



CIPA

*California Independent
Petroleum Association*

Are Hydraulically Fractured Wells Regulated in California? YES!

Recently, the Environmental Working Group (EWG) published and circulated a brochure about hydraulic fracturing that reveals their clear misunderstanding of what hydraulic fracturing is, confuses key drilling and production processes and terminology, and omits numerous rules and statutes that regulate all oil and gas drilling operations, including those that use hydraulic fracturing. In their brochure, “California Regulators: See no Fracking, Speak no Fracking” EWG claims that regulators have been “asleep at the wheel” when it comes to regulating wells that use a completion technique called “hydraulic fracturing”, more commonly referred to as “fracking”. This paper presents facts about the use of hydraulic fracturing in California and refutes EWG’s allegations that these wells are not regulated.

What is hydraulic fracturing?

Hydraulic fracturing is NOT a drilling technique contrary to how it is routinely described in the media. In reality, hydraulic fracturing is a type of “completion” technique that is used to stimulate the reservoir after a well has already been drilled. Before hydraulic fracturing can begin, the drilling rig is removed from the well pad and replaced with highly specialized equipment designed to complete the well. While it may take a drilling rig 2-3 weeks to drill a well, the hydraulic fracturing process usually takes just 1-2 days.

The vast majority of wells in California are not hydraulically fractured because the geologic zones that have historically been targeted and explored are highly permeable and capable of yielding oil and gas without hydraulic fracture stimulation. The practice is strictly reserved for reservoirs where the geologic conditions are such that the oil and natural gas can’t be commercially produced without the benefit of some form of stimulation. Hydraulic fracturing is a process by which high pressure water, sand, and chemicals are injected usually thousands of feet below the surface into low permeability rock to create microscopic fractures that allow oil and natural gas trapped in small pores to migrate to the wellbore and be produced. Depending on the amount of fluid and pressures used, the fractures can extend up to several hundred feet in length. Extensive computer modeling is run on each planned hydraulic fracturing job to calculate the precise amount of fluid and pressure needed to create the desired result. The length

of the fracture required is driven entirely by the geologic conditions of the area where the work is being performed. The entire process is highly engineered and controlled to ensure the results of the hydraulic fracturing job remain consistent with the computer generated models.

The injected fluid for each hydraulic fracturing job is typically 95% water, 4.5% sand, and 0.5% chemicals. A list of chemicals used in the process can be found at www.fracfocus.org. Many of the chemicals typically used, as stated in EWG's report, are for eliminating bacteria, and inhibiting corrosion. The use of these additives will help to ensure the integrity of the well so the oil, gas, water, and recaptured chemicals stay confined within the wellbore and do not come in contact with drinking water or other geologic zones. It is important to remember that the design of every well is aggressively regulated, particularly at the point where the wellbore penetrates any water aquifer.

The use of the technique in California could increase in the future as industry begins to explore the Monterey Shale and other similar formations which are estimated to hold as much as 15 billion barrels of oil according to the Federal Energy Information Agency (EIA). Since 100% of the oil produced in California is refined and sold in the state, expanded production from these shales has the potential to significantly reduce the amount of oil California needs to import from foreign sources.

Are wells that are “fracked” permitted by the state?

Yes. While the words “hydraulic fracturing” do not specifically appear in current codes, every well in California, regardless of what completion technique is used, is highly regulated by the state and requires several permits, including a permit from the State’s Division of Oil, Gas, and Geothermal Resources (DOGGR). CCR 1722.2 requires that wells are designed with “the appropriate design factor provided to obtain safe operations” and “to seal off fluids and segregate them for the protection of all oil, gas, and fresh water zones.” These regulations are written broadly to ensure DOGGR can take action against negligent operators. If a producer violates this code section and damage to any resource occurs, they are subject to adverse action by the state. California’s regulatory emphasis on wellbore integrity is historically in line with other oil and gas producing states.

Operators use a variety of completion techniques that are tailored to the specific geologic characteristics of the oil and gas reservoirs. Due to improvements in technology, these techniques continue to evolve and allow industry to become increasingly more efficient. Accordingly, DOGGR’s regulations have also evolved with increasing emphasis on ensuring wellbore integrity. Existing regulations require the operator to design wells to be “leak proof” after it is drilled and completed. This approach, regardless of completion technique, ensures ground water is protected and fluids that are produced or injected are prevented from migrating to fresh water aquifers.

Under existing regulations, before obtaining a permit from DOGGR a producer must submit a comprehensive drilling application that includes a diagram of the proposed wellbore that is reviewed by state engineers. Wellbores in California have multiple barriers of protection between the inside of the well where the fluid flows, and the outer casing of the well. Cement

and steel casings are used in each to form an impermeable barrier between the well and the surrounding geologic environment.

