

**Tim Kustic**  
**State Oil & Gas Supervisor**  
**Division of Oil, Gas, and Geothermal Resources**  
**Department of Conservation**

**Dear Mr. Kustic,**

**Restrict Fracking in California:**

**The Society for Conservation Biology advocates** greater research and regulation of hydraulic fracturing (fracking) activities within the state in order to preserve both human health and the conservation of biodiversity. The California Division of Oil Gas and Geothermal Resources (DOGGR)'s draft rules require public disclosure of all hydraulic fracturing fluid chemicals within 60 days after the cessation of operations,<sup>1</sup> which is not enough to protect biodiversity in the state. The Davis chapter of the Society for Conservation Biology (SCB) would like to encourage a **ban on hydraulic fracturing** within the state. Failing that, we would like to support the proposed regulations and encourage a **moratorium on hydraulic fracturing activities until regulations can be enacted**. Regulations should include **public disclosure of locations of wells and fracturing fluid chemicals** before activities begin, **recycling of flowback water**, and **increased research on potential negative impacts** before fracking activities begin. These suggestions are in addition to the national SCB letter calling for more research into biodiversity consequences of fracking<sup>2</sup>.

**Toxic Chemicals:**

In hydraulic fracturing, the fluid injected into the ground is a mixture of approximately 90% water, 9.5% sand proppants, and 0.5% chemical additives by total fluid volume<sup>3</sup>. Crystalline silica dust exposure resulting from the sand proppant is found to increase the risk of lung cancer, pulmonary tuberculosis, and industrial bronchitis, as well as lead to a chronic, inflammatory lung disease, silicosis, in workers<sup>4</sup>. From 2005 to 2009, the 14 leading oil and gas service companies used 780 million gallons of hydraulic fracturing products, excluding water added at the site, that contained 750 chemicals and components<sup>5</sup>. They used 29 chemicals that are, "(1) known or possible human carcinogens, (2) regulated under the Safe Drinking Water Act for their risks to human health, or (3) listed as hazardous air pollutants under the Clean Air Act"<sup>5</sup>. The most widely used chemical, methanol, was found in 342 fracturing products, is a hazardous air pollutant, and is on the list for potential regulation under the Safe Drinking Water Act. Other highly toxic components included lead, benzene (a known human carcinogen) toluene, xylene, and ethylbenzene, all of which are regulated under the Safe Drinking Water and Clean Air Acts<sup>5</sup>. It is also unclear how the process of fracking will interact with existing infrastructure such as abandoned wells. Even if proposed regulations are followed and safety precautions are taken, there is no information about how fracking might cause leakage from point sources outside the individual wells.

SCB recommends the following interim policy measures to protect ecosystems while research is conducted:

- 1) Require collection of baseline measurements of air and water quality, and completion of assessments of biological diversity *prior* to well construction. Biological diversity (both terrestrial and aquatic) should be assessed at the area of the well pad, in freshwater systems that are hydrologically connected downstream of the well location, and at stream sites used for water sourcing.
- 2) Mandate full disclosure of the chemical composition of fracking fluids and the amount of water used during the gas extraction process.
- 3) Require the use of non-toxic, company-specific chemical tracers in fracking fluid to increase scientific understanding of chemical migration and to determine liability in the event of freshwater contamination.
- 4) Rigorously enforce EPA water quality standards relating to aquatic life and ensure that all discharges of pollutants from fracking operations comply with the Clean Water Act.<sup>1</sup>
- 5) Require companies to develop response plans and provide financial assurances for all cleanup costs for incidents that result in contamination.
- 6) Establish mandatory reporting requirements for all accidents and spills associated with the entire fracking process.
- 7) Consult with the Federal Energy Regulatory Commission to ensure that the permitting of natural gas pipelines associated with fracking operations fully comply with all environmental law, including National Environmental Policy Act (NEPA) and the Endangered Species Act.

