

TAYLOR ENGINEERING, INC.

Venice Stormwater Projects Update

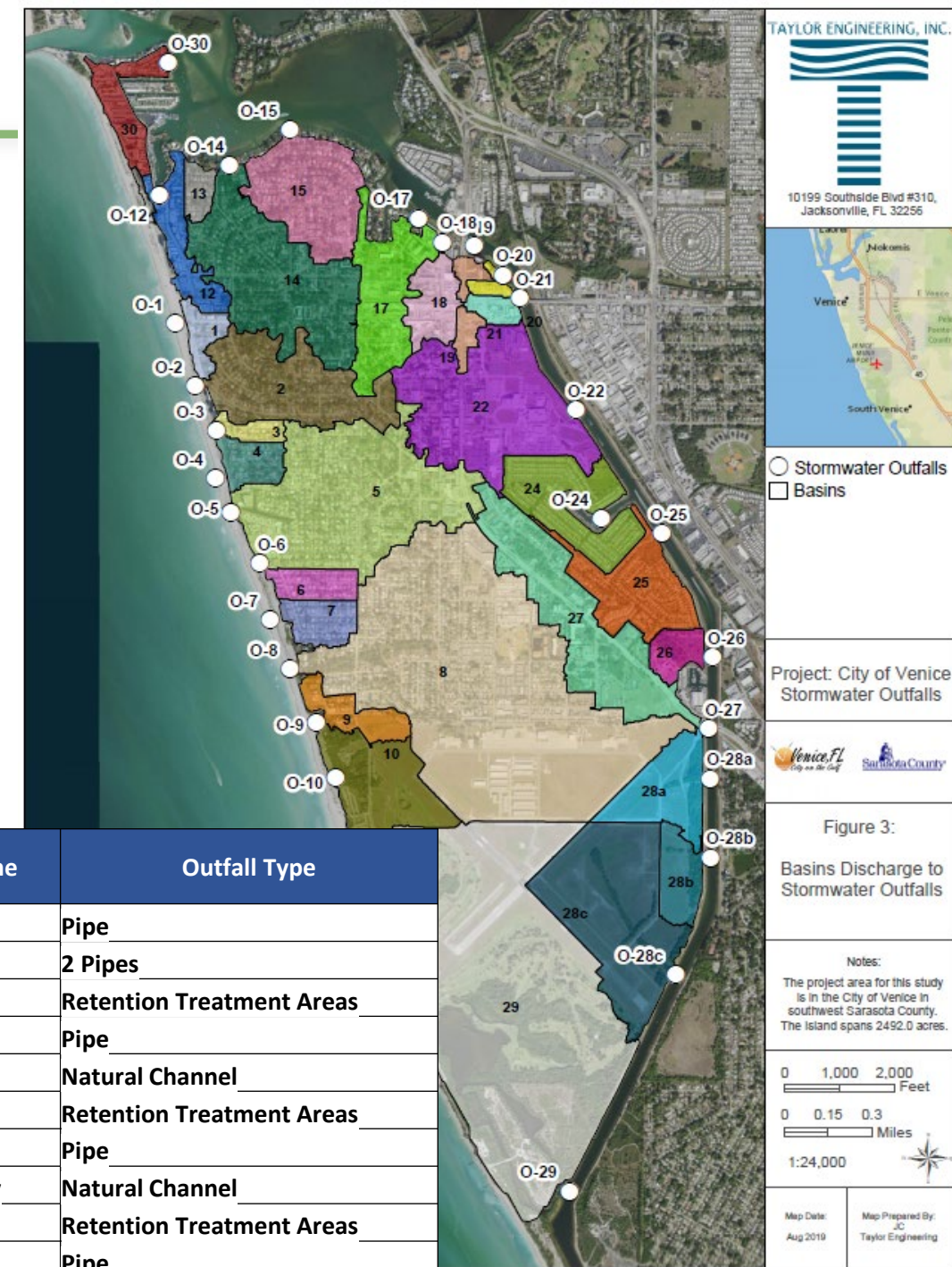


June 8, 2021

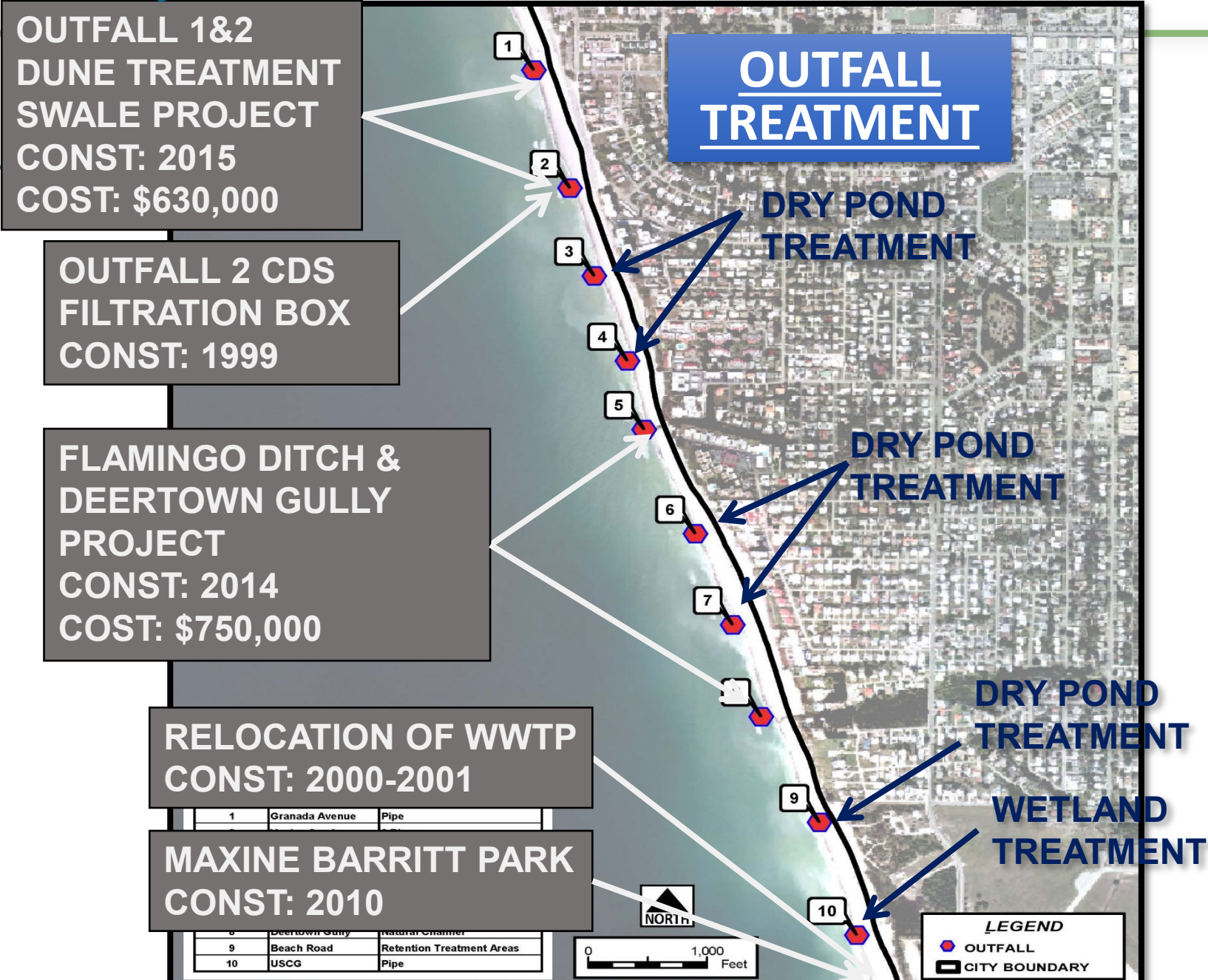
Agenda

- Introductions
- Overview and Outfall History
- SIMPLE Modeling – 28 outfalls
- Initial Sampling – 16 outfalls
- Priority Outfall Monitoring
- Model Calibration
- Preliminary Priority Projects
- Target Schedule
- Next Steps

Outfall Number	Outfall Name	Outfall Type
1	Granada Ave	Pipe
2	Venice Sands	2 Pipes
3	Gulf Manor	Retention Treatment Areas
4	Aldea Mar	Pipe
5	Flamingo Drive	Natural Channel
6	Spadaro Drive	Retention Treatment Areas
7	Darling Drive	Pipe
8	Deertown Gully	Natural Channel
9	Beach Road	Retention Treatment Areas
10	USCG	Pipe

