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August 10, 2012

Mark Nechodom
Director
Department of Conservation

Tim Kustic
Supervisor
Division of Oil Gas and Geothermal Resources
801 K St. Sacramento, CA 95814

Re: Public comments regarding hydraulic fracturing regulatory process

Dear Director Nechodom and Supervisor Kustic:

Clean Water Action, on behalf of our 80,000 California members, is pleased to submit these comments in response the your request for public input during the workshops held throughout the state this summer. We appreciate the Department and the Division's interest in hearing from residents throughout California and hope your agencies will heed their concerns. Unfortunately, since at these workshops your agencies:

- failed to allow for the public to ask questions and gain more than a cursory insight into the hydraulic fracturing operations that have occurred and will likely occur in California in the future;
- showed no intention of responding to the comments that you received during these workshops; and
- proposed a quick process for completing regulations;

we were left with the distinct impression that the purpose of the workshops was not really to "listen" to the people, but rather to be able to say that the regulations were developed with public input.

The overwhelming sentiment that was expressed at the workshops is that Californians want to know that hydraulic fracturing won't threaten their health and the environment, and won't cause or exacerbate earthquakes. Some called for bans, others for a moratorium, and others for strict and protective regulations. It is our organization's belief that your agencies have shown a historic disregard for public health and environment in California by failing to regulate hydraulic fracturing, and having had lax enforcement of the Underground Injection Control program. Therefore, the rushed process for developing regulations of hydraulic fracturing regulations that your agencies presented in the public workshops gives us no confidence that the state is prepared to do an adequate job of ensuring public health and the environment are protected.

I. Clean Water Action's Priority Demand- A Moratorium until Health and Environmental Concerns are Addressed

In light of the many outstanding questions surrounding threats to public health and the environment posed by hydraulic fracturing, Clean Water Action calls for a moratorium on all hydraulic fracturing in

California until these concerns are adequately addressed. Due to uncertainties regarding the safety of the technique in our earthquake-prone, water challenged state, The Division of Oil Gas and Geothermal Resources (DOGGR) should stop issuing permits to oil and gas drilling operations that use hydraulic fracturing immediately. Across the country, hydraulic fracturing has negatively impacted communities, impaired air and water quality and poses significant risks. Problems associated with hydraulic fracturing (e.g. "fracking") include contamination of water supplies, massive water usage, health-threatening air pollution, man-made seismic activity and industrialization of small rural communities. There is a growing body of evidence regarding the dangers of fracking and California cannot afford to take these risks. Before any more fracking occurs, there must be an independent scientific review of each of the threats associated with fracking, and associated activities such as wastewater disposal, with respect to the unique geology, seismology, air quality, and water resources issues in the regions of California where hydraulic fracturing might occur. The State must examine if and how the industry can operate without compromising California's environment, health, and communities.

Clean Water Action recommends that the moratorium include the following conditions:

1. Analysis of all health and environmental impacts related to fracking, including, but not limited to, the handling and disposition of produced water or wastewater, contamination of groundwater, increased demand for water supplies, air quality impacts including greenhouse gas and particulate releases, and the potential for generating seismic activity. These impacts should be addressed both individually and cumulatively, e.g. additional air quality impacts in the San Joaquin Valley are significant at any level;
2. The moratorium should apply to all regulated well activities involving hydraulic fracturing, including but not limited to reworking an existing well, not just the issuing of new drilling permits.
3. Joint full CEQA review of fracking (including water use, produced water disposal, air quality impacts, and seismologic concerns) conducted by all responsible agencies, including the Air Resources Board, the State Water Resources Control Board, and the Department of Public Health.
4. Development of revised agreements between responsible agencies for continuing inter-agency coordination and ensuring adequate monitoring and enforcement of identified impacts.
5. The development by the Resources Agency of a 'Health Impact Assessment' (HIA) of hydraulic fracturing to ensure the full identification and incorporation of health protective measures into any adopted program for renewal for hydraulic fracturing. The HIA process is highly a refined and widely respected process for assessing the potential public health impacts of projects to help guide the implementation of specific projects as well as broader policy decisions.
6. Identification of areas where fracking should not be permitted, including in areas where wells are drilled through groundwater aquifers identified as a source or potential source of municipal supply; areas with significant seismic activity, and areas where discharges to surface or groundwater cannot meet the requirements of a local salinity management plan.

