

**COUNTY OF SAN LUIS OBISPO BOARD OF SUPERVISORS
AGENDA ITEM TRANSMITTAL**

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|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| (1) DEPARTMENT Planning and Building | (2) MEETING DATE 9/23/2014 | (3) CONTACT/PHONE John McKenzie 781-5600 | |
| (4) SUBJECT Submittal of a report and solicitation of possible Board direction related to Hydraulic Fracturing. All Districts. | | | |
| (5) RECOMMENDED ACTION It is recommended that the Board receive a report related to Hydraulic Fracturing and provide direction to staff. | | | |
| (6) FUNDING SOURCE(S) N/A | (7) CURRENT YEAR FINANCIAL IMPACT \$0.00 | (8) ANNUAL FINANCIAL IMPACT \$0.00 | (9) BUDGETED? Yes |
| (10) AGENDA PLACEMENT <input type="checkbox"/> Consent <input type="checkbox"/> Presentation <input type="checkbox"/> Hearing (Time Est. ___) <input checked="" type="checkbox"/> Board Business (Time Est. <u>90 Minutes</u>) | | | |
| (11) EXECUTED DOCUMENTS <input type="checkbox"/> Resolutions <input type="checkbox"/> Contracts <input type="checkbox"/> Ordinances <input checked="" type="checkbox"/> N/A | | | |
| (12) OUTLINE AGREEMENT REQUISITION NUMBER (OAR) N/A | | (13) BUDGET ADJUSTMENT REQUIRED? BAR ID Number: N/A <input checked="" type="checkbox"/> 4/5 Vote Required <input type="checkbox"/> N/A | |
| (14) LOCATION MAP N/A | (15) BUSINESS IMPACT STATEMENT? No | (16) AGENDA ITEM HISTORY <input type="checkbox"/> N/A Date: <u>May 20, 2014</u> | |
| (17) ADMINISTRATIVE OFFICE REVIEW Guy Savage | | | |
| (18) SUPERVISOR DISTRICT(S) All Districts. | | | |

County of San Luis Obispo



TO: Board of Supervisors

FROM: Planning and Building / John McKenzie
781-5600

VIA: James Bergman, Planning Director
Guy Savage, Assistant County Administrative Officer

DATE: 9/23/2014

SUBJECT: Submittal of a report and solicitation of possible Board direction related to Hydraulic Fracturing. All Districts.

RECOMMENDATION

It is recommended that the Board receive a report related to Hydraulic Fracturing and provide direction to staff.

DISCUSSION

Background Information

On May 20, 2014, your Board directed staff to research and report back on the subject of hydraulic fracturing, which is a technique sometimes used to improve the extraction of crude oil and/or natural gas.

The Administrative Office convened staff from several departments to prepare this briefing for the Board including:

County Counsel
Planning and Building
Public Works
Health Agency - Environmental Health

As part of their independent research on the topic, staff received input from various interested parties, as well as attending meetings or interacting with other agencies or commissions who are discussing hydraulic fracturing.

This staff report and accompanying presentation are intended to provide an informational overview that addresses the following questions:

- I. What is hydraulic fracturing (also known as 'fracking')?
- II. What is the fracking potential in the County?
- III. What are the existing and proposed regulations relating to fracking?
- IV. What are some of the important environmental issues?
- V. What is happening in other jurisdictions?

The staff report concludes with a list of options for your Board's consideration.

I. What is Hydraulic Fracturing (also known as 'Fracking')?

Hydraulic Fracturing is a complex subject, which includes a wealth of information and perspectives from the regulators, industry, the general public and environmental groups. The following two definitions have been selected to aid in the explanation of the process:

Division of Oil, Gas and Geothermal Resources (DOGGR) website definition/discussions

Hydraulic fracturing (also known as hydrofracturing, "fracking", or "fracking") is the high-pressure injection of a mix of fluids and substances called "proppants" into an oil or gas reservoir. The mix, injected under pressure, fractures the reservoir rock. When the fluids are removed, the proppants keep open the cracks left by the fracturing, allowing oil or natural gas to flow back to the well. Fracturing the rock is necessary to extract oil or natural gas from formations in which the pore space in the rock making up the oil or natural gas reservoir is too tight to allow the flow of fluids or gasses to the well. Without a man-made fracture, the oil or gas cannot be recovered.

