

The Florida Senate
BILL ANALYSIS AND FISCAL IMPACT STATEMENT

(This document is based on the provisions contained in the legislation as of the latest date listed below.)

Prepared By: The Professional Staff of the Committee on Environmental Preservation and Conservation

BILL: SB 318

INTRODUCER: Senator Richter

SUBJECT: Regulation of Oil and Gas Resources

DATE: January 12, 2016 REVISED: _____

	ANALYST	STAFF DIRECTOR	REFERENCE	ACTION
1.	Istler	Rogers	EP	Pre-meeting
2.			AGG	
3.			AP	

I. Summary:

SB 318 revises Florida’s oil and gas regulations to define the term “high-pressure well stimulation” and require a separate permit for the performance of high-pressure well stimulations. The bill prohibits permits for high-pressure well stimulations from being issued until the Department of Environmental Protection (DEP) adopts rules that regulate high-pressure well stimulations. The bill also requires the DEP to conduct a study analyzing the potential impacts that high-pressure well stimulations may have on Florida’s underlying geologic features.

Additionally, the bill:

- Preempts to the state all matters relating to the regulation of the exploration, development, production, processing, storage, and transportation of oil and gas;
- Requires inspections during the testing of blowout preventers, the pressure testing of the casing and casing shoe, and the integrity testing of cement plugs in plugging and abandonment operations;
- Requires notice to be given, a fee to be paid, and a permit to be granted before performing a high-pressure well stimulation;
- Requires the DEP to consider groundwater contamination by high-pressure well stimulations and public policy when reviewing a permit application for high-pressure well stimulations;
- Specifies that a permit may be denied or specific permitting conditions may be applied based on the past history of adjudicated violations committed by the permit applicant or an affiliated entity of the applicant of any substantive and material rule or law pertaining to the regulation of oil or gas, including violations that occurred outside the state;
- Clarifies the inspection authority of the DEP;
- Requires the permit applicant to provide surety to the DEP that the high-pressure well stimulation will be conducted in a safe and environmentally compatible manner;
- Increases the civil penalty from \$10,000 per day to \$25,000 per day for violations; and

- Designates FracFocus as the state’s registry for chemical disclosure for all wells on which high-pressure well stimulations are performed.

The bill provides a \$1 million nonrecurring appropriation from the General Revenue Fund to the DEP to conduct a study on high-pressure well stimulations. According to the DEP, the increased workload related to the regulatory and rulemaking process can be handled with existing resources.¹ The remaining fiscal impact of the bill is indeterminate at this time.

II. Present Situation:

Production of conventional versus unconventional oil and gas resources: the use of well stimulation techniques

Conventional oil and gas resources are found in permeable sandstone and carbonate reservoirs.² To extract conventional resources wells have historically been drilled vertically, straight down into a rock formation. Whereas conventional resources are found in concentrated underground locations, unconventional resources are highly dispersed through impermeable or “tight” rock formations such as shales and tight sands. To extract unconventional resources, drilling has shifted from vertical to horizontal or directional away from the reservoir to the source rock, and well stimulation techniques have been developed to increase the production at such oil or gas wells. The profitable extraction of unconventional resources is relatively new.³

Well stimulation techniques are used in the production of both conventional and unconventional resources. The techniques can be focused solely on the wellbore for maintenance and remedial purposes or can be used to increase production from the reservoir.⁴ The three most commonly used well stimulation techniques include matrix acidizing, acid fracturing, and hydraulic fracturing. Dating back to 1895, matrix acidizing is the oldest well stimulation technique. It involves pumping acid into the well at a pressure that does not exceed the fracture gradient to dissolve some of the rock to bypass wellbore damage or to stimulate carbonate formations.⁵ Acid fracturing is a well stimulation technique that involves pumping acidic fluids into a well at a pressure that fractures the rock. The acid etches the walls of the fracture so the fractures remain open after the pressure is released. These types of acid stimulations are preferred in carbonate reservoirs.⁶

Hydraulic fracturing was developed in the 1940s to increase production of conventional resources. While the technique, itself, is not new, the composition of the fracturing fluids has evolved over time. Initially the technique used very little water and relied on a mixture of

¹ DEP, *Senate Bill 318 Agency Legislative Bill Analysis*, pg. 4 (Nov. 6, 2015) (on file with the Senate Committee on Environmental Preservation and Conservation).

² Michael Ratner & Mary Tiemann, Cong. Research Serv., R 43148, *An Overview of Unconventional Oil and Natural Gas: Resources and Federal Actions*, pg. 2 (Apr. 22, 2015), available at <https://www.fas.org/sgp/crs/misc/R43148.pdf>.

³ *Id.* at 3.

⁴ California Council on Science and Technology Lawrence Berkeley National Laboratory, *An Independent Assessment of Well Stimulation in California (CA Study)*, Vol. 1, Well stimulation technologies and their past, present, and potential future use in California, January 2015, pg. 14, available at <http://ccst.us/publications/2015/2015SB4-v1.php>.

⁵ *Id.* at 69.

⁶ *Id.* at 56.

petroleum compounds, such as napalm and diesel fuels.⁷ Modern hydraulic fracturing involves a fracturing fluid that is composed of a base fluid, in most cases water; additives, each designed to serve a particular function; and a proppant, such as sand, to hold the fractures open. The composition of the fracturing fluid varies depending on the property of the reservoir rock, specifically the rock's permeability and brittleness.⁸ An hydraulic fracturing operation at a horizontal well involves four stages. The first is the "stage" during which a portion of the well is isolated to focus the fracture fluid pressure. The second is the "pad" in which fracture fluid is injected without proppant to initiate and propagate the fracture. The proppant is then added to keep the fractures open. The third stage is the "flush" during which fluid is injected without proppant to push any remaining proppant into the fractures. The fourth is the "flowback" during which the hydraulic fracturing fluids are removed and the fluid pressure dissipates.⁹

The EPA estimates that between 25,000-30,000 new wells were drilled and hydraulically fractured annually in the United States between 2011 and 2014.¹⁰ Horizontal or directional drilling techniques in conjunction with hydraulic fracturing has led to a surge in domestic production of oil and gas resources in the recent decade, and in 2014 the United States was the world's top producer of petroleum and natural gas hydrocarbons.¹¹

