMENDATIONS: Continue to maintain and monitor existing beach conditions and plan for future renourishment projects and sand sources. Continue to follow the recommendations of the 2019 Beach Comprehensive Management Plan. Investigate additional opportunities for Public Outreach and Education on Natural and Beneficial Functions of beach renourishment and protection of marine species (Turtles, Shore Birds).

■ Police and Fire Departments Emergency Services

- Enhance the early-warning systems – Police (PD) and Fire (FD) Departments
 - To provide the earliest warning of weather conditions to all residents, commercial owners, and Town employees.
- STATUS: Conversion from the Town’s CodeRED to the new “Alert Longboat Key” automatic phone notification system occurred in 2020. The Town is now promoting participation through the Town’s website and local newspapers. The Town updates on an annual basis the Town of Longboat Key Hurricane Plan.
- RECOMMENDATIONS: Investigate further opportunities for improvements to and use of latest technologies for communications and early warning coordination. Coordinate with Sarasota and Manatee Counties’ EOC communication systems and insure requirements can be met to provide for opportunity to continue eligibility for CRS Activity 610 reporting. Insure participation on Early Flood Warning during annually scheduled Hurricane Exercises and actual storm events.
- Enhancement of the evacuation program for residents including Special Needs residents. - FD
 - STATUS: The Special Needs Evacuation lists are updated annually on the county and local levels.

- RECOMMENDATIONS: Monitor progress of improvements and maintenance of evacuation routes through participation in the monthly Metropolitan Planning Organization and Fla. Dept. of Transportation. Maintain lists on an annual basis.
- Continued Participation in Manatee County Disaster Preparedness Planning Committee (DPPC) – All participating Town Departments
 - STATUS: Participation is ongoing.
 - RECOMMENDATIONS: Attend regularly scheduled monthly meetings and provide input through the committee process to include available information to improve public outreach and education for floodplain management programs.

■ Structural Projects/Capital Improvements

- Town-wide storm water system improvements – PW
 - STATUS: The Town includes an annual review, in all budget year preparations, an analysis of storm water system conditions. The Town is in progress of conducting specific reviews and analysis of storm water system conditions, including areas in the Village, Sleepy Lagoon, and other low-lying areas within the Town. Additionally, as a supplement to the Sea Level Rise Analysis underway, all storm water systems are being studied. A subsequent report will provide information and recommendations to move forward with design and potential future projects for improved storm water services in the upcoming budget years.
 - RECOMMENDATIONS: Implement recommendations from the reports as they become available. Continue appropriate maintenance of systems, including installation of valves to reduce the impact of tidal waters.
- Continue comprehensive 5-year Public Works projects for Water and Wastewater facilities. – PW
 - STATUS: Construction improvements to harden water and sewer plants have been completed. A new sub-aqueous water main crossing of Longboat Pass for insurance of maintained water supply from Manatee County was completed in April 2015. An additional sub-aqueous main connection to Sarasota County has been completed. Replacement of the sub-aqueous wastewater force main to Manatee County is in the accelerated planning stages.
 - RECOMMENDATIONS: Complete improvements as identified through the planning, design and construction phases. Continue to fund and complete projects in annual budget cycle process.
- Fire Station Improvements – PW/Fire Department

- STATUS: As a result of a funding referendum, the Town is moving forward with Fire Station improvements, to include:
 - Demolition and replacement of the south Fire Station, 92. Improvements will include elevation of the station to +2-feet above current NFIP-FIRM;
 - North Fire Station, 91, renovations to include improvements to harden facility from impacts of wind.
- RECOMMENDATIONS: None.

Public Information

- Floodplain Management Plan Updates and Evaluations - PZB, PW
 - STATUS: In progress.
 - RECOMMENDATIONS: Complete the process by of the current Floodplain Management Plan Committee review for the required modification and adoption before the beginning of October, 2020. Complete process for scoring under the current version of the CRS Coordinator Manual implemented in 2017. Continue participation of the committee for the effective application of the adopted plan for the 5 Year Cycle Verification visit and schedule quarterly meetings in the future to maintain current CRS Classification 6. Continue participation in the Sarasota County FPM/PPI Committees.
- Public Education Program: PW – PZB
 - STATUS: Ongoing.
 - RECOMMENDATIONS: Maintain current activities and investigate other venues for educating the public and construction industry. Continue with the development of a permanent Floodplain Management Plan Committee and schedule quarterly meetings. Include regularly scheduled presentations on a minimum annual basis at various town Homeowners/Condominium Association meetings.

ADOPT, IMPLEMENT, EVALUATE AND REVISE

◆ Summary: Monitoring and Evaluation

PLAN MAINTENANCE

The Floodplain Management Plan will be monitored by the Public Works and Planning, Zoning and Building Departments as part of the regular status report procedures. The Departments will also be responsible for overseeing the implementation of the action plan activities in regards to developing and monitoring necessary budgets, developing a monitoring potential structural mitigation projects, and monitoring the progress of the Floodplain Management Plan Committee.

The Floodplain Management Plan Committee will meet quarterly to review, monitor and evaluate implementation of the Plan. As a result, the Floodplain Management Plan will be updated annually by the Town Planner, CRS Coordinator, Building official, and the Floodplain Management Plan Committee Members. The Plan will be submitted and reviewed by appropriate Town departments and Local Mitigation Strategy Committee members. The update will include an overview of this original plan, and provide status reports on projects and any revisions to the plan. Any recommendations or changes will be included in an annual update to Town Commission and made available to the public prior to October or May 1st of each year. The annual report will be available to the public and released to the media. The overall plan will be updated every five years in conjunction with the Community Rating System recertification process.