



BOARD OF SUPERVISORS
AGENDA LETTER

Agenda Number:

Clerk of the Board of Supervisors
105 E. Anapamu Street, Suite 407
Santa Barbara, CA 93101
(805) 568-2240

Department Name: Planning and
Development
Department No.: 053
For Agenda Of:
Placement: Departmental
Estimated Tme: One hour
Continued Item: No
If Yes, date from:
Vote Required: Majority

TO: Board of Supervisors

FROM: Department Director(s)
Contact Info: Dr. Glenn Russell, PhD, 568-2085
Doug Anthony, Deputy Director, 568-2046

SUBJECT: Briefing on Hydraulic Fracturing

County Counsel Concurrence

As to form: N/A

Auditor-Controller Concurrence

As to form: N/A

Other Concurrence: N/A

As to form: No

Recommended Actions:

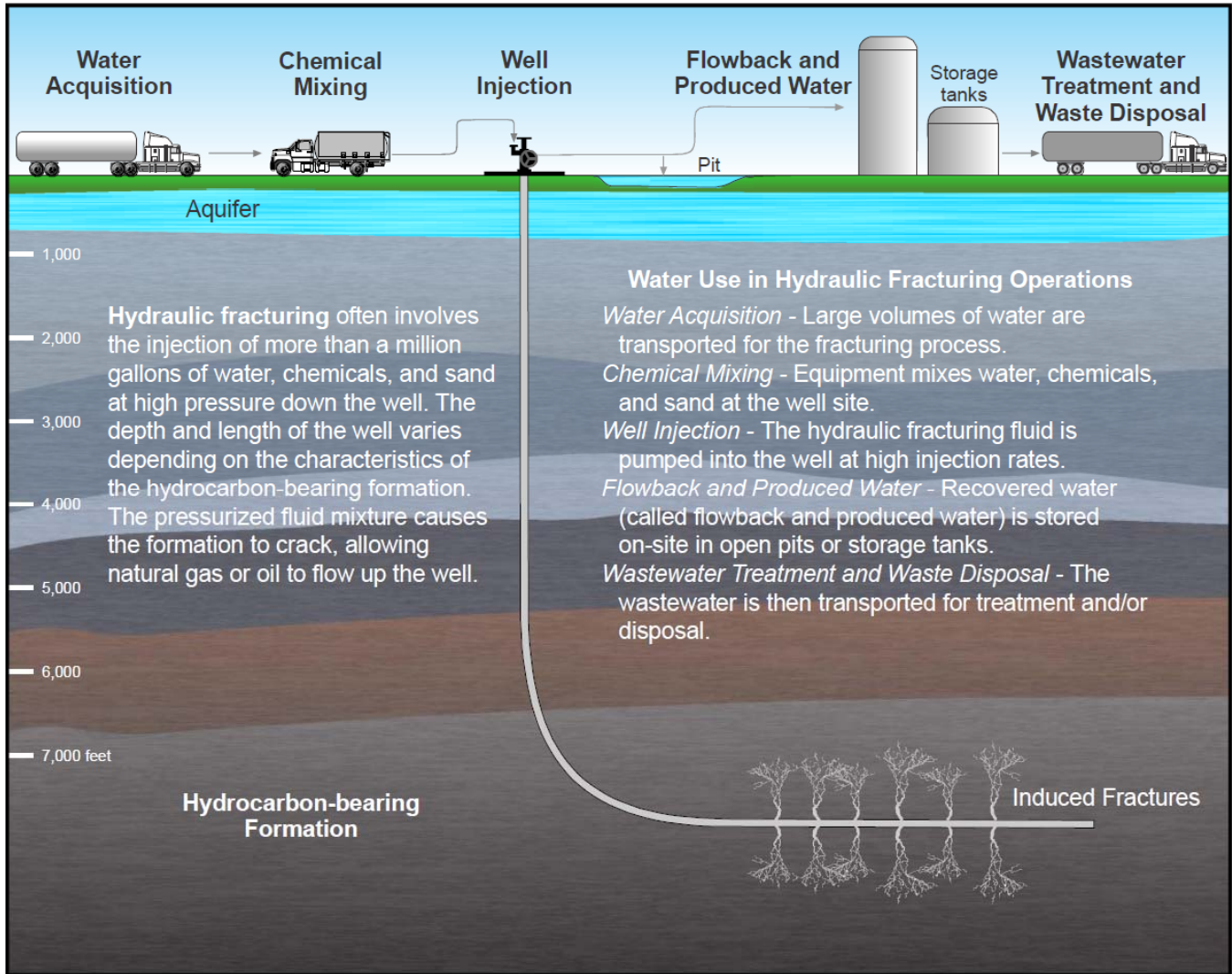
That the Board of Supervisors receive a briefing on hydraulic fracturing as a means of enhancing extraction of oil and/or gas from subsurface formations, and continue this item to August 2, 2011, when Ms. Elena Miller, State Oil and Gas Supervisor, Division of Oil, Gas, and Geothermal Resources, California Department of Conservation will be available to answer questions from the Board.

Summary Text:

At its hearing of May 3, 2011, the Board of Supervisors requested a briefing on hydraulic fracturing. The following briefing summarizes:

- what is hydraulic fracturing
- what are public concerns about it
- what is the local oil industry's perspective about it
- what is the current regulatory framework
- what legislation is pending in Sacramento to address the use of hydraulic fracturing in California
- what are potential next steps for the county

Hydraulic Fracturing in a Horizontal Well¹



Hydraulic Fracturing

Hydraulic fracturing, also called fracking, is a process applied to some hydrocarbon-bearing formations to enhance extraction of oil and/or natural gas. It was first applied to oil/gas extraction in the late 1940s. As illustrated above, this process involves the pumping of fluid into the targeted subsurface formation at pressures high enough to fracture the oil shale, coalbed, or tight sands to improve the flow of oil and/or gas to the wellhead. It is used in both vertical and horizontal wells. After the fracturing, the pressure is reduced and roughly about 25% of the fluid returns to the surface, leaving behind particles, such as sand, bauxite, or ceramic beads that keep the new fractures open. As illustrated above, water is a typical fluid used in the process; it is brought to the site and stored in open pits or portable tanks. The hydraulic fracturing process is typically of short duration, lasting less than a month, including mobilization, set-up, and demobilization.

¹ U.S. Environmental Protection Agency, *Draft Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources*, EPA/600/D-11/001/February 2011, page 11.

Chemicals may also be added for a variety of reasons.² Some of those chemicals are toxic, including but not limited to diesel, polycyclic aromatic hydrocarbons, methanol, formaldehyde, ethylene glycol, glycol ether, hydrochloric acid, and sodium hydroxide. The industry sometimes considers the types and concentration of chemical additives to be confidential trade secrets, which makes precise identification of the chemicals used at a specific well-site difficult.³ The industry has established a voluntary chemical disclosure registry – fracfocus.org – to help overcome this barrier. Both Congress and several states are considering legislation that would require disclosure of the chemicals used in fracking fluids.