Once a well is drilled, DOGGR's regulations require operators to conduct mechanical integrity tests on a prescribed timeframe to ensure the condition of the well is holding as intended. In every instance, DOGGR's regulations require the operator to update the "well file history" with the agency once the tests have been performed. Idle wells and injection wells are also subject to regular integrity testing requirements under the existing regulations.

Existing regulations also require the operator to file the details of the drilling and completions process in the well file history. If a well is hydraulically fractured as part of the completion process, for example, details about the job will be documented in the well file history. Significant maintenance work that is done to a well over its productive life must also be permitted by DOGGR and documented in the well's history file. This provides regulators additional tools by which they can verify if the well's integrity is remaining intact and what kind of work is being performed. These files are available for public review at each of DOGGR's district offices.

Does the Industry support disclosing where and when fracking occurs?

Yes. CIPA supports legislation which would require the disclosure of when and where hydraulic fracturing occurs, a list of chemicals injected, and the volumes of water used, consistent with the same approach taken by other states that have recently enacted reporting based regulations. Furthermore, several California companies have already begun to voluntarily report when and where fracking is occurring in California at www.fracfocus.org.

Has fracking been used in California?

Yes. As the EWG's own report states, hydraulic fracturing has occurred safely in California since the 1950s.

Have there been documented cases of ground water contamination from fracked wells in CA?

No. The geologic zones that require hydraulic fracturing to release the oil and gas are, by definition, not sufficiently permeable to produce economically. Whereas groundwater is usually found at depths just a few hundred feet below the surface of the earth's crust, the impermeable zones where the hydraulic fracturing activity occurs is several thousands of feet below the surface. In most cases, more than a mile of impermeable rock and earth separate the hydraulically fractured zone and the groundwater zone making it impossible for even large fractures to migrate anywhere close to the groundwater zone.

Wells with inadequate downhole integrity can provide a potential conduit for fluid to migrate upward if the hydraulic fracturing job is conducted in close proximity to the damaged wellbore. However, there are no documented occurrences of this type of event in California and, as noted above, the scenario is a remote possibility given California's extensive design, drilling, and

regular testing requirements and the fact that shale zones are typically located thousands of feet below the historic oil and gas zones that have been produced in California.

Nationally there are no known cases of ground water contamination due to hydraulic fracturing. This fact has been repeatedly stated by federal regulators as evidenced by the following quotes:

- In 1995, as EPA Administrator under President Clinton, Carol Browner stated there was "no evidence that hydraulic fracturing resulted in any drinking water contamination".
- In 2009 at a Senate Committee on Environment and Public Works hearing on "Federal Drinking Water Programs," officials from the Environmental Protection Agency (EPA) and the United States Geological Survey (USGS) under the Obama Administration said they were unaware of any documented cases of hydraulic fracturing contamination.
- As recently as May, 2011 during a House Oversight and Government Reform Committee hearing, EPA Administrator Lisa Jackson stated, "I'm not aware of any proven case where the fracking process itself has affected water."
- A. Scott Anderson, a senior policy adviser with the Environmental Defense Fund agrees. "The groundwater pollution incidents that have come to light to date have all been caused by well construction problems," he said.

It is worth noting that companies spend significant amounts of money fracturing wells and they would be financially irresponsible if they allowed fractures outside of the hydrocarbon bearing zone.

Finally, the EWG report alludes to ongoing litigation between an oil company and a Kern County farmer involving alleged issues of groundwater contamination. What the EWG report fails to mention however is that the litigation in question pertained to the past use of surface ponds and had nothing to do with hydraulic fracturing operations. The inclusion of the case in EWG's report is misplaced, misleading, and irrelevant to the policy discussion about hydraulic fracturing.

Didn't the U.S. EPA issue a study that claims groundwater contamination occurred in Wyoming?

Not quite. The EPA is currently investigating a case in the small town of Pavillion, Wyoming of alleged contamination associated with wells that used hydraulic fracturing. In December 2011 the EPA released a draft report detailing its investigation into the Pavillion case. At the time the report was released comments by the EPA were taken out of context and significantly misrepresented. The misrepresentation of the comments continues to persist today despite EPA attempts to clarify the truth.