Just as oil and gas production operations differ from region to region nationwide, so too do regional methods of hydraulic fracturing. To date, the Division is aware of very little, if any, fracturing of horizontal shale gas wells in California of the type performed in other parts of the United States. Most of California's oil and gas production to date has been from vertical wells into traditional oil and natural gas reservoirs.

There are other differences between the typical use of hydraulic fracturing in California and elsewhere. For instance, in other states the extraction of unconventional natural gas resources requires lengthy fracturing periods along lengthy stretches of horizontally-drilled production wells. Millions of gallons of water are injected under constant pressure, a process that may take days or weeks in order to effectively open the reservoir rock. In California, much less water is used and the period of pressurizing the reservoir rock is much shorter. In other states, the extent of fracturing in unconventional rock stretches for hundreds of yards along the horizontal well and the fractures stretch farther away from the well. In California, fracturing projects tend to use far less fluid to fracture within a narrow vertical band along a well, generally starting at a point several thousand feet underground, with the fractures extending only tens to hundreds of feet away from the well.

Wikipedia definition

Hydraulic fracturing is the fracturing of rock by a pressurized liquid. Some hydraulic fractures form naturally—certain veins or dikes are examples. Induced hydraulic fracturing (also hydrofracturing, fracking, and fracking) is a well-stimulation technique in which a high-pressure fluid (usually water mixed with sand and chemicals) is injected into a wellbore in order to create small fractures (usually less than 1.0 mm wide) in the deep-rock formations in order to allow natural gas, petroleum, and brine to migrate to the well. When the hydraulic pressure is removed from the well, small grains of hydraulic fracturing proppants (either sand or aluminum oxide) hold open the small fractures once the deep rock achieves geologic equilibrium.

The fracking technique is commonly applied to wells for shale gas, tight gas, tight oil, and coal seam gas. Such well-stimulation usually is done once during the productive life of the well, and greatly assists in removing fluids (gas, petroleum), and thus increases the productivity of the well; often, multiple application of induced hydraulic fracturing (and/or other well-stimulation techniques) are used as the field's production declines.

It should be noted that this staff report is focused on hydraulic fracturing. There are a number of other enhanced forms of oil recovery that are not discussed, including but not limited to: cyclic steam stimulation, waterflood injection, steam flood injection, acid well stimulation, matrix acidization, and well acidization.

II. What is the Fracking Potential in San Luis Obispo County?

Existing Geology

As certain geologic formations are more likely than others to contain oil and/or natural gas reserves, it is important to

know if the County has such formations and where are they located. The next question would be for those formations with potential oil or gas deposits, what is the likelihood that hydraulic fracturing could be used?

The two main geologic formations known to exist in the County that could potentially contain crude oil and/or natural gas are the Monterey and Vaquero formations. The County has a geological formation map for the surface geology in the County (prepared by U.S. Geological Survey (USGS)) and has identified these formations as follows (See Attachment 1):

- Monterey Shale –Surface formation exists along the County’s eastern edge, and in a north-south sliver between Huasna Valley and the northern County line
- Vaquero –Surface formation located near Nacimiento Lake

While the surface mapping is the best information available to the County, it does not represent the geologic formations thousands of feet below the surface, which is typically where the oil and/or gas formations exist. In addition, the geological variability below the surface is high due to California’s very robust seismically active areas (e.g., tectonic plates colliding which create geologic folding, deformation and numerous fault zones) (see Attachment 2).

Unfortunately, there is very limited geologic formation information about what exists below the surface layer and the potential oil/gas resources. Please refer to Attachment 1, which shows the following information: active and plugged wells according to DOGGR, DOGGR Designated Fields, surface geological formations (primarily Vaquero and Monterey).

The U.S. Energy Information Administration, an agency within the U.S. Department of Energy, recently concluded that their previous estimate for oil in the Monterey Shale throughout the country of 13.7 billion barrels was too high and has been revised downwards to just over 600 million barrels of recoverable crude. This report did not provide a specific breakdown for potential County resources.