Public Concerns about the Process

Some of the literature and video on hydraulic fracturing reveals growing public concern nationwide about the potential to cause adverse impacts to public health and the environment, particularly with regard to shale gas fracturing. Expressed concerns include:

- a potential release of pollutants from the toxic chemicals used in the fracking fluids and/or the constituents of the oil and natural gas into surface water, groundwater, and the atmosphere;
- a lack of disclosure of chemicals used in the fracking fluids;
- a potential increase in seismic activity, including earthquakes, as a result of fracking;
- the use of large amounts of groundwater to conduct the fracking;
- the increase in air emissions related to transport of water and chemicals to and from the wellhead; and
- a lack of sufficient regulatory oversight.

A recently released study by scientists at Duke University appears to support some of this public concern as it found systematic evidence that shallow drinking-water systems near active gas-extraction areas aided by hydraulic fracturing in northeast Pennsylvania and upstate New York have been contaminated with methane, the primary constituent of natural gas. While methane was found in 85% of the 60 drinking-water wells tested across the region, concentrations were substantially higher for those wells that were closer to active gas-producing wells with related hydraulic fracturing.⁴

Oil/Gas Industry Perspective

Individual oil companies that operate in Santa Barbara County defer to state and national industrial associations on this industry-wide matter.

The California Independent Petroleum Association (CIPA) supports the goal of mandatory disclosure being pursued in several states, and is working with California state legislators on requirements for such

² Typical reasons to add chemicals include: elimination of bacteria in water, maintain viscosity of fluid as temperature rises, enhance flow of fluid by reducing friction, inhibit corrosion, thicken water to carry particles for propping fractures open, stabilize product, and help dissolve minerals and initiate cracks.

³ U.S. Environmental Protection Agency, *Op. Cit.*, page 25. Spence, David, “Fracking Regulations: Is Federal Hydraulic Fracturing Regulation Around the Corner?” page 4, <http://blogs.mcombs.utexas.edu/energy/energy-management-briefs/fracking-regulations-is-federal-hydraulic-fracturing-regulation-around-the-corner/>. Fracking pressures also are considered to be trade secrets, at least in some applications.

⁴ Osborn, Stephen, *et. al.*, “Methane contamination of drinking water accompanying gas-well drilling and hydraulic fracturing, 2011, <http://www.propublica.org/documents/item/methane-contamination-of-drinking-water-accompanying-gas-well-drilling>

disclosure. CIPA notes that California already has time-proven requirements to ensure the integrity of oil and/or gas wellbores through appropriate casing and cementing (see next section).⁵

The American Natural Gas Alliance (ANGA) also endorses state-based disclosure of chemicals used in individual hydraulic fracturing undertakings and encourages its members to participate in such registries.⁶ However, it is unclear if it supports mandatory disclosure. The alliance also believes that the extent to which hydraulic fracturing has been applied to date – over a million wells over the last 60 years – provides a proven track record – and that the U.S. Environmental Protection Agency’s (EPA) current study (discussed below) will provide policymakers and the public with greater reassurance of the safety of this practice.⁷

Regulation of Hydraulic Fracturing in California

The federal government’s regulation of hydraulic fracturing is relatively limited. The Clean Water Act regulates disposal of waterborne wastes, such as fracking fluids, into lakes, streams, or sewage treatment facilities, and the Hazardous Materials Transportation Act regulates the transport of hazardous chemicals.⁸ However, hydraulic fracturing is exempt from the federal Safe Drinking Water Act, the Resource Conservation and Recovery Act, and the Emergency Planning and Community Right to Know Act, which address treating, storage, and disposal of hazardous wastes, protection of groundwater from injection wells, and disclosure of toxic chemicals, respectively. As discussed below, Congress is considering legislation that would mandate disclosure of

Additionally, the EPA recently prepared a draft plan to study whether or not hydraulic fracturing has the potential to contaminate drinking water, and if it does, what are the predominant circumstances of such occurrence.⁹ The study will consider contamination from toxic chemicals in the fracking fluids as well as any mobility of naturally occurring substances in the subsurface potentially caused by hydraulic fracturing (e.g., methane, metals, and naturally occurring radioactive material).¹⁰ Hypothetical pathways to groundwater may include upward migration through the wellbore if it has not been properly cased and cemented, upward migration through the fractures themselves, upward migration through disposal reservoir, or downward migration via surface spillage. The study is scheduled to be completed at the end of 2012. Its conclusions may lead to some regulatory action at the federal level.

The California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR) has exclusive jurisdiction over the down-hole component of all phases of oil and gas drilling and production in California, including regulation of well casing and cementing to prevent oil, gas, drilling muds, etc. from entering into ground water reservoirs. DOGGR recently updated its website to address hydraulic fracturing.¹¹ The webpage is included as Attachment A, along with a letter from Ms. Elena Miller, head of DOGGR, to State Senator Fran Pavley, that briefly responds to questions about hydraulic fracturing.

⁵ Phone conversation with Rock Zierman, Director of Public Affairs, CIPA.

⁶ <http://www.anga.us/media-room/press-releases/2010/12/anga,-ipaa,-axpc-endorse-state-based-registry-for-disclosure-of-hydraulic-fracturing-chemicals>

⁷ <http://www.anga.us/media-room/press-releases/2010/09/anga-statement-on-epa-public-meeting-on-hydraulic-fracturing-study>

⁸ Spence, David, *Op. Cit.*, page 3.

⁹ *Ibid*, entire document.

¹⁰ *Ibid*, page 30.

¹¹ http://www.conservation.ca.gov/dog/general_information/Pages/HydraulicFracturing.aspx

In her letter to Senator Pavley, Ms. Miller states that, while DOGGR has statutory jurisdiction to regulate hydraulic fracturing under Section 3106, "... it has not yet developed regulations to address this activity." (Page Two.) The agency does plan to develop such regulations in its effort to correct deficiencies in its Underground Injection Control Program, which has been delayed due to staffing shortages. Her letter also states that DOGGR has not tracked the extent to which hydraulic fracturing occurs throughout California.

However, DOGGR does extensively regulate the integrity of the wellbore, which includes the integrity of casing and the cementing of the space between the casing and the wellbore to protect the groundwater aquifer(s). Current regulation requires operators to fill the space to at 500 feet above oil and gas zones, and at least 100 feet above the base of the freshwater zone.¹² This regulatory focus addresses one of the pathways by which fracking fluids and/or other toxic materials in the target formation could potentially reach a groundwater reservoir.

The Regional Water Quality Control Board is working with the State Water Quality Board to determine how it should address the application of hydraulic fracturing under its regulatory jurisdiction of protecting groundwater. Its current effort considers the entire life-cycle of fracking fluids, starting with source of the fluid (e.g., fresh groundwater) to its use at a drill site and ultimately its disposal.

