August 23rd, 2013

Mr. Neil Kornze
Principal Deputy Director, Bureau of Land Management
U.S. Department of the Interior, Director (630)
Bureau of Land Management
Mail Stop 2134 LM
1849 C St. NW
Washington, DC, 20240

Attention: 1004-AE26

Re: Comments on Proposed Rule on Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands

Dear Principal Deputy Director Kornze:

Please accept these comments on the Bureau of Land Management's proposed rule to regulate hydraulic fracturing on public land, Indian land, and private land overlying federal minerals, published in the Federal Register on May 24, 2013 at 78 Fed. Reg. 31636. These comments are submitted by the Center for Effective Government, Clean Air Task Force, Clean Water Action, Natural Resources Defense Council, and Sierra Club on behalf of the following organizations: Allegheny Defense Project, American Rivers, Biodiversity Conservation Alliance, Buckeye Forest Council, Californians for Western Wilderness, Clark Resource Council, Delaware Riverkeeper Network, Earthjustice, Earthworks, EcoFlight, Environment America, Environmental Defense Center, Georgia ForestWatch, Grassroots Coalition, Heartwood, Los Padres ForestWatch, Northern Plains Resource Council, Ouachita Watch League, Pavillion Area Concerned Citizens, People's Oil & Gas Collaborative – Ohio, Powder River Basin Resource Council, Riverkeeper, San Juan Citizens Alliance, Shenandoah Valley Network, Southern Environmental Law Center, Southern Utah Wilderness Alliance, Virginia Forest Watch, Virginia Wilderness Committee, Western Environmental Law Center, Western Organization of Resource Councils, Wild Virginia, and Wilderness Workshop. The organizations submitting these comments are described in Section XIII.

Respectfully submitted,

Sofia Plagakis
Environmental Right-to-Know Policy Analyst
Center for Effective Government
splagakis@foreffectivegov.org

L. Bruce Hill, Ph.D.
Senior Geologist
Clean Air Task Force
bruce@catf.us

Lynn Thorp
National Campaigns Director
Clean Water Action
lthorp@cleanwater.org

Amy Mall
Senior Policy Analyst
Natural Resources Defense Council
amall@nrdc.org

Deborah J. Nardone, Director
Beyond Natural Gas Campaign
Sierra Club
814-308-9767

Contents

I. Introduction

The undersigned groups are extremely concerned about the risks to the environment and human health from oil and gas well development activities, including hydraulic fracturing and other forms of well stimulation. As a result, we are highly disappointed in the proposed rule published in May 2013 by the Bureau of Land Management (BLM). The re-proposed rule fails to remedy significant deficiencies in existing regulations. As with the initial proposal, the BLM has failed to address important aspects of well stimulation that present risks to groundwater, surface water, air, soil, fish and wildlife habitat, and human and animal health.

The BLM has not even proposed to require operators on federal lands to adhere to practices called for by this administration's own advisory board on shale gas extraction more than two years ago, such as full disclosure of all hydraulic fracturing chemicals with a high bar for trade secrecy protection, baseline water testing, strong rules for cement evaluation logs and remedial cementing, declaring unique and/or sensitive areas off-limits to operations, tracking water flows, analyzing wastewater, and prohibiting use of diesel as a well stimulation fluid.[1] Please see our comments submitted in September 2012, pp 4-6, for further discussion of the important need to place unique or sensitive areas of federal lands off-limits to drilling and well stimulation. In addition, the BLM is silent on other related issues such as the air quality impacts of well stimulation, failing to consider measures that would reduce the emissions of stimulated wells or setbacks that would protect the public from the worst impacts of air emissions.

As the BLM recognizes, existing BLM regulations do not adequately address the environmental and public health risks from oil and gas production currently occurring on federal lands. The advent of horizontal drilling and hydraulic fracturing and other well stimulation techniques used to access unconventional resources has dramatically changed U.S. oil and gas production, including production on the 759 million acres of mineral estate administered by the BLM. Indeed, the BLM estimates that roughly 90% of new wells on federal lands are hydraulically

[1] USDOE, Secretary of Energy Advisory Board (August 18, 2011). Shale Gas Production Subcommittee 90-day Report.

fractured.[2] The BLM's regulations for oil and gas production, however, were last updated in 1988—in the BLM's words, "long before the latest hydraulic fracturing technologies became widely used."[3] It is no surprise that these rules did not foresee the development and prevalent adoption of well stimulation techniques used today, nor did the environmental review of the 1988 rules consider the impact of these practices.

Accordingly, it is urgent that the BLM update its regulations to address well stimulation. However, the BLM must do much more than it has currently proposed. It must also update its regulations that pertain to related areas of risk including but not limited to geologic site characterization, baseline water testing and ongoing monitoring, well construction, and air and climate impacts. Due to the failure of these proposed rules and existing rules to provide effective safeguards against the environmental and public health risks of oil and gas extraction, we oppose opening up new federal landscapes to drilling if the draft rules are finalized in their current form. Furthermore, because even the most stringent rules can not completely eliminate environmental and public health risks, certain environmentally sensitive areas should be completely off limits to oil and gas development regardless of what rules are in place. Categories of lands where oil and gas development is not permitted should be identified in the final rule, consistent with the BLM's multiple use mandate. All oil and gas operations on public lands must adhere to stringent standards, which we discuss in detail below.

II. Applicability of the Proposed Rule

The BLM should reverse its proposal to narrow the scope of the rule to include only hydraulic fracturing. Acid stimulation[4] is one of the two primary stimulation techniques used by the oil and gas industry today, the other being hydraulic fracturing.[5] In 2000, it was estimated that matrix stimulation, which includes matrix acidizing, accounted for 75%-80% of all stimulation treatments worldwide (both matrix and fracturing), and that more than 40,000 acid stimulation treatments are performed in oil and gas wells every year.[6]

a. Other well stimulation techniques, including acidizing, can present the same environmental and public health risks as hydraulic fracturing and should be regulated similarly

Like hydraulic fracturing, acid stimulation uses chemicals hazardous to the environment and public health, requires careful management of hazardous waste fluid, and may require large volumes of fluid. Accordingly, many of the risks of acid stimulation should be addressed by the same rules the BLM proposed for hydraulic fracturing. Indeed, other states have demonstrated the feasibility of regulating all well stimulation techniques together.[7] The BLM should do so here, as it originally proposed.

Acid stimulates production by dissolving minerals in the target formation to restore and/or increase permeability. Multiple different types of acid are used in acid stimulation, depending on the function and the geology, including but not limited to:

- Hydrochloric acid;
- A mixture of hydrochloric and hydrofluoric acids, often referred to as "mud acid";
- Acetic acid; and
- Formic acid.

---

[2] "Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands; Proposed Rule." Federal Register 78:101 (May 24, 2013) p. 31638/3.
[3] *Id*.
[4] The terms "acid stimulation" or "acidizing" may refer to a set of practices including acid washes (sometimes referred to as "pickling"), matrix acidizing, and acid fracturing.
[5] Economides, M.J.; Nolte, K.G. (Eds.), Reservoir Stimulation, 3rd ed., Wiley: New York, 2000.
[6] Ibid.
[7] See, e.g., Wyoming Oil and Gas Conservation Commission Rules, Chapter 3, passim.

The concentration of acid varies depending on the function and geology. Hydrochloric acid concentration generally ranges from about 5% - 30%. The mixture of hydrochloric and hydrofluoric typically ranges up to 12% HCl mixed with 3% HF although operators have also experimented with higher concentrations.[8]

Hydrofluoric acid in particular is extremely toxic and exposure to it can be life threatening. The hazards of hydrofluoric acid are unique among other inorganic acids because the fluoride ions penetrate quickly and deeply into the body. Fluoride is a calcium scavenger, pulling calcium from bodily tissue and eventually from bone, causing severe damage. Low concentrations, such as those used in the oil and gas industry, can still cause health risks, but the symptoms of exposure may be delayed by up to a day, meaning that extensive damage may be done before the person seeks medical attention.[9]

In addition to acid, other chemicals are used in acid stimulation fluids including but not limited to corrosion inhibitors, surfactants, clay-stabilizers, solvents, and iron control agents.[10] These products are composed of a range of chemicals, some of which may be toxic or otherwise hazardous. Many are the exact same products used in hydraulic fracturing fluids.

The total volume of acid used depends on multiple factors including the type of acid stimulation being performed and the volume of rock targeted for stimulation. Operators in California have experimented with using very large volumes of acid to stimulate production in the Monterey Shale, which is an emerging tight oil play thought to contain up to 15 billion barrels of oil.[11] A paper published in 2004 by the Society of Petroleum Engineers describes one such experiment in the Elk Hills Field in Kern County, CA.[12] After initial disappointing production rates from both horizontal and vertical wells drilled into the Monterey Shale, the operator used acid stimulation as part of a program to increase production. The operator initially experimented with injecting 5.5 gallons per foot of net pay (gpnf) of 17% concentration hydrochloric acid (HCl). When this did not achieve the desired production rates, the acid volume was increased and a hydrofluoric acid (HF) blend (12% HCl + 3% HF) was added, eventually using up to 135 gpnf of hydrofluoric acid blend in horizontal wells and up to 250 gallons per foot of perforations in vertical wells. The operator reported using 2,024,351 gallons of acid to acidize 49 vertical wells (the total volume of acid used in the horizontal wells was not reported). Due to the success of these large volume acid stimulation jobs, this technique was adopted widely throughout the field. The BLM must consider the possibility that such high volume acidizing could be widely used to stimulate oil production in the Monterey and potentially also in other formations.

Other states have demonstrated that acid stimulation and hydraulic fracturing can be regulated under a single well stimulation framework. The state of Wyoming regulates all forms of well stimulation, requiring approval in order to "acidize, cleanout, flush, fracture, or stimulate a well."[13] The application for a permit to drill must include a "[d]escription of the anticipated completion and stimulation program, including the base stimulation fluid and its source, the chemical additives and proposed concentrations to be mixed…"[14] Wyoming's rules for disclosure of chemicals and stimulation design, monitoring, operation, and reporting apply to all forms of well stimulation, not

---

[8] See, e.g., use of 10% HCl/5% HF in the South Belridge Field, Kern County, CA: Dominquez, F. E., & Lawson, J. B. (1992, October). Foamed High-Concentration/High-Volume Mud Acid Stimulations at South Belridge Field. In *SPE Annual Technical Conference and Exhibition*.