Existing Oil Fields

In San Luis Obispo County there are 3 active oil and gas fields with a total of about 250 producing wells. None of these use hydraulic fracturing as a part of their extraction process. These active areas (see Attachment 1 for locations), along with other areas, are summarized as follows:

- A. Arroyo Grande Oil Field – about 165 active wells on private property; extracted from Monterey Formation; heavy crude; no exportable natural gas; no fracking; steam injection used; east of Pismo Beach (Price Canyon); Freeport-McMoRan current operator;
- B. Midway-Sunset Field –about 40 active wells on private property; extracted from Monterey Formation; heavy crude; includes exportable natural gas; no fracking; uses steam injection; along the eastern edge/corner of the County that are connected to much larger operation in Kern County; Chevron current operator;
- C. Russell Ranch oil field – about 44 active wells (in 2008) on federal lands; extractable oil nearly exhausted; Miocene & Vaquero Formations & Dibblee Sand; medium grade crude; no exportable natural gas; no fracking or steam; located near the Cuyama area;
- D. Other – DOGGR has identified two other potential ‘jurisdictional’ oil field boundaries in the County: Huasna and Lopez Canyon (identified as an abandoned field). Neither of these have active wells currently.
- E. Historic – DOGGR map shows the locations of hundreds of previous unsuccessful attempts to drill for oil throughout the County.

New Oil Resource Development - Proposed

County Planning is processing two permits for new oil wells:

- Porter Enterprises – request for an exploratory oil well permit (one well : no production) on Alamo Creek Road (Hwy 166), and
- Freeport-McMoRan – request for a 450 oil well expansion (Phase V) at the existing oil field in Price Canyon (northeast of Pismo Beach).

No hydraulic fracturing is being proposed under either of these permits.

III. What are the Existing and Proposed Regulations Relating to Fracking?

Depending on specific circumstances, there are three levels of regulations that could apply to oil/gas development: local, state and/or federal. The following generally describes to what extent hydraulic fracturing is addressed in these regulatory processes.

A. Local Regulations

In San Luis Obispo County, when development is proposed on lands privately owned, local regulations will apply for most of the proposed grading and above-ground structures. Per the County's Land Use Ordinance ((LUO) Inland Sec 22.34; Coastal Sec. 23.08.172 – see Attachments 3a and 3b), a land use permit would be required. Depending on the level of proposed development, as well as proximity to populated areas, either a Minor Use Permit (MUP) or Conditional Use Permit (CUP)/Development Plan (DP) would be required. All of these land use permits are subject to environmental review (CEQA). The County's LUO currently does not include any specific language relating to well stimulation techniques, including hydraulic fracturing.

The County's Conservation and Open Space Element (COSE) provides general guidance goals and policies relating to energy development within the County, including oil and natural gas development. The COSE does not include any specific language relating to well stimulation techniques, including hydraulic fracturing.

The County has recently updated its land use permit application forms for oil and gas development, where more specific details are requested, including those related to well stimulation methods, such as hydraulic fracturing (see Attachment 4).

Other locally administered regulations apply when oil or natural gas drilling is proposed, potentially involving other local permitting agencies, such as the Air Pollution Control District (APCD), County Environmental Health Services (EHS), and CalFire. For instance, EHS acts as the County's Certified Unified Program Agency (CUPA) and is authorized to carry out several of the various hazardous materials regulatory programs, which require the preparation of certain Plans (e.g., Spill Prevention Control and Countermeasure (SPCC) Plan, Hazardous Materials Business Plan, etc). Also, a Fire Safety Plan would be required by CalFire, which would likely include a range of requirements to minimize potential fire hazards, such as adequate access, establishing and maintaining fuel modification zones, adequate and readily available fire suppressants, and so on.

B. State Regulations

The State's Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR), regulates the 'down-hole' component of oil and gas drilling and production, including well casing and cementing to prevent oil, gas, drilling muds, etc. from entering into groundwater reservoirs. They also oversee produced water reinjection wells, and proper closure of all wells.

Senate Bill 4

Senate Bill 4 (Pavley) was approved last year [PRC Sec. 3161, subd (b)(3) and (4)], which is intended to direct DOGGRs to better address well stimulation techniques, including hydraulic fracturing. To meet the intent of this legislation, DOGGRs has implemented interim measures (see Attachment 5). The interim measures require written notice to DOGGR and neighboring property owners and tenants prior to commencement of any well stimulation activities. The notice must identify the chemicals to be used in the well stimulation fluids and include a Water Management Plan that explains the amount and sources of water to be used to complete the job and how the produced

water will be disposed. Upon request of a neighboring property owner, the operator must perform water quality testing, including before and after samples of groundwater. The notice to DOGGR must also include a Groundwater Monitoring Plan meeting the standards set forth in its interim regulations. The regulations set forth additional standards for well integrity and require a spill contingency plan. Following completion of the fracking activity, the operator must post a report detailing the activity on a website designated by DOGGR and must submit groundwater monitoring reports.