Cities and counties may exercise land use controls and environmental protections, where not pre-empted by DOGGR regulations. Historically, DOGGR has exercised sole jurisdiction over the down-hole component of oil/gas extraction. Santa Barbara County regulations do not specifically address hydraulic fracturing in its regulations. However, the Land Use and Development Code requires a discretionary Oil Drilling and Production Plan for any oil and/or gas well drilled in an inland area, within a state designated oil field, that, among other things, uses fresh ground water as a means of flooding a subsurface formation. This same permit is also required for any oil well or related activity that is determined to have the potential to significantly impact the environment, based on initial site visits by staff and screening-level analyses of air emissions (including greenhouse gases) and risk to public safety. The Planning Commission is the designated review authority for approval of this type of permit. This regulatory framework has existed since the early 1980s, and tools to implement it have been augmented over time. Staff recently augmented the application process by requiring applicants to complete a supplemental application to ensure that sufficient information is provided in all future oil and gas related permit applications to address secondary and tertiary recovery methods, including hydraulic fracturing (included as Attachment B).

The County also often serves as the Lead Agency pursuant to the California Environmental Quality Act (CEQA) when operators submit applications for oil and gas wells, with DOGGR and the Santa Barbara County Air Pollution Control District serving as Responsible Agencies. Lastly, the County's Fire Department requires operators to file a Business Plan that lists all chemicals stored onsite if the exceed specified thresholds.

Staff recently learned that hydraulic fracturing had been conducted on two wells north of Los Alamos, using 126,000 gallons of groundwater on one well and 109,200 gallons on the other. Both incidents were short-term in length of time. The operator should have sought approval of an Oil Drilling and Production

¹² Title 14, California Code of Regulations, Section 1722.4.

Plan, pursuant to LUDC Section 35.52.050.C, prior to conducting the hydraulic fracturing, but did not. The local oil industry has been notified that it must seek necessary permits prior to performing any hydraulic fracturing within the land-use jurisdiction of the County.

Pending Legislation

In California, Assembly Bill (AB) 591 seeks to amend Section 3107 and 3203 of the Public Resources Code, both of which are administered by DOGGR (included as Attachment C). In its current version (as of May 10, 2011), the bill seeks to require mandatory disclosure of all chemicals used in hydraulic fracturing along with other information to enhance understanding of potential impacts. The bill would require DOGGR to collect, map, and post information on the presence of oil and gas throughout the state, along with the extent of groundwater and surface water that might be affected by oil/gas extraction.

The bill also would require any operator who proposes to conduct hydraulic fracturing to file an application with DOGGR with information on chemicals to be used, and presence of known active seismic faults within five miles of the well. After drilling, the operator would be required to submit a list of all chemicals and radioactive components or tracers, and source of water injected into a wellbore. The operator is required to notify every property owner and occupant within one mile of the well, if the list contains any chemical known to cause cancer or reproductive toxicity.

Two companion bills – S 587 and HR 1084 – have been re-introduced in the U.S. Senate and House of Representatives as the Fracturing Responsibility and Awareness of Chemicals Act, or FRAC Act.¹³ In their current version (March 15, 2011, included in Attachment C), the bills seek to repeal the exemptions for hydraulic fracturing in the Safe Water Drinking Act, and to require disclosure of chemicals used in any hydraulic fracturing activity to the primary responsible state agency. The timing of disclosure is similar to that proposed in AB-591.

Potential Next Steps

The one challenge for which staff is preparing is achieving adequate assessment of the potential impacts to public health and the environment as demand for hydraulic fracturing grows within Santa Barbara County. Some of the environmental analyses required are routine, such as disclosure of impacts from truck trips, or impacts of proposed withdrawal from local groundwater aquifers, or disposal of fracking fluids. However, ensuring adequate analysis of potential results of fracturing in the subsurface area will be new territory. It will involve the expertise of geologists and reservoir engineers, as well as potential review by the Regional Water Quality Control Board. Staff plans to work with relevant state agencies, and other counties, in this effort.

Another challenge lies with determining if the CEQA process may be more efficient by employing a programmatic assessment for an oil field that may then be tiered from to examine application to individual wells.

The Board already is monitoring AB 591, and may wish to request amendments with regard to mandatory disclosure of fracking chemicals. While mandating disclosure, the timing of disclosure does

¹³ First versions of the FRAC Act were introduced in 2009, but never came out of committee.

not appear to be consistent with the required disclosure of hazardous materials and related impacts for any project subject to review under the California Environmental Quality Act. The Board may also may also seek other legislation to address all concerns of hydraulic fracturing.

Fiscal and Facilities Impacts:

Budgeted: Yes

Fiscal Analysis:

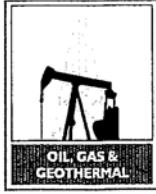
Staff time to research and prepare this briefing is funded in the Administration Program of the Development Review Division, North found on page D-334 of the FY 10-11 budget book.

Attachments:

- A. DOGGR webpage and letter to State Senator Pavley
- B. Santa Barbara County Oil and Gas Supplemental Application
- C. Assembly Bill 591, S. 587, H.R. 1084

Attachment A

**DOGGR Webpage &
Letter to State Senator Pavley**



DEPARTMENT OF CONSERVATION

Managing California's Working Lands

Public Affairs Office

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Hydraulic Fracturing

Overview - The practice of hydraulic fracturing or “fracking” is commonly associated with the recovery of non-associated natural gas (that is, gas not produced along with oil) from gas shale, primarily in the eastern United States. In California, fracking is occasionally used for a brief period to stimulate production of oil and gas wells. A relatively small percentage of California’s oil and gas production is from shale formations.

The California Division of Oil, Gas, and Geothermal Resources (DOGGR) has statutory authority to regulate hydraulic fracturing under Section 3106 of the Public Resources Code, but does not have regulations requiring reporting or requirements to permit or track the different methods of hydraulic fracturing or fluids injected. The practice is largely exempted from the U.S. Safe Drinking Water Act, except when diesel fuel is used as the fracking agent. (42 U.S.C.S § 300h(d)). The United States Environmental Protection Agency (U.S. EPA) is undertaking a multi-year study of hydraulic fracturing and its potential impacts. More information can be found at the U.S. EPA web link:

http://water.epa.gov/type/groundwater/uic/class2/hydraulicfracturing/upload/HFStudyPlanDraft_SAB_020711.pdf.

What is hydraulic fracturing? Hydraulic fracturing is a process that involves injecting fluids into a well bore at pressures that exceed the strength of the formation (rock), thereby resulting in the formation breaking down or fracturing. Typically, a propping agent, such as sand, is also injected into the well to ensure the fractures in the formation remain open. This process increases the permeability of the formation and, therefore, increases the production of the resource.