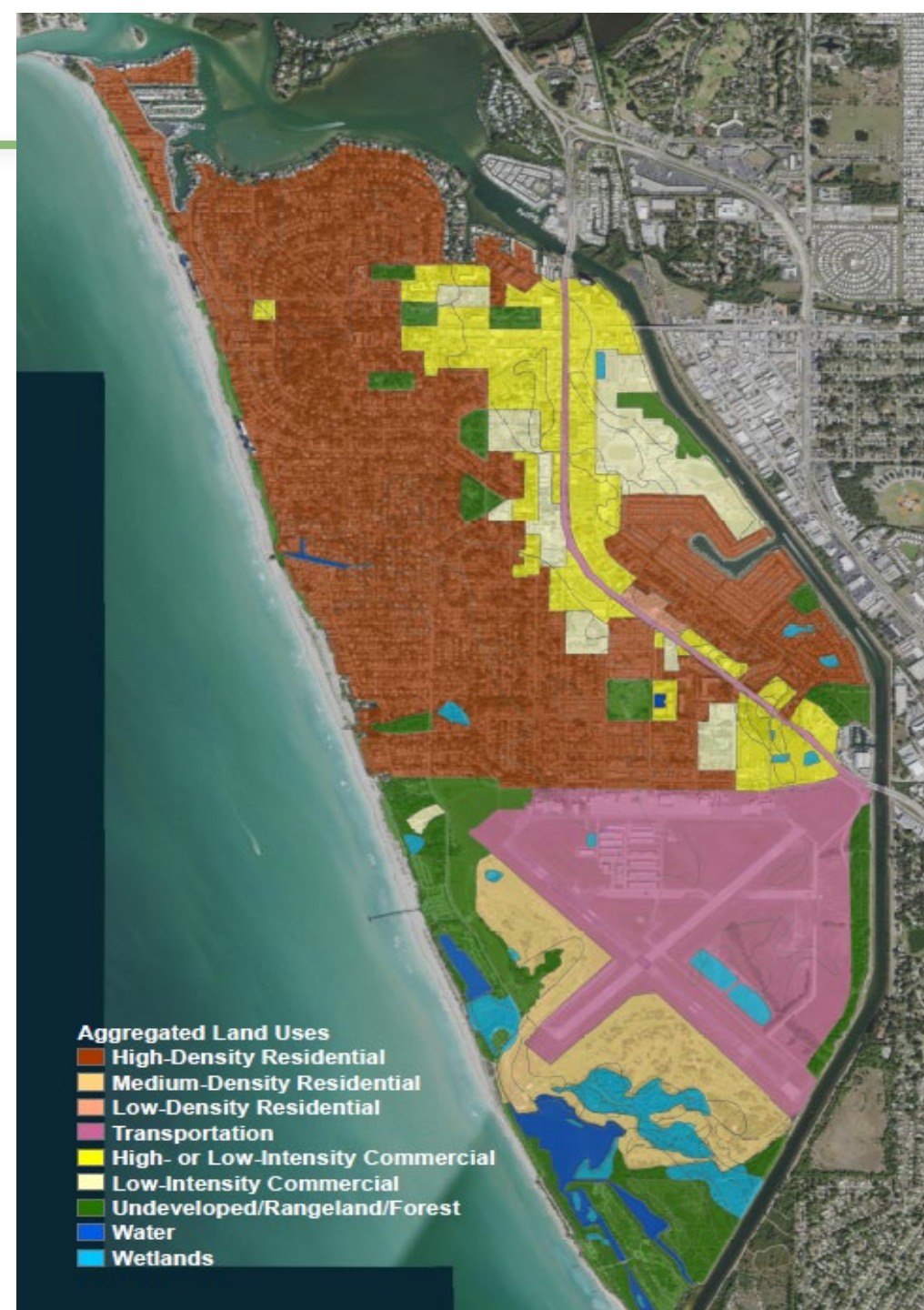


City Project History



Water Quality Model Inputs

- SIMPLE model – calc pollutant loads from surface water runoff
- Estimated annual loads for the following constituents:
 - Total Suspended Solids (TSS)
 - Total Nitrogen (TN)
 - Total Phosphorus (TP)
 - Fecal Coliform (FC)
- Identified Land Use and Event Mean Concentrations for each basin
 - 42% High-density residential,
 - 18% highway/transportation,
 - 15% low-intensity commercial,
 - 12% undeveloped rangeland/forest,
 - 7% med-density residential
- Identified septic tanks within direct runoff model



Water Quality Model Results

- Constituent loads per catchment basin and sub-basin
- Reported as direct runoff, septic system loads, and sub-total load
- Annual total load (lb/yr)
- Est. annual total loads normalized over catchment area (lb/ac/yr)

