**In the April 2015 edition of Gulfshore Life, Jennier Reed writes, The Truth About Our Oil**

The following are excerpts from her article which I am including since her article is centered around Collier Resources, in Collier Florida.

The landowner leased the property's mineral rights to a Texas company in 2013. Around the same time, another drill site, the Collier-Hogan well, south of Lake Trafford, was hydraulic fractured by Dan A. Hughes Company in an effort to force oil out of a reservoir about two miles underground.

Drilling has been going on in Florida since oil was discovered near Immokalee in 1943. Much of it occurs out of sight, in Big Cypress National Preserve where the federal government and its many environmental regulators signed off on a deal years ago shielding the 729,000 acres from development but allowing native tribes, property owners and mineral rights holders to continue their pursuits—including energy extraction.

"This is nothing new," says Collier Commissioner Tim Nance.

Maybe not. But the context—and the implications—of drilling have changed considerably.

American energy production, on the decline for decades, is booming. A resurgence, born in the shale formations in the North and West, is winding its way south. Techniques such as horizontal drilling and hydraulic fracturing have allowed energy producers to unlock billions of barrels of oil and natural gas previously trapped in rock.

The energy rush has propelled the U.S. to the top of the world's oil producers—and boosted domestic production to 60 percent of the nation's oil needs and 100 percent of its natural gas ones. Florida doesn't have shale, but new techniques may allow drillers to extract more from the Upper Sunniland Trend and tap into the lower, deeper one. The Sunniland is an oil reservoir that runs from Fort Myers to Miami.

New seismic surveying technology, moreover, enables oil prospectors to more accurately pinpoint potential reservoirs. That's the next step in Collier: About 200 square miles in Big Cypress and near Immokalee are slated to be surveyed, pending approval of the applications. The findings will determine the industry's next steps.

Jennifer Hecker,a natural resource policy director at the Conservancy of Southwest Florida, states;

“The bottom line is Florida is completely different geologically and hydrologically from other parts of the U.S. where this is being done. So even if this technique is ‘proven’ in North Dakota, it is not proven in Florida limestone and interconnected aquifers,” Hecker says. Her organization is calling for a moratorium on new extraction techniques until its experts see more evidence validating their safety

## Does the state regulate hydraulic fracturing and related procedures?

Minimally—and this is perhaps the greatest area of concern to residents and others worried about new drilling techniques.

Companies wishing to frack or use related well-stimulation techniques don’t need a permit to do so; rather, they inform the Department of Environmental Protection that they plan to do a “workover.” The department can ask them to hold off—that’s what happened when DEP officials filed a “cease and desist” order at Collier-Hogan well—but the penalties for disregarding the DEP are minimal and the current statute lacks teeth, according to environmental advocates.

## What kinds of toxic waste result from drilling?

In the case of hydraulic fracturing, some 98 percent of the drilling solution is made up of water and sand. Two percent is chemicals.

Some of the substances, like hydrochloric acid, are fairly ubiquitous in industrial applications. Mixed with Florida’s limestone base, the acid and the base convert into salt and are absorbed into the soil over time.“It’s first-year chemistry,” Lewis says.

But environmental and resident groups say there are more insidious chemicals in the hydraulic fracturing wastewater, known as “flowback”—even in small amounts. They include benzene, toluene, ethyl benzene and xylenes—compounds that can damage organs and the nervous system.

Also posing a risk is “produced water” or “brine”—water that mixes with oil deep underground and is brought to the surface during extraction. For every barrel of oil that’s extracted, six to 10 barrels of produced water comes up with it, according to the EPA.

These energy-related wastewaters are exempt from the Safe Drinking Water Act, a provision written to the law during the Bush administration and dubbed the "Halliburton loophole," referring to the energy giant once led by former Vice President Dick Cheney.The state can write its own more stringent water safety regulations, a matter that some residents and environmental groups say must be considered. Preserve Our Paradise is pushing to make the Floridan Aquifer, a drinking water source for Florida and parts of four other states, a so-called "sole-source aquifer," a designation that would allow further safeguards against pollution.