Is fracking used in California? DOGGR only has anecdotal information about the use of the practice. That said, the Division does not believe that fracking is widely used in California. Fracking, as portrayed in the documentary “Gasland,” is used to retrieve non-associated natural gas. More than 90 percent of California’s non-associated gas production occurs north of Stockton and is produced from sands rather than shale. Sands do not respond well to hydraulic fracturing. California’s non-associated gas production has been on the decline since 2006. While DOGGR is aware of industry interest in the potential to increase non-associated natural gas production in the state through hydraulic fracturing, the associated costs of production may remain too high to be beneficial at present natural gas prices.

What specific statutory and regulatory authority does DOGGR have? Per Public Resources Code Section 3106, the State Oil and Gas Supervisor permits the owners or operators of wells to, “utilize all methods and practices known to the oil industry for the purpose of increasing the ultimate recovery of underground hydrocarbons . . . [and to] do what a prudent operator using reasonable diligence would do . . . including, but not limited to, the injection of air, gas, water, or other fluids into the productive strata, the

Hydraulic fracturing 2-2-2

application of pressure heat or other means for the reduction of viscosity of the hydrocarbons, the supplying of additional motive force, or the creating of enlarged or new channels for the underground movement of hydrocarbons into production wells.”

DOGGR has an Underground Injection Control (UIC) Program in place to address enhanced oil recovery, water disposal, and gas storage. Additionally, the division has State and federal authority to permit Class II injection wells, which allow for injection of California non-hazardous fluids produced in the course of oil and natural gas production operations. The division has a primacy agreement with the U.S. EPA to permit and regulate Class II injection wells under the federal Safe Drinking Water Act (Act). Hydraulic fracturing operations are excluded from regulation under the Act, except when diesel fuel is used as the fracking agent. DOGGR has no authority to permit the injection of diesel fuel because it is a refined product.

Before a permit is issued, the proposed injection project is studied by DOGGR engineers and reviewed by the appropriate Regional Water Quality Control Board. Injection project permits often include conditions, such as approved injection zones, allowable injection pressures, and testing requirements. State regulations were designed to ensure that injected fluids are confined to the project area and zone, and that formation pressures are not exceeded to the extent that damage occurs.

Are more fracking regulations forthcoming? Due to the ongoing natural gas drilling boom in the eastern U.S., some members of Congress are calling for more regulation of hydraulic fracturing. During the summer of 2010, the U.S. EPA conducted a “listening tour” to receive public comments about how to structure a forthcoming \$1.9 million study of fracking. The “Draft Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources” can be found at the link provided above to the U.S. EPA website.

LINKS

- [U.S. EPA](#)
- [Groundwater Protection Council](#)
- [STRONGER](#)
- [California Office of Environmental Health Hazard Assessment](#)

May 1, 2011



DEPARTMENT OF CONSERVATION

Managing California's Working Lands

Division of Oil, Gas, & Geothermal Resources

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February 16, 2011

The Honorable Fran Pavley
California State Senate
23rd State Senate District Office
2716 Ocean Park Blvd. Ste 3088
Santa Monica, CA 90405

Dear Senator Pavley;

I appreciate your letter concerning the practice of "hydraulic fracturing" as it relates to the recovery of natural gas in California. Recent news events have brought to light the use of hydraulic fracturing in gas shale, similar to those found in Texas, such as the Barnett Shale and the Marcellus Shale, which are located in the eastern states of New York and Pennsylvania, respectively. In these shale formations, the gas production is not associated with oil production and is referred to as *non-associated gas production*. Although California, as the fourth largest oil and gas producing state in the nation, indeed has some oil and gas production from shale formations, it is not noted for shale non-associated natural gas production. Over 90 percent of California's non-associated gas production occurs in northern California, north of Stockton, and is produced from sands, rather than from shale. This is because sands do not respond well to hydraulic fracturing. While the Division is aware of industry white papers touting the potential for increasing non-associated natural gas production in the state through hydraulic fracturing, the associated costs of production may remain too high to be beneficial at present natural gas prices. Since 2006, the non-associated gas production in California has been on the decline. (2008 Annual Report of the Oil and Gas Supervisor.)

History and Definition of Hydraulic Fracturing

Hydraulic fracturing, which was first introduced in western Kansas in 1947, has been used primarily to overcome wellbore damage and to create deep-penetrating reservoir fractures to improve the productivity of a well.

Hydraulic fracturing associated to natural gas production from shale and other underground deposits is related to creating deep-penetrating reservoir fractures to improve the productivity of a well. More specifically, hydraulic fracturing is a process that involves injecting fluids into a wellbore at pressures that exceed the strength of the formation (rock), thereby resulting in the formation breaking down or fracturing. Typically, a propping agent, such as sand, is also injected into the well to ensure the

fractures in the formation remain open. This process increases the permeability of the formation and, therefore, increases the production of the resource.

Responses to your questions are presented below in the order included in your letter:

- **What is the extent to which hydraulic fracturing is used, including number and location of wells?** The Division is unable to identify where and how often hydraulic fracturing occurs within the state. The limited data we have is unreliable as there are neither reporting requirements nor regulatory parameters of when, how, and what needs to be reported when applying for permits. Although the Division has statutory authority to regulate hydraulic fracturing under Section 3106 of the Public Resources Code, the Division has not yet developed regulations to address this activity. A BCP was approved last year to provide additional resources to address deficiencies in the Underground Injection Control Program (UIC). These resources were to put engineers in the field for inspections, monitoring, compliance, and equipment testing functions; to provide an environmental planner to address CEQA issues, and an environmental planner to address regulatory and CEQA tasks. Late passage of the Budget, the subsequent hiring freeze, ensuing retirements, and existing vacancies have delayed much progress for this program. As we are able to thoroughly assess the UIC Program, the Division will begin the process of determining what regulations are needed as well as identifying any necessary additional resources to ensure the Division and the industry is in compliance with state and federal law.
- **What is the amount of energy produced using hydraulic fracturing?** The Division permits well drilling, re-drilling, deepening, and any permanent alteration of well casing. The Division collects annual assessment amounts from the operators based upon each barrel of oil and/or metric cubic feet (mcf) of gas produced. However, the Division is not aware of the amount of energy produced using hydraulic fracturing, since there is no provision in the statutes requiring the reporting or collection of this information.
- **What is the amount of water used in the hydraulic fracturing process?** Recent literature indicates that in the Barnett Shale (located in Texas) an estimated 70,000 barrels of water per well are injected for hydraulic fracturing. Again, because California has no such reporting requirements for this specific information, the Division does not have information specific to the practice here.
- **Does the Division have any information regarding the safety, efficacy, and necessity of hydraulic fracturing as it is currently employed in California?** Again, because there are no reporting requirements for hydraulic fracturing, the Division has no data on the safety, efficacy, and necessity as currently employed in California. The Division's mission is to prevent damage to life, health, property, natural resources, and underground and surface waters suitable for irrigation or domestic purposes. (CA Public Resources Code Section 3106). The Division has no known reports of damage occurring in relation to hydraulic fracturing.