Table 7 Watershed Annual Total Loads by Source

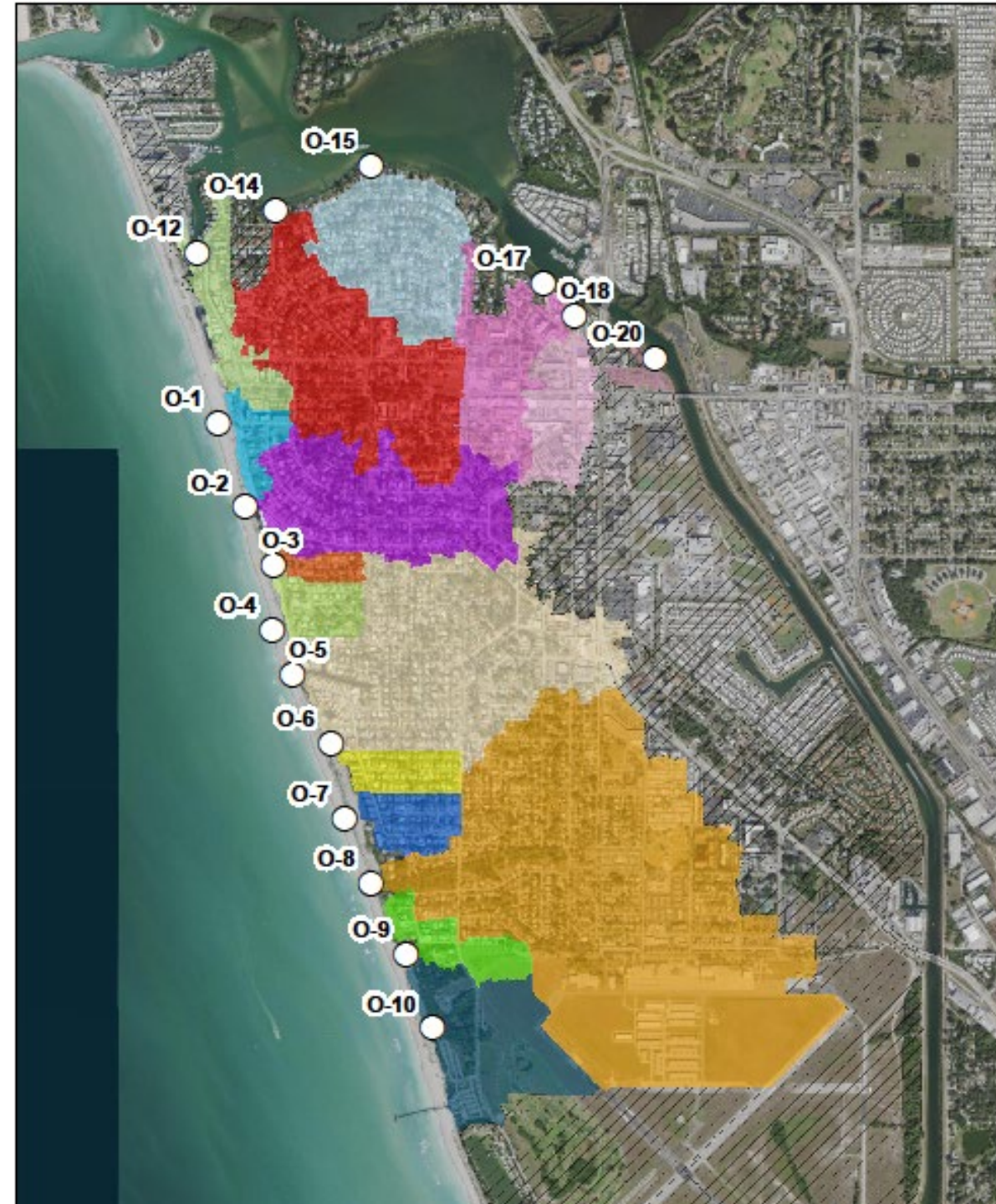
	Direct Runoff		
	Direct Runoff (lb/yr)	Septic Tanks (lb/yr)	Total (lb/yr)
TSS	1,386,355	240	1,386,595
TP	2,784	18	2,801
TN	14,866	513	15,379
FC	957,760	1,116,027	2,073,787

Annual Total Load (lb/yr) for Stormwater Outfalls											
Outfall	TSS	% Total	Outfall	TP	% Total	Outfall	TN	% Total	Outfall	FC	% Total
8	286,204	21%	8	550	20%	8	3,039	20%	27	389,039	19%
29	195,199	14%	5	348	12%	29	1,781	12%	8	265,123	13%
5	154,703	11%	29	278	10%	5	1,759	11%	13	250,688	12%
14	104,150	8%	14	231	8%	14	1,163	8%	29	248,045	12%
22	95,202	7%	22	214	8%	22	1,089	7%	21	169,675	8%
27	79,514	6%	27	181	6%	27	1,085	7%	10	164,842	8%
2	68,191	5%	2	154	5%	17	780	5%	17	101,914	5%