DOGGRs has provided a useful 'Frequently Asked Questions' handout (see Attachment 6). Prior to adopting final measures next year, the State will be preparing an Environmental Impact Report. During the EIR Notice of Preparation process, the County Planning Department submitted initial comments regarding the proposed regulations, as well as provided a response to recent changes to the interim regulations (see Attachments 7a and 7b). Once the Draft EIR is completed and available for public review, County Planning will review the document and submit written comments to the State.

In addition to requiring an EIR, SB 4 requires the California Natural Resources Agency to prepare an independent study of well stimulation treatments, including hydraulic fracturing and acid well stimulation treatments, by January 1, 2015. The California Council of Science & Technology has been selected to conduct the study and work is underway.

Other

A separate but related effort under SB4 is currently underway by the State Water Quality Control Board (SWQCB). SWQCB is developing model groundwater monitoring criteria to be used in conjunction with new oil well development that proposes to use well stimulation techniques. Completion of this program is expected in 2015. Thereafter, regional water quality control boards will use the adopted model criteria to develop and implement a groundwater monitoring program. In the event that no such program is developed, oil operators will use the model criteria to create well-by-well groundwater management plans, which will be included in the notice to DOGGR and neighboring properties. County Planning intends to track this process and provide input, as needed, when the draft Plan is completed and available for public review.

As an extension of the SWQCB, the local Regional Water Quality Control Board (RWQCB) is responsible for regulating water quality. Should fracking occur at some point in the future, the spent fracking fluids would need to be disposed. One common technique is to inject them into deep waste disposal wells. This would require an underground injection control permit. Currently, while the RWQCB is charged with this responsibility, they have developed a Memorandum of Understanding with DOGGRs to administer this program. Certain other activities, such as the water treatment facility at the Price Canyon oil field (and the discharge of treated water into Pismo Creek), will involve permits from this agency.

C. Federal

Oil and natural gas development is allowed on most lands owned by the federal government. One of the three active County oil development areas (Russell Ranch) is on federal lands. Oil and natural gas development on federal lands does not require any local land use permit nor is there any local control.

The federal government's regulation of hydraulic fracturing is relatively limited. The Clean Water Act, which is administered by the Environmental Protection Agency (EPA), 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. 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. However, some efforts by the EPA on hydraulic fracturing impacts is currently underway. The EPA is planning on releasing a draft assessment report synthesizing research findings about hydraulic fracturing and potential impacts to groundwater later this year.

In response to providing more information about oil activities nationwide, in 2011 a website was created called FracFocus (<http://fracfocus.org>) to help provide information on hydraulic fracturing. Participation by industry is voluntary. The intent of this website is to provide information in the following areas: how hydraulic fracturing works, groundwater protection, chemical usage, state regulations, and finding specific wells. It is managed by the Ground Water Protection Council (GWPC) and Interstate Oil and Gas Compact Commission (Industry). GWPC is a 'nonprofit (501(c)(6)) organization whose members consist of state ground water and underground injection control (UIC) regulatory agencies

that work toward the protection of the nation's ground water supplies.

Under the recently approved SB4, FracFocus is cited as the Chemical Disclosure Registry, where operators using hydraulic fracturing must publicly post the information as required under this legislation (CCR, Title 14, Div. 2, Chptr 4, Subchptr 2, Sec. 1788).

IV. What are Some of the Important Environmental Issues and Public Concerns?

Crude oil and natural gas development includes a wide range of potential environmental impacts that need to be carefully considered. Specific to well stimulation/hydraulic fracturing, key environmental issues to consider include, but are not necessarily limited to: water use, nearby faulting /earthquakes; well casing integrity; potential for spills of fracking fluids on-site and during transport as well as disposing of spent fluids; the potential for oil or natural gas to migrate outside of its existing boundary formation.

With regard to public concerns, literature and video on hydraulic fracturing identify public health and environmental concerns, particularly with regard to shale gas fracturing. Expressed concerns include:

- Potential release of pollutants from some of the chemicals used in the fracking fluids and/or the constituents of the oil and natural gas into surface water, groundwater, and the atmosphere;
- Limited disclosure of chemicals used in the fracking fluids;
- Potential increase in seismic activity, including earthquakes, in areas where fracking occurs;
- Use of large amounts of water from hydraulic fracturing needed to complete the well;
- Increase in air emissions related to truck transport of fluids and chemicals; and
- Lack of sufficient regulatory oversight.