II. DOGGR has the authority to prohibit fracking activities

The California Public Resources Code sec. 3106 clearly delineates DOGGR's responsibility to protect California from any danger posed from oil and gas production. Specifically, it provides:

(a) The supervisor shall so supervise the drilling, operation, maintenance, and abandonment of wells and the operation, maintenance, and removal or abandonment of tanks and facilities attendant to oil and gas production, including pipelines…so as to prevent, as far as possible, damage to life, health, property, and natural resources... and damage to underground and surface waters.

If DOGGR finds such potential damages from fracking, then a ban or a policy to not issue permits would be well within its regulatory power.

At the final listening session workshop in Sacamento on July 25, DOC Chief Deputy Jason Marshall said, "banning fracking would require a change in the statute, something that this department does not have the authority to do. The legislature does." This statement is in direct conflict with Public Resources Code 3106 (a) and DOGGR's responsibility to "prevent as far as possible damage to life, health, property and natural resources…and damage to underground and surface waters." DOGGR clearly has the authority to implement a policy of not issuing permits for hydraulic fracturing in the presence of evidence showing that the practice puts California at risk.

There is adequate evidence of the risks associated with fracking for DOGGR to issue a ban or moratorium until an independent scientific review of the technique proves no harm.

III. What we've learned from other states

There have been numerous examples of problems arising from fracking in other states that are well documented. For example:

- In Pennsylvania[i] contaminated fracking wastewater was discharged into the Monongahela River, the drinking water source for hundreds of thousands of people in and around Pittsburgh; groundwater has been contaminated with methane; and small rural towns have been overrun with heavy gas industry traffic and air pollution;
- In Pavilion, Wyoming, groundwater contamination has been linked to wastewater discharged from fracking;[ii]
- In Colorado, air pollution from fracking operations has resulted in increased smog (ground level ozone) from volatile organic compounds (VOC's) and health threatening air toxics;[iii]
- In Ohio, a series of earthquakes near Youngstown has been linked to the underground injection of fracking wastewater.[iv]

IV. California: The New Frack Frontier

According to industry, California may contain the resources to spur an all out oil rush in the coming years. The Monterey Shale, which underlies most of Kern County and large portions of the Central Coast is the largest oil shale play in the country and companies are lining up to exploit its resources. Occidental Corporation (Oxy), for example, is the largest holder of land/mineral rights to acreage in California, holding rights to drill over 1.6 million acres of land in the Monterey Shale, In a presentation to shareholders in 2010, Oxy officials stated that "in 10 years, California shale could become Oxy's largest business unit."

Venoco Inc. has one of the largest stakes in the Monterey Shale with rights to drill in over 300,000 acres in the Monterey Shale. In its 2011 report to shareholders, the company stated that it continues to expand its onshore Monterey acreage lease holdings across three basins: Santa Maria, Salinas Valley, and San Joaquin. Tim Marquez, Chief Executive of Venoco, said in 2011, "Not only is the Monterey shale the largest overall play, it also dwarfs all other individual U.S. oil shale plays. According to the EIA, at 15.4 billion barrels the Monterey shale represents 64% of the technically recoverable shale oil resources in the lower 48 states."[v]

V. Concerns Specific to California's Environment, Communities, and Regulatory Agency

- **A Rush to Develop Regulations**

Clean Water Action does not approve of the rushed timeline that DOGGR has set as it moves forward in developing fracking regulations. The Division has stated that it will develop draft regulations by the end of the summer in August or September, followed by a public comment period, then final regulations by July 2013.[vi]

This is a rushed timeline for the development of regulations and does not allow for full investigation into the numerous concerns around the safety of the practice. This timeline appears to be an effort to implement superficial regulations, such as limited disclosure, quickly so as to keep the oil industry growing in California without regulatory interference.