[9] "Facts About Hydrogen Fluoride (Hydrofluoric Acid)." Centers for Disease Control and Prevention. n.p. 22 April 2013. Web. 2 August 2013. <http://www.bt.cdc.gov/agent/hydrofluoricacid/basics/facts.asp>.

[10] *Ibid.* supra note 5.

[11] U.S. Energy Information Administration. (2011, July). Review of Emerging Resources: U.S. Shale Gas and Shale Oil Plays. 82 p.

[12] Greg, R., Robert, H., & Norman, J. (2004, March). Unlocking the Monterey Shale Potential at Elk Hills: A Case Study. In *SPE International Thermal Operations and Heavy Oil Symposium and Western Regional Meeting*.

[13] Weil's Code of Wyo. Rules, Oil and Gas Conserv. Comm'n, Gen. Agency, Bd or Comm'n Rules, ch. 3, § 1(a).

[14] *Id.* at ch. 3, § 8(c)(ix).

only hydraulic fracturing.[15] Wyoming was the first state in the nation to institute such requirements, and the oil and gas industry has continued to flourish there and there is no evidence that the industry has even complained about this approach.

b. The BLM's reasoning for narrowing the scope of the proposed rule to cover only hydraulic fracturing rather than well stimulation broadly is scientifically unsupportable.

The BLM provides multiple lines of reasoning for narrowing the scope of the rule to cover only hydraulic fracturing rather than well stimulation techniques more broadly, none of which are scientifically supported in its proposal. The BLM's proposal fails to address the risks posed by well stimulation techniques other than hydraulic fracturing and the inadequacy of the environmental protection provided by the BLM's current outdated regulation (which does not include any requirements for the design, operation, or monitoring of any will stimulation activities).

i. Practices not intended to be covered

In the preamble to the rule, the BLM justifies narrowing the scope by stating that the definition of well stimulation in the initial proposed regulations "could also be interpreted to mean other operations such as thermal stimulation and maintenance fracturing, designed to open up fractures near the wellbore."[16]

First, it is unclear why the BLM believes these activities, which pose many of the same risks, should not be covered by this rule. The BLM has not provided sufficient justification for why the environmental and public health risks from all forms of well stimulation should not be managed by these regulations. Furthermore, it is unclear to which practices the proposed rules will apply. The language above from the preamble implies that, even though it is a form of hydraulic fracturing, "maintenance fracturing" will not be covered even under the new definition of "hydraulic fracturing." Additionally, while it appears that acidizing treatments that are performed above the reservoir fracture pressure would be subject to the proposed rule based on the definition of "hydraulic fracturing," the BLM creates ambiguity by stating that the term "does not include … acidizing." The BLM should clarify its intent and the scope of the rule.

Second, if there are justifications for excluding particular practices from the rule, the BLM should exclude those particular practices, rather than adopt a blanket narrowing that excludes all practices other than hydraulic fracturing. Existing rules include several such exclusions, stating that "No prior approval or a subsequent report is required for well cleanout work, routine well maintenance, or bottom hole pressure surveys."[17] If the BLM agrees with commenters who argued that the "requirements in the proposed rule were too onerous for what they considered to be routine maintenance operations,"[18] the appropriate response is to exclude those particular practices, as is done under existing regulations, rather than to narrow the rule so as to exclude all well stimulation other than hydraulic fracturing. Although acid may be used in well maintenance activities, matrix acidizing and acid fracturing are not routine well maintenance – they are indeed forms of well stimulation.

ii. Acidizing as a workover activity and impacts

In the Environmental Assessment for the proposed rule, the BLM justifies omitting acidizing by stating that, "…acidizing is a procedure that is considered to be a workover activity on a well that does not result in the types of downhole impacts that have been attributed to hydraulic fracturing."[19] This sentence contains several

[15] *Id.* at ch. 3, § 45.
[16] *Id.* supra note 2 at 31645.
[17] 43 C.F.R. § 3162.3-2(c).
[18] *Id.* supra note 2 at 31645.
[19] "Environmental Assessment U.S. Department of the Interior Bureau of Land Management Proposed Hydraulic Fracturing Rule." Docket ID: BLM-2013-0002-0011. (May 24, 2013).

misconceptions. First, matrix acidizing and acid fracturing are forms of well stimulation. Well stimulation, including acidizing and hydraulic fracturing, may be performed at any time during the life of the well, whether as part of the initial completion, recompletion, restimulation, a workover program, or other activities. Second, acidizing can result in some of the same "downhole impacts" as hydraulic fracturing. Just like with hydraulic fracturing, the acid is injected into the well under pressure, whether for matrix acidizing or acid fracturing. In addition, the acids used in acidizing treatments are corrosive and present a risk to well integrity. Just like with hydraulic fracturing, mechanical integrity must be established and maintained before, during, and after acid stimulation. Finally, "downhole impacts" are not the only environmental and public health risks posed by acidizing. Like hydraulic fracturing, acid stimulation presents risks below ground and at the surface. The spent acid that returns to the surface after acidizing poses similar environmental risks as produced water and hydraulic fracturing flowback and must also be properly handled, transported, and disposed of. Like with hydraulic fracturing, the chemicals used in the stimulation fluid must be disclosed in order to properly manage the associated environmental and public health risks.

The BLM's stated reasoning for narrowing the applicability of the proposed rules is not sufficiently justified and is inconsistent with its existing regulations. All forms of well stimulation must be subject to common sense rules, including rules for chemical disclosure, mechanical integrity, and waste water handling. Such standards are necessary to reduce environmental and public health risks. One of the BLM's stated reasons for proposing these new rules is that it's current regulations are now 30 years out of date and do not reflect modern technology. In fact, the BLM's existing rules do not include any standards that apply to well stimulation of any kind. Failing to restore the more broad definition of well stimulation included in the 2012 proposed rule will mean that BLM rules will continue to be outdated and the BLM's regulations will continue to lag behind any new stimulation technology that is developed. As such, the BLM should restore applicability of these proposed rules to all forms of well stimulation.

III. Definition of Usable Water

Nothing is more important to public health or the environment than clean water. Therefore, we support the BLM's decision to remove the definition of "fresh water" and references thereto, and its critical clarification that all usable waters are protected.[20] We also generally support the BLM's proposal to broadly define usable water, and to thereby protect a wide range of water resources. The BLM should clarify, however, the relationship between the subparts of the proposed usable water definition and the scope of the exemptions thereto in order to ensure the highest level of protection for water sources.

Under the proposed definition, water is defined as "usable water," and therefore subject to protection under the proposed regulation, if it falls into any one of the following four categories:[21]

(1) Underground sources of drinking water as defined by the U.S. Environmental Protection Agency or by State law (for Federal lands) or tribal law (for Indian lands);
(2) Zones in use for supplying water for agricultural or industrial purposes, regardless of the concentration of total dissolved solids, unless the operator demonstrates that the existing agricultural or industrial user would not be adversely affected;
(3) Zones designated by a State (for Federal lands) or a tribe (for Indian lands) as requiring isolation or protection from oil and gas operations; and
(4) Zones containing up to 10,000 ppm of total dissolved solids that are not excluded by paragraphs (A), (B), or (C) of this definition. . . .

[20] Id. supra note 2 at 31646.
[21] Id. supra note 2 at 31674.

The most natural reading of the proposed definition is that a zone or water that falls into any one of these categories is a usable water, regardless of whether it would fall into an exception contained in another category. The BLM should clarify the proposed regulation to make this explicit.

This interpretation is necessary to give proper effect to subsections (1) and (3), because the BLM's regulations must, at an absolute minimum, be at least as protective as any standards set by federal, state, or tribal law, whether those standards are set under the Safe Drinking Water Act (SDWA) or more stringent protections of another law. Accordingly, a zone or water falling into subsection (1) or (3) must be recognized as a usable water, regardless of whether the operator "demonstrates that the existing agricultural or industrial user would not be adversely affected" by use of the water or that the zone falls into the exceptions to subsection 4 contained in paragraphs (4)(A), (4)(B), and (4)(C). The BLM cannot exempt zones that have been designated for protection under other law. The BLM should also clarify that under subsection (1), a zone is protected if it meets either the Environmental Protection Agency's (EPA) definition of an Underground Source of Drinking Water (USDW) or, as appropriate a more expansive definition under applicable state or tribal law. Any exemptions to subsections (1) and (3) would be unnecessary as well as unlawful, because these subsections implicitly include the exemptions already embodied in other law: if a zone meets the criteria for exemption under the SDWA, for example, then the zone will not be an "underground source of drinking water as defined by" any of the listed authorities, and the zone will already be outside the ambit of subsection (1).

The BLM should also clarify subsections (2) and (4), and, as above, explicitly confirm that the exceptions to subsection (2) do not apply to a zone otherwise meeting the criteria under subsection (4), and vice versa. Subsections (2) and (4) serve important and complimentary purposes. Section (4) effectuates the BLM's conclusion that, in addition to zones specifically designated as protected under other law, all waters with less than 10,000 part per million (ppm) of total dissolved solids (TDS) should be protected unless specifically designated as exempt.[22] Environmental commenters do not object to the exceptions contained in paragraphs (4)(B) and (4)(C), provided that the BLM clarifies that these exceptions do not apply to other subsections. For example, as explained above, a zone designated as an underground source of drinking water by the EPA, and thus satisfying subsection (1), cannot be removed from the ambit of the BLM's definition simply because a state or tribe has designated the water as exempt, as described by paragraph (4)(C). As to paragraph (4)(A), the BLM should clarify what type of authorization falls within the scope of this definition.