- **Is the Division able to provide any information regarding potential risks to human or environmental health associated with hydraulic fracturing?** On February 7, 2011 the US EPA released a, "Draft Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources." The Plan and additional information on this subject are available at:
<http://yosemite.epa.gov/sab/SABPRODUCT.NSF/PeopleSearch/D3483AB445AE61418525775900603E79?OpenDocument>.

Siting and Permitting

- **What is the current permitting process, including the duration of permits, in California for the recovery of natural gas via hydraulic fracturing?** There is currently no permitting process for the recovery of natural gas via hydraulic fracturing in the State.
- **What specific statutory and regulatory authority is in place to regulate this drilling technique, including the chemical components of the fluids that are injected into the strata during the drilling process?** As noted above, there are no regulations currently in place specific to hydraulic fracturing. In Public Resources Code Section 3106, the Supervisor permits the owners or operators of wells to, "utilize all methods and practices known to the oil industry for the purpose of increasing the ultimate recovery of underground hydrocarbons . . . [and to] do what a prudent operator using reasonable diligence would do . . . including, but not limited to, the injection of air, gas, water, or other fluids into the productive strata, the application of pressure heat or other means for the reduction of viscosity of the hydrocarbons, the supplying of additional motive force, or the creating of enlarged or new channels for the underground movement of hydrocarbons into production wells."

However, the Division does have a UIC Program in place to address enhanced oil recovery (EOR), water disposal, and gas storage. Historically, these three methods have been treated by the Division as sustained injection. The Federal Code of Regulations defines hydraulic fracturing as one of several processes used for well stimulation to, "clean the well bore, enlarge channels, and increase pore space in the interval to be injected thus making it possible for wastewater to move more readily into the formation . . ." (40 CFR Ch.1 Section 146.3).

Additionally, the Division has state and federal authority to permit Class II injection wells, which allow for injection of fluids produced in the course of oil and natural gas production operations. The US EPA has delegated its authority under the Safe Drinking Water Act (SDWA) to the Division to permit Class II injection wells. The SDWA specifically excludes hydraulic fracture, except when diesel fuel is used as the fracking agent. The Division has not permitted the injection of diesel fuel as it is a refined product rather than a crude product.

Before a permit is issued, the proposed injection project is studied by Division engineers and reviewed by the appropriate Regional Water Quality Control Board.

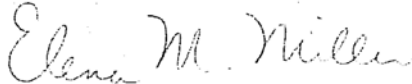
Senator Pavley
February 16, 2011
Page Four

Injection project permits often include conditions, such as approved injection zones, allowable injection pressures, and testing requirements. State regulations, beginning at CA Code of Regulations Section 1724.6 *et seq.*, were designed to ensure that injected fluids are confined to the project area and zone, and that formation pressures are not exceeded to the extent that damage occurs.

- **If possible, please provide the results of any risk assessments that the State of California has conducted regarding potential groundwater contamination associated with hydraulic fracturing.** The Division does not know of any state risk assessment regarding potential groundwater contamination associated with hydraulic fracture.

Thank you for this opportunity to address your questions. If you have additional questions for the Division, please contact Marni Weber, Assistant Director, Office of Governmental and Environmental Relations, at (916) 445-8733. We would be pleased set an appointment to come to your office to provide more information and answer any further questions you may have on this issue.

Sincerely,



Elena M. Miller
State Oil and Gas Supervisor

cc: John Laird, Secretary, California Natural Resources Agency
Derek Chernow, Acting Director, Department of Conservation
Marni Weber, Assistant Director, Department of Conservation

Attachment B

**Santa Barbara County
Oil and Gas Supplemental Application**



COUNTY OF SANTA BARBARA

Planning and Development

www.sbcountyplanning.org

OIL AND GAS SUPPLEMENT

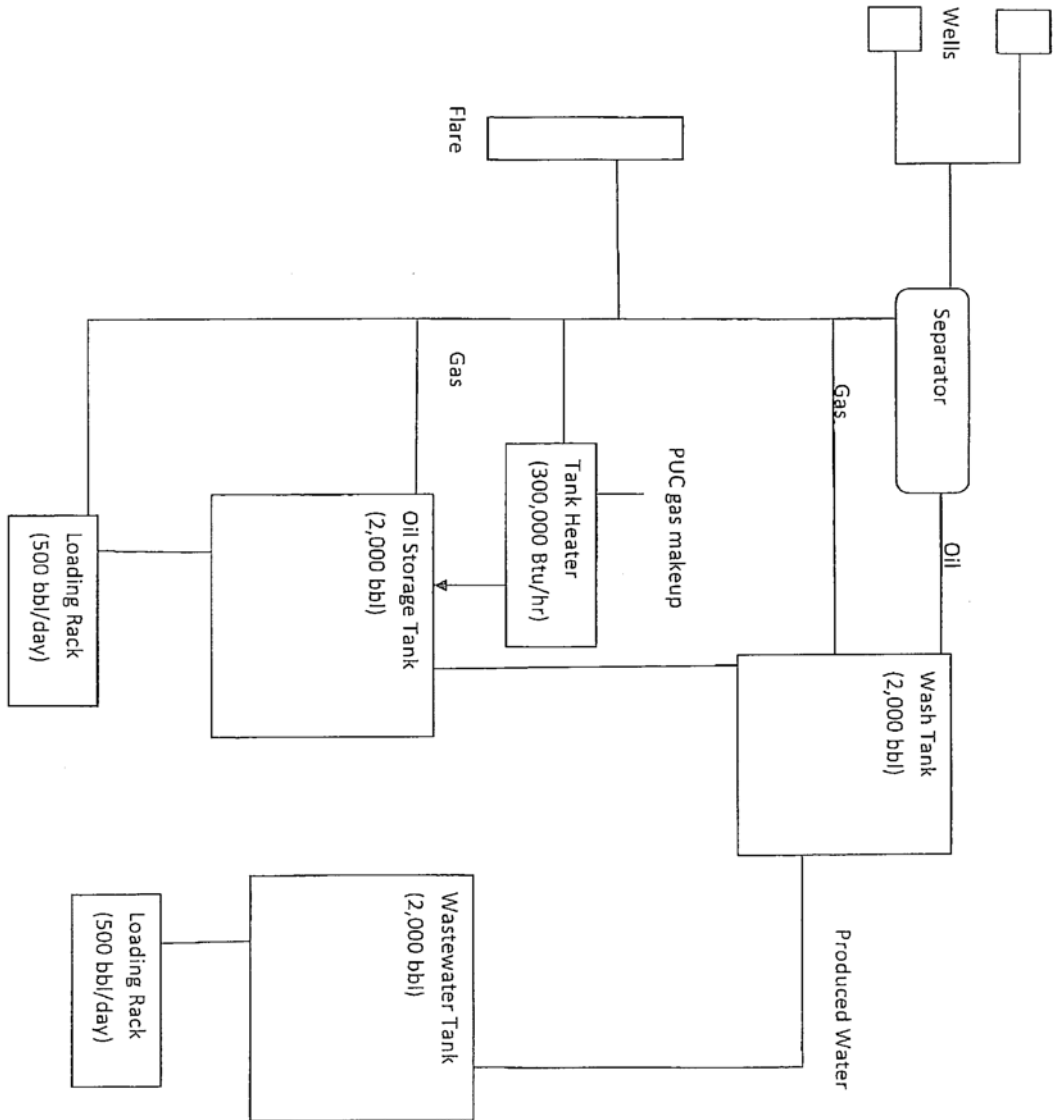
The purpose of this supplement is to ensure that sufficient information is provided at the application submittal stage per Section 35.52.50, Inland Area Oil Drilling and Production of the Land Use and Development Code. Specifically, Section 35.53.30.C.6, Inland Area Permit Requirements and Plan Applications, Processing, and Review. This information must be provided for those projects where the property is currently in oil and gas production. The information in this section will be used to evaluate the project's impacts and to determine the project's consistency with the Land Use and Development Code.

