

## Hydraulic Fracturing

February 2011

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*“Hydraulic fracturing...is a valuable tool in reducing our dependence on foreign energy supplies. During both the Clinton administration, and the current administration, the EPA has maintained that Federal regulation of hydraulic fracturing is not required”<sup>1</sup>*

Sen. Jeff Bingaman (D-NM), Chairman, Senate Energy Committee  
March 7, 2002

*“ There is no evidence that the hydraulic fracturing at issue has resulted in any contamination or endangerment of underground sources of drinking water (USDW).”*

Carol Browner, President Clinton’s EPA Administrator  
May 5, 1995

Testifying before the Senate Environment and Public Works Committee, EPA officials Peter Silva, Assistant Administrator for Water; and Cynthia Giles, Assistant Administrator for Enforcement and Compliance Assurance confirmed that they know of no cases of ground water contamination from hydraulic fracturing.<sup>2</sup>

December 8, 2009

- Hydraulic fracturing (fracing) is a safe, well-tested technology that has enabled the United States to develop unconventional natural gas and increase reserves to over a one hundred year supply. Fracing has been performed in over one million wells with an exemplary safety record and no documented cases of contamination to drinking water from fracing.
- The EPA has affirmed during the Clinton Administration, the Bush Administration, and now during the Obama Administration that there have been no documented cases of contamination of drinking water from fracing. Despite that, EPA is conducting another study of fracing. Congress should wait for EPA to complete its fracing study before advancing any fracing legislation.
- States have successfully regulated fracing for over 60 years, and new federal mandates are not necessary given the states’ exemplary safety record. Any efforts to standardize disclosure requirements should be led by the Interstate Oil and Gas Compact Commission (IOGCC), which already has model regulatory processes in place through the STRONGER program (State Review of Oil and Natural Gas Environmental Regulations).
- As the entities closest to the wellhead, state regulatory bodies are more responsive to conditions on the ground and the larger needs of communities with respect to jobs and economic activity than far-removed federal agencies.
- Fracing involves pumping fluid down a wellbore and into the oil or gas-bearing rock to create fractures in the formation so that the gas or oil can flow from low permeability reservoirs into the

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<sup>1</sup> *Congressional Record – Senate*, March 7, 2002, page S1633.

<sup>2</sup> In a Senate Environment and Public Works hearing on December 8, 2009, Peter Silva, Assistant Administrator for Water, EPA; Cynthia Giles, Assistant Administrator for Enforcement and Compliance Assurance, EPA; and Matthew Larsen, Associate Director for Water, U.S. Geological Survey could not provide an example of contamination of drinking water caused by fracing. [Minority Press Update](#), Senate Environment and Public Works Committee, Dec 8, 2009;

well and to the surface. Sand or ceramic grains are used to prop the fractures open. Industry is pumping these fluids down steel casing that is cemented in place and carefully designed to protect fresh water aquifers and into formations that contain oil and natural gas.