- **Fracking Threatens California's Water Supply**

Hydraulic fracturing poses serious threats to California's drinking water quality and water supply. California is currently in one of its worst water crises in history[vii], facing reduced water supply due to climate change and multiyear draughts, the water needs of agriculture and urban uses should take priority. In a state that is home to 35 million people and the largest agricultural industry in the country, there is simply not enough water to accommodate such high levels of water usage for oil and gas drilling. Fracking has an especially high impact on water resources because most contaminated wastewater from fracking is injected into deep wells and effectively removed from the water cycle instead of regenerating groundwater and waterways.[viii]

The fracking process utilizes a mixture of chemicals, many of which are toxic or are known to cause human health problems. A 2011 study by the US Congress[ix] identified over 750 different chemicals used in the fracking process, including 29 different chemicals that are either: 1) known or possible human carcinogens; 2) regulated under the Safe Drinking Water Act for their risk to human health; or 3) are listed as hazardous air pollutants under the Clean Air Act. Millions of gallons of dangerous chemicals, such as naphthalene, BTEX compounds (benzene, toluene, ethylbenzene, and xylene), methanol and lead are injected into the earth every year, posing serious risks to water sources and air quality. In addition to the chemicals added to fracking products, the wastewater (referred to as "produced water") from deep within fracking wells contain harmful components such as high salt content, naturally occurring radioactive material, and heavy metals such as arsenic.

The Central Valley, where the majority of fracking in California occurs, is already under major pressure from contaminated drinking water sources. For example, in 2009 in Kern County, contamination primarily

from arsenic and nitrates resulted in over 100 violations impacting approximately 175,000 people.[x] Since 90% of Central Valley residents rely on groundwater, any increase in groundwater contamination is unacceptable. Environmental justice, as defined in California law (Government Code section 65040.12) requires "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws and policies." Low-income residents and people of color are already disproportionately affected by groundwater contamination in the Central Valley and fracking-caused contamination of groundwater would exacerbate the problem.

Wastewater from fracking operations in California is often disposed of into underground injection wells deep beneath the surface of the earth. These wells are known as Class II injection wells under the US EPA Underground Injection Control (UIC) Program. They are often in close proximity to or pass through underground sources of water used for drinking and agriculture. EPA has criticized California's implementation of the UIC program and monitoring of Class II wells.[xi] In particular, the report criticizes DOGGR's one size fits all risk assessment for protection of waterways. In a seismically active region such as California, there is increased risk of well-casing failure and the possibility of wastewater transport through faults into aquifers. A recent study of injection wells across the country reported an alarming integrity failure rate of one in six wells.[xii] In addition, there is a growing body of evidence to suggest that fluids injected deep into the earth can migrate over time, potentially entering underground sources of drinking water, even in the absence of well casing failures.[xiii]

In addition to underground injection, frackers dispose of wastewater into open-air pits, where the dangerous chemicals can off-gas creating air quality problems, or discharge into waterways, threatening drinking water sources and habitats. Under the Clean Water Act, any discharged water into waterways must be treated, however most water treatment plants are not equipped to handle the types and volume of wastewater from fracking. Lacking regulation and disclosure about wastewater methods, the state does not know the extent to which these different methods are used and if contamination has occurred.

The Monterey Shale underlies an area of California's Southern San Joaquin Valley and Central Coast that has also had some of the most serious earthquakes in California history. Without regulations to ensure that fracked wells are secure enough to withstand major seismological activity, Californians have no assurances that when big earthquakes occur, wells containing toxic mixtures of benzene and other carcinogens aren't leaking into groundwater used for drinking water or to irrigate crops.

- **Fracking Threatens California's Air Quality and Exacerbates Climate Change:**

California's Central Valley (home to 4 million Californians), has the highest level of particulate matter and ozone pollution in the United States and the asthma rate is three times the national average, according to the American Lung Association. Deep shale drilling is known to release significant levels of methane gases and volatile organic compounds (VOC's) that cause smog and lead to respiratory problems, and cancer causing air toxics such as benzene and arsenic. The oil and gas industry is the single largest producer of methane gas in the US, accountable for approximately 40% of all methane emissions.[xiv] In addition to the emissions from drilling, large numbers of trucks are used to transport chemicals to each drill site and wastewater away from each drill site, causing significant increases in particulate and smog-forming pollutants. The cumulative air pollution and health problems that result from fracking are costs and impacts that Central Valley residents cannot bear.