Production of oil and gas resources in Florida

Northwest and South Florida are the major oil and gas producing areas in the state. The first producing oil well was discovered in 1943 at a wellsite located in Big Cypress Preserve.¹² It was not until 1970 that oil and gas resources were first discovered in Northwest Florida. There are seven active fields in South Florida, specifically in Lee, Hendry, Collier, and Dade Counties, and three active fields in Northwest Florida, specifically in Escambia and Santa Rosa Counties.¹³ While geologists believe that there may be large oil and natural gas deposits off Florida's western coast, the state enacted a drilling ban for state waters in 1990, and in 2006 Congress banned the leasing of federal offshore blocks within 125 miles of Florida's western coast until at least 2022.¹⁴

⁷ Gallegos, T.J., and Varela, B.A., *Trends in hydraulic fracturing distributions and treatment fluids, additives, proppants, and water volumes applied to wells drilled in the United States from 1947 through 2010—Data analysis and comparison to the literature: U.S. Geological Survey Scientific Investigations Report 2014–5131*, pg. 7 (2015), available at <http://pubs.usgs.gov/sir/2014/5131/pdf/sir2014-5131.pdf>.

⁸ CA Study at 48.

⁹ *Id.* at 42.

¹⁰ U.S. Environmental Protection Agency (EPA), *DRAFT An Assessment of the Potential Impacts of Hydraulic Fracturing for Oil and Gas on Drinking Water Resources, Executive Summary*, ES-5 (2015), available at http://www2.epa.gov/sites/production/files/2015-07/documents/hf_es_erd_jun2015.pdf. This draft document is undergoing peer review by the Scientific Advisory Board (SAB) Hydraulic Fracturing Research Advisory Panel. A SAB Draft Report is available at <http://yosemite.epa.gov/sab/sabproduct.nsf/LookupWebProjectsCurrentBOARD/f7a9db9abbac015785257e540052dd54!OpenDocument&TableRow=2.2#2>.

¹¹ U.S. Energy Information Administration (EIA), *Today in Energy*, <http://www.eia.gov/todayinenergy/detail.cfm?id=20692> (last visited Jan. 11, 2016).

¹² American Oil & Gas Historical Society, *First Florida Oil Well*, <http://aoghs.org/states/first-florida-oil-well/> (last visited Jan. 11, 2016).

¹³ DEP, *Oil and Gas Annual Production Reports, 2014*, available at http://www.dep.state.fl.us/water/mines/oil_gas/production.htm.

¹⁴ EIA, Florida State Profile and Energy Estimates, *Analysis*, <http://www.eia.gov/state/analysis.cfm?sid=FL> (last visited Jan. 11, 2016). See also, s. 377.242(1), F.S.

There are approximately 163 active wells in Florida.¹⁵ The DEP's 2014 Annual Production Report totaled natural gas production at 728,884 million cubic feet (MMcf) and oil production totals at 614,668 thousand barrels (MBbls).¹⁶

Proven oil and gas reserves both in Northwest and South Florida are composed of carbonate formations and reservoirs that have relatively high permeability.¹⁷ Because acid easily dissolves carbonate materials, techniques such as matrix acidizing and acid fracturing are preferred in carbonate reservoirs.¹⁸ In December 2013, the DEP received a workover notice proposing use of an enhanced extraction procedure, which the DEP requested that the company not complete until additional review could be performed.¹⁹ The company commenced with the workover procedure and the DEP issued a cease and desist order. After failing to comply with the order, the company withdrew its permit application.²⁰ DEP reported that the last use of hydraulic fracturing on record was in the Jay oilfield in 2003.²¹

Regulation of well stimulation techniques

Federal

There is limited direct federal regulation over the use of well stimulation techniques. In 2005, Congress passed the Energy Policy Act amending the Safe Water Drinking Act (SWDA) and the Clean Water Act (CWA).²² The SWDA was amended to revise the definition of the term "underground injection" to specifically exclude the underground injection of fluids or propping agents (other than diesel fuels) pursuant to hydraulic fracturing operations. The CWA was amended to characterize oil and gas exploration and production as "construction activities," thereby removing these operations from the scope of the CWA.²³ Thus, the Energy Policy Act effectively exempted non-diesel hydraulic fracturing from federal law.²⁴

¹⁵ Email from Andrew Ketchel, Director, Office of Legislative Affairs, DEP (Jan. 7, 2016) (on file with the Senate Committee on Environmental Preservation and Conservation).

¹⁶ DEP, *Oil and Gas Annual Production Reports, 2014*, available at http://www.dep.state.fl.us/water/mines/oil_gas/production.htm.

¹⁷ DEP, *Hydraulic Fracturing Background and Recommendations* (Sept. 29, 2015) available at <http://archive.news-press.com/assets/pdf/A4195556107.PDF>.

¹⁸ California Council on Science and Technology Lawrence Berkeley National Laboratory, *An Independent Assessment of Well Stimulation in California* (CA Study), Vol. 1, Well stimulation technologies and their past, present, and potential future use in California, January 2015, pg. 56 and pg. 69, available at <http://ccst.us/publications/2015/2015SB4-v1.php>.

¹⁹ DEP, *Collier Oil Drilling*, http://www.dep.state.fl.us/secretary/oil/collier_oil.htm (last visited Jan. 11, 2016).

²⁰ *Id.*

²¹ DEP, *Frequently Asked Questions Regarding the Oil and Gas Permitting Process*, http://www.dep.state.fl.us/water/mines/oil_gas/docs/faq_og.pdf (last visited Jan. 11, 2016).

²² Energy Policy Act of 2005, H.R. 6, 109th Cong. (2005-2006).

²³ The EPA rule implementing the CWA amendment was challenged and the Ninth Circuit Court of Appeals vacated the rule. Oil and gas construction facilities remain subject to stormwater permitting requirements, as well as, NPDES permit requirements. See William J. Brady, *Hydraulic Fracturing Regulation in the United States: The Laissez-faire approach of the Federal government and varying state regulations* at 8 (Unv. of Denver Sturm College of Law), available at <http://www.law.du.edu/documents/faculty-highlights/Intersol-2012-HydroFracking.pdf>.