Meanwhile, state Rep. Ray Rodrigues, R-Estero, is filing—for the third time—a chemical disclosure bill. "Our bill would be the most strict disclosure requirement in the county," he says.

## Can toxic water and oil infiltrate the aquifers?

Yes. Experts say there are three primary scenarios: through old abandoned wells, surface spills and engineering failures. With precautions, though, the threats can be minimized.

## Boreholes

Southwest Florida is littered with boreholes—old wells from the 1940s and '50s. They were sealed off to the requirements of the day, lenient by today's standards, and some of the plugs that protect aquifers from oil and brine are missing or corroded.

"The concern is they could potentially act as straws, allowing for the upward migration of these fluids into the drinking water," says Hecker of the Conservancy.

The Collier-Hogan well was sunk within a mile of two old wells. In that particular case, three consultants say contamination from them was "highly improbable" if not impossible. But two of the firms advised further investigation of the region's abandoned wells.

Mark Stewart, professor emeritus in the University of South Florida's geosciences department, did a water study a few years ago along County Road 951 where his team ran across an area of high electric conductivity near the surface—an unusual occurrence that he later theorized was electrically charged

brine rising to the surface via old wells. Fracking could further trigger such fluid migration, he says.

“Unless we know where all the wells are and if they’re properly abandoned, that’s a potential pathway for contamination of a shallow aquifer,” Stewart says.

The Conservancy is asking the state to enforce a perimeter around the boreholes or require drillers to re-plug them to today’s standards.

### Spills

Statewide since 1972, 1,281 barrels of crude oil and 16,636 barrels of brine have been spilled in Florida, according to a report from the consulting firm AECOM. There apparently was some sort of ground-level “release” at the Collier-Hogan well, according to another firm, ALL Consulting, which could be worrisome since chemicals were used there. (There was not enough information to know whether the spillage affected water-table aquifers; state monitoring continues.)

In fairness, there’s an asterisk: The total quantity spilled amounts to 0.0002 percent of all oil ever produced here. A spill isn’t expected to move much, according to Lewis, the CRA engineer. His modeling suggests that, under worst-case scenarios, it might creep 1,500 feet in 10 years.

Nevertheless, the fragility of Southwest Florida’s ecosystem—and the fact that Collier’s aquifers lie close to the surface—makes this an important matter to monitor. That’s why there’s a push for more DEP oversight authority—right now, state inspectors must get the permission of the energy companies and the property owners before they can enter a well field.

## Well failures

Engineering failures to the well casings—protective sheaths around the wellbores—are the third big risk.

One study of the Marcellus Shale in the eastern U.S. found 83 examples of cement casing failures in 573 wells. State records from 2010-13 show Pennsylvania wells failed at rates of 3 to 6 percent in their first three years of life, according to recent report The Environmental Costs and Benefits of Fracking conducted by seven government and university environmental scientists.

But the industry can do it right, Stewart says, citing an Environmental Defense Fund study showing that well-constructed casings fail 1 to 2 percent of the time. “A 1 to 2 percent failure rate is not bad,” he says. “That’s what the industry is capable of, but at the moment, there’s no economic or regulatory incentive for them to try to achieve that.”

## What happens to wastewater?

Oil and gas wastewater—along with household and industrial wastewater, septic sludge, motor vehicle waste and other liquid cast-offs—is being disposed of underground in injection wells, holding pens for toxic byproducts. Florida had more than 13,000 injection wells as of 2011, according to the EPA.

Like it or not, the entire water system from Lake Okeechobee south is entirely human-managed today, Nance says, expressing confidence in injection wells as a waste management tool; Collier County is even using them to store excess water collected during the rainy season, he says.

There is a big difference, however—the aforementioned exemption that the oil and gas industry enjoys.

The state Underground Injection Code regulating for non-energy waste, such as municipal wastewater, runs 33,400 words long; the Class II well regulations for oil and gas waste are not quite 900.

In other parts of the country, scientists believe the pressure of injecting oil and gas waste provokes earthquakes. That doesn’t appear to be a risk here because wells are installed in the Boulder Zone, whose structure allows materials to shift, dissipating pressure.