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VI. If no Moratorium, Adequate Regulations must be Developed

If DOGGR moves forward without implementing a moratorium, the agency has a responsibility to regulate hydraulic fracking in a manner that will ensure the protection of California's water, air and communities. That regulatory framework must include, at minimum:

- **A broad definition of fracking and enhanced oil and gas recovery:** Fracking should be defined broadly to include the actual fracture of a geologic formation, the drilling of a frack well, all associated activities on or near the well pad, all disposal of wastewater, the transport of chemicals, hydrocarbons or wastewater to or from the site, the all industrial activities that may disrupt a nearby community. While the regulations that DOGGR is developing are likely to be specifically for hydraulic fracturing, DOGGR should include in the regulations, as much as possible and where appropriate, other forms of enhanced oil and gas recovery, such as steam flooding, acidification and shallow diatomite extraction, to ensure a continuum of regulatory protection for local communities. These other forms of oil and gas extraction may also pose significant threats to public health and the environment and should not be excluded from the regulatory process.

- **Identification of setbacks and areas inappropriate for fracking or wastewater disposal:** In coordination with all relevant state agencies, DOGGR should determine which areas are appropriate or inappropriate for fracking and the injection of wastewater, including, but limited to: proximity to groundwater or surface water, proximity to seismic faults, proximity to schools and residential communities, and local air quality. For those areas deemed to be inappropriate for fracking activities, fracking and wastewater disposal should not be permitted, and an additional setback identified to ensure a margin of safety for those conflicting uses.

- **Conditional permitting and public input:** DOGGR should require specific permits for any frack job or injection of wastewater. All pending permits should be open for public comment with opportunities for community participation in the form of a public hearing.

- **Water source and volume:** The source and volume of all water used in the fracking process should be disclosed, and should not interfere with other beneficial uses of water, including but not limited to urban, agricultural, industrial, recreation, habitat and environmental. Furthermore, an independent study should determine the regional impact of fracking on California's water supply.

- **Wastewater disposition:** All information concerning the disposition of fracking wastewater, including method, location, volume, chemical volume and percent of chemicals recovered, should by disclosed. Setbacks and off limits wastewater disposal criteria should be developed, to prevent high risk disposal methods, including but not limited to unlined surface pits, injection of wastewater through or near groundwater sources, in close proximity to faults, and untreated disposal into surface waterways. Fracking operations should be subject to salinity management requirements being developed by the Regional Water Quality Control Boards.

- **Ground and surface water monitoring:** Prior to fracking or injecting wastewater, testing of groundwater or surface water should be conducted to develop baseline data, and a monitoring

program developed to track changes in water quality during operations and after abandonment of any frack or injection well.

- **Radiological elements**: Any radiological elements which are injected should be disclosed and recovered and reported as to where and how disposed. Any radiological elements that are brought to the surface in produced water should be reported and disposed of safely.

- **Air quality:** Fracking operations should be regulated to prevent greenhouse gas emissions and other air pollutant emissions. DOGGR should require green completions on all frack wells and monitoring of baseline and ongoing air quality for greenhouse gas, air toxics and volatile organic compound emissions.

- **Community impacts:** There should be rules to control and mitigate noise, dust and light pollution, to minimize impacts on communities.

- **Seismicity:** All fracking and the injection of wastewater should be adequately studied prior to beginning operations to ensure that activities will not result in induced seismic events. No fracking or wastewater injection may occur within a reasonable distance of any faults. DOGGR should require all operators to report all seismic activities during operation.

- **Well casing failures:** All well casing failures of frack and injection wells should be reported. DOGGR should develop response criteria for any well casing failure that includes reporting, repair and monitoring.

- **Public notice:** At least 60 days prior to any fracking operations or injection of wastewater, an operator should disclose to neighboring landowners and residents, water users, water providers and local governments of their intent. Neighboring should be classified as any property owner whose property is within one mile (along the surface) of the nearest fracture. All local jurisdictions that contain any neighboring parties listed above, shall be notified.

- **Chemical Disclosure:** All chemicals, injected or brought to the frack site, should be fully disclosed by name, volume, concentration, intended use and disposal plan in an application for permit.

- **Ban Chemicals:** Ban the injection of diesel chemicals and the BTEX compounds (benzene, toluene, ethylbenzene, zylene). Ban the injection of chemicals that are 1) known or possible human carcinogens; 2) regulated under the Safe Drinking Water Act for their risk to human health; or 3) are listed as hazardous air pollutants under the Clean Air Act.