Subsection (2) serves an important independent function. Even if a zone is not designated as protected pursuant to subsections (1) and (3), and the water is outside the scope of subsection (4) (whether because it contains 10,000 ppm or more of total dissolved solids or because it falls into the exceptions contained in paragraphs (4)(A)-(C)), if that zone supplies water that is actually being used for agricultural or industrial purposes, the zone is self-evidently "usable." Such use should be protected from interference by oil or gas operations regardless of whether the supplying zone meets other definitions of usability. Importantly, subsection (2), as drafted, protects waters in actual use even when these waters contain more than 10,000 ppm TDS.[23] The exemption contained in subsection (2), however, is unworkably vague as proposed. The BLM proposes to exempt zones eligible for protection as a usable water *solely* because of existing use by agriculture or industry where such use "would not be adversely affected" by well stimulation, but the BLM has not articulated standards that an operator would need to meet to show that no

[22] Id. supra note 2 at 31647.

[23] The proposed regulation would, on its face, protect water over 10,000 ppm TDS when in actual agricultural or industrial use. We note that the preamble to the re-proposed rule repeatedly refers to protecting water "up to" 10,000 ppm TDS. 78 Fed. Reg. 31646-31647. Water containing less than 10,000 ppm TDS must be protected regardless of whether it is presently used for any purpose, and proposed subsections (1), (3), and (4) will generally protect such waters. BLM should clarify that subsection (2) does not contain a salinity limit. As explained above, if water is in actual use, it is usable, regardless of its salinity.

adverse effect would occur. Indeed, in light of the uncertainty inherent in well stimulation, it is unclear how such a showing could be possible. Accordingly, the BLM should remove this exemption from subsection (2).

IV. The "Type Well" Approach

A major change from the initially proposed rules is the BLM's new "type well" approach, which allows operators to submit a single APD or notice of intent sundry for a group of wells and to run a cement evaluation log (CEL) on only certain wells in a field. The BLM must abandon this approach, because it unreasonably eliminates important groundwater protections. In fulfilling its general duty to "prevent unnecessary or undue degradation" to public lands, the BLM must take "*any* action necessary to prevent unnecessary or undue degradation" to the public lands, including water resources.[24] Cement and casing failures are recognized as one of the most likely ways by which contaminants may reach groundwater. CELs are an important tool for reducing these failures. Yet the BLM anticipates that under this type well approach, initial CELs will be performed for less than 9% of new wells.[25] To justify this approach, the BLM assumes that if an operator adequately cements one well in a field, as demonstrated by a CEL, then the cement bond will also be adequate in other wells cemented using the same procedure. The BLM has fully acknowledged that there is uncertainty about the effectiveness of this approach and has not conducted any analysis to support this assumption. Furthermore, scientific principles and available evidence indicate that this is a poor assumption. Differences in geologic, environmental, and operational settings necessitate differences in well design and construction, and industry acknowledges that "every basin, play, *well and pay zone* may require a unique treatment."[26] Accordingly, the BLM cannot rationally conclude that a positive CEL for one well indicates that the same cementing process will achieve adequate cementing in other wells in the same field. The final rule must omit the type well approach.

a. Cement failure is a critical problem

The need to evaluate and confirm cement integrity is illustrated by widespread mechanical integrity failures in oil and gas wells. A study[27] published in 2009 examined records of more than 315,000 oil and gas production and injection wells drilled through 2004 in Alberta, Canada. The researchers collected information including but not limited to well configuration; production, stimulation, and abandonment methods; producing formation; and instances of surface casing vent flow (SCVF), gas migration (GM), casing failures, and non-routine abandonment. The researchers documented an occurrence rate of SCVF/GM of 4.6% for the entire province of Alberta, and 15.5% in their test area. Low cement top or exposed casing was the most important factor for the occurrence of SCVF/GM. Low cement top/poor cement quality were also key factors in external casing corrosion. Failure to isolate formations behind cement caused the vast majority of SCVF/GM and casing failures.

There are also many examples of well integrity failure in U.S. oil and gas operations, some with disastrous consequences. For example, 65 wells in the Pennsylvania Marcellus were cited for faulty casing and cementing during the first eight months of 2011. In August of that year alone Pennsylvania DEP inspectors found defective or inadequate casing or cement at 8 wells.[28] A 2012 study suggests a well integrity failure rate of seven percent in the Pennsylvania Marcellus: 111 well integrity failures in 2010 (of 1,609) and 142 well integrity failures in 2011 (of

---

[24] *See* 43 U.S.C. § 1732(b) (emphasis added).
[25] BLM, *Economic Analysis for Hydraulic Fracturing Rule*, BLM-2013-0002-0002, at 44.
[26] U.S. Shale Gas, White Paper, Halliburton, Page 2 (emphasis added), Available at: http://www.halliburton.com/public/solutions/contents/shale/related_docs/H063771.pdf.
[27] Watson, T., & Bachu, S. (2009). Evaluation of the Potential for Gas and CO2 Leakage along Wellbores. *SPE Drilling & Completion*, 24(1), 115-126.
[28] Legere, Laura. "DEP inspections show more shale well cement problems." *The Scranton Times Tribune* 18 September 2011: n.p. Web. 18 August 2013.

1,979).[29] Improper well construction and mechanical well failures and attendant gas migration have also resulted in catastrophic events as reported in a number of states, including Wyoming[30], Colorado[31], West Virginia[32], Ohio[33], Texas[34]. A survey of the Texas Railroad Commission's Blowouts and Well Control Problems database highlights the importance of well integrity; according to the Railroad Commission, since January 2011 there have been approximately a half-dozen blowouts during hydraulic fracturing resulting from mechanical integrity failures.[35] See our comments submitted in September 2012 for additional cases where improper well construction led to groundwater contamination.

b. The type well approach fails to address risk by ignoring fundamental geologic principles and sound engineering practice

The BLM defines a type well as "an oil and gas well that can be used as a model for well completion in a field where geologic characteristics are substantially similar within the same field, and where operations such as drilling, cementing, and hydraulic fracturing are likely to be successfully replicated using the same design."[36]

The type well approach is predicated on the incorrect assumption that the geology and mechanical properties of a rock sequence in even a small area will be homogeneous and therefore repetitive across adjacent wells; "type wells" treat rocks as a compositionally, texturally and mechanically homogeneous media. It is scientifically incorrect to assume that the geology and attendant wellbore geometry of a single well can reasonably serve as a proxy for multiple associated wells in a field.

Facies heterogeneity is a fundamental concept in geology. It is well-known that sedimentary depositional facies can change over very small distances and therefore the particular geologic sequence in one well will not generally be the same in a nearby adjacent well. Neither state-of-the-art modeling nor seismic imaging nor correlations can accurately predict a rock sequence in the subsurface to the level of detail needed to assess the "substantially similar" criteria proposed by the BLM. According to Walther's Law,[37] horizontal facies variability is reflected in the corresponding vertical sequence and translates to vertical heterogeneity.[38] Figure 1, Lower Minturn Formation, photographed by the commenters in August 2013 along Highway 24 near Minturn Colorado, illustrates how a sandstone (left) can abruptly interface with a shale (right) along a very sharp contact in a laterally continuous (unfaulted) horizontal sequence. This is hardly an uncommon relationship. Drilling two wells even only feet away

---

[29] Ingraffea, A. (2012) Fluid migration mechanisms due to faulty well-designed and/or construction: an overview of recent experiences in the Pennsylvania Mar Available at: http://catskillcitizens.org/learnmore/PSECementFailureCausesRateAnalysisIngraffea.pdf.

[30] Legere, Laura. "Wyoming County well malfunction causes spill, evacuation" *The Scranton Times Tribune* 15 March 2013: n.p. Web. 18 August 2013.

[31] Coffman, Keith. "Natural Gas Well Burst Kills One, Injures Three In Colorado" *Reuters* 15 August 2012: n.p. *The Huffington Post.* Web. 18 August 2013.

[32] Gutman, David. "Doddridge County gas fracking explosion injures at least 7" *The Charleston Gazette* 7 July 2013: n.p. *Sunday Gazette-Mail*. Web. 18 August 2013.

[33] OH DNR Letter to GWPC, May 27, 2009, available in appendix at: http://energyindepth.org/wp-content/uploads/2009/03/gwpc-06-04-09.pdf.

[34] Cavnar, Bob. "Major Failure: A Graphic Example of the Risks of Modern Well Completion" *This Small Planet* 27 March 2013: n.p. Web. 18 August 2013.

[35] Texas Railroad Commission Blowouts page: http://www.rrc.state.tx.us/data/drilling/blowouts/allblowouts11-15.php.

[36] Id. supra note 2 at 31636, 31674.

[37] Walther's law states that lithologies conformably overlying one another must have formed in adjacent depositional environments and that the vertical sequence can be translated to a horizontal depositional pattern. The significance of this is that in all depositional environments that can be very rapid changes in geologic sequences over short distances. Imagine for example, a meandering river sequence with interbedded sands and muds.

[38] Catuneanu, O. (2006). Principles of sequence stratigraphy. Access Online via Elsevier.

from each other through a sequence such as this may result in wells that penetrate rocks with very different geologic properties. It is likely not possible to predict such heterogeneity prior to drilling the well and collecting actual data, meaning that an operator would likely assume that the two wells envisioned in this example are "substantially similar," when in fact they are not. Another failing of the proposed type well approach is that the rules fail to define the term "substantially similar" or provide any criteria for how operators or regulators should interpret this phrase. While one might suggest the careful interpretation of mud logs and petrophysical logs as a way to determine geologic similarity, abrupt changes over several feet, such as in this photo, could go undetected.