Annual Total Load (lb/ac/yr) for Stormwater Outfalls											
Outfall	TSS	% Total	Outfall	TP	% Total	Outfall	TN	% Total	Outfall	FC	% Total
19	1,309.2	8%	21	3.0	8%	21	21.0	10%	13	20,991.3	39%
21	1,169.9	7%	19	2.7	8%	13	17.8	9%	21	16,674.0	31%
18	1,168.1	7%	20	2.5	7%	19	14.3	7%	27	3,242.2	6%
20	1,051.5	6%	18	2.4	7%	20	12.4	6%	10	2,178.3	4%
17	936.4	6%	17	2.2	6%	18	12.1	6%	17	1,455.3	3%
30	911.4	6%	13	2.0	6%	17	11.1	6%	19	1,181.0	2%
12	831.3	5%	12	1.9	5%	30	9.7	5%	20	682.8	1%
5	786.1	5%	30	1.9	5%	12	9.6	5%	18	605.6	1%
14	752.2	5%	5	1.8	5%	27	9.0	4%	8	593.7	1%
15	711.8	4%	14	1.7	5%	5	8.9	4%	12	523.7	1%
4	711.5	4%	15	1.6	5%	14	8.4	4%	29	512.6	1%
13	710.6	4%	2	1.6	4%	15	8.1	4%	5	500.0	1%
2	704.1	4%	24	1.5	4%	2	8.0	4%	30	498.7	1%
26	683.3	4%	27	1.5	4%	24	7.7	4%	14	446.0	1%
27	662.7	4%	4	1.5	4%	4	7.5	4%	28a	435.1	1%
24	655.0	4%	22	1.4	4%	22	7.1	4%	15	433.4	1%
8	640.9	4%	8	1.2	3%	8	6.8	3%	22	428.6	1%
22	621.6	4%	26	1.1	3%	26	6.0	3%	2	428.6	1%
29	403.4	2%	29	0.6	2%	29	3.7	2%	24	425.3	1%
28a	324.0	2%	25	0.5	2%	10	3.1	2%	4	384.4	1%
25	250.9	2%	28a	0.3	1%	25	2.7	1%	28b	272.1	1%
28b	225.9	1%	10	0.3	1%	28a	2.5	1%	26	258.2	0%
10	137.9	1%	28b	0.2	1%	28b	1.6	1%	28c	183.5	0%
28c	121.6	1%	28c	0.1	0%	28c	1.0	0%	25	141.3	0%
1	14.9	0%	7	0.0	0%	7	0.2	0%	7	9.2	0%
3	14.4	0%	6	0.0	0%	6	0.2	0%	6	9.0	0%
6	14.2	0%	3	0.0	0%	3	0.2	0%	3	8.7	0%
7	14.1	0%	1	0.0	0%	1	0.1	0%	1	6.1	0%
9	10.2	0%	9	0.0	0%	9	0.1	0%	9	3.8	0%

Grab Sample Collection

- 16 Major Outfalls
- Nutrients, solids, bacteria, field parameters
- Two storms
- 10 samples