Please prepare a detailed project description. The project description should include the following information, where it is applicable to your project:

- a) A description of the use, size, height, and location of all proposed wells, drilling pads, production equipment, pipelines, processing equipment, ancillary structures, and limits of work areas for all phases of the project.
- b) A schedule for all phases of the project, including an estimate of how long the drilling rig will be located on-site (including assembly, disassembly and removal) and how long the drilling program will take. Describe any subsequent phases envisioned upon completion of the project.
- c) A description of the disposition of oil, natural gas, natural gas liquids, and produced water extracted from the well(s), including mode and route of transportation.
- d) A description of the proposed road system and/or road improvements that will be necessary to carry out the project. Include information on ingress, egress, road width and surface.
- e) Information on measures proposed to prohibit public access to the site during drilling operations.
- f) Oil spill contingency plan.
- g) Name of State Designated Oilfield.
- h) Distance from nearest residence.
- i) A description of any secondary and enhanced recovery method (anything that enhances natural flow of production) proposed as part of this project. Identify what means you are employing; all fluids to be used as part of the secondary and enhanced recovery method; the source of the water. All chemicals to be used and how and where they would be stored onsite.
- j) A list any hazardous materials proposed to be stored/discharged/produced on the property. Describe the proposed use and method of storage and disposal.
- k) A representative gas analysis that includes the various components expected in the gas (usually methane, CO₂, and hydrogen sulfide in percent or ppm), and the maximum pressure at the well head and maximum pressure in a pipeline.

- l) A description of the expected number of truck trips required to implement the proposed project (Peak and Daily Average Trip). Please include trips for: 1) Site Preparation; 2) Drilling; 3) Production; 4) Processing; and 5) Maintenance.
- m) A list of equipment for exploration and production (tanks, pipelines, number of wells and well cellars, loading racks, combustion equipment) and indicate the equipment's operational characteristics, (size/capacity, horsepower ratings or maximum rated fuel input, daily and annual throughput amounts) required to implement the proposed project. If the project will utilize any existing equipment (for example, drilling rigs, tanks, pipelines, loading racks, or combustion equipment), please identify the equipment and quantify any throughput increases expected. Describe how the drilling rigs will be powered (i.e., via electricity or via internal combustion engine) and whether the rigs will be registered with the California Air Resources Board's Portable Equipment Registration Program. Submit fugitive emissions calculations using SBCAPCD Application Form 31, available at <http://www.sbcapcd.org/eng/dl/dl01.htm>. (number and type) required to implement the proposed project. Additionally, provide calculations for criterion pollutants and Greenhouse Gases (GHG) emissions. Attach a process flow diagram for the oil production and gas handling equipment at the site (see attached APCD example). Indicate all listed equipment on the flow diagram. Also, list any energy efficiencies incorporated into the project design.

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Attachment C

AB 591

S. 587

H.R. 1084

AMENDED IN ASSEMBLY MAY 10, 2011

AMENDED IN ASSEMBLY APRIL 12, 2011

CALIFORNIA LEGISLATURE—2011–12 REGULAR SESSION

ASSEMBLY BILL

No. 591

**Introduced by Assembly Member Wieckowski
(Principal coauthor: Assembly Member Dickinson)**

February 16, 2011

An act to amend Sections 3107 and 3203 of the Public Resources Code, relating to oil and gas production.

LEGISLATIVE COUNSEL'S DIGEST

AB 591, as amended, Wieckowski. Oil and gas production: hydraulic fracturing.

(1) Under existing law, the Division of Oil, Gas, and Geothermal Resources in the Department of Conservation regulates the drilling, operation, maintenance, and abandonment of oil and gas wells in the state. The State Oil and Gas Supervisor supervises the drilling, operation, maintenance, and abandonment of wells and the operation, maintenance, and removal or abandonment of tanks and facilities related to oil and gas production within an oil and gas field regarding safety and environmental damage. Existing law requires the district deputy to prepare maps regarding oil and gas production in each district and to collect information regarding the presence of oil and gas and the location and extent of strata bearing water or surface water suitable for irrigation or domestic purposes.

This bill would instead require the district deputy to collect information on the presence of oil and gas deposits and the location and extent of strata bearing water or surface water suitable for irrigation,

domestic, industrial, or wildlife purposes that might be affected. The bill would also require the maps prepared by the district deputy to be posted, as specified, on the division's Internet Web site.

(2) Existing law requires the operator of a well, before commencing the work of drilling the well, to file with the supervisor or the district deputy a written notice of intention to commence drilling, and prohibits the commencement of drilling until approval is given by the supervisor or the district deputy. The existing Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) prohibits any person, in the course of doing business, from knowingly and intentionally exposing any individual to a chemical known to the state to cause cancer or reproductive toxicity without giving a specified warning, or from discharging or releasing such a chemical into any source of drinking water, except as specified.

This bill would revise that procedure to instead require the operator to file an application before commencing drilling and would require additional information to be included in the application, including information regarding the chemicals, if any, ~~to be injected that the operator intends to bring onsite for purposes of injecting into the well.~~ ~~The bill~~ The bill would also require the operator, after drilling has commenced, to submit certain information to the supervisor, including a list of chemicals used, and would require the supervisor to post the information regarding the type of process and ~~list of listed~~ chemicals on the division's Internet Web site. The bill would require the operator to notify every property owner and occupant of property within one mile of a well if the ~~application~~ *listed chemicals* includes a chemical known to cause cancer or reproductive toxicity pursuant to the list adopted in accordance with the Safe Drinking Water and Toxic Enforcement Act of 1986.

Vote: majority. Appropriation: no. Fiscal committee: yes.
State-mandated local program: no.

The people of the State of California do enact as follows:

- 1 SECTION 1. The Legislature finds and declares all of the
- 2 following:
- 3 (a) Hydraulic fracturing is a technique used in the production
- 4 of oil and gas that involves the pressurized injection of water and
- 5 a mix of chemical into an underground geologic formation in order

1 to fracture the formation, thereby causing or enhancing the
2 production of oil or gas from a well.