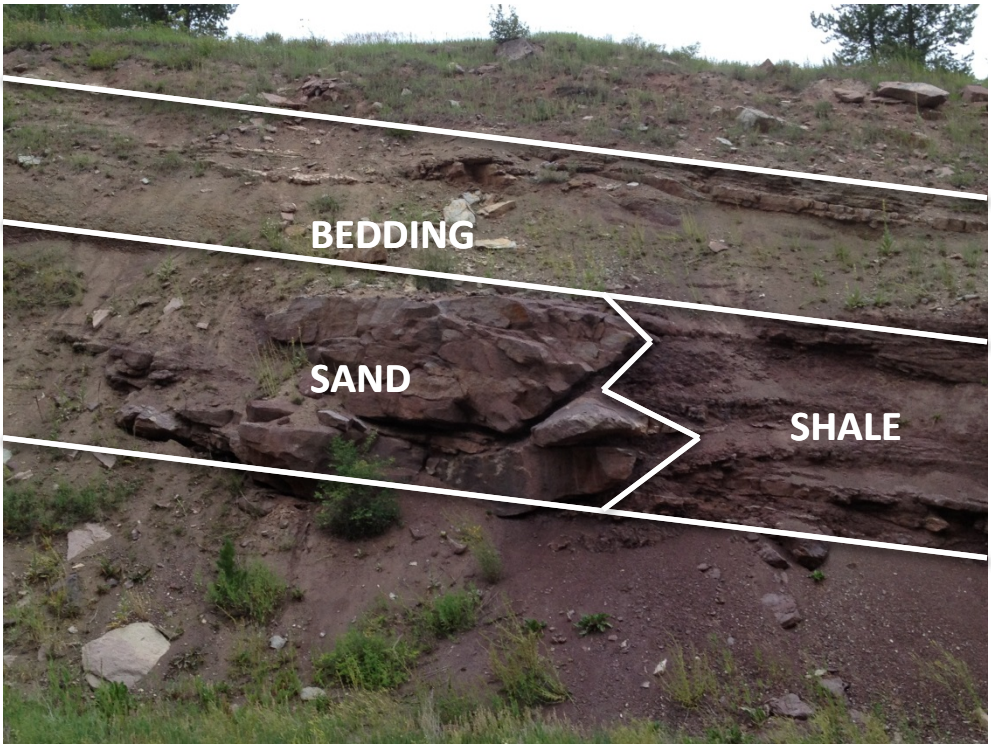

Figure 1. Lower Minturn Formation, photographed August 2013, Highway 24, Minturn, CO

Different rock types such as sandstone, shale, and carbonate have different rheological and mechanical properties and will therefore behave differently during drilling. Fracture and joint sets are not distributed homogeneously but occur in clusters known to geologists as "swarms." Faults can remove or add sections of rock over short distances resulting in an adjacent well missing a section of rock that the "type well" shows. Folding can result in reoriented or repeated sections such as is seen in the Rocky Mountain fold and thrust belt. Tilting will result in formations being at differing depths in adjacent wells. And missing sections could also result from the presence of unconformities. In sum, the geology across wells will rarely be perfectly correlated, except in the most homogeneous flat-lying rock sequences. The resulting geologic heterogeneity will impact borehole geometry and, as a result, casing and cement design and placement. Therefore, the "geologic characteristics" of the rocks in one drilled well will not necessarily be similar to the "geologic characteristics" in an adjacent well, and the similarities or differences will be difficult to judge prior to actually drilling the well and collecting data.

The nuances of local geology affect the quality of the wellbore, or hole, and this in turn affects many aspects of

cementing operations.[39] Hole quality will vary from well-to-well in part because geologic sequences are not homogeneous laterally and, thus, the mineralogy, petrology, stratigraphy, structure, and rock properties in one well will be different from those properties in an adjacent well. Rock layers are complex and heterolithic—they horizontally pinch and inter-finger, resulting from the processes by which they were formed.

The above evidence demonstrates that field-wide conditions will not frequently, if ever, be so similar as to support the assumption that CELs on every well in a field are superfluous.

c. BLM has not analyzed the likelihood of "successfully replicat[ing]" operations even where geology is similar

The second unsupported assumption underlying the type well approach is the assumption that, where geology is in fact similar, replication of the drilling and cementing process used in a single well that achieved a good cement bond is sufficiently likely to result in the same cement integrity in a different well. To support this assumption, the BLM would need to perform a statistical analysis. This would require gathering data on the listed operations from a statistically significant sample of wells with the same design, and then analyzing the similarities and differences in operational parameters. The BLM has not conducted such an analysis. The proposed rules simply assume that wells with the same design will perform similarly. The BLM has no basis for this assumption, as the characteristics of a single well are not predictive of the characteristics of multiple other wells.

Indeed, the BLM itself questions the effectiveness of the type well approach, noting: "There is uncertainty about the effectiveness of the type well concept, and how reliably the CEL results on casing strings of a type well assure adequate cementing for subsequent wells in the same geologic area."[40] Given the great pressures and fluid volumes utilized in injecting hydraulic fracturing fluids, superior well construction must be demonstrated for every well, not presumed by proxy as BLM's proposed "type well" approach will allow.

d. Requiring CELs when there is evidence of cementing problems is not an adequate substitute for requiring CELs for all wells

In lieu of requiring a CEL for every well, the proposed regulation would require a CEL for wells where there is evidence of inadequate cementing, for which there are minimal objective criteria in the rule: lost returns, cement channeling, gas cut mud, or failure of equipment.[41] Though pressure tests required by the BLM rule are essential, for geological reasons described in detail above, only proper well design and construction can ensure that mechanical integrity is achieved in the first place. And while Onshore Order No. 2 requires remedial cementing if cement is not circulated back to the surface, voids, channels, or other cement bond problems can occur even when cement is circulated to surface. Therefore CELs should be performed for all strings of cemented casing that isolate protected water, potential flow zones, or through which stimulation will be performed.

Confirmation of mechanical integrity in a properly cased well requires that, among other things, drillers ensure full displacement of the drilling mud prior to cementing, correctly-installed casing, and a tight cement job. An important tool in evaluating mechanical integrity is cement evaluation logging. The BLM's "type well" approach falls well short of best engineering practices by allowing operators to demonstrate cement integrity in one representative well, rather than to prove up the cement bond in each and every well. This approach rests on unwarranted assumptions regarding geological similarity from well-site to well-site and consistency of cementing operations. Cement bond needs to be evaluated for every well and BLM should not finalize any kind of "type wells" approach to this issue.

[39] API (2010). Isolating potential flow zones during well construction, page 18. Available at: http://www.shalegas.energy.gov/resources/65-2_e2.pdf.
[40] *Id*. supra note 2 at 31664.
[41] *Id*. supra note 2 at 31676.

V. Information Submitted with the Application for Permit to Drill (APD) or Notice of Intent Sundry

a. Submission of "type well" information

We object to the provision in the rules that would allow operators to submit an APD or a sundry notice for "a group of wells within the same geologic formation." Under this proposed rule, BLM regulators would be making decisions to issue permits without critical information about drilling and fracturing operations, and therefore without a complete understanding of the environmental and public health risks. Under current regulations, all information that must be submitted with a permit application must be unique to the well for which a permit is being sought. This same standard should be applied to all well stimulation operations governed by any new rules. The BLM should restore the requirements in the initial proposed rules that required unique information to be submitted for each well.

See Section IV for a complete discussion of concerns about the type well approach.

b. Information that must be submitted

We support the following revisions from the initial proposed draft:

- 43 CFR § 3162.3–3(d)(2): Requirement to estimate the depth of usable water from a drill log
- 43 CFR § 3162.3–3(d)(3): Inclusion of reused and recycled water among the potential sources of water for well stimulation
- 43 CFR § 3162.3–3(d)(4)(iv): Inclusion of fracture direction in the proposed hydraulic fracturing design plan, and requirement to plot anticipated fracture characteristics on the well schematic and on a map
- 43 CFR § 3162.3–3(d)(4)(v): Requirement to report the estimated vertical distance between the fracture zone and usable water

We recommend the following additions and clarifying revisions to the requirements in proposed 43 C.F.R. 3162.3-3(d): (*In these suggested revisions, additions to proposed regulations are indicated by underlined text while deletions are indicated by text with strikethrough*.)

(1) The geological names, a geological description, and the proposed measured and true vertical depth of the top and the bottom of the formation into which well stimulation ~~hydraulic fracturing~~ fluids are to be injected and of an independent confining zone; [42]

(2) The measured or estimated depths (both top and bottom), reported as both measured depth and true vertical depth, of all occurrences of usable water by use of a drill log from the subject well or another well in the vicinity and within the same field;

(3) The proposed measured and true vertical depth of perforations or the open-hole interval,

(4) Estimated pump pressures,

(5) A water use plan, including:

> (i) The proposed source(s), location(s), volume by location, and timing of withdrawal of the water to be used in the stimulation fluid or, if the base fluid is other than water, the proposed volume and trade name of the base fluid;
>
> (ii) Planned cumulative water use over the life of the well;

[42] The following definition should be added to the proposed rules: "Confining zone" means a geological formation, group of formations, or part of a formation above a zone that will be hydraulically fractured that has sufficient areal extent and permeability to prevent the movement of injected or displaced fluids to protected water, is free of transmissive faults or fractures that could allow the movement of injected or displaced fluids to protected water, and with sufficient thickness and geomechanical properties to prevent or arrest the vertical propagation of fractures.