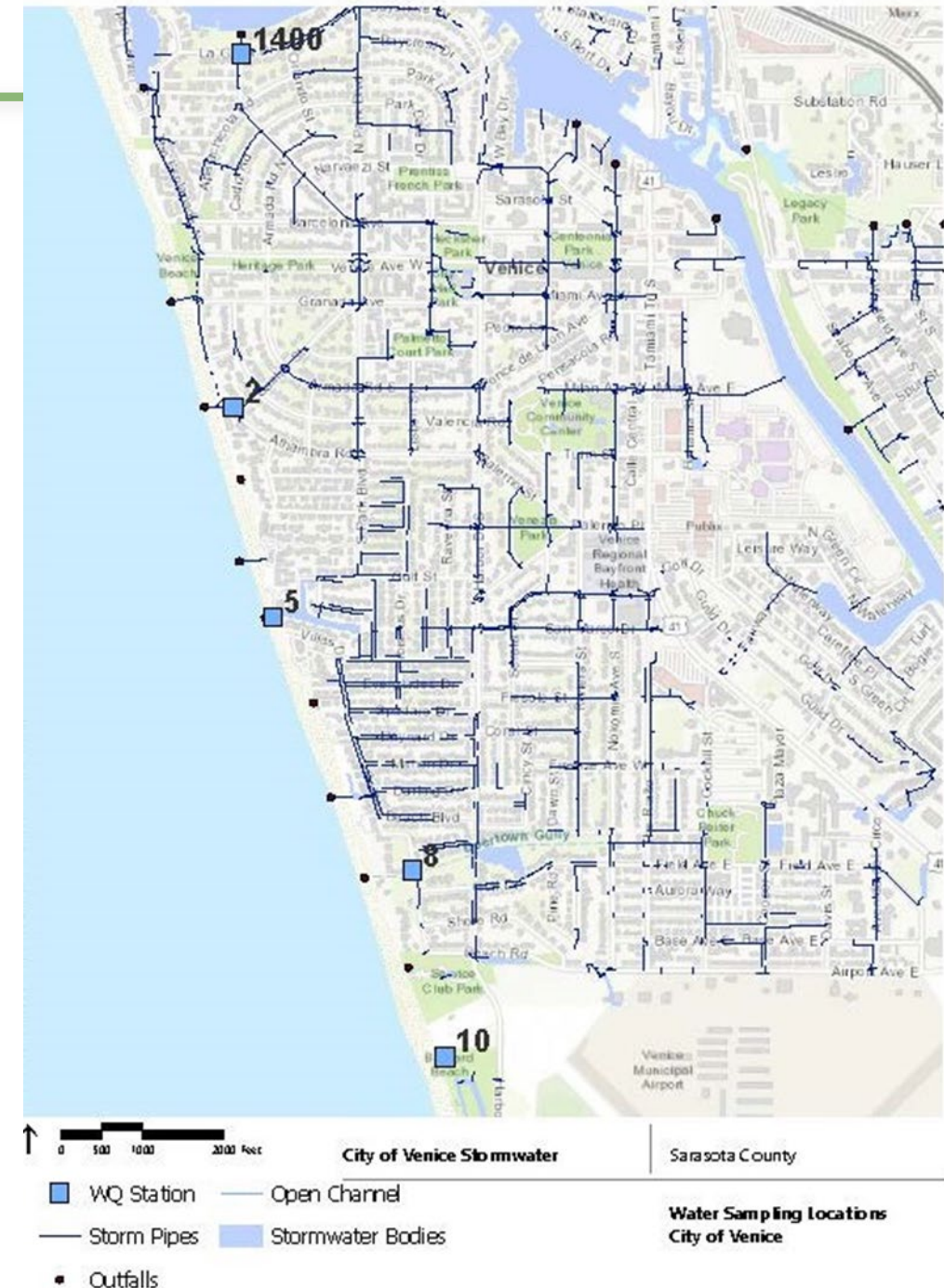
Initial Grab Sampling Results

- Meet State water quality stream standards for nutrients
- Exceed State water quality estuarine standards for nutrients
- Bacteria exceed both freshwater and estuarine standards
- High total suspended solids and turbidity at Outfall 1800



Storm Event Monitoring

- Outfalls 2, 5, 8, 10, & 1400
- Stage & discharge
- Rainfall
- Nutrients, solids, bacteria, field parameters
- June 1 to December 7, 2020
- 16 storms
- 6 to 10 samples per outfall



Monitoring Equipment

- Shelter, solar panel & rain gauge
- ISCO autosamplers – flow-weighted composite sample
- Velocity meter
- Modem
- Data sonde



Discharge Results

- Complicated by tidal influence and blockage
- Generally aligned with modeled discharge
- Secondary source of water at Outfall 2



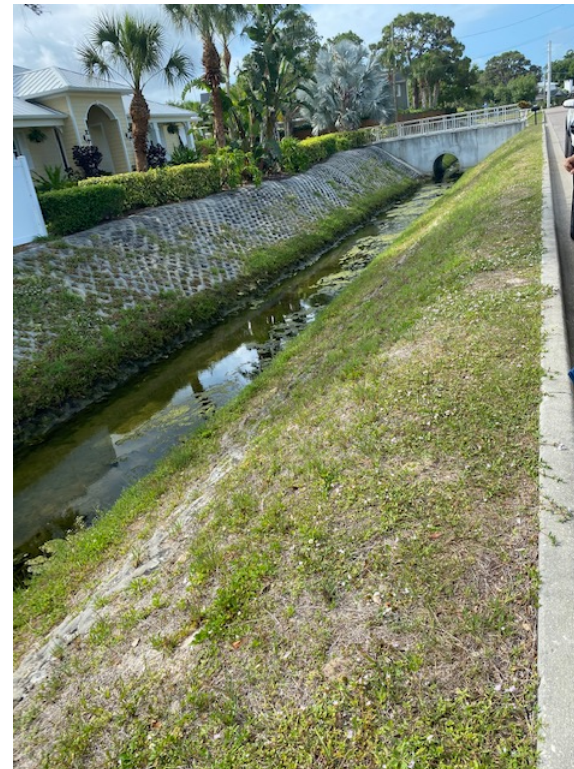
Water Quality Monitoring Results

- Bacteria results above State standards but less than modeled
- Total nitrogen levels below State standards and model
- Total phosphorus levels just below State standards, but above model
- Generally confirmed that nutrients (particularly total phosphorus) and bacteria should be focus of future stormwater quality projects.