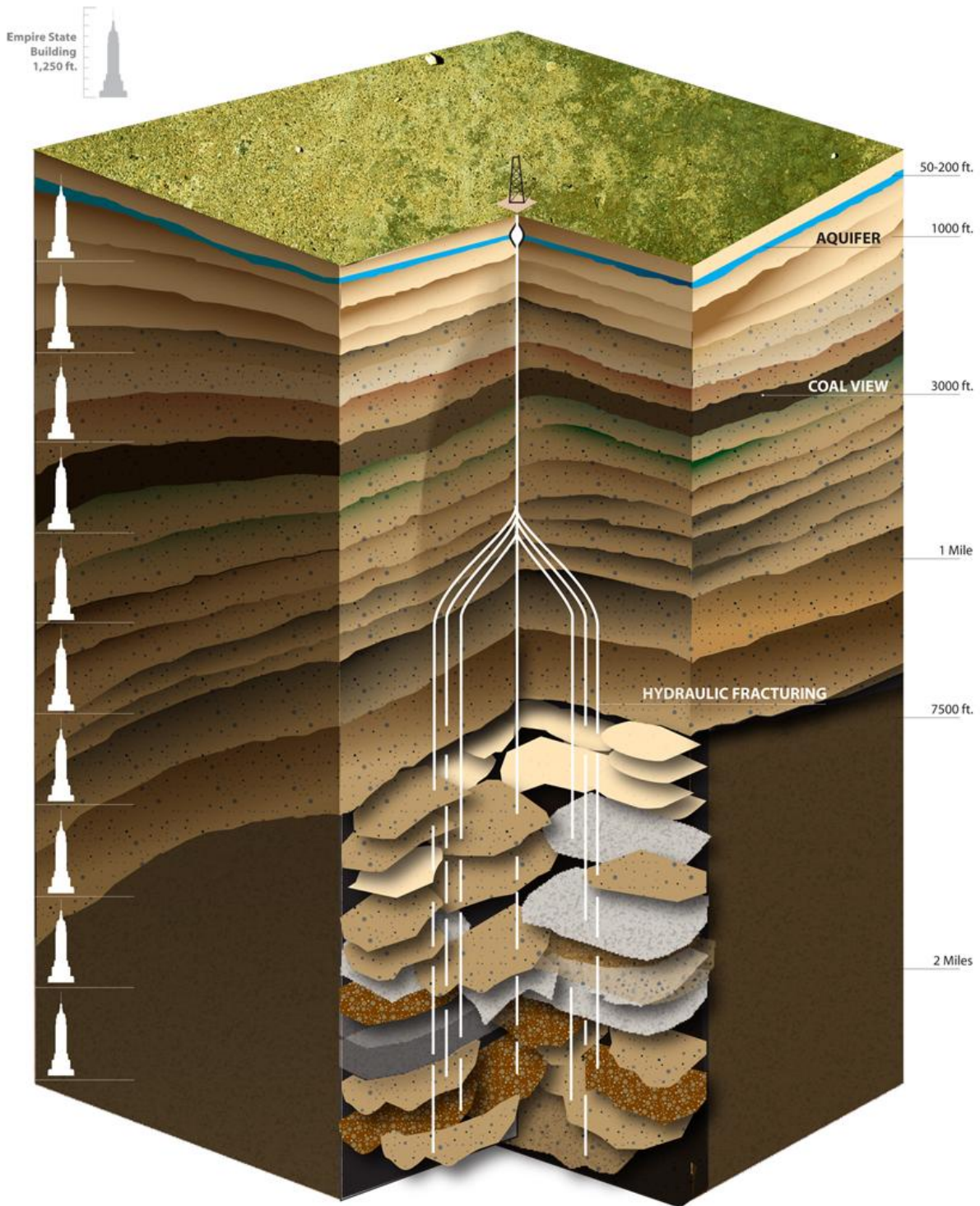
- Hydraulic fracturing fluids typically consist of 99.5% water and sand. The remaining 0.5% contains primarily three additives: 1) a friction reducer, similar to Canola oil, to thicken the liquid; 2) a bactericide like Chlorine used in swimming pools; and 3) a micro emulsion element similar to those found in personal care products.
- Western Energy Alliance supports full chemical disclosure to state regulators and emergency responders on a per well basis in the event of an incident, with confidentiality of formula.
- Like all procedures surrounding the development of energy, hydraulic fracturing is already covered by hundreds of regulations. Because the states regulate the practice of hydraulic fracturing, federal regulation is unnecessary. The Safe Drinking Water Act exemption for hydraulic fracturing does not eliminate the EPA's ability to become involved if necessary. If the practice is subject to another layer of regulation it will delay natural gas supplies from reaching consumers.
- The Interstate Oil and Gas Compact Commission, representing all natural gas and oil producing states, issued a resolution in 2009 asking Congress not to repeal the fracturing exemption. IOGCC completed a survey of all producing states in 2002 and found no cases of contamination from fracturing.
- EPA has found no evidence that water quality degradation has resulted from fracturing.<sup>3</sup>
- In a May 5, 1995 letter, then EPA Administrator Carol Browner stated "There is no evidence that the hydraulic fracturing at issue has resulted in any contamination or endangerment of underground sources of drinking water (USDW). Repeated testing, conducted between May 1989 and March 1993 ... failed to show any chemicals that would indicate the presence of fracturing fluids."<sup>4</sup>
- Fracturing has been exempt from the Underground Injection Control (UIC) program of the Safe Drinking Water Act (SDWA) since 1974 because Congress determined then, and with subsequent updates of the law, that the UIC program was not applicable to fracturing. However, industry must comply with the SDWA when the frac fluids are returned to the surface.
- The fracturing exemption is not a recent "Halliburton loophole." Rather, the Energy Policy Act of 2005 merely clarified the SDWA exemption in place since 1974.
- Chemicals used in fracturing have been disclosed publicly by the Groundwater Protection Council and are available on the web. Information about chemicals is also maintained on site in the form of Materials Safety Data Sheets, and is readily available in the event of an accident.