The Boulder Zone is well-separated from the aquifers, and reports of leakage are few. That doesn’t mean it hasn’t happened. ProPublica reported in 2012 that 20 South Florida wells failed in the early 1990s, releasing partially treated sewage into aquifers that Miami may someday have to use for drinking water. If more drilling means more potential waste, the regulatory conversation should include further review of injection wells.

Florida has a number of options. It could provide further safeguards for residents in rural areas; the Durans initially proposed keeping wells a mile away from the nearest existing homes. It could go the way of New York State and ban fracking all together.

But we should acknowledge: A permanent ban does not take into account the rights of mineral owners, the industry's six-decade track record or its contribution to domestic energy production, even if Florida is no North Dakota.

The answer lies somewhere in between in carefully balanced regulation based on hard data—or moratoriums on procedures whose implications are not fully understood in the context of Florida's distinct geology and ecosystems.

In addition to Rodrigues' disclosure legislation and Bullard's fracturing prohibition, the DEP, the Conservancy and Collier County's consultant, AECOM, have proposed numerous changes, including: increased fines; independent monitoring protocols; closer oversight of well construction and surface management; and change of the permitting process so drillers must expressly receive permission before embarking on well stimulation procedures

## The Barnett Shale, Texas.

I experienced Fracking first hand when I lived for four years in Robson Ranch, Denton, Texas. We discovered, after building our home, that we had built on the Barnett Shale and Horizontal Fracking had just been invented. In 2011, Texas had about 93,000 natural-gas wells, up from approximately 58,000 in 2000.

Gas wells were drilled 250 feet from homes, schools, and other public sites,with little regulation.

In Dish, Texas, five miles to the west of our home, 11 natural gas compression stations were created. Residents complained about odor, noise and health problems which included headaches and blackouts as well as neurological defects and blindness in their horses. A private hired environmental consultant found that air samples contained high levels of neurotoxins and carcinogens in 2009.

Infrared videos taken in October 2014 in Denton, Texas showed oil and gas air pollution despites assurances of safety by the gas industry. A Texas jury on April 2014 awarded $2.9 million to Bob and Lisa Parr from Aruba Petroleum Inc., for health problems for their family, pets and livestock because of wells drilled and fracked in the Barnett Shale.

The Texas Commission on Environmental Quality reported that storage tanks used in the exploration and production of natural gas and oil are the largest source of VOCs in the Barnett Shale.

The Houston Advanced Research Center estimated that emissions from natural gas compressor stations and flares contributed signmificant amounts of ground-level ozone and formaldehyde in the Dallas-Fort Worth area.

The 2009 Environmental Defense Fund report stated that the natural gas and oil industry in the Barnett Shale area produced more smot-forming emissions during the summer of 2009 than were produced by all motor vehicles in the Dallas Fort Worth metropolitan area.

In July 2012 nearly 80% of all air samples taken by the National Institute of Occupational Safety and Health showed exposure rates to silica above federal recommendations. High exposure to silica can lead to silicosis, a potentially fatal lung disease linked to cancer. Silica is a key component used in fracking

The Texas Commission on Environmental Quality found airborne benzene near Barnett Shale wells at levels of up to five times higher than allowable limits.

The Environmental Denfense Fund reported that natural gas wells in the Barnett Shale were emiting up to 60,000 kilograms of methane an hour. After completing their statistical analysis in December 2015, the organization reported that fracking in the Barnett Shale region was releasing at least 90 percent more methane from drilling operations than the EPA had estimated.

The Eagle Ford Shale development in South Texas consumed nearly a quarter of overall water consumption in 2011 and was estimated to grow to a third within a few years.

A 2013 study of 100 private water wells in and near the Barnett Shale showed elevated levels of contaminants such as arsenic and selenium closest to natural gas extraction sites.

EPA in 2010 determined that natural gas drilling by Range Resources contributed to the contamination of residential drinking water wells with extremely high levels of methane as well as benzene.

The National Academy of Sciences analyzed 67 earthquakes recorded between November 2009 and September 2011 in a grid covering northern Texas Barnett Shale formation. The study found that all 24 of the earthquakes with the most reliably located epicenters originated with 2 miles of one or more injection wells for wastewater disposal.