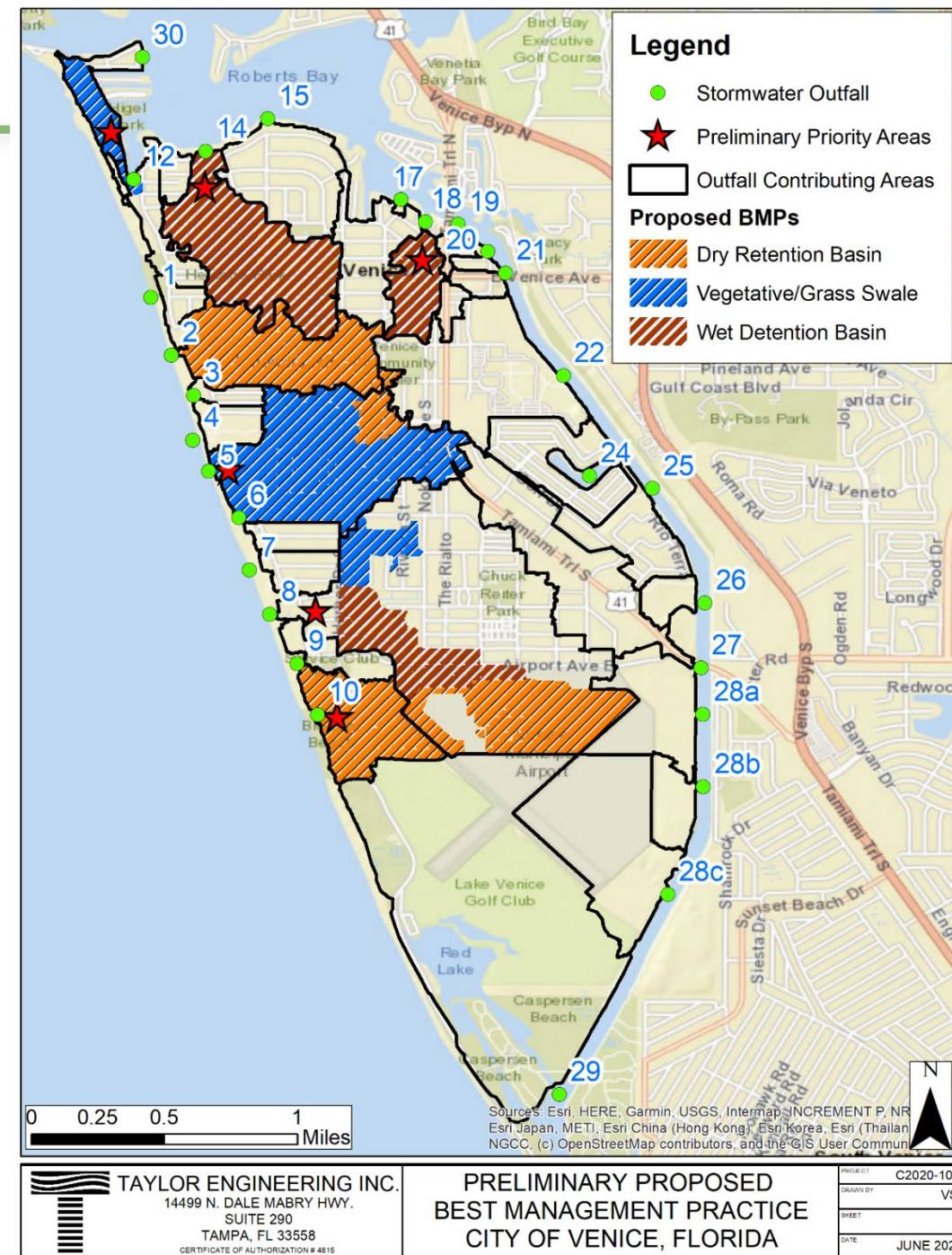
Preliminary Priority Projects

- Model calibration using monitoring results
- Site visit with city and water management district staff
- Alternatives analysis of 15 options