(iii) information concerning the source and location of water supply, such as reused or recycled water, or rivers, creeks, springs, lakes, ponds, and wells, ~~which may be~~ shown by quarter-quarter section on a map or plat, ~~or~~ and which may also be described in writing;

(iv) ~~It must also identify~~ The anticipated access route, transport distances, and transportation method for all water planned for use in stimulating ~~fracturing~~ the well, and methods to minimize related impacts including but not limited to land disturbance, traffic, vehicle accidents, and air pollution;

(v) Anticipated on-site storage methods;

(vi) A description of methods the operator will use to maximize the use of non-potable water sources, including reuse and recycling of wastewater;

(vii) An evaluation of potential adverse impacts to aquatic species and habitat, surface water, groundwater, and wetlands, including the potential for the introduction of invasive species, and methods to minimize those impacts;

(6) A certification signed by the operator that the proposed treatment fluid complies with all applicable permitting and notice requirements as well as all applicable Federal, tribal, state, and local laws, rules, and regulations;

(7) A plan for the proposed stimulation ~~hydraulic fracturing~~ design that includes, but is not limited to, the following:

(i) The estimated total volume of fluid to be used;

(ii) The anticipated surface treating pressure range;

(iii) The maximum injection treating pressure;

(iv) The estimated or calculated fracture direction, length, and height, including the estimated fracture propagation plotted on the well schematics and on a map. The map must be of a scale no smaller than 1:24,000; ~~and~~

(v) The estimated vertical distance to the nearest usable water aquifer above the fracture zone;

(vi) The operating procedure; and

(vii) The estimated or calculated fracture gradient of the producing and confining zone(s)

(8) A report (table) that discloses all anticipated additives of the stimulation fluid, by additive trade name, vendor, and purpose (such as, but not limited to, acid, biocide, breaker, brine, corrosion inhibitor, crosslinker, demulsifier, friction reducer, gel, iron control, oxygen scavenger, pH adjusting agent, proppant, scale inhibitor, or surfactant);

(9) A report (table) that discloses the complete chemical makeup of all materials anticipated to be used in the stimulation fluid without regard to original source additive. For each chemical, the operator must provide the Chemical Abstracts Service Registry Number as well as the percentage by mass. The percent mass value is the mass value for each component (Mc) divided by the value of the entire fluid mass (Mt) times 100. (Mc/Mt)*100 = percent value. The percent mass values should be for the entire stimulation operation, not for the individual stages.

(10) The following information concerning the handling of recovered fluids:

(i) The estimated volume of fluid to be recovered during flow back, swabbing, and recovery from production facility vessels;

(ii) The proposed methods of handling the recovered fluids, including, but not limited to, anticipated chemical composition of the fluid[43] (based on offset wells), tanks, pit requirements, pipeline requirements, truck transport, or holding pond use, ~~re-use for other stimulation activities, or injection~~; and

(iii) The proposed disposal method and location of the recovered fluids, including, but not limited to, injection, recycling and reuse (including the purpose for which it is re-used), or discharge. ~~hauling by truck, or transporting by pipeline; and~~

(11) Certification by the operator that notice of proposed well stimulation will be provided to public water systems within ½ mile of any part of the wellbore, the owner of the surface estate, if applicable, adjacent landowners, other landowners whose land lies within ½ mile of any part of the wellbore, and non-owning residents of any of the aforementioned lands, at least 30 days and not more than 90 days prior to commencement of well stimulation. Such notification shall include a form letter or brochure prepared by the BLM that includes basic information regarding available information.

(12) The authorized officer may request additional information prior to the approval of the Notice of Intent Sundry.

See also Section XII.a. of these comments.

See also our comments submitted in September 2012 for other recommended additions to the APD or Notice of Intent Sundry and an explanation of proposed changes.

VI. Monitoring of Cementing Operations and Cement Evaluation Log Prior to Hydraulic Fracturing

a. New cement monitoring provisions at 43 CFR § 3162.3–3(e)(1)

We support the BLM's proposed requirements for parameters that must be monitored and recorded during cementing. These requirements are important to ensure that the cementing operation conforms to the design parameters. However, the required cement operation monitoring report prepared using this data should be submitted to the authorized officer prior to well stimulation rather than within 30 days after completion of the hydraulic fracturing operations. This information is necessary to help BLM regulators determine if the casing was cemented properly, so that any additional analysis or remedial operations that may be necessary to protect groundwater can be identified and implemented *prior* to stimulation.

b. Requirement to run cement evaluation logs at 43 CFR § 3162.3–3(e)(2)

We support the BLM's revision to require the use of cement evaluation logs, rather than cement bond logs, on each casing that protects usable water. However, we object to the inclusion of the following tools as acceptable methods of verifying the integrity of annular cement bonding:

[43] The BLM's original proposal required disclosure of estimated flowback fluid composition. The BLM's proffered justification for omitting this requirement from the re-proposed rule is flawed. 78 Fed. Reg. at 31649. As we explain elsewhere, the BLM should require full disclosure of all stimulation fluid constituents before approving well stimulation and require operators to seek new approval before deviating from approved stimulation plans. Accordingly, the BLM should not be concerned that disclosure of anticipated flowback composition will reveal stimulation fluid composition or be rendered unreliable because of post-approval changes in stimulation fluid composition. Nor should the BLM be concerned that estimates of flowback fluid composition will be imperfect because of uncertainty regarding the chemistry of the stimulated geologic zone. The composition of recovered fluid from offset wells can be used to help estimate fluid composition in the will for which a permit is being sought. Finally, the BLM argues that knowledge of flowback composition is not important for BLM's goals of ensuring "an adequate plan to manage and contain the recovered fluids." Id. This reasoning is not supported because the BLM must also ensure that a plan is in place to adequately dispose of recovered fluids, and disposal options necessarily depend on fluid composition.

1. Cement bond logs. Traditional bond logs cannot detect the fine scale channeling which may allow fluids to slowly migrate over years or decades and therefore the use of more advanced cement evaluation tools is crucial. Cement integrity and location must be verified using advanced cement evaluation tools only.
2. Micro-seismograms. It is unclear to which technology the BLM is referring. In current usage, the term microseismic typically refers to a technology used to monitor and map hydraulic fracturing operations, which is not a standard tool for evaluating cement integrity. Alternatively, if by micro-seismogram[44] the BLM is referring to an acoustic log displayed as variable density, then it is using outdated terminology. In either case, this term should be dropped from the list of acceptable methods.

Additionally, cement evaluation logs should be submitted to the authorized officer prior to hydraulic fracturing rather than within 30 days after completion of the hydraulic fracturing operations. As with the cement monitoring provisions, the goal of running cement evaluation tools is to ensure that usable water is protected *before* stimulation operations begin. If drinking water isn't properly isolated, the well needs to be fixed before stimulation. However, under the proposed rules, BLM regulators may not know if there's a problem until after stimulation has happened – or they may not know at all, if the results submitted are for a different well. Only by requiring in the rule that operators demonstrate cement integrity for every well prior to injection will all operators be impelled to use best practices that will protect sources of water before permanent harm can be done.

c. Exemption from cement evaluation log requirements at 43 CFR § 3162.3–3(e)(3)

We object to the BLM's decision to exempt certain wells from the cement evaluation log requirements. The BLM's logic for exempting these wells, by allowing the use of the cement evaluation results from a "type well" as a proxy, is flawed. The results of cement evaluation tools from a single well provide no information about the cement integrity of a completely different well.

Furthermore, the proposed rules do not provide sufficient clarity as to how these provisions would be implemented. How will the BLM ensure that its regulators have sufficient information to determine if the exempt well has the "same specifications and geologic characteristics as the type well?" The rules do not include any robust, objective standards that could be used to evaluate the similarity or dissimilarity of the characteristics of the exempt well to the type well.

This concept does not have scientific or technical merit and the BLM must abandon this provision. If finalized, this rule would set a dangerous precedent. The BLM's adoption of this provision could encourage other states to create rules that rely on the same flawed logic.

See Section IV for a complete discussion of concerns about the type well approach.

d. Requirements in the event of an inadequate cement job at 43 CFR § 3162.3–3(e)(4)

We support the intent of the BLM's proposal that any indications of an inadequate cement job must be reported to the regulator and that a cement evaluation tool (CET) must be run to show that the problem has been corrected, but the proposed rule does not sufficiently reduce the risks to groundwater. The proposed timing of running the CET is problematic. The proposed rule states that the CET should be run "[p]rior to commencing hydraulic fracturing…" This wide timeframe would allow the CET to be run – and the problem to be remedied – any time between discovering the problem and hydraulically fracturing the well, which could equate to a period of days to months. Any problems with the cement should be remedied prior to drilling the next section of the well, and logs should be run in this same timeframe. After additional casing is installed, it is more difficult to access the surface casing because it will then be behind one or more additional layers of casing and possibly cement. Therefore any remedial work should be performed and documented to be successful before the next string of casing is installed in the well.

[44] The term Micro-Seismogram® also refers to acoustic log technology trademarked by Halliburton in the 1960s.

Also, CETs cannot evaluate the cement bond through multiple layers of casing and cement. Therefore the CET should also be run before the next string of casing is installed in the well.

e. Recommended additions to proposed language at 43 CFR § 3162.3–3(e)

In addition to the proposed rules, we recommend the following requirements:

Operators should be required to run cement evaluation logs to verify placement and integrity of cement behind any string of casing through which stimulation operations will be performed (i.e. intermediate or production casing) and to submit the results of such logs to the BLM. If stimulation operations occur through casing with improper or insufficient cement, a loss of mechanical integrity can occur, which may allow stimulation fluids, formation fluids, or hydrocarbons to migrate into protected water.

For any casing strings used to isolate potential flow zones[45] (and where cement evaluation tools are not otherwise required to be run) if cement operation parameters such as fluid return volumes, displacement volumes, etc. indicate inadequate cement coverage, a cement evaluation tool must be run and the results submitted to the BLM.

If cement evaluation logs indicate inadequate cement coverage, remedial action must be performed prior to continuing operations and documentation of successful results submitted to the BLM. If the problem cannot be remediated, the well must be plugged and abandoned.

VII. Mechanical Integrity Testing Prior to Hydraulic Fracturing

Mechanical integrity testing prior to well stimulation is critically important and we support the intent of the proposed requirements but they are inadequate and do not go far enough to reduce the risks to groundwater. The proposed regulations do not include any steps that must be taken if the mechanical integrity test is not successful. In addition to the regulations proposed, BLM should include the following additional requirements:

§ 3162.3–3(f)(4) If the requirement at (f)(3) is not met, the operator must:

(i) Orally notify the authorized officer as soon as practicable but no later than 24 hours following the failed test, and;
(ii) Perform remedial work to restore mechanical integrity.

Stimulation operations may not begin until a successful mechanical integrity test is performed and the results are submitted to the BLM. If mechanical integrity cannot be restored, the well must be plugged and abandoned.