²⁴ Hannah Wiseman, *Untested Waters: The Rise of Hydraulic Fracturing in Oil and Gas Production and the Need to Revisit Regulation*, 20 FORDHAM ENVTL. L. REV. 115 (2009), available at <http://law.uh.edu/faculty/thester/courses/Emerging%20Tech%202011/Wiseman%20on%20Fracking.pdf>.

In an attempt to regulate hydraulic fracturing on federal and tribal lands, the Bureau of Land Management (BLM) in March 2015, published final rules over hydraulic fracturing.²⁵ The rules were to take effect on June 24, 2015, however, the United States District Court for the District of Wyoming granted a preliminary injunction, holding that the BLM lacked the authority to regulate hydraulic fracturing.²⁶ The BLM is enjoined from enforcing the final rules pending the finality of the rule challenge.

While direct regulation over well stimulation techniques at the federal level is limited, there are several federal statutes that have been applied to regulate the impacts of oil and gas extraction more generally. The Oil and Gas Extraction Effluent Guidelines and Standards regulate wastewater discharges from field exploration, drilling, production, well treatment, and well completion activities.²⁷ The regulations apply to conventional and unconventional extraction with the exception of extractions of coalbed methane.²⁸ These standards are incorporated in the National Pollutant Discharge Elimination System (NPDES).

Because it is possible that oil and gas activities could result in the release of hazardous substances into the environment at or under the surface in a manner that may endanger public health or the environment, these activities are regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).²⁹ While any recovered petroleum or natural gas is exempt, other hazardous substances that result from oil or gas production, including fracturing fluids, fall under the act and if a release were to occur, the facility owner and operator could face liability under CERCLA.³⁰

To ensure that employees who may be exposed to hazardous chemicals in the workplace are aware of the chemicals' potential dangers, manufacturers and importers must obtain or develop Material Safety Data Sheets (MSDS) for hydraulic fracturing chemicals that are hazardous according to the Occupational Safety and Health Administration (OSHA) standards. MSDS sheets must be maintained for hazardous chemicals at each job site and must, at a minimum, include the chemical names of substances that are considered hazardous under OSHA regulations.³¹

State

States have primary jurisdiction and authority over the regulation of oil and gas activities. Almost all states with economically viable production wells have extensive regulatory programs

²⁵ Under the final BLM regulations, the term “hydraulic fracturing” is defined as “those operations conducted in an individual wellbore designed to increase the flow of hydrocarbons from the rock formation to the wellbore through modifying the permeability of reservoir rock by applying fluids under pressure to fracture it. Hydraulic fracturing does not include enhanced secondary recovery such as water flooding, tertiary recovery, recovery through steam injection, or other types of well stimulation operations such as acidizing.”

²⁶ State of Wyo. vs. U.S. Dept. of the Int., No. 2: 15-CB-043-SWS (D. Wyo. Sept. 30, 2015) (order granting preliminary injunction), available at <http://www.wyd.uscourts.gov/pdf/orders/15-cv-043%20130%20order.pdf>.

²⁷ EPA, *Oil and Gas Extraction Effluent Guidelines*, <http://www.epa.gov/eg/oil-and-gas-extraction-effluent-guidelines> (last visited Jan. 11, 2016).

²⁸ *Id.*

²⁹ Adam Vann, Brandon J. Murrill, & Mary Tiemann, Cong. Research Serv., R 43152, *Hydraulic Fracturing: Selected Legal Issues*, pg. 12 (Sept. 26, 2014), available at <https://www.fas.org/sgp/crs/misc/R43152.pdf>.

³⁰ *Id.* at 13.

³¹ *Id.* at 22.

in place for permitting and monitoring oil and gas activities. Recent advances in technology and the widespread use of well stimulation techniques, particularly hydraulic fracturing, have motivated some states to update and revise their oil and gas regulations to specifically address such techniques or to ban certain techniques altogether.³²

The Department of Environmental Protection (DEP) has regulatory authority over oil and gas resources in Florida. The Division of Water Resource Management (Division) within DEP oversees the permitting process for drilling production and exploration. The DEP adopted Rules 62C-25 through 62C-30 of the Florida Administrative Code to implement and enforce the regulation of oil and gas resources. The Division has jurisdiction and authority over all persons and property necessary to administer and enforce all laws relating to the conservation of oil and gas.³³ Drilling and exploration is not authorized or is subject to local governmental approval in tidal waters, near improved beaches, and within municipal boundaries.³⁴

When issuing permits for oil or gas exploration or extraction, the division is required to consider the nature, character, and location of the lands involved; the nature, type, and extent of ownership of the applicant; and the proven or indicated likelihood of the presence of oil, gas, or related minerals on a commercially viable basis.³⁵ The DEP is required to ensure that all precautions are taken to prevent the spillage of oil or other pollutants in all phases of the drilling for, and extracting of, oil, gas, or other petroleum products.³⁶ Additionally, the DEP is authorized to issue rules to require the drilling, casing, and plugging of wells to be done in such a manner as to prevent the escape of oil or other petroleum products from one stratum to another.³⁷

Before any person begins work other than environmental assessments or surveying at the site of a proposed drilling operation, a permit to drill is required and a preliminary site inspection must be conducted by the DEP.³⁸ An application for a permit to drill must include a proposed casing and cementing program and a location plat survey.³⁹ Each drilling permit is valid for one year and may be extended for an additional year.⁴⁰ Before a well is used for its intended purpose, a permit to operate the well must be obtained.⁴¹ Operating permits are valid for the life of the well; however, every five years the DEP is required to perform a comprehensive field inspection and the permit must be re-certified.⁴² Each application and subsequent re-certification must include the appropriate fee; bond or security coverage; a spill prevention and cleanup plan; flowline specification and an installation plan; containment facility certification; and additional reporting

³² Hannah Wiseman, *Untested Waters: The Rise of Hydraulic Fracturing in Oil and Gas Production and the Need to Revisit Regulation*, 20 FORDHAM ENVTL. L. REV. 115 (2009). See also *State of Wyo. vs. U.S. Dept. of the Int.*, No. 2: 15-CB-043-SWS, pg. 40 (D. Wyo. Sept. 30, 2015) listing Wyoming, Colorado, Utah, North Dakota, Alaska, Illinois, Michigan, New Mexico, Ohio, Oklahoma, Pennsylvania, Texas, California, Montana, and Nevada as states with regulations in places addressing hydraulic fracturing.