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<sup>3</sup> *Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs*, Final Report, US Environmental Protection Agency, June 2004, page ES-13.

<sup>4</sup> Letter dated May 5, 1995, from Carol Browner, EPA Administrator, to David Ludder, general counsel for the Legal Environmental Assistance Foundation, denying a petition for EPA to regulate hydraulic fracturing based on a case in Alabama. The EPA determined state law is appropriate for regulating hydraulic fracturing and there is no need to supplant these efforts.

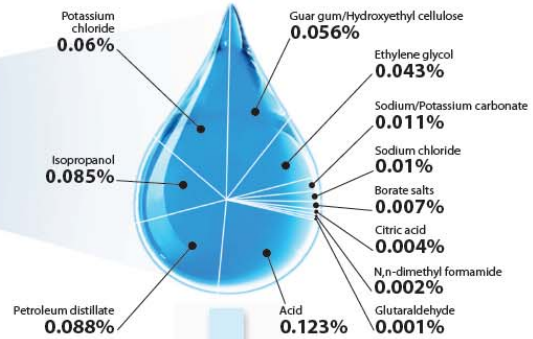
**Going Deep:** Well Stimulation Technology Deployed Thousands of Feet Below the Water Table



**Source:** Energy-In-Depth ([www.energyindepth.org](http://www.energyindepth.org))

# A FLUID SITUATION: TYPICAL SOLUTION\* USED IN HYDRAULIC FRACTURING

**0.49%**  
ADDITIVES\*



Compound*	Purpose	Common application
Acids	Helps dissolve minerals and initiate fissure in rock (pre-fracture)	Swimming pool cleaner
Glutaraldehyde	Eliminates bacteria in the water	Disinfectant; Sterilizer for medical and dental equipment
Sodium Chloride	Allows a delayed break down of the gel polymer chains	Table Salt
N, n-Dimethyl formamide	Prevents the corrosion of the pipe	Used in pharmaceuticals, acrylic fibers and plastics
Borate salts	Maintains fluid viscosity as temperature increases	Used in laundry detergents, hand soaps and cosmetics
Polyacrylamide	Minimizes friction between fluid and pipe	Water treatment, soil conditioner
Petroleum distillates	"Slicks" the water to minimize friction	Make-up remover, laxatives, and candy
Guar gum	Thickens the water to suspend the sand	Thickener used in cosmetics, baked goods, ice cream, toothpaste, sauces, and salad dressing
Citric Acid	Prevents precipitation of metal oxides	Food additive; food and beverages; lemon juice
Potassium chloride	Creates a brine carrier fluid	Low sodium table salt substitute
Ammonium bisulfite	Removes oxygen from the water to protect the pipe from corrosion	Cosmetics, food and beverage processing, water treatment
Sodium or potassium carbonate	Maintains the effectiveness of other components, such as crosslinkers	Washing soda, detergents, soap, water softener, glass and ceramics
Proppant	Allows the fissures to remain open so the gas can escape	Drinking water filtration, play sand
Ethylene glycol	Prevents scale deposits in the pipe	Automotive antifreeze, household cleansers, deicing, and caulk
Isopropanol	Used to increase the viscosity of the fracture fluid	Glass cleaner, antiperspirant, and hair color

On average, **99.5%** of fracturing fluids are comprised of freshwater and compounds are injected into deep shale gas formations and are typically confined by many thousands of feet or rock layers.

Source: DOE, GWPC: Modern Gas Shale Development In the United States: A Primer (2009)

\*The specific compounds used in a given fracturing operation will vary depending on source water quality and site, and specific characteristics of the target formation. The compounds listed above are representative of the major material components used in the hydraulic fracturing of natural gas shales. Compositions are approximate.