In the preamble to the rule, the BLM stated that it "does not believe that a requirement to notify the BLM of a failed MIT is necessary…" because, "if the MIT failed and the operator proceeded with hydraulic fracturing operations, the operator would be in violation of the rule and would be subject to enforcement actions."[46] This reasoning is not sufficiently protective of the environment and public health. If an operator hydraulically fractured a well that lacked mechanical integrity, then groundwater contamination, catastrophic well failure, or other environmental and public health impacts may occur. The BLM rules should be written to prevent such impacts rather than issuing violations after the fact.

VIII. Monitoring and Recording During Hydraulic Fracturing

[45] Defined in API Standard 65-Part 2 as, "Any zone in a well where flow is possible when wellbore pressure is less than pore pressure."
[46] *Id*. supra note 2 at 31654.

We support the BLM's proposal to adopt requirements for monitoring and recording during hydraulic fracturing but, as proposed, they are inadequate and require the following revisions and additions:

a. Recommended revisions to proposed language at 43 CFR § 3162.3–3(g)(1)

During any well stimulation ~~hydraulic fracturing~~ or re-stimulation ~~refracturing~~ operation, the operator must continuously monitor and record the pressures in each well annuli ~~annulus pressure at the bradenhead. The pressure in the annulus between any intermediate casings and the production casing must also be continuously monitored and recorded.~~ The operator must also continuously monitor and record surface injection pressure, slurry rate, proppant concentration, fluid rate, and sand or proppant rate. A continuous record of all monitored parameters ~~the annulus pressure~~ during the well stimulation ~~fracturing operation~~ must be submitted with the required Subsequent Report Sundry Notice (Form 3160–5, Sundry Notices and Reports on Wells) identified in paragraph (i) of this section.

These recommendations are consistent with API Guidance Document HF1, Hydraulic Fracturing Operations – Well Construction and Integrity Guidelines. The BLM should not be issuing any regulations that are weaker than the industry's own guidelines.

b. Recommended revisions to proposed language at 43 CFR § 3162.3–3(g)(2)

If during any stimulation ~~hydraulic fracturing~~ or re-stimulation ~~refracturing~~ operation the annulus pressure: (i) increases by more than 500 pounds per square inch as compared to the pressure immediately preceding the stimulation, or (ii) exceeds 80% of the API rated minimum internal yield on any casing string in communication with the stimulation treatment the operator must take immediate corrective action and must orally notify the authorized officer immediately ~~as soon as practicable, but no later than 24 hours~~ following the incident. Within one week~~30 days~~ after the stimulation ~~hydraulic fracturing~~ operations are completed, the operator must submit a report containing all details pertaining to the incident, including corrective actions taken, as part of a Subsequent Report Sundry Notice (Form 3160–5, Sundry Notices and Reports on Wells).

c. Recommended additions to proposed language at 43 CFR § 3162.3–3(g)

We support the intent of BLM's proposed requirements for taking immediate corrective action and reporting pressure increases during well stimulation. However, the proposed regulations are inadequate and should include more details about the evaluation and corrective actions that may be required. In addition to the regulations proposed, BLM should include the following requirements:

(3) If at any point during the stimulation operation the monitored parameters indicate a loss or potential loss of mechanical integrity, if injection pressure exceeds the fracture pressure of the confining zone(s), or if there are any indications that injected fluids or displaced formation fluids have contacted a transmissive fault or fracture or improperly constructed or plugged well, or if communication occurs with an offset well[47], the operation must immediately cease. If any of the preceding occurs, the operator must notify the regulator within 24 hours and must take all necessary steps to determine the presence or absence of a leak or migration pathways to USDWs. Prior to any further operations, mechanical integrity must be restored and demonstrated to the satisfaction of the regulator and the operator must demonstrate that the ability of the confining zone(s) to prevent the movement of fluids to USDWs has not been compromised. If a loss of mechanical integrity is discovered, if the integrity of the confining zone has been compromised, or if fluids have reached a transmissive fault or improperly constructed or plugged well operators must take all necessary steps to evaluate whether injected fluids or formation fluids may have contaminated or have the potential to contaminate any unauthorized zones. If such an assessment indicates that

[47] For additional information on managing subsurface integrity associated with hydraulic fracturing subsurface operations, in particular managing the risks of communication between offset wells during well stimulation, see Alberta Energy Board. (2013 May). Directive 083: Hydraulic Fracturing – Subsurface Integrity. 15p. available at http://www.aer.ca/documents/directives/Directive083.pdf.

fluids may have been released, or pose any risk of release into a USDW or any unauthorized zone, operators must notify the oil and gas and environmental regulators and FLM immediately, take all necessary steps to characterize the nature and extent of the release, and comply with and implement a remediation plan approved by the regulator. If such contamination occurs in a USDW that serves as a water supply, a notification must be placed in a newspaper available to the potentially affected population and on a publically accessible website and all known users of the water supply must be individually notified immediately by mail and by phone.

IX. Storage of Recovered Fluids

We continue to believe that storing flowback in open pits, whether lined or unlined, should be prohibited. As stated in our comments submitted in September 2012, pits have been identified as one of the most common sources of environmental pollution from oil and gas operations and are potential sources of water contamination and air pollution, and present significant risks to wildlife.

a. Distinguishing flowback water from produced water

The BLM requested comment on how to distinguish flowback water from produced water. For the purposes of reducing the risks associated with handling flowback, an appropriate distinction is that flowback is the fluid produced from the well subsequent to well stimulation but prior to connecting the well to sales lines and/or storage equipment; produced water is the fluid produced from the well subsequent to connecting the well to sales lines and/or storage equipment. This flowback period as defined above is the period during which the recovered fluids may be directed to an open pit, in order to sufficiently "clean up" the well so that it may be connected to sales equipment.

The EPA's Oil and Natural Gas Sector New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews rules state that, "The flowback period begins when material introduced into the well during the treatment returns to the surface immediately following hydraulic fracturing or refracturing. The flowback period ends with either well shut in or when the well is producing continuously to the flow line or to a storage vessel for collection, whichever occurs first."[48]

b. Environmental and economic costs and benefits

While we are not aware of any public data that quantifies the differences in cost, if any, between using tanks rather than pits to handle flowback, there are considerable data regarding the cost benefits of using tanks for produced water. NRDC's September 2010 petition to the Environmental Protection Agency (EPA) regarding the regulation of oil and gas wastes under the Resource Conservation and Recovery Act documents that alternative waste management technologies and practices are available and that the use of these safer practices has been proven to result in significant cost savings. Studies and federal and state agencies have found that the use of more environmentally sound disposal practices actually saves oil and gas companies money.[49] In addition, see our comments submitted in September 2012 on the environmental benefits of containing flowback in closed tanks rather than open pits.

The BLM should prohibit flowback storage in open-air pits and ensure the most stringent requirements for management of this waste whether it is stored on wellpads or in centralized locations or tank farms, and whether it is transported by pipe or by truck across federal lands. Any new rule for well stimulation should include strong protections for transporting and storing waste under federal leases, including an inspection regime for all stages of

[48] 40 C.F.R. § 60.5430.

[49] Natural Resources Defense Council, Petition for Rulemaking Pursuant to Section 6974(a) of the Resource Conservation and Recovery Act Concerning the Regulation of Wastes Associated with the Exploration, Development, or Production of Crude Oil or Natural Gas or Geothermal Energy. September 8, 2010. For details on documented cost savings, see pages 32-34.

the process, spill containment including secondary lined barriers around all tanks, tracking all truck volumes to ensure no leaks or spills go undetected, and air emissions protections. This may entail different rules for waste storage depending on volume.

X. Chemical Disclosure

The public must be informed of all chemicals used in well stimulation. BLM's proposed rules requiring disclosure to the public of information on the chemicals used in hydraulic fracturing treatments are an improvement over current requirements. However, the proposed rule contains significant gaps that BLM can and should close to ensure that the public will receive complete information about well stimulation events.

Well stimulation disclosure rules serve a number of vital purposes. Knowledge of the chemicals used in well stimulation helps those who might be exposed to the chemicals to determine what chemicals they may have been exposed to, who is at fault for any exposure, and the appropriate response. Nearby residents benefit from disclosure because it enables them to conduct appropriate baseline testing and is a basis for future monitoring of water quality. Local governments need to know the chemicals used to ensure that emergency responders have the training, personal protective equipment, and plans needed to respond to accidents, and that they are adequately protected from chemicals and not unwittingly exposed. Medical professionals need to know the chemicals used when diagnosing and treating exposure to the chemicals, and to study the public health effects of well stimulation. Disclosure of chemicals used facilitates a more thorough environmental review of the risks and consequences of well stimulation, and will likely incentivize drillers to use safer chemicals.

Because existing state and federal law does not provide for full and adequate disclosure, BLM rulemaking on this issue is necessary. BLM must require disclosure of chemicals, compounds, and amounts used in all well stimulation, not just hydraulic fracturing. Chemicals must be disclosed both before and after well stimulation. Public disclosure must be comprehensive, requiring identification by Chemical Abstract Service number of all constituents, without exemptions for purported trade secrets (or, at a minimum, such exemptions must be carefully cabined). And disclosure must be made in a manner that will ensure full public access to the information —which will not occur under the existing FracFocus database and without any requirement for affirmative notification. We explain each of these issues in greater detail below.

a. A BLM disclosure rule is necessary

Several states have adopted disclosure rules, and federal law requires disclosure of some information in specific circumstances, but the existing patchwork of disclosure laws apply only to a small subset of BLM lands, and no existing law requires the comprehensive disclosures the public needs. Accordingly, BLM must reject suggestions that a BLM disclosure rule is unnecessary.

i. State disclosure rules are absent and incomplete

Other commenters on the proposed rules have argued that the BLM public disclosure requirements are unnecessary because many states have disclosure requirements related to hydraulic fracturing. Closer analysis however, demonstrates the necessity for the BLM to promulgate minimum federal requirements for public disclosure of well stimulation on public and Indian lands. Every existing state disclosure requirement is incomplete, and many states have no disclosure requirements whatsoever. BLM must require disclosure to fill this gap.