Two months after releasing its draft report on Pavillion, the EPA and Department of Interior clarified the Administration's interpretation of the draft report in testimony before the House Subcommittee on Energy and Environment. During the hearing, EPA Region 8 administrator

Jim Martin stated, “We make clear that the causal link [of water contamination] to hydraulic fracturing has not been demonstrated conclusively,” adding that EPA’s draft report “should not be assumed to apply to fracturing in other geologic settings.” Two days later, during a hearing before the House Natural Resources Committee, Interior Secretary Ken Salazar stated of hydraulic fracturing, “From my point of view, it can be done safely and it has been done safely.”

Since the congressional hearings, the EPA has further acknowledged that the Pavillion draft report had not been peer reviewed before it was released and that there were potential problems with the testing the agency had conducted for the report. New testing is being conducted in cooperation between the State of Wyoming and the EPA and the EPA continues to maintain that the Pavillion investigation is still ongoing and no formal conclusions have been established. The draft report is undergoing public commentary and peer-review by independent scientists. A final report is expected to be released in 2014. Assertions that the EPA has linked hydraulic fracturing to groundwater contamination in Wyoming are not accurate.

Have there been documented cases of earthquakes being caused by fracking in the United States?

No. The amount of energy used in the hydraulic fracturing process is much smaller than the amount recorded during actual seismic events that can be felt. In the Barnett Shale in Texas, the amount of energy used in a large hydraulic fracture treatment is equivalent to 1 gram of explosive charge, the approximate size of a single blasting cap. By contrast, the equivalent explosive charge of an earthquake event that can actually be felt is approximately 30 tons.

In the United Kingdom, there was a report that suggested hydraulic fracturing may have contributed to minor seismic activity. The report concluded however that the “combination of geological factors was rare” and “unlikely to occur together again at future well sites.” There was no structural impact at the surface in the UK case study.

In attempting to connect hydraulic fracturing with seismic activity, EWG inaccurately cites a recent report from Ohio pertaining to an issue involving waste water injection – not hydraulic fracturing. In its report, the State of Ohio identified an issue where continual water injection over an extended period of time for disposal purposes had resulted in a small seismic event. The area where the well was injecting into was deemed unsuitable for injection and the State of Ohio forced the operator to close its well. The issue in question had nothing to do with hydraulic fracturing and is another example of where the EWG report incorrectly links unrelated aspects of the production process under the overly simplified banner of “hydraulic fracturing.”

California’s existing regulations protect against the type of event that occurred in Ohio. Wells utilized for continuous injection are regulated by US EPA’s Class II Injection Well Program which is administered in California by DOGGR. In California, before obtaining a permit for an injection well, the producer must submit an analysis of all known fault lines and how injected fluids are prevented from interacting with those faults. State engineers review those applications to ensure no damage to the environment will occur. This review process helps the regulators ensure that the injection will be done safely and not result in an adverse seismic condition. The fact that water injection has been occurring routinely throughout the state, including the Los

Angeles Basin, without any documented occurrences of seismic events is further proof that California's regulations have worked.

Is fracking a "Class II Well"?

No. The EWG erroneously states on page 14 of their report that hydraulically fractured wells are technically Class II Wells. This is incorrect. As was stated earlier, hydraulic fracturing is a completion technique, not a type of well or drilling technique. Class II wells are injection wells that continuously inject water, gas, or steam for purposes of disposal or enhanced oil recovery. Producers submit monthly reports of the chemical makeup of all fluids injected into a Class II well.

Do the chemicals used in the fracking process stay in the ground?

No. Once the well is put "on production", the chemicals used in the stimulation process are pumped back to surface through the well bore and captured by the operator with other produced fluids including oil, gas, and water. The captured fluids are separated, treated where necessary, and disposed of in a variety of regulated methods.

Is fracking in CA the same as in other states?

Typically, no. The types of hydraulic fracture jobs that have been conducted in California use significantly less water and energy than the types of jobs commonly conducted in Pennsylvania, Texas and other shale producing states. These types of jobs are "smaller" in nature because the geologic characteristics of the shales in California are significantly different than that of shales found in other parts of the country.

Hydraulic fracturing jobs in Pennsylvania and Texas can typically use 2 million gallons of water or more per stage whereas the average California job uses less than 10% that amount. Additionally, water disposal regulations in California are much more stringent than other states. Contamination that has occurred by disposal of waste water into streams and creeks is against the law in California.

Has the Division of Oil, Gas, and Geothermal Resources expanded their staff to aggressively regulate oil and gas drilling in CA?