3 (b) Hydraulic fracturing has been used in California for several
4 decades to extract oil and gas and is likely to be used more
5 extensively as the industry seeks to develop additional oil and gas
6 bearing formations.

7 (c) The Division of Oil, Gas, and Geothermal Resources in the
8 Department of Conservation, which has the obligation to protect
9 public health and the resources of the state, including groundwater
10 resources, has the authority to regulate all oil and natural gas
11 drilling in the state, but currently does not require the disclosure
12 of pertinent information regarding hydraulic fracturing or ascertain
13 what specific types of production and exploration are taking place
14 at permitted wells.

15 (d) Given California's geologic, seismic complexity, and finite
16 and significantly compromised water resources, it is important to
17 collect basic information about natural resource production
18 processes. The state and the public should know when and where
19 hydraulic fracturing is occurring and what chemicals are being
20 used in the process.

21 SEC. 2. Section 3107 of the Public Resources Code is amended
22 to read:

23 3107. (a) A district deputy in each district, designated by the
24 supervisor, shall collect all necessary information regarding the
25 oil and gas wells in the district, with a view to determining the
26 presence of oil and gas deposits and the location and extent of
27 strata bearing water or surface water suitable for irrigation,
28 domestic, industrial, or wildlife purposes that might be affected.

29 (b) The district deputy shall prepare maps and other accessories
30 necessary to determine the presence of oil and gas deposits and
31 the location and extent of strata bearing water or surface water
32 suitable for irrigation, domestic, industrial, or wildlife purposes.
33 The maps prepared by the district deputy pursuant to this section
34 shall be posted on the division's Internet Web site, as a
35 modification to any existing maps, and shall include the
36 information obtained pursuant to ~~paragraph (2) of subdivision (e)~~
37 *subdivision (b)* of Section 3203.

38 (c) This work shall be done with the view to advising an operator
39 as to the best means of protecting the oil and gas ~~sands~~ *deposits*
40 and the water-bearing strata and surface water, and with a view to

1 aiding the supervisor in ordering tests or repair work at wells. All
2 data shall be kept on file in the office of the district deputy of the
3 respective district.

4 SEC. 3. Section 3203 of the Public Resources Code is amended
5 to read:

6 3203. (a) The operator of a well, before commencing the work
7 of drilling the well, shall file with the supervisor or the district
8 deputy an application to commence drilling. Drilling shall not
9 commence until approval of the application is given by the
10 supervisor or the district deputy. If the supervisor or the district
11 deputy fails to give the operator a written response to the
12 application within 10 working days from the date of receipt, that
13 failure shall be considered as an approval of the application, and
14 the application, for the purposes and intents of this chapter, shall
15 be deemed a written report of the supervisor. If operations have
16 not commenced within one year of receipt of the application, the
17 application shall be deemed canceled. The application shall contain
18 the pertinent data the supervisor requires on printed forms supplied
19 by the division or on other forms acceptable to the supervisor. The
20 supervisor may require other pertinent information to supplement
21 the application.

22 (b) (1) On and after January 1, 2012, in addition to the pertinent
23 information required to be collected pursuant to subdivision (a),
24 the application shall include all of the following information:

25 (A) The type of exploration and production techniques that the
26 operator will use at the well or wells.

27 (B) A complete list of the chemicals, if any, that ~~will be injected~~
28 *the operator intends to bring onsite for purposes of injecting* into
29 the well for hydraulic fracturing or other production enhancement
30 methods in the exploration or production process or processes.
31 ~~This list shall include all of the following:~~

32 ~~(i) The name of the chemical.~~

33 ~~(ii) The purpose of the chemical in the production or exploration~~
34 ~~process.~~

35 ~~(iii) The Chemical Abstract Service numbers for the chemical.~~

36 ~~(iv) The estimated total amount of the chemical used.~~

37 ~~(v) The actual rate or concentration of the chemical expressed~~
38 ~~as pounds per thousand gallons or gallons per thousand gallons~~
39 ~~and expressed as a percentage by volume of the total hydraulic~~
40 ~~fracturing fluid or other injected fluid used.~~

- 1 ~~(C) The estimated amount and source of water that will be used~~
2 ~~in the exploration or production from the well that is being~~
3 ~~proposed to be permitted.~~
4 ~~(D) Any radiological components or tracers to be injected into~~
5 ~~the well and a description of the recovery method, if any, for those~~
6 ~~elements or tracers, the expected recovery rate and disposal method~~
7 ~~for recovered components or tracers.~~
8 ~~(E) The location of any known~~
9 ~~(C) The location of any known active seismic faults within five~~
10 ~~miles of the well.~~
11 ~~(2) After drilling has commenced, the operator shall submit to~~
12 ~~the supervisor all of the following information:~~
13 ~~(A) A list of the chemicals that were injected into the well. This~~
14 ~~list shall include all of the following information:~~
15 ~~(i) The name of the chemical.~~
16 ~~(ii) The purpose of the chemical in the production or exploration~~
17 ~~process.~~
18 ~~(iii) The Chemical Abstract Service numbers for the chemical.~~
19 ~~(iv) The estimated total amount of the chemical used.~~
20 ~~(v) The actual rate or concentration of each chemical used,~~
21 ~~expressed as pounds per thousand gallons or gallons per thousand~~
22 ~~gallons and expressed as a percentage by volume of the total~~
23 ~~hydraulic fracturing fluid or other injected fluid used.~~
24 ~~(B) The amount and source of water used in the exploration or~~
25 ~~production from the well.~~
26 ~~(C) Any radiological components or tracers injected into the~~
27 ~~well and a description of the recovery method, if any, for those~~
28 ~~components or tracers, the recovery rate, and disposal method for~~
29 ~~recovered components or tracers.~~
30 ~~(2)~~
31 ~~(3) The supervisor shall post the type of process and list of~~
32 ~~chemicals obtained pursuant to ~~paragraph (1)~~ this subdivision on~~
33 ~~the division's Internet Web site in such a way that it is accessible~~
34 ~~to the public.~~
35 ~~(3)~~
36 ~~(4) If any of the information required pursuant to ~~paragraph (1)~~~~
37 ~~this subdivision changes over the course of the exploration and~~
38 ~~production process, the operator shall immediately notify the~~
39 ~~supervisor.~~
40 ~~(4)~~

S 587 IS

112th CONGRESS
1st Session
S. 587

To amend the Safe Drinking Water Act to repeal a certain exemption for hydraulic fracturing, and for other purposes.

IN THE SENATE OF THE UNITED STATES

March 15, 2011

Mr. CASEY (for himself, Mr. SCHUMER, Mrs. FEINSTEIN, Mrs. GILLIBRAND, Mr. LAUTENBERG, Mr. WHITEHOUSE, Mr. SANDERS, and Mr. CARDIN) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

A BILL

To amend the Safe Drinking Water Act to repeal a certain exemption for hydraulic fracturing, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the 'Fracturing Responsibility and Awareness of Chemicals Act' or the 'FRAC Act'.