Hydraulic fracturing is occurring in at least thirty-one states across the country. Each of these states contains federal mineral estate. At least twelve of these states have no fracturing disclosure requirements whatsoever. This fact alone justifies a decision by the BLM to institute its own public disclosure requirements. Even among the states that have some chemical disclosure requirements, no state requires the full set of necessary disclosures we outline below. The currently proposed BLM rule is a step in the right direction, as the proposal would fill some of the gaps in the

patchwork of existing state rules.[50] Although the proposed rule would therefore be an improvement over the status quo, a more comprehensive rule is required.

ii. EPCRA Is not a substitute for a BLM disclosure rule

Some commenters argue that the Emergency Planning and Community Right-to-Know Act (EPCRA) obviates the need for a BLM disclosure rule, at least insofar as medical professionals and emergency responders are concerned.[51] BLM must reject this suggestion, because EPCRA does not provide the information necessary to adequately respond to emergencies or to diagnose and treat patients in the well stimulation context.

First, because EPCRA's chemical storage and reporting requirements rest on the Occupational Safety and Health Act's Material Data Safety Sheets (MSDSs), these requirements do not encompass all potentially harmful chemicals used in well stimulation. EPCRA requires facilities to maintain Material Safety Data Sheets (MSDSs) for chemicals stored on-site and to submit copies to state and local emergency planning committees and the local fire department.[52] Additionally, each facility must prepare an annual inventory, estimating the maximum amounts of each chemical with an MSDS that is stored on-site in the past year and the average daily amounts. But it is likely that many chemicals used in well stimulation will not have an MSDS, falling outside the scope of these requirements.

MSDSs are required only for those chemicals deemed "hazardous chemicals" under OSHA regulations.[53] Yet OSHA does not classify all dangerous chemicals as hazardous. OSHA requires that chemicals be identified as hazardous only if studies have shown that they are dangerous in a workplace setting. But many chemicals used in the hydraulic fracturing process have not been adequately studied. If chemicals have not been studied, they are not identified as hazardous. Even where chemicals are studied, the focus of studies under OSHA is generally acute exposure and exposure pathways likely to occur in a workplace context. Thus, a chemical may present a hazard for long term exposure or through exposure pathways that are not generally studied in the workplace context (as with contamination of drinking water sources, for example) but not be classified as hazardous under OSHA. Even for those chemicals for which an MSDS is required, OSHA does not ensure that the information provided is complete or accurate. While the regulations provide some guidelines concerning the contents of an MSDS, the rules do not require manufacturers to list all ingredients in a product or the amounts of hazardous chemicals in the product. Furthermore, companies can unilaterally withhold information from MSDSs as a trade secret.[54]

Reviews of Material Safety Data Sheets clearly demonstrate that these concerns are real and widespread. Ingredients are often only identified by their general function (e.g. "biocide") without actually identifying the specific chemicals in the product. Certain chemical ingredients are also frequently listed simply as "proprietary." An analysis of MSDSs used in the oil and gas context found that of 944 products for which an MSDS was prepared,

[50] Each piece of information BLM proposes to require is required by at least one state. Thus, every aspect of BLM's proposal has been demonstrated in practice. Many of the additions environmental commenters recommend have also been demonstrated to be feasible by the states.
[51] *See* Pub. L. 99-499, codified at 42 U.S.C. §§ 11001-11050. For more information on the requirements of EPCRA, see Linda-Jo Schierow, Cong. Research Serv., RL 32683, *The Emergency Planning and Community Right-to-Know Act (EPCRA): A Summary* (2012).
[52] Facilities storing certain quantities of chemicals deemed "extremely hazardous" by EPA must also report to local emergency planning committees that they are storing such chemicals and work with the local emergency planning committee to develop a response plan in case of emergency. *See* 42 U.S.C. § 11002(a)(2). This analysis focuses on the MSDS requirements, however, because the set of chemicals covered by the MSDS provisions is much broader.
[53] *See* 29 C.F.R. §§ 1910.1200 & 1910.1200 App. A.
[54] See part XXXX, below, for discussion of trade secrets.

43% reported less than 1% of the total composition.[55] Only 14% of the MSDSs reviewed provided information on the complete contents of the product.[56]

EPCRA's Toxic Release Inventory (TRI) is also an inadequate disclosure solution. Only certain classes of facilities, must report releases to the TRI, and reporting is only required for listed chemicals.[57] Oil and gas extraction facilities are not required to report releases to the TRI.[58] In certain emergency situations, EPCRA also requires reporting of the release of chemicals deemed "extremely hazardous" by EPA or that are hazardous chemicals covered by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). However, this notification is only required if the amount released is above certain reporting thresholds and need not be provided where the release results in exposure to persons solely within the site on which the facility is located.[59]

b. Chemical disclosure is necessary for all well stimulation events

As discussed in section II above, BLM should apply the proposed rules to all well stimulation treatments. Because other well stimulation techniques, like acidizing, pose similar risks to hydraulic fracturing, there is no clear justification for exempting these processes from the rules. Protection of public health also requires information on all chemicals used in well stimulation events. Well stimulation fluids of all kinds are injected near groundwater supplies and some acidizing treatments are performed at high enough pressure to fracture the rock. The chemicals used in all well stimulation events must be transported to the well site and stored there. Flowback containing the chemicals must be stored at the well site, transported off site, and disposed of. Each of these processes poses risks of accidental spills or release into the environment. And there is increasing evidence that high-volume acidizing may become a commonly used technique to increase the permeability of formations like the Monterey Shale. There is little to no justification for treating these well stimulation techniques differently and failing to provide the public with information on the chemicals to be used.

c. When disclosure occurs: BLM must require full disclosure both before and after well stimulation in order to provide BLM, emergency professionals, residents, and the public with information on well stimulation chemicals

BLM's proposed rule requires an important set of information to be disclosed prior to well stimulation. The proposed requirements, however, fail to require disclosure of the chemicals intended to be used prior to stimulation. In order to achieve BLM's goals of protecting public health and the environment, prior disclosure of chemicals is crucial to the purposes of a disclosure rule. BLM must revise its rule to require prior disclosure of chemical information. BLM must further ensure that prior disclosures are not only available, but are actually received by nearby residents and other key parties, by adding a requirement for affirmative notification.

Prior disclosure of chemical information serves several crucial purposes, enabling review of stimulation's potential impacts, establishment of clear baselines, and development of emergency response plans. BLM and other relevant federal agencies, such as the U.S. Forest Service, cannot evaluate the risks that a particular stimulation treatment poses to the lands and resources these agencies manage without knowing the anticipated chemicals and their concentrations. For example, many hydraulic fracturing chemicals are toxic.[60] Some, like formaldehyde, are known

[55] *See* Theo Colborn et al., *Natural Gas Operations from a Public Health Perspective*, 17 Hum. & Ecological Risk Assessment: An Int'l J. 1039, 1040, 1045.
[56] *Id.*
[57] *See* 42 U.S.C. § 11023(b)(1)(A) (applying the requirement to report to the TRI to facilities covered by Standard Industrial Classification [SIC] codes 20-39).
[58] Oil and gas extraction facilities are classified under SIC code 19. *See* http://www.naics.com/free-code-search/sictwodigit.html?minsic=10&maxsic=14. EPA is given authority under EPCRA to add or remove SIC codes for which reporting is required, but has not done so for oil and gas extraction facilities.
[59] *See* 42 U.S.C. § 11004(a)(4).
[60] *See* Theo Colborn et al., *Natural Gas Operations from a Public Health Perspective*, 17 Hum. & Ecological Risk Assessment: An Int'l J. 1039,1040, 1045-46.

carcinogens.[61] Blow-outs, which can send thousands of gallons of stimulation fluids spewing from the well, have occurred during numerous hydraulic fracturing operations.[62] And spills of hydraulic fracturing fluids and other chemicals have polluted streams and lakes.[63] The BLM cannot adequately plan for or manage these risks without requiring permittees to report the chemicals they anticipate using in each stimulation treatment. Additionally, the information is necessary in order for the BLM, other relevant agencies, private landowners and Public Water Systems to document baseline conditions, including air, water, and soil quality.[64] Finally, advance disclosure of the chemicals used in stimulation enables emergency responders to develop plans for responding to accidents that occur in the delivery of chemicals to the site, storage of chemicals onsite, or during the stimulation process.

BLM's reasons for failing to require prior disclosure ring hollow. In the re-proposed rule's response to prior comments, BLM first stated that prior disclosure was unnecessary because the impacts of stimulation would be performed as part of the NEPA analysis, and that this analysis would simply presume that all fluids used were hazardous.[65] While on face this appears to be a cautionary approach, the BLM cannot determine the risks posed by specific chemicals in specific circumstances by simply presuming that well stimulation fluids are hazardous. The BLM's approach also ignores many of the other purposes of prior disclosure, such as facilitating baseline testing and formation of adequate emergency response plans. Disclosure of specific chemicals to be used enables baseline testing for those chemicals, rather than requiring testing for every conceivable chemical. A general presumption that fluids are "hazardous" is inadequate to ensure emergency response, because responders must be prepared to deal with the specific hazards present at a site. Thus, BLM's response disregards the other purposes of prior disclosure not related to NEPA. Even as to NEPA itself, the law requires consideration of particular hazards and the severity thereof; merely assuming that all chemicals used are hazardous is inadequate. It is not clear how BLM and other surface management agencies can fulfill the requirements of NEPA without advance disclosure of all well stimulation chemicals, as well as requiring that all information be submitted to the agency regardless of trade secret claims, as discussed further at Section X(d)(iii)(1).