- **Frack job details:** All details should be included in the permit application, including, but not limited to exact length, width, and pressure of proposed and actual frack job.

- **Trade secrets:** Trade secret exemptions must be consistent with existing state laws, regulations, and existing practices from other agencies. Specifically, the Division must be allowed to access all trade secret information in order to understand the impacts of the operation and to determine whether the claim of trade secrets is warranted.

- **Confidential wells**: Exploratory wells, which are currently given confidential status, should not be exempt from any of the above disclosure requirements or limitations.

- **Public access to data:** All data required above should be available in a searchable database that can be used by the public to search by any area or criteria and that also provides aggregated data for any desired area or criteria. The Division should file an annual report of all data disclosed, including individual well and aggregate data, to be made public.

Conclusions and Recommendations

Clean Water Action recommends a statewide moratorium on hydraulic fracturing in California. The development of fracking regulations by DOGGR should be put on hold and a full independent review of all the following concerns about fracking and the disposal of fracking wastewater should be conducted: increased demand on California's water supply, risk of ground and surface water contamination, impacts on air quality and greenhouse gas emissions, seismic impacts and risk of induced seismic activity and earthquake caused well casing failure. Upon completion of an independent, scientific investigation, the state should also consider whether promoting new technologies to enhance the oil industry's ability to extract oil in California is consistent with the state's policies on global warming, under AB 32, and its commitment to create a clean energy economy. If the state moves forward with developing regulations and permitting of fracking and other new technologies for onshore oil recovery, it should absolutely ensure the safety and protection of California's environment, public health and communities and at a minimum include measures that address the recommendations provided above.

Sincerely,

Miriam Gordon
California Director

Andrew Grinberg
Program Associate

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[i] Groups Reach Settlement with McKeesport in Gas Drilling Wastewater Dumping Case (http://cleanwateraction.org/press/groups-reach-settlement-mckeesport-gas-drilling-wastewater-dumping-case)

[ii] US Environmental Protection Agency (http://www.epa.gov/region8/superfund/wy/pavillion/)

[iii] Colorado School of Public Health (http://attheforefront.ucdenver.edu/?p=2546%2526utm_source=feedburner%2526utm_medium=feed%2526utm_campaign=Feed%25253A%252Btheforefront%252B%252528%252540theForefront%252529)

[iv] Scientific American (http://www.scientificamerican.com/article.cfm?id=ohio-earthquake-likely-caused-by-fracking)

[v] Quote based on data from US Energy Information Administration "Review of Emerging Resources: US Shale Gas and Shale Oil Plays" (ftp://ftp.eia.doe.gov/natgas/usshaleplays.pdf)

[vi] DOC Deputy Director Jason Marshall at DOGGR Fracking Workshop Salinas 6/27/12

[vii] Department of Water Resources "California Water Plan Update 2009"

[viii] Western Resource Advocates "Fracking Our Future" p. 14, Fig 2
(http://www.westernresourceadvocates.org/frackwater/WRA_FrackingOurFuture_2012.pdf)

[ix] US House of Representatives Committee on Energy and Commerce "Chemicals Used in Hydraulic Fracturing" April 2011
http://democrats.energycommerce.house.gov/sites/default/files/documents/Hydraulic%20Fracturing%20Report%204.18.11.pdf

[x] California Department of Public Health "2009 Annual Compliance Report"
http://www.cdph.ca.gov/certlic/drinkingwater/Documents/DWdocuments/2009%20Annual%20Compliance%20Report.pdf

[xi] Horsley Witten Group "California Class II Underground Injection Control Program Review" (ftp://ftp.consrv.ca.gov/pub/oil/fullreport.pdf"

[xii] Pro Publica "Injection Wells: The Poison Beneath Us" (http://www.propublica.org/article/injection-wells-the-poison-beneath-us)

[xiii] National Academy of Sciences "Geochemical evidence for possible natural migration of Marcellus Formation brine to shallow aquifers in Pennsylvania" (http://www.pnas.org/content/early/2012/07/03/1121181109.full.pdf+html)

[xiv] US EPA (http://www.epa.gov/airquality/oilandgas/basic.html)