³³ Section 377.21(1), F.S.

³⁴ Section 377.24, F.S.

³⁵ Section 377.241, F.S.

³⁶ Section 377.22, F.S.

³⁷ *Id.*

³⁸ Fla. Admin. Code R. 62C-26.003.

³⁹ *Id.*

⁴⁰ *Id.*

⁴¹ Fla. Admin. Code R. 62C-26.008.

⁴² Fla. Admin. Code Rules 62C-25.006 and 62C-26.008.

and data submissions, such as a driller's logs and monthly well reports.⁴³ Before a permit is granted, the owner or operator is required to post a bond or other form of security for each well. The amounts vary depending upon the well depth.⁴⁴ In lieu of posting a bond or security for each well, the owner or operator may file a blanket bond for multiple operations in the amount of \$1,000,000, which may cover up to ten wells.⁴⁵

A separate permit is not required for the performance of well stimulation techniques, the techniques are regulated as workovers.⁴⁶ Rule 62C-25.002(61) of the Florida Administrative Code defines the term "workover" as "an operation involving a deepening, plug back, repair, cement squeeze, perforation, hydraulic fracturing, acidizing, or other chemical treatment which is performed in a production, disposal, or injection well in order to restore, sustain, or increase production, disposal, or injection rates." An operator is required to notify the DEP before commencing a workover procedure and must submit a revised Well Record⁴⁷ to the DEP within 30 days after the workover.⁴⁸

A person that violates any statute, rule, regulation, order, or permit of the Division relating to the regulation of oil or gas resources or who refuses inspection by the Division is liable for damages caused to the air, waters, or property of the state; for reasonable costs in tracing the source of the discharge, in controlling and abating the source and the pollutants; and in restoring the air, waters, and property.⁴⁹ Such persons are also subject to judicial imposition of a civil penalty up to \$10,000 for each offense.⁵⁰ Each day during any portion of which a violation occurs constitutes a separate offense.⁵¹

Local

As most states with oil and gas interests have extensive regulatory programs governing oil and gas activities, the issue relating to what extent local governments may regulate oil and gas activities within their boundaries has arisen. In some areas local governments have banned or limited certain well stimulation techniques within their boundaries with varying success. In Colorado a number of municipalities passed bans on hydraulic fracturing within their city limits, but state courts have overturned the bans recognizing that the state's interest in the efficient and fair development of its resources may otherwise be threatened by inconsistent ordinances.⁵² In Pennsylvania similar bans have been passed, and Pennsylvania state courts have held that

⁴³ Fla. Admin. Code Rule 62C-26.008.

⁴⁴ Fla. Admin. Code Rule 62C-26.002.

⁴⁵ *Id.*

⁴⁶ *See e.g.*, s. 377.22, F.S., requiring the Division to adopt rules to "regulate the shooting, perforating, and chemical treatment of wells" and to "regulate secondary recovery methods, in the introduction of gas, air, water, or other substance in producing formations." *See also*, s. 377.26, F.S., requiring the Division to "take into account technological advances in drilling and production technology, including, but not limited to, horizontal well completions in the producing formation using directional drilling methods."

⁴⁷ Fla. Admin. Code R. 62C-26.008.

⁴⁸ Fla. Admin. Code R. 62C-29.006.

⁴⁹ Section 377.37(1)(a), F.S.

⁵⁰ *Id.*

⁵¹ *Id.*

⁵² David L. Schwan, *Preemption Update: Local Attempts to Preempt State Regulation of Hydraulic Fracturing*, pg. 5, available at http://www.americanbar.org/content/dam/aba/administrative/litigation/materials/2015-joint-cle/written_materials/01_fracked_up_preemption_update.authcheckdam.pdf/.

municipalities retain their authority to limit oil and gas development within their borders, effectively authorizing them to regulate the “where, but not the how, of hydrocarbon recovery.”⁵³

While cities and counties do not operate oil and gas permitting programs in Florida, some through their land use regulations or zoning ordinances require special exceptions for oil and gas activities or limit oil and gas activities to certain zoning classifications.⁵⁴ When authorizing oil and gas activities, local governments consider factors such as consistency with their comprehensive plan, injuries to communities or the public welfare, and compliance with zoning ordinances.⁵⁵

Section 377.24(5), F. S., restricts the DEP from issuing a permit for drilling within the corporate limits of a municipality unless the municipality adopts a resolution approving the permit. Three municipalities, Estero, Bonita Springs, and Coconut Creek have banned well stimulation techniques by ordinance.⁵⁶ Additionally, many counties and cities have passed resolutions supporting various types of bans and moratoriums relating to well stimulation techniques.⁵⁷

Environmental Concerns

There are a variety of environmental concerns relating to well stimulation techniques. Potential impacts and concerns include: groundwater and surface water contamination; stress on water supplies; inadequate wastewater management and disposal; and air quality degradation.⁵⁸ Because well stimulation techniques are applied to so many types of formations using a variety of methods and fluids, environmental impacts vary depending on factors such as toxicity of the fluid used; the closeness of the fracture zone to underground drinking water; the existence of a barrier between the fracture formation and other formations; and how wastewater is disposed.⁵⁹

Water Quality

A major environmental concern is the impact well stimulation techniques may have on drinking water quality. The EPA estimated that 6,800 sources of drinking water are within one mile of a well that has been hydraulically fractured.⁶⁰ Sources of drinking water may be contaminated through the release of gas-phase hydrocarbons, in what is known as stray gas migration, through

⁵³ *Id.* at 6.

⁵⁴ Florida League of Cities, *Legislative Issue Briefs, Hydraulic Fracturing (Fracking)*, http://www.floridaleagueofcities.com/Assets/Files/Advocacy/2016_IB_Fracking.pdf (last visited Jan. 7, 2016). *Also see e.g.*, Lee County’s Land Development Code s. 34-145(c).

⁵⁵ *Id.*

⁵⁶ Ordinance No. 2015-19 bans well stimulation within and below the corporate boundaries of the Village of Estero; Article IV, Section 13-1000 of Coconut Creek’s Land Development Code bans well stimulation in Coconut Creek; and Chapter 4, Article VI, Division 15, Section 4-1380 of Bonita Spring’s Land Development Code bans well stimulation in Bonita Springs, Florida.