From 2010 to July 2014 drillers in the state of Texas reported using 21.96 gallons of diesel injected into 25 wells. The Environmental Integrity Project extensively researched diesel in fracking. The environmental research organization argues that diesel use in fracking is widely under reported.

The Environmental Integrity Project 2014 study "Fracking Beyond the Law, Despite Industry Denials Investigaton Reveals Continued Use of Diesel Fuels in Hydraulic Fracturing." found that hydraulic fracturing with diesel fuel can pose a risk to drinking water and human health because diesel contains benezene, toluene, xylene, and other chemicals that have been linked to cancer and other health problems. The Environmental Integrity Project identified numerous fracking fluids with high amounts of diesel, including additives, friction reducers, emulsifiers, solvents sold by Halliburton

Due to the Halliburton loophole, the Safe Drinking Act regulates benzene containing diesel-based fluids but no other petroleum products with much higher levels of benzene.

## Fracking Pollution

The 2012 report by the Environmental Integrity Project, "Nearly 93,000 Tons of Pollution Released From Upsets and Emission Events at Natural Gas and Petrochemical Plants iin Texas" found that flares, leaking pipelines, and tanks emitted 92,000 tons of toxic chemicals into the air during accidents, break-downs, and maintenance at Texas oil and gas facilities, refineries, and petrochemical plants from 2009 to 2011. The data was collected from the Texas Commission on Environmental Quality and shows that, in addition to the emissions from normal operations, more than 42,000 tons of sulfur dioxide and just over 50,000 tons of smog-forming volatile organic compounds were released from 2009 through 2011. Natural gas operations, including well heads, pipelines, compressors, boosters, and storage systems, accounted for more than 85 percent of total sulfur dioxide and nearly 80 percent of the VOCs released during these emission events. The report shows a "pattern of neglect" as the pollution from these events drags on for weeks or months.

http://www.sourcewatch.org/index.php/Texas_and_fracking

# Fracking in Florida

ballotpedia.org

## *Major issues*

**House Bill 191**

The Florida House of Representatives passed a bill (HB 191) updating state fracking regulations on January 27, 2016. Provisions in the bill would prohibit local governments from banning fracking in their jurisdictions and require the state Department of Environmental Protection to write a study reviewing the potential costs and benefits of the oil and gas extraction technique. Upon completion of the study, the Department of Environmental Protection would create new rules for fracking that would have to be approved by the state legislature. The bill was passed 73-45, with mostly Republicans supporting the measure. The Florida State Senate received the measure on February 9, 2016.

**Acidification**

Although fracking does not occur in Florida, acidification (also known as "acid fracking") has occurred in the state. Acidification is an oil drilling process whereby acid is injected under high pressure into the ground. According to a report by National Public Radio, an oil company (Dan A. Hughes, Co.) utilized the practice in Florida for the first time in December 2013, near a town on the western edge of the Everglades. This resulted in outcry from local officials and environmental advocates, who argued that state officials were "lax in their oversight of the drilling, jeopardizing public health and the environment."

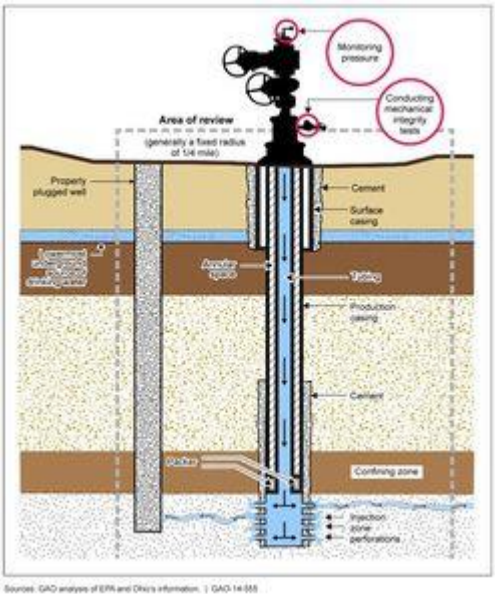
The state issued a cease and desist order to the company upon discovering that acidification was taking place, but the company did not stop operations. The company ultimately paid a $25,000 fine and agreed to install groundwater monitors. The state Department of Environmental Resources also installed groundwater monitors and maintained that early evidence showed no evidence of water contamination.