V. What is Happening in Other Jurisdictions?

Other cities and counties within the state have considered or are considering restrictions relating to hydraulic fracturing. The following are a few examples:

Counties

The following is a list of counties that have taken some action relating to hydraulic fracturing:

Santa Barbara County

- County Board of Supervisors put fracking ban initiative (Measure 'P') on the November 4, 2014 ballot (rather than directly adopting a County ordinance);
- Stricter permitting requirements passed in 2011 (no fracking projects proposed since then), such as:
 - Additional advanced public noticing requirements with substantive public health, safety and environmental impact information prepared prior to this noticing;
 - In addition, alternatives and mitigation measures must also be provided at this time.

Santa Cruz County

- On March 14, 2014, the Santa Cruz County Board of Supervisors voted to prohibit fracking in their County (one source notes that there are no known oil resources/leases in Santa Cruz County).

Butte County

- On April 8, 2014, the Butte County Board of Supervisors directed their staff to prepare an ordinance to ban fracking.

Marin County

- On August 20, 2013, the Marin County Board of Supervisors passed a resolution against fracking in their County.

Mendocino County

- On August 6, 2014, the Mendocino County Board of Supervisors directed staff to put fracking ban initiative on the November 4, 2014 ballot.

San Benito County

- On May 8, 2014, the San Benito County Board of Supervisors directed staff to put fracking ban initiative on the November 4, 2014 ballot.

Cities

The cities of Arroyo Grande and San Luis Obispo, and the Cambria Community Services District have sent letters to the County opposing the use of hydraulic fracturing within the County (Attachments 8-10).

Beverly Hills recently enacted a ban on fracking and other well stimulating operations from any surface within the city as well as from any site outside of city limits that would extract oil and gas underneath the city. Los Angeles and Culver City are considering similar actions. According to the 'Food & Water Watch' website (an environmental group), other cities that have considered or approved one or more actions in opposition to hydraulic fracturing include: Berkeley, Carson, Compton, Fairfax, Oakland, San Francisco, Sebastopol, and Sonoma.

Options for Consideration

Based on the information provided in this briefing, your Board could pursue any of the following options (it should be noted that some of these actions would require significant amounts of staff resources to complete):

- A. Maintain the status quo and direct the Clerk to receive and file this report; County Planning will continue to follow and comment on SB4-related regulations;
- B. Direct staff to obtain additional or more specific information and report back to the Board at a future date; this may include a more detailed review of hydraulic fracturing potential in County and other jurisdictions;
- C. Direct staff to provide specific or additional comments to the State on SB4 EIR and proposed regulations, as well as the SWQCB's companion efforts to develop a groundwater monitoring plan;
- D. Direct staff to report back once the final SB4 measures are approved;
- E. Direct staff to propose LUO revisions and bring back for Board consideration; such changes could include additional provisions relating to projects using well stimulation, such as hydraulic fracturing;
- F. Direct staff to prepare or develop process to limit or ban certain well stimulation processes, such as hydraulic fracturing, and bring back for Board consideration;
- G. Direct staff to consider additional input from the County's Water Resources Advisory Committee or other committees.

OTHER AGENCY INVOLVEMENT/IMPACT

County departments that were consulted for this overview include: the Administrative Office, County Counsel, Planning and Building, Public Works and the Health Agency (Environmental Health Services).

FINANCIAL CONSIDERATIONS

There is no cost associated with this action. This briefing report was prepared using existing staffing resources. If the Board directs staff to prepare additional information, staffing cost estimates should be prepared.

RESULTS

This presentation is intended to provide the Board with an overview so that the Board can give staff further direction, if necessary. This is consistent with the County-wide goals of promoting a well governed, safe, healthy, and livable community.

ATTACHMENTS

1. Historic and Current Oil Drilling Activity
2. Typical geologic cross section
- 3a. Inland Land Use Ordinance on Petroleum Resources

- 3b. Coastal Land Use Ordinance on Petroleum Resources
4. County's Supplemental Application – Oil and Gas Development
5. Senate Bill 4 (with revisions)
6. Senate Bill 4 "Frequently Asked Questions" Handout
- 7a. Planning Department NOP Response on SB4
- 7b. Planning Department Comments on 6/14/14 SB4 Revisions
8. City of San Luis Obispo Letter
9. City of Arroyo Grande Letter
10. Cambria CSD Letter