⁵⁷ See Food & Water Watch, *Local Regulations Against Fracking*, <http://www.foodandwaterwatch.org/insight/local-resolutions-against-fracking#florida> (last visited Jan. 7, 2016).

⁵⁸ EPA, Natural Gas Extraction - Hydraulic Fracturing, <http://www.epa.gov/hydraulicfracturing> (last visited Jan. 11, 2016).

⁵⁹ Hannah Wiseman, *Untested Waters: The Rise of Hydraulic Fracturing in Oil and Gas Production and the Need to Revisit Regulation*, 20 FORDHAM ENVTL. L. REV. 115 (2009), available at <http://law.uh.edu/faculty/thester/courses/Emerging%20Tech%202011/Wiseman%20on%20Fracking.pdf>.

⁶⁰ U.S. Environmental Protection Agency (EPA), *DRAFT Assessment of the Potential Impacts of Hydraulic Fracturing for Oil and Gas on Drinking Water Resources, Executive Summary*, pg. 6 (2015), available at http://www2.epa.gov/sites/production/files/2015-07/documents/hf_es_erd_jun2015.pdf.

the movement of liquid or gases out of the well if well casing or cementing is too weak or if it fails.⁶¹ While concerns related to inadequate well casing or cementing are not unique to hydraulic fracturing, horizontally drilled, hydraulically fractured wells pose more production challenges because they are subject to greater pressures.⁶²

Mitigating measures, such as extending the casing farther below groundwater resources and pressure testing the well casing before the injection of fluids, may work to prevent well casing failures. Blowout preventers also help control and prevent pressure build-ups. Furthermore, hydraulically fractured wells in shale formations are usually drilled deeper than vertical wells and, therefore, the vertical separation between the formation and the drinking water resource is greater.⁶³ Thousands of feet of rock layers typically overlay the produced portion of shale and serve as a barrier to contamination.⁶⁴ The vast majority of Florida's public water supply is obtained from groundwater sources, specifically from the Floridan aquifer system which underlies the state of Florida.⁶⁵ Areas in which oil and gas have been extracted have an upper confining unit that is generally greater than 100 feet, which serves as a barrier to contamination.⁶⁶

Fractures created during hydraulic fracturing can intersect nearby wells or their fracture networks, resulting in the flow of fluids into those wells and to underground drinking water resources. These "frac-hits" are more likely to occur if wells are close to each other or are on the same well pad.⁶⁷ In Florida, horizontal wells deeper than 7,000 feet have more stringent spacing requirements.⁶⁸

Surface water contamination may occur as a result of the inadequate storage and disposal of produced waters, which includes fractured fluids or "flowback." Approximately 10-40 percent of the volume of the injected fracturing fluids returns to the surface after hydraulic fracturing.⁶⁹ In most produced waters the concentrations of toxic elements, such as radioactive radium, are positively correlated with salinity, which suggests that many of the potential water quality issues associated with produced waters may be attributable to the geochemistry of the brines within the shale formations.⁷⁰ In Florida, all spills of waste material must be immediately reported to the

⁶¹ Avner Vengosh, Robert B. Jackson, Nathaniel Warner, Thomas Darrah, & Andrew Kondash, *A Critical Review of the Risks to Water Resources from Unconventional Shale Gas Development and Hydraulic Fracturing in the United States*, American Chemical Society, 48 *Env. Sci. & Technol.* 8334-8348, 8336 (2014).

⁶² Michael Ratner & Mary Tiemann, Cong. Research Serv., R 43148, *An Overview of Unconventional Oil and Natural Gas: Resources and Federal Actions*, pg. 8 (Apr. 22, 2015), available at <https://www.fas.org/sfp/crs/misc/R43148.pdf>.

⁶³ *Id.* at 7.

⁶⁴ *Id.*

⁶⁵ DEP, *Aquifers*, <https://fldep.dep.state.fl.us/swapp/Aquifer.asp> (last visited Jan. 11, 2016).

⁶⁶ U.S. Geological Survey (USGS), *Conceptual Model of the Floridan*, <http://fl.water.usgs.gov/floridan/conceptual-model.html> (last visited Dec. 18, 2015).

⁶⁷ U.S. Environmental Protection Agency (EPA), *DRAFT Assessment of the Potential Impacts of Hydraulic Fracturing for Oil and Gas on Drinking Water Resources, Executive Summary*, ES-16 (2015).

⁶⁸ Fla. Admin. Code R. 62C-26.004(5).

⁶⁹ Avner Vengosh, Robert B. Jackson, Nathaniel Warner, Thomas Darrah, & Andrew Kondash, *A Critical Review of the Risks to Water Resources from Unconventional Shale Gas Development and Hydraulic Fracturing in the United States*, American Chemical Society, 48 *Env. Sci. & Technol.* 8334-8348, 8340 (2014).

⁷⁰ *Id.*

Division and the appropriate federal agencies, and the owner or operator is responsible for the costs of cleanup or other damage incurred by the state.⁷¹

Water Supply

The amount of water used during the performance of a well stimulation depends on the well depth, formation geology, and the composition of the fracturing fluid. In some cases, over 90 percent of the fracturing fluid is made up of water and each hydraulically fractured well could require thousands to millions of gallons.⁷² A well operator may obtain water in one of three ways: surface water withdrawals using a pump; groundwater withdrawals using a pipeline; or groundwater withdrawals using a well. While the total water use for well stimulation techniques is relatively low compared to other water users,⁷³ wells that are good candidates for such techniques are usually located near the same source and as a result the collective impact of water withdrawals could result in increased competition among users.⁷⁴ To decrease the competition among users, some states have implemented pilot projects evaluating the feasibility of reusing produced waters or other brackish or wastewaters.⁷⁵

Wastewater Management and Disposal

As the use of hydraulic fracturing has increased, so has the volume of wastewaters that are generated. Produced water is the water that comes to the surface naturally, as part of the oil and natural gas production process, and for a hydraulically fractured well, includes flowback. The vast majority of produced water is disposed of using injection wells. Injection wells are permitted under the Underground Injection Control (UIC) program.⁷⁶ The goal of the UIC program is the effective isolation of injected fluids from underground sources of drinking water.⁷⁷ Class II injection wells are designed to inject fluids associated with the production of oil and natural gas or fluids used to enhance hydrocarbon recovery. As unconventional oil and gas wells are being drilled at rapid rates, space for underground injection wells is becoming limited in some areas. Another issue that is developing with the increase in injection wells is the concern that the deep-well disposal of oil and gas production wastewater is responsible for seismic activity in certain areas.⁷⁸ The Oklahoma Geological Survey determined that the primary suspected source of triggered seismicity is from the injection of produced water associated with oil and gas production in disposal wells.⁷⁹

⁷¹ Section 377.371, F.S.