SEC. 2. REGULATION OF HYDRAULIC FRACTURING.

(a) Underground Injection- Section 1421(d) of the Safe Drinking Water Act (42 U.S.C. 300h(d)) is amended by striking paragraph (1) and inserting the following:

 (1) UNDERGROUND INJECTION-

 (A) IN GENERAL- The term 'underground injection' means the subsurface emplacement of fluids by well injection.

 (B) INCLUSION- The term 'underground injection' includes the underground injection of fluids or propping agents pursuant to hydraulic fracturing operations relating to oil or gas production activities.

` (C) EXCLUSION- The term `underground injection' does not include the underground injection of natural gas for the purpose of storage.'

(b) Disclosure- Section 1421(b) of the Safe Drinking Water Act (42 U.S.C. 300h(b)) is amended by adding at the end the following:

` (4) DISCLOSURES OF CHEMICAL CONSTITUENTS-

` (A) IN GENERAL- A person conducting hydraulic fracturing operations shall disclose to the State (or to the Administrator, in any case in which the Administrator has primary enforcement responsibility in a State), by not later than such deadlines as shall be established by the State (or the Administrator)--

` (i) before the commencement of any hydraulic fracturing operations at any lease area or a portion of a lease area, a list of chemicals intended for use in any underground injection during the operations (including identification of the chemical constituents of mixtures, Chemical Abstracts Service numbers for each chemical and constituent, material safety data sheets when available, and the anticipated volume of each chemical to be used); and

` (ii) after the completion of hydraulic fracturing operations described in clause (i), the list of chemicals used in each underground injection during the operations (including identification of the chemical constituents of mixtures, Chemical Abstracts Service numbers for each chemical and constituent, material safety data sheets when available, and the volume of each chemical used).

` (B) PUBLIC AVAILABILITY- The State (or the Administrator, as applicable) shall make available to the public the information contained in each disclosure of chemical constituents under subparagraph (A), including by posting the information on an appropriate Internet website.

` (C) IMMEDIATE DISCLOSURE IN CASE OF MEDICAL EMERGENCY-

` (i) IN GENERAL- Subject to clause (ii), the regulations promulgated pursuant to subsection (a) shall require that, in any case in which the State (or the Administrator, as applicable) or an appropriate treating physician or nurse determines that a medical emergency exists and the proprietary chemical formula or specific chemical identity of a trade-secret chemical used in hydraulic fracturing is necessary for medical treatment, the applicable person using hydraulic fracturing shall, upon request, immediately disclose to the State (or the Administrator) or the treating physician or nurse the proprietary chemical formula or specific chemical identity of a trade-secret chemical, regardless of the existence of--

` (I) a written statement of need; or

- ˘ (II) a confidentiality agreement.
- ˘ (ii) REQUIREMENT- A person using hydraulic fracturing that makes a disclosure required under clause (i) may require the execution of a written statement of need and a confidentiality agreement as soon as practicable after the determination by the State (or the Administrator) or the treating physician or nurse under that clause.
- ˘ (D) NO PUBLIC DISCLOSURE REQUIRED- Nothing in subparagraph (A) or (B) authorizes a State (or the Administrator) to require the public disclosure of any proprietary chemical formula.'

END

1st Session
H. R. 1084

To repeal the exemption for hydraulic fracturing in the Safe Drinking Water Act, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

March 15, 2011

Ms. DEGETTE (for herself, Mr. HINCHEY, Mr. POLIS, Mr. ACKERMAN, Mr. BERMAN, Mrs. CAPPAS, Mr. CONNOLLY of Virginia, Mr. ELLISON, Mr. ENGEL, Mr. FARR, Mr. FRANK of Massachusetts, Mr. GRIJALVA, Ms. HIRONO, Mr. HOLT, Mr. HONDA, Mr. KILDEE, Mr. KUCINICH, Mrs. LOWEY, Mrs. MALONEY, Ms. MCCOLLUM, Mr. MORAN, Ms. MOORE, Mr. NADLER, Mr. PALLONE, Ms. PINGREE of Maine, Mr. SARBANES, Ms. SCHAKOWSKY, Mr. STARK, Mr. TONKO, Mr. VAN HOLLEN, Mr. WEINER, and Ms. WOOLSEY) introduced the following bill; which was referred to the Committee on Energy and Commerce

A BILL

To repeal the exemption for hydraulic fracturing in the Safe Drinking Water Act, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the 'Fracturing Responsibility and Awareness of Chemicals Act of 2011'.

SEC. 2. REGULATION OF HYDRAULIC FRACTURING.

(a) Hydraulic Fracturing- Section 1421(d)(1) of the Safe Drinking Water Act (42 U.S.C. 300h(d)(1)) is amended by striking subparagraph (B) and inserting the following:

- ` (B) includes the underground injection of fluids or propping agents pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities; but
- ` (C) excludes the underground injection of natural gas for purposes of storage.'

(b) Disclosure of Hydraulic Fracturing Chemicals; Medical Emergencies; Proprietary Chemical Formulas- Section 1421(b) of the Safe Drinking Water Act (42 U.S.C. 300H(b)) is amended by adding at the end the following:

 ` (4)(A) Regulations included under paragraph (1)(C) shall include the following requirements:

 ` (i) A person conducting hydraulic fracturing operations shall disclose to the State (or the Administrator if the Administrator has primary enforcement responsibility in the State)--

 ` (I) prior to the commencement of any hydraulic fracturing operations at any lease area or portion thereof, a list of chemicals intended for use in any underground injection during such operations, including identification of the chemical constituents of mixtures, Chemical Abstracts Service numbers for each chemical and constituent, material safety data sheets when available, and the anticipated volume of each chemical; and

 ` (II) not later than 30 days after the end of any hydraulic fracturing operations, the list of chemicals used in each underground injection during such operations, including identification of the chemical constituents of mixtures, Chemical Abstracts Service numbers for each chemical and constituent, material safety data sheets when available, and the volume of each chemical used.

 ` (ii) The State or the Administrator, as applicable, shall make the disclosure of chemical constituents referred to in clause (i) available to the public, including by posting the information on an appropriate Internet Web site.

 ` (iii) Whenever the State or the Administrator, or a treating physician or nurse, determines that a medical emergency exists and the proprietary chemical formula of a chemical used in hydraulic fracturing operations is necessary for medical treatment, the person conducting the hydraulic fracturing operations shall, upon request, immediately disclose the proprietary chemical formulas or the specific chemical identity of a trade secret chemical to the State, the Administrator, or the treating physician or nurse, regardless of whether a written statement of need or a confidentiality agreement has been provided. The person conducting the hydraulic fracturing operations may require a written statement of need and a confidentiality agreement as soon thereafter as circumstances permit.

 ` (B) Subparagraphs (A)(i) and (A)(ii) do not authorize the State (or the Administrator) to require the public disclosure of proprietary chemical formulas.'. *END*