## Fracking background

> Hydraulic fracturing, or fracking is the process of injecting fluid—mostly water and sand, but with additional chemicals—into the ground at a high pressure to fracture shale rocks and release the crude oil l and natural gas inside.
>
> Recent technological advances in oil and gas drilling—horizontal drilling and hydraulic fracturing—have created both opportunities and challenges for states with fossil fuelf reserves that can be accessed through the combination of these two technologies. The increased use of fracking has been an economic boon for many states, not only those with fracking but also those with supporting industries such as frac sand mining or associated machinery manufacturing. As with any type of energy extraction, there are risks involved.

Opponents of fracking argue that the potential negative environmental and human health impacts could be significant. Although wells have been fracked for over 65 years in the United States, concerns have been raised about whether federal, state and local regulatory agencies can keep up with the recent rapid increase in fracking activity and adequately protect the environment and human health. As with any type of energy extraction, either traditional or renewable, there are economic, environmental and political trade-offs.

## Injection wells

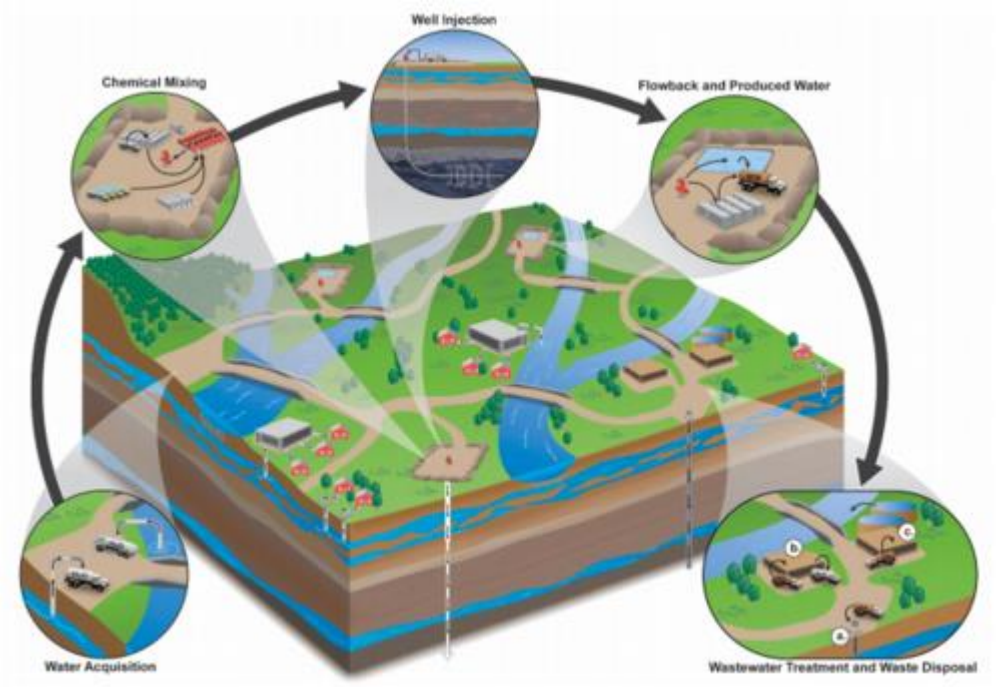



**An example of a Class II injection well**

Injection wells are used to store fluid or other substances such as carbon dioxide ($CO_2$) under the earth. There are a variety of injection wells, some of which are shallow and are used to store water and non-hazardous liquids. One type of these wells are Class II wells that are used to store salt water and other fluids produced during the oil and gas extraction process. The map in this section shows the distribution of injection wells in each state that has Class II injection wells. In 2011, 32 states had Class II injection wells. According to the U.S. Environmental Protection Agency (EPA), **Florida had 56 Class II injection wells in 2011, which accounted for 0.03 percent of all of these injection wells nationwide.** The table below contains data on injection wells in Florida and its adjacent neighboring states. The map in this section shows the distribution of injection wells in each state that has Class II injection wells. Florida had fewer Class II injection wells than any of its neighboring states except Georgia, which did not have any such wells.