⁷² EPA, *Executive Summary* at 6.

⁷³ Avner Vengosh, Robert B. Jackson, Nathaniel Warner, Thomas Darrah, & Andrew Kondash, *A Critical Review of the Risks to Water Resources from Unconventional Shale Gas Development and Hydraulic Fracturing in the United States*, American Chemical Society, 48 *Env. Sci. & Technol.* 8348, 8343 (2014).

⁷⁴ Hannah Wiseman, *Risk and Response in Fracturing Policy*, 84 *Unv. of Col. L. Rev.* 729-817, 776 (2009), available at http://lawreview.colorado.edu/wp-content/uploads/2013/11/11.-Wiseman_For-Printer_s.pdf.

⁷⁵ *Id.* at 770.

⁷⁶ EPA, Underground Injection Control Program, <http://water.epa.gov/type/groundwater/uic/> (last visited Jan. 11, 2016).

⁷⁷ *Id.*

⁷⁸ See Peter Folger & Mary Tiemann, Cong. Research Serv., R 43836, *Human-Induced Earthquakes from Deep-Well Injection: A Brief Overview*, (May 12, 2015) available at <https://www.fas.org/spp/crs/misc/R43836.pdf>.

⁷⁹ Oklahoma Geological Survey, *Statement on Oklahoma Seismicity* (Apr. 21, 2015), http://wichita.ogs.ou.edu/documents/OGS_Statement-Earthquakes-4-21-15.pdf (last visited Jan. 12, 2016).

Additionally, in some states the produced waters are being sent to treatment facilities that are not equipped to treat wastewater from hydraulically fractured wells.⁸⁰ In April 2015, the EPA under the authority of the Clean Water Act published proposed rules for the oil and gas extraction category which would set pretreatment standards for discharges of wastewater from unconventional oil and gas operations to a publicly owned treatment works plant.⁸¹

Air Quality

The key emissions associated with unconventional oil and natural gas production include methane, volatile organic compounds (VOCs), nitrogen oxides, sulfur dioxide, particulate matter, and various hazardous air pollutants.⁸² In 2012, the EPA issued New Source Performance Standards that require reductions in emissions from VOCs from hydraulically fractured natural gas wells.⁸³ These rules were the first federal air standards for natural gas wells that were hydraulically fractured.⁸⁴ In August 2015, the EPA proposed additional requirements that would complement the 2012 standards, including requiring operators of hydraulically fractured oil wells, in addition to natural gas wells, to use “green completion” and a proposal to require owners or operators to find and repair leaks, which can be significant causes of methane and VOC pollution.⁸⁵

Chemical Disclosure

Fracturing fluids vary in composition based on a variety of factors, including, but not limited to, the geologic type of formation being fractured, temperature, the sensitivity of the reservoir system to water.⁸⁶ Fracturing fluids are commonly composed of water, sand, a friction reducer, acid, biocide, a breaker, a stabilizer, a cross linker, gel, a non-emulsifier, a scale inhibitor, a surfactant, a pH adjuster agent, a gelling agent, and an iron control.⁸⁷ FracFocus is a publicly accessible database managed by the Groundwater Protection Council and the Interstate Oil and Gas Compact Commission and was created to provide public access to reported chemicals used for hydraulic fracturing.⁸⁸ There are 106,132 well sites registered and the website lists over 50 chemicals that are used most often.⁸⁹ In February 2015, the Ground Water Protection Council

⁸⁰ Wiseman, *Risk and Response in Fracturing Policy* at 768-769.

⁸¹ EPA, *Unconventional Extraction in the Oil and Gas Industry*, <http://www2.epa.gov/eg/unconventional-extraction-oil-and-gas-industry> (last visited Jan. 11, 2016).

⁸² Ratner & Tiemann, R 43148 at 9.

⁸³ EPA, *Oil and Natural Gas Air Pollution Standards, Regulatory Actions*, <http://www3.epa.gov/airquality/oilandgas/actions.html> (last visited Jan. 7, 2016).

⁸⁴ *Id.*

⁸⁵ EPA, *Overview of Final Amendments to Air Regulations for the Oil and Natural Gas Industry: Fact Sheet*, August 2015, http://www3.epa.gov/airquality/oilandgas/pdfs/og_fs_081815.pdf.

⁸⁶ Gallegos, T.J., and Varela, B.A., *Trends in hydraulic fracturing distributions and treatment fluids, additives, proppants, and water volumes applied to wells drilled in the United States from 1947 through 2010—Data analysis and comparison to the literature: U.S. Geological Survey Scientific Investigations Report 2014–5131*, pg. 1 (2015), available at <http://pubs.usgs.gov/sir/2014/5131/pdf/sir2014-5131.pdf>.

⁸⁷ FracFocus Chemical Disclosure Registry, *Why Chemicals are Used*, <https://fracfocus.org/chemical-use/why-chemicals-are-used> (last visited Jan. 11, 2016).

⁸⁸ *Id.*

⁸⁹ *Id.*

reported that 27 states require chemical disclosure relating to hydraulic fracturing operations, and at least 18 of these states allow or require companies to use FracFocus.⁹⁰

Because unique formulas are used based on the geology of each formation, the exact contents and proportions of various chemicals within the mixtures may not be common knowledge within the industry and could possibly be claimed as trade secret.⁹¹ Therefore, while some states require specific fracturing fluid compositions to be disclosed to the state agencies, confidentiality provisions are provided to protect such trade secret information.

III. Effect of Proposed Changes:

Section 1 amends s. 377.06, F.S., to preempt all matters relating to the regulation of the exploration, development, production, processing, storage, and transportation of oil and gas to the state. The bill declares that any such existing ordinance or regulation is void, with the exception of zoning ordinances adopted before January 1, 2015.