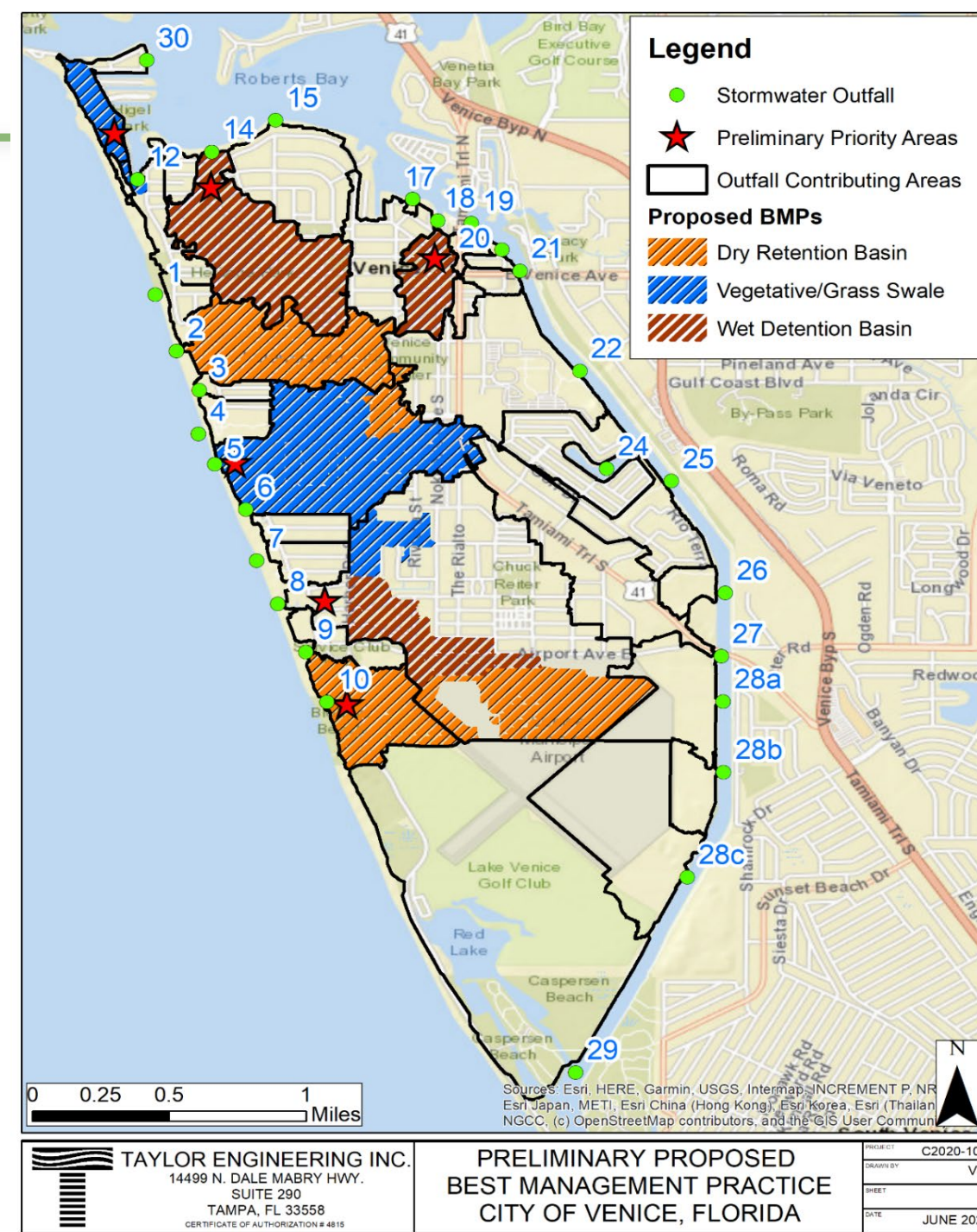
Preliminary Project Options

- 6 sites + Outfall 1 & 2
- Outfall 1 and 2 Combination - divert flow and remove outfall #1
- Basin 18 @ Belle Costa (38 ac) –
 - enlarge baffle box at parking lot,
 - add eco vault,
 - multiple boxes along Nokomis Ave
- Outfall 14 (138 ac) – baffle box
- Tarpon Center Drive swale and hybrid seawall design



Preliminary Project Options

- Outfall 5 (196 ac) – dry retention in Venezia Park and/or enhance existing grass swales
- Basin 8 (429 ac) – 4 options using wet and/or dry retention
 - 2 parcels at Sunset/Harbor Dr,
 - airport,
 - Cincy Drive easement
- Basin 10 (76 ac)– remove pipe, add dry retention and wetland restoration



Next Steps

- Complete alternatives analysis and develop cost estimates for priority 6 'island' outfall projects
- WQ model and sampling for Hatchett Creek
- ICPR model updates
 - Island of Venice
 - Hatchett Creek
 - Curry Creek/Myakka
 - Cowpen Slough
- Stormwater Management Plan Update
- Priority Project Implementation

Target Schedule

- Upcoming work

Estimated Project Timeline	Months										
	1	2	3	4	5	6	9	12	16	18	24+
Island Outfall WQ Monitoring & Modeling											
Hatchett Creek WQ Modeling & Sampling											
Island of Venice ICPR Model Update											
Outfall 1 & 2 Design/Permitting											
Hatchett Creek ICPR Model Update											
Update Stormwater Mgmt Plan											

Special Thank You to SWFWMD and FDEP!!!



Questions!?