## Water impacts

When considering the effects of fracking on water supply and safety, there are four main areas of risk: the depletion of fresh water sources, spills and leaks of fracking fluid into water, mismanaged produced water and flowback, and stormwater pollution. Stormwater, flowback, produced water and wastewater can be harmful because they contain total dissolved solids and naturally occurring radioactive materials. Because of the recent rapid growth in fracking, there are still many uncertainties about the effects of fracking on water. There are studies that link fracking to groundwater contamination, but they remain controversial.




The stages of the hydraulic fracturing water cycle.

On June 4, 2015, the U.S. Environmental Protection Agency (EPA) released an assessment, a "synthesis of available scientific literature and data," of fracking on drinking water sources.

The report found that in the United States between 2011 and 2014,

Between 25,000 new wells to 30,000 new wells were hydraulically fractured (fracked) annually.

In total, 9.4 million people lived within one mile of a well that was fracked.

There were 6,800 drinking water sources located within one mile of a well that had been fracked.

On average, 1.5 million gallons of water were required to frack a well. This figure varied depending on the state.

## Land impacts


Aerial view of an hydraulic fracturing site

When oil and gas companies are preparing the area around a future well for drilling, roads must first be constructed. Then the surrounding area must be flattened and covered with crushed stone and plastic liners to protect the ground. Once operations cease, reclamation can begin. Reclamation includes closing the well, removing all storage tanks, vehicles and other equipment, returning the land to its previous form by shaping it, and planting seeds.

Oil spills on land can occur in a variety of ways, including pipeline leaks, railroad accidents, poor oil storage, natural seeping into land or soil, poor working practices, drilling accidents and more. Inland oil spills can prevent water from being absorbed by the soil. Spills near agricultural operations or grassland can harm plant life and ecosystems. Cleaning up inland spills depends on the kind of soil affected, the geology of the area, the presence and depth of ground water sources and access to the areas affected by the spill. A typical response to a spill involves preventing the oil from contaminating ground water sources or running off into surface waters like rivers and streams

### Emissions

Natural gas is usually considered a cleaner fossil fuel [l] because it contains fewer impurities than petroleum or crude oil.. For example, natural gas releases significantly fewer sulfur dioxide and nitrogen oxide emissions compared to oil. According to a 2014 study by the National Oceanic and Atmospheric Administration, "as a result of the increased use of natural gas, $CO_2$ emissions from U.S. fossil-fuel power plants were 23% lower in 2012 than they would have been" without the increase in natural gas use. Natural gas does contain methane, and methane traps 20 times more carbon dioxide than other greenhouse gases.

The U,S, Environmental Protection Agency (EPA) estimated that, on average, 1,672 pounds of carbon dioxide, , 12 pounds of sulfur dioxide and four pounds of nitrogen oxide are emitted per megawatt hour (MWh) of electricity produced from burning oil. Natural gas-fired energy generation emits 1,135 pounds of carbon dioxide per(MWh) of electricity, 0.1 pounds of sulfur dioxide per (MWh) and 1.7

pounds of nitrogen oxide per(MWh). The table below contains estimates of the percentage of methane that is emitted as oil and natural gas are produced and processed. This data was provided by companies in the natural gas and oil industries in 2012.

**Methane emissions from the oil and gas industries (2012)**

| Source | Percentage of emissions |
|---|---|
| Production | 45% |
| Transmission and storage | 27% |
| Distribution | 16% |
| Processing | 12% |

**Source:** *U.S. Environmental Protection Agency*, "Methane Emissions from 2012

**What are the differences among wastewater, produced water and flowback?**

The terms wastewater, produced water and flowback are used interchangeably, but all three refer to different types of water. The contaminated water that is stored in injection wells is called **wastewater**; it includes both produced water and flowback. **Produced water** is the salt water that has been under the earth for millions of years and is released when extracting oil or natural gas. **Flowback** is the fluid that was used when extracting oil or natural gas. This fluid returns to the earth's surface along with the oil or natural gas that is extracted. According to *Energy in Depth*, an outreach campaign associated with the Independent Petroleum Association of America, most of the wastewater that is produced during the fracking process is produced water.