### **Depleting California's Water Supply:**

Hydraulic fracturing is a water intensive process since water is injected into wells in order to improve production and extract natural gas. According to the United States Environmental Protection Agency (EPA), a shale gas well requires between 2.3 million and 3.8 million gallons of water per well<sup>6</sup>. However, estimates from other regions suggest that water requirements could be even greater depending on the circumstances. In Pennsylvania, it is estimated to take 4.5 million gallons per well<sup>7</sup>, while areas of Texas require up to 13 million gallons of water per well<sup>8</sup>. Given the nature of the shale reserves in California, it is not expected to require such significant water investments; nevertheless, the California Department of Conservation does acknowledge that most require a stimulation (in the form of water) to flow<sup>17</sup>. In addition to the water required to establish the well and make it productive it is estimated that an additional 40,000 -- 1 million gallons is required to drill a well<sup>3</sup>.

Spills or accidents associated with fracking could also contaminate fresh water resources<sup>6</sup>. The most likely contaminants are methane, fracking fluid chemicals, and substances already present in the shale formation that are flushed out during fracking, such as salts, minerals, naturally occurring radioactive materials (NORMs), and hydrocarbons<sup>9</sup>. Faulty well construction or failure of well casings could lead to

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<sup>1</sup> <http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm>

underground leakage of these contaminants into drinking water aquifers<sup>9</sup> and spills of fracking chemicals and flowback water (the waste water that comes back out of the well after fracking) could contaminate surface water. Flowback water is highly dangerous and difficult to dispose of even when it does not directly contaminate surface water<sup>6</sup>.

For California, these water investments are a serious concern at a time when we already have challenges securing water for our state's urban population, farmers, and for continued survival of fish and vulnerable habitats. Changing climatic conditions and increasing frequency and intensity of extreme events mean that California's water supply for the future remains even more fragile and important to conserve<sup>10,11</sup>.

SCB recommends the following interim policy measures to protect water flows:

- 1) Prohibit water sourcing from streams, rivers, lakes, or ponds which are inhabited by federally threatened or endangered species, including water sources that provide resources to protected species at a single life stage.
- 2) Based on current research, establish precautionary minimum flow guidelines for streams and rivers that protect aquatic life.
- 3) Enact a moratorium on water sourcing during periods of drought.

### **Increasing Greenhouse Gases:**

Besides the direct impact of the wells themselves, increased greenhouse gases from both production processes and burning of fossil fuels will hurt residents of California and the environment. Hydraulic fracturing produces more greenhouse gases than traditional oil and gas production, both due to energy-intensive well construction and methane leakage from oil and gas extraction<sup>12</sup>. Increased production of fossil fuels will hurt investment in green forms of energy and limit our ability to fight climate change. California is particularly vulnerable to climate change due to its high diversity of native plants and animals, many of which occur nowhere else on earth. These range from charismatic mammals like the salt marsh harvest mouse (whose habitat will be destroyed by the predicted 1.4m sea level rise)<sup>13</sup>, to the delta smelt (a fish whose native waters will become too hot for it to survive)<sup>14</sup>, to the Jepson's pincushion, a plant restricted to a single soil type in Northern California<sup>15</sup>. Climate predictions already project an increase in temperature of 4.5-6.5 degrees F in the next century<sup>16</sup>, and tapping new sources of oil and natural gas through hydraulic fracturing will only increase this estimate.

SCB recommends the following interim policy measures to safeguard against unknown cumulative effects on ecosystems and greenhouse gas emissions:

- 1) Require programmatic environmental impact statements for fracking operations that address cumulative impacts at the landscape scale. Where significant cumulative impacts are predicted, ensure that fracking operations fully address the risks posed by those impacts to biodiversity, especially those protected under the Endangered Species Act.

### **Do not let fracking continue unregulated:**

The proposed regulations requiring disclosure of chemicals and well locations are a step in the right direction. However, they will not be enough to protect California's environment on their own. We would like to encourage DOGGR and the California Legislature to enact regulations requiring greater safety standards of well operators, restrict the nature and location of hydraulic fracturing wells, and encourage greener alternatives to fossil fuels.

**Sincerely,**

**The Davis Chapter of the Society for Conservation Biology**

Brief written by policy committee members Megan Kelso, Rosemary Hartman, and Emily Miller, and Meredith Niles. Approved by the Davis Chapter and the parent organization

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