Currently, three municipalities have banned well stimulation techniques within their boundaries and because these ordinances were adopted after January 1, 2015, the ordinances would be void.

Section 2 amends s. 377.19, F.S., to define the term “high-pressure well stimulation” as “all stages of a well intervention performed by injecting fluids into a rock formation at high pressure that exceeds the fracture gradient of the rock formation in order to propagate fractures in such formation to increase production at an oil or gas well by improving the flow of hydrocarbons from the formation into the wellbore.” The bill specifies that the term does not include “well stimulation or conventional workover procedures that may incidentally fracture the formation near the wellbore.”

As defined, the term “high-pressure well stimulation” includes both hydraulic fracturing and acid fracturing and, consequently, a permit will be required before the performance of either technique. However, matrix acidizing, as it is performed at a pressure that does not exceed the fracture gradient, is outside the scope of the definition and would remain regulated as a workover.

Section 3 amends s. 377.22, F.S., to require the DEP to adopt rules for the regulation of high-pressure well stimulations, as well as rules relating to oil and gas well operations generally. The bill:

- Requires a bond or other form of security to be conditioned upon properly drilling, casing, producing, and operating each well and upon restoration of the area.
- Specifies that inspections are required during the testing of blowout preventers, during the pressure testing of the casing and casing shoe, and during the integrity testing of the cement plugs in plugging and abandonment operations.

⁹⁰ Michael Ratner & Mary Tiemann, Cong. Research Serv., R 43148, *An Overview of Unconventional Oil and Natural Gas: Resources and Federal Actions*, pg. 12 (Apr. 22, 2015), available at <https://www.fas.org/sgp/crs/misc/R43148.pdf>.

⁹¹ Hannah Wiseman, *Trade Secrets, Disclosure, and Dissent in a Fracturing Energy Revolution*, 111 COLUM. L. REV. SIDEBAR 1, 6-7 (2011), available at http://www.columbialawreview.org/wp-content/uploads/2011/01/1_Wiseman.pdf.

- Authorizes the DEP to evaluate the history of past adjudicated violations committed by the permit applicant or the applicant's affiliated entities of any substantive and material rule or law pertaining to the regulation of oil or gas.

Section 4 amends s. 377.24, F.S., to require a person who desires to perform a high-pressure well stimulation to provide notice to the DEP, pay a fee, and receive a permit before the performance of a high-pressure well stimulation. The bill provides that a permit may authorize a single activity or multiple activities. The bill provides that an application for permission to perform a high-pressure well stimulation may only be denied by the Division for just and lawful cause.

The bill removes the prohibition against the granting of permits for drilling a gas or oil well within the corporate limits of a municipality without the approval of the governing authority of the municipality by resolution.

The bill prohibits the DEP from approving a permit authorizing high-pressure well stimulations until the DEP adopts rules for high-pressure well stimulations.

Section 5 amends s. 377.241, F.S., to add criteria the DEP must consider and be guided by relating to the issuance of permits for high-pressure well stimulations; specifically, whether the high-pressure well stimulation as proposed is designed to ensure that the groundwater through which the well will be or has been drilled is not contaminated by the high-pressure well stimulation and whether the performance of the high-pressure well stimulation is consistent with the public policy of the state to safeguard the health, property, and public welfare of the citizens of the state.⁹²

The bill specifies that a permit may be denied or specific conditions of a permit may be required, including increased bonding and monitoring, if the permit applicant or affiliated entity has a history of adjudicated violations of any substantive and material rule or law pertaining to the regulation of oil and gas, including violations that occurred outside of Florida.

Section 6 amends s. 377.242, F.S., to specify that the DEP has the authority to issue permits for the performance of a high-pressure well stimulation. The bill clarifies that a permittee agrees to inspections during the installation and cementing of the casing, during the testing of blowout preventers, during the pressure testing of the casing and casing shoe, and during the integrity testing of the cement plugs in plugging and abandonment operations.

Section 7 amends s. 377.2425, F.S., to require the permit applicant or operator to provide surety that the performance of a high-pressure well stimulation will be conducted in a safe and environmentally compatible manner.

Section 8 creates s. 377.2436, F.S., to require the DEP to conduct a study on high-pressure well stimulations. The study must include all of the following:

- An evaluation of the underlying geologic features in the counties where oil wells have been permitted and an analysis of the potential impact that high-pressure well stimulations and wellbore construction may have on the underlying geologic features.

⁹² Section 377.06, F.S.

- An evaluation of the potential hazards and risks that high-pressure well stimulations pose to surface water and groundwater resources.
- An assessment of the potential impact of high-pressure well stimulations on drinking water resources and an identification of the main factors affecting the severity and frequency of impacts.
- An analysis of the potential for the use or reuse of recycled water in well stimulation fluids, while meeting the appropriate water quality standards.
- A review and evaluation of the potential for groundwater contamination from conducting high-pressure well stimulations under wells that have been previously abandoned and plugged.
- An identification of a setback radius from plugged and abandoned wells that could be impacted by high-pressure well stimulations.
- A review and evaluation of the ultimate disposition of high-pressure well stimulation fluids after use in high-pressure well stimulation processes.

The bill specifies that the DEP shall continue conventional oil and gas business operations during the performance of the study and that there is not a moratorium on the evaluation and issuance of permits for conventional drilling, explorations, conventional completions, or conventional workovers during the performance of the study.

The bill requires the study to be subject to an independent scientific peer review, and the findings of the study to be submitted to the Governor, the President of the Senate, and the Speaker of the House of Representatives by June 30, 2017. It also requires the results of the study to be posted to the DEP's website.

Section 9 amends s. 377.37, F.S., to increase the civil penalty from \$10,000 per offense per day to \$25,000 per offense per day.

Section 10 creates s. 377.45, F.S., to require the DEP to designate the national chemical registry FracFocus as the state's registry for chemical disclosure for all wells on which high-pressure well stimulations are performed. In addition to providing the following information to the DEP as part of the permitting process, the bill requires a service provider, vendor, or owner or operator to report all of the following information, at a minimum, to the DEP for submission to FracFocus:

- The service provider, vendor, or owner or operator's name.
- The date of completion of the high-pressure well stimulation.
- The county in which the well is located.
- The American Petroleum Institute (API) well number.
- The well name and number.
- The longitude and latitude of the wellhead.
- The total vertical depth of the well.
- The total volume of water used in the high-pressure well stimulation.