Yes. Just since 2008, the size of DOGGR staff has grown by nearly 40%. 51 new DOGGR personnel have been added by the legislature through the annual state budgets. These new staff members were primarily hired to implement new regulations on surface facilities and work on a backlog of Class II injection project permits that had piled up in 2009-2010. However, the presence of the additional staff allows the Division to more thoroughly review drilling permits and inspect facilities. As has been stated, state engineers' and inspectors' review of the integrity of wellbore designs and drilling programs ensures that injected fluids cannot migrate to water aquifers.

DOGGR is again asking for 18 additional regulatory positions as part of the current budget year. CIPA is supporting their request. Industry pays 100% of DOGGR's operating budget through an annual barrel tax.

Is diesel fuel injected during fracking?

No. While diesel fuel had been used in the past, the practice has been curtailed throughout the country and does not occur in California. The EPA holds regulatory jurisdiction over the use of diesel fuel in hydraulic fracturing.

Has fracking been successful in the United States?

Yes. The most glaring omission in the EWG's report are the significant benefits that have resulted from hydraulic fracturing including finding new, desperately needed domestic sources of oil and natural gas, creating new jobs, increasing tax receipts, and increasing the nation's energy security. As the recent tensions with Iran demonstrate, it is vital that the United States not be held hostage by energy dependency on unpredictable political turmoil in other parts of the world. In 2011, the country imported just 45 percent of the liquid fuels it used, down from a record high of 60 percent in 2005. This has led to a 20% decrease of imports from OPEC countries. California continues to hover between 35% and 38% of crude produced to meet in-state demand. Consumers have also benefited from the dramatic fall in natural gas prices by saving billions in home energy costs thanks in large part to the success of hydraulic fracturing.

The Bakken Shale in North Dakota is an example of the how domestic producers can radically increase domestic oil and gas production. In 1995, the U.S. Geological Survey estimated 150 million "technically recoverable barrels of oil" from the Bakken Shale. In April 2008 that number had increased to an estimated four billion barrels, and in 2010 geologists at Continental Resources (the major drilling operation in North Dakota) placed actual estimates at eight billion. Recently, given the discovery of a lower shelf of oil, Continental revised its estimates and now predict that 24 billion barrels of recoverable oil are in place thanks in large part to completion techniques like hydraulic fracturing.

North Dakota's oil production has tripled since 2007 and it surpassed California this year as the third largest oil producing state. The Census found that North Dakota led the nation in job and income growth in 2011. It has the nation's lowest unemployment rate, at 3.3% (California's is 11.1%), and it saw a huge 38.5% increase in its number of millionaires between 2009 and 2010. North Dakota is also flush with cash and has a budget reserve of at least \$1 billion, out of a \$3.5 billion biennial budget. The state has already cut income taxes, and it is building thousands of miles of "shovel ready" infrastructure projects—roads, bridges, railroads, and pipelines. Other oil and gas producing states have experienced similar booms.

A recent analysis by the consulting firm Wood Mackenzie found that if over burdensome regulations are avoided, the development of new and existing oil and gas resources could, by 2030, increase domestic oil and natural gas production by over 10 million barrels a day, support an additional 1.4 million jobs, and raise over \$800 billion of cumulative additional government revenue.

How can we ensure that fracking is done safely in California?

DOGGR's historic focus on regulating wellbore integrity has worked well and is appropriate, as evidenced by industry's safe track record. CIPA maintains that the Division's first and primary focus should continue to place an emphasis on wellbore integrity. DOGGR's request to add 18 positions will help strengthen the agency's ability to ensure all wells are constructed properly from the outset.

Oil and gas producing states throughout the nation are adopting disclosure based regulations and CIPA believes California should follow suit. These regulations generally allow the public to identify the well's location and the types of chemicals used in a hydraulic fracturing job. Rather than "recreate the wheel" however, CIPA believes the State of California would be well served to strive for regulatory consistency and adopt a disclosure model that is consistent with other leading oil and gas states.

California should avoid the urge to adopt rules based on unsubstantiated anecdotes, inaccurate linking of unrelated issues, or provocative headlines. Each hydraulic fracturing job is extensively modeled and engineered to ensure the operation is conducted in a safe manner and will not create environmental impacts. New regulations should reflect this reality so that California can experience the prospective benefits an increase in state oil production would bring to our state.

Two recent articles have been published regarding this issue:

"EPA Backpedals on Fracking Contamination," Wall Street Journal, April 1, 2012.

"California faces increasing dependence on high-priced oil imports," Los Angeles Times, March 30, 2012

Contact Us

California Independent Petroleum Association
1001 K Street, 6th Floor
Sacramento, CA 95814
916-447-1177

Rock Zierman
Chief Executive Officer
rock@cipa.org

Blair Knox
Director of Public Affairs
blair@cipa.org