## Earthquakes

States across the central and eastern United States have been experiencing an increased number of earthquakes over the last few years, according to the U.S. Geological Survey(USGS), the government agency responsible for such data. Studies from the USGS have not found fracking directly responsible for this increase in felt earthquakes; however, the USGS is looking into regulations that would use seismic data to determine thresholds dictating when and where fracking can occur.

There is a growing body of evidence suggesting that this growth in the number of earthquakes has been caused by the increased use of injection wells. also known as Class II injection wells, to dispose of fracking wastewater. Once a well has been fracked, water returns to the earth's surface; this water contains large amounts of salt and other contaminants. Some of this water can be recycled, but the water that can't be recycled is often stored in injection wells. These injection wells are generally considered the safest and most cost-effective place for wastewater to be stored. Injection wells are located thousands of feet underground and are encased in cement. Multiple oil and gas wells often rely on one disposal well for wastewater storage. The U.S. Environmental Protection Agency (EPA) estimates there are 144,000 of these wells across the United States receiving 2 billion gallons of frack fluid per day. According to the EPA, Florida had 56 injection well(s) in 2011, 0.03 percent of all such wells across the country.

There is a scientific link between injection wells and induced seismology, or man-made earthquakes. These earthquakes have been around for decades and can be caused by mining, damming rivers and injection wells. Earthquakes are caused by injection wells when water pumped into underground wells causes the faults under the earth to slip. Even though scientists at the USGS have been able to cause earthquakes intentionally by carefully injecting liquid into the earth, the link between injection wells and earthquakes is not fully understood. One of the largest concerns for scientists and regulators is that they do not have the tools to predict whether wastewater will cause seismic activity. These concerns are compounded by the lack of knowledge about where faults are located across the central and eastern United States. The USGS is just beginning to map these areas in more detail in order to understand the seismic risks. As of August 2015, these earthquakes had typically been small, 2.0 or 3.0 in magnitude on the Richter scale, but at least one scientist has raised concerns that earthquakes could grow in intensity if old injection wells continue to be used for storage. Some states, including Colorado, Kansas, Ohio, Oklahoma and Texas, have set up seismic monitoring stations and updated injection well regulations, among other activities, to deal with increased seismic activity.[1]

## Fracking Legislation in Florida

### FL H0589- Environmental Control

Revises eligibility requirements for taking water well contractor licensure examinations, provides conditions under which certain constructed clay settling areas are exempt from reclamation rate and financial responsibility requirements; autorizes use of land set-asides

and land use modifications in water quality credit trading; provides applicability of prohibited variances concerning certain discharges and hazardous waste management; revises conditions under which DEP may use specified funds to contract with third parties for closing and long-term care of solid waste management facilities; abrogates scheduled expiration of such authorization; requires Florida registered professionals to certify that certain stormwater management systems will meet general permit requirements; requires that such certification be submitted to DEP or water management district before construction of such systems begins; provides appropriation

Placed on Calendar 2/25/2016

Sponsors: Edwin Cary Pigman; Lawrence T. Ahern

**FL S1400 Water Oversight and Planning**

Establishes the Water Oversight and Planning Board to address water issues in the state; requiring the Department of Environmental Protection to provide staff to the board; requiring the board to submit the long-range plans to the department, each water management district, the Governor, and the Legislature, etc.

Bill is introduced 1/14/2016

Sponsors Audrey Gibson

**FL H1159- Water Oversight and Planning**

Establishes Water Oversight and Planning Board to address state water issues; provides membership for board; provides duties of board; requires board to submit long-range plans to DEP, water management districts, Governor and Legislature; requires board to provide findings and recommendations to Governor and Legislature

Referred to Agriculture and Natural Resources Subcommittee, Agriculture and Natural Resources Appropriations Subcommittee, State Affairs Committee 1/13/2016

Sponsors

Bruce Antone