- Each chemical ingredient that is subject to the Occupational Safety and Health Administration (OSHA) regulations set forth in 29 C.F.R. s. 1910.1200(g)(2)⁹³ and the ingredient concentration in the high-pressure well stimulation fluid by mass for each well on which a high-pressure well stimulation is performed.
- The trade or common name and the Chemical Abstract Service (CAS) number for each chemical ingredient.

The bill requires the DEP to report this information to FracFocus, excluding any information that is subject to the Uniform Trade Secrets Protection Act as set forth in chapter 688, F.S. If FracFocus cannot accept and make publically available such information, the DEP is required to post the information on its website, excluding trade secret information.

The service provider, vendor, owner or operator is required to report the chemical disclosure information within 60 days of the initiation of the high-pressure well stimulation. The service provider, vendor, well owner, or operator must also notify the DEP if any chemical ingredient not previously reported was intentionally included and used for the purpose of performing a high-pressure well stimulation.

The bill exempts from disclosure any ingredients that are unintentionally added to the high-pressure well stimulation, occur incidentally, or are otherwise unintentionally present in the high-pressure well stimulation.

The bill provides the DEP with rule authority to administer this section.

Section 11 amends s. 377.07, F.S., to rename the Division of Resource Management the Division of Water Resource Management.

Section 12 amends s. 377.10, F.S., to make technical changes.

Section 13 amends s. 377.243, F.S., to make technical changes.

Section 14 amends s. 377.244, F.S., to make technical changes.

Section 15 provides a nonrecurring appropriation of \$1 million from the General Revenue Fund to the DEP to conduct a study on high-pressure well stimulations.

Section 16 provides an effective date of July 1, 2016.

IV. Constitutional Issues:

A. Municipality/County Mandates Restrictions:

The county/municipality mandates provision of Art. VII, section (18)(b) of the Florida Constitution may apply because the bill restricts the authority of counties and

⁹³ 29 C.F.R. s. 1910.1200(g)(2) requires chemical manufacturers and importers to insure that the safety data sheets have the required information. See Appendix D to s. 1910.1200 - Safety Data Sheets, *available at* <https://www.osha.gov/dsg/hazcom/hazcom-appendix-d.html>.

municipalities to establish programs that regulate any activity related to oil and gas exploration, production, processing, storage, and transportation. No county or municipality currently operates such permitting program.⁹⁴ Therefore, the exemption for insignificant fiscal impact may apply.

B. Public Records/Open Meetings Issues:

None.

C. Trust Funds Restrictions:

None.

V. Fiscal Impact Statement:

A. Tax/Fee Issues:

The bill authorizes a new permit fee for high-pressure well stimulations and increases fines from \$10,000 per offense per day to \$25,000 per offense per day.

B. Private Sector Impact:

The bill increases penalties from \$10,000 to \$25,000 per offense, which will have a negative fiscal impact on private companies that are found in violation of the law.

C. Government Sector Impact:

The Department of Environmental Protection (DEP) will incur additional costs associated with separately permitting high-pressure well stimulation techniques. The regulatory costs and permit fees will be based on the permitting requirements that the DEP will establish through the rulemaking process. According to the DEP, existing staff is sufficient to handle the anticipated workload increases.⁹⁵

The bill increases the penalty for violations from \$10,000 per offense to \$25,000 per offense. Should violations occur, the increased revenue will have a positive fiscal impact to the Minerals Protection Trust Fund within the DEP.

According to the DEP, the costs associated to amend Rules 62C-25 through 30 of the Florida Administrative Code can be absorbed within the DEP's existing budget and the estimated cost for the study on high pressure well stimulations is \$1 million.⁹⁶

⁹⁴ Florida League of Cities, *Legislative Issue Briefs, Hydraulic Fracturing (Fracking)*, http://www.floridaleagueofcities.com/Assets/Files/Advocacy/2016_IB_Fracking.pdf (last visited Jan. 7, 2016).

⁹⁵ DEP, *Senate Bill 318 Agency Legislative Bill Analysis*, pg. 4 (Nov. 6, 2015) (on file with the Senate Committee on Environmental Preservation and Conservation).

⁹⁶ *Id.*

VI. Technical Deficiencies:

None.

VII. Related Issues:

The bill authorizes the DEP to evaluate the history of past adjudicated violations committed by permit applicants or an affiliated entity of the applicant as a basis for permit denial or the imposition of specific permit conditions. The term “adjudicated” implies some sort of legal proceeding to resolve a dispute,⁹⁷ which may not include citations that were not challenged. However, the DEP has represented that “adjudicated” will be interpreted to include all “final” violations.⁹⁸

The bill requires the DEP to conduct a study evaluating underlying geologic features. The language refers only to counties in which oil wells have been permitted and, therefore, may not include counties that have only permitted gas wells or counties where applications have been submitted for exploratory permits. The DEP has represented that any variation in the underlying geologic features between the counties where oil wells have been permitted and counties where gas wells or exploratory permits have been applied for are negligible for the purposes of the study.⁹⁹

VIII. Statutes Affected:

This bill substantially amends the following sections of the Florida Statutes: 377.06, 377.19, 377.22, 377.24, 377.241, 377.242, 377.2425, 377.37, 377.07, 377.10, 377.243, and 377.244.

This bill creates the following sections of the Florida Statutes: 377.2436 and 377.45.

IX. Additional Information:**A. Committee Substitute – Statement of Changes:**

(Summarizing differences between the Committee Substitute and the prior version of the bill.)

None.

B. Amendments:

None.

This Senate Bill Analysis does not reflect the intent or official position of the bill’s introducer or the Florida Senate.

⁹⁷ Merriam-Webster defines the term “adjudicate” as “to make an official decision about who is right in a dispute.”

⁹⁸ Email from Andrew Ketchel, Director, Office of Legislative Affairs, DEP (Jan. 7, 2016) (on file with the Senate Committee on Environmental Preservation and Conservation).

⁹⁹ *Id.*