BLM staff has also argued that prior disclosure of chemicals is unnecessary because information regarding chemicals to be used is available even without prior disclosure. BLM contends that companies generally use the same well stimulation plan within a given field, so local residents who want to conduct baseline tests and others interested in advance information can simply refer to the reports for first stimulation treatment that was conducted and disclosed. Of course, this is of no use in areas where stimulation has not yet occurred. Moreover, BLM's assumption of homogeneity is unfounded. Industry has argued that it customizes stimulation fluids and treatment for each well and often changes recipes based on unique circumstances.[66] Indeed, companies have opposed some prior disclosure proposals on the ground that companies must have the freedom to make such adjustments. Even if an individual operator consistently used the same formulation in a given formation, different operators may use

---

[61] *See Id*. at 1050, tbl.2; International Agency for Research on Cancer, List of Classifications by CAS Number Registry, available at http://monographs.iarc.fr/ENG/Classification/index.php.

[62] *See, e.g.*, Andrew Maykuth, *Pa. Investigating Marcellus Well Blowout*, Philadelphia Inquirer (Jan. 26, 2011); s*ee, also.*, Martin Kidston, *5 Years After Gas Well Blow Out, Clark Residents Vent Frustrations*, Billings Gazette (Aug. 4, 2011).

[63] *See, e.g.*, Laura Legere, *Natural Gas Well Suffers Blowout, Releasing Fluids in Bradford County*, The Times-Tribune (Apr. 21, 2011).

[64] As discussed further in section 12(b), BLM should require operators to perform comprehensive baseline characterization of all usable ground water and all surface water within a designated area of review. Even with such a requirement, BLM must enable landowners, government agencies, and others to conduct independent baseline testing, both to verify operators' water quality data as well as to establish baselines in other media, such as soil and air quality.

[65] *See* supra note 2 at 31,649-650.

[66] *See, e.g.*, U.S. Shale Gas, White Paper, Halliburton, Page 2. Available at: http://www.halliburton.com/public/solutions/contents/shale/related_docs/H063771.pdf.

different formulations: in North Dakota's Bakken Formation, over 3,000 new wells have been drilled in the past five years with over 80 companies leasing, drilling and hydraulically fracturing in the area.

On the other hand, advance disclosure of anticipated stimulation chemicals imposes minimal costs on the oil and gas industry and has been shown to be feasible. For instance, the state of Wyoming implemented a requirement for prior disclosure of all well stimulation chemicals in September of 2010.[67] These rules were supported by members of the oil and gas industry.[68] Two years after these rules were implemented, the Wyoming oil and gas industry continues to flourish. Advance disclosure will not delay the permitting process to any meaningful degree. Because prior disclosure of stimulation chemicals provides important public benefits while imposing minimal cost on industry and BLM, BLM should require such disclosure in its final rule.

To implement prior disclosure, BLM should require the sundry notice to include a statement of the maximum concentration of each individual chemical that will be used, identified by Chemical Abstract Service number, as described below. Operators should be prohibited from using chemicals in excess of those reported on this sundry notice. If, for any reason, an operator concludes that a departure from the previously disclosed chemicals is necessary, a new sundry notice should be required, restarting the public notice period. This prior disclosure is in addition to, and cannot replace, the requirement to file a report after hydraulic fracturing is completed of the chemicals actually used. To ensure that operators provide good faith estimates in their initial disclosures, operators must be required to provide an explanation whenever the volumes of chemicals actually used diverge significantly from the prior disclosures. This process for prior disclosure is similar to a law recently adopted in Illinois.[69]

BLM must also take steps to ensure that affected persons receive actual notice of these disclosures. Nearby landowners (including surface estate owners where BLM owns the mineral estate), non-owner residents, and public water systems[70] should be notified of upcoming stimulation treatments at least 30 days prior to the treatment. The parties notified should also include owners of land within ½ mile of any part of the wellbore, non-owner residents living in this region, and public water systems in this area. The pending rule must address this issue because existing rules do not provide a surface owner with notice prior to well stimulation. BLM currently requires notice to surface owners before leasing[71] and requires that oil and gas lessees contact a surface owner before entry onto land and engage in good faith efforts to secure a surface use agreement.[72] But well stimulation, including fracturing or refracturing, can occur a significant time after an area is leased and a well is drilled. Additionally, no existing provisions protect nearby landowners or non-owning residents.

Providing this notice would not be burdensome because the BLM and lessees already have contact information for surface landowners, and several states have demonstrated the feasibility of requiring notice to adjacent landowners and public water systems in the area. Colorado's rules also provide for notification of hydraulic fracturing to landowners within 500 feet of a well to be hydraulically fractured.[73] The notice sent to landowners instructs them to notify non-owner residents. In Idaho, new rules require companies to notify all home owners, water well owners and

---

[67] Wyoming Oil and Gas Conservation Commission Rules, Chapter 3 § 45. The section took effect on September 15, 2010 and applied to all well stimulation performed after the effective date of the rule.

[68] *See, e.g.*, Jim Magill, Wyoming E&P in Fracking Probes, Intl. Gas R. (Sept. 27, 2010) (quoting a spokesman for Encana, an oil and gas company, noting that the company had "supported the [Wyoming] regulation"); see also Inside the EPA, New Hydraulic fracturing Rules Could Aid Industry Opposition to EPA Oversight, (June 18, 2010) (quoting an industry source calling the Wyoming rules "workable").

[69] *See See* Illinois Public Act 098-0022 section 1-77 available at http://www.ilga.gov/legislation/publicacts/98/PDF/098-0022.pdf.

[70] As defined by the Safe Drinking Water Act, 42 U.S.C. § 300g.

[71] Instruction memorandum 2009-184.

[72] Onshore Oil and Gas Order #1, Part VI.

[73] Colorado Oil and Gas Conservation Commission Rule 305(e).

owners of public drinking water systems located within ¼ mile of an oil and gas well of proposed well treatments.[74] Illinois requires notice be provided to owners of real property within 1,500 feet of the site at which hydraulic fracturing will take place, as well as requiring public notice by publication of the notice in a local newspaper, when an operator applies for a permit to conduct hydraulic fracturing. [75]

Given the minimal costs of an advance notice requirement and the clear benefits of allowing parties to assess pre-stimulation conditions, there is little justification for not including an advance notice requirement.

d. Disclosures must encompass all chemicals used, identified by chemical abstract service number, with no exceptions for trade secrets

i. The chemical information disclosed to the public in the proposed rule provides important information and the existing proposed requirements should be maintained

The proposed rule rightly requires information about hydraulic fracturing fluids, including trade name, purpose, and chemical constituent identities (including Chemical Abstract Service (CAS) numbers and concentrations). Information on the fluid names and purposes provides important information about the additives used. Chemical Abstract Service numbers are unique numerical identifiers for each chemical assigned by the American Chemical Society. CAS numbers are the global standard for authoritative identification of chemicals and allow each chemical constituent to be unambiguously identified, which is essential to provide an accurate record of the substances used in each well stimulation treatment.

Without CAS numbers, uncertainty can arise as to the precise chemical being identified, its physical and chemical characteristics, and the health effects from exposure. For example, if provided the chemical name "dichlorobenzene," it is impossible to know if the substance is 1,2 dichlorobenzene, 1,3 dichlorobenzene, or 1,4 dichlorobenzene. 1,4 dichlorobenzene is considered a carcinogen but the other two are not. Separate CAS numbers exist for each type of dichlorobenzene, plus one for mixed dichlorobenzene, so that if CAS numbers are required, the chemical can be precisely identified. Unfortunately, only about half of states with disclosure rules currently require all chemical additives in fracturing fluid to be identified by their CAS numbers. In order to ensure that the public can unambiguously identify the chemicals being used in well stimulation events on public and Indian lands, BLM should maintain the requirement that all CAS numbers must be provided.

ii. BLM must not allow withholding of chemical information on the basis of trade secrecy

The proposed rule allows companies to identify information which they believe should be exempt from public disclosure and withhold it from BLM and the public.[76] This provision should be deleted. Instead, BLM should require public disclosure of all relevant information, including the composition, concentration, and chemical identities of all stimulation fluids that are collected under the rules.

Complete disclosure of all chemicals and techniques used in well stimulation is required to adequately protect the environment and public health. For instance, if the identities of certain chemicals are withheld, physicians may be unaware of certain chemicals to which a patient may have been exposed. This may make it difficult or impossible to accurately diagnose and treat the patient, or to understand the interactive effects that chemicals can have on a patient's health. Because complete information is necessary to "ensure that acute exposures are handled appropriately and to ensure that surveillance programs are optimized," the Pediatric Environmental Health Specialty

[74] IDAPA 20.07.02 – 055.01.m.
[75] *See* Illinois Public Act 098-0022 section 1-40(c) available at http://www.ilga.gov/legislation/publicacts/98/PDF/098-0022.pdf. Note that the Illinois law applies only to "high-volume hydraulic fracturing" or hydraulic fracturing which uses more than 80,000 gallons per stage or more than 300,000 gallons total of hydraulic fracturing fluid and proppant.
[76] Note that BLM would be able to request information claimed to be a trade secret specifically but would not receive the information as a matter of course.

Units, a network of experts in children's environmental health, have recommended full disclosure of all chemical information.[77] Beyond care of individual patients, epidemiologists and other public health researchers require knowledge of the full suite of chemicals used in order to evaluate the risks posed by well stimulation, and these researchers must be able to freely share information about stimulation chemicals. Chemical information is also needed by BLM to evaluate the hazards posed by these chemicals in advance of well stimulation. Information on chemicals used also encourages industry to create safer products and allows parents and community leaders to protect families from unnecessary toxic exposures. Trade secret exemptions undermine these purposes and put public health at risk. BLM should eliminate any exemption for disclosure of trade secret information in the proposed rule.

Requiring disclosure of all stimulation chemicals, regardless of claims of trade secrecy, prior to use of chemicals on federal land is consistent with the policy established by other environmental statutes. The public has a right to know the identities and details of chemicals introduced into the environment. For example, both the Clean Air Act and the Clean Water Act explicitly disavow trade secret protections when it comes to reporting of chemicals discharged into the environment, whether as air emissions or water effluent.[78] Use of chemicals in the federal mineral estate is a similar introduction into the environment, especially in light of the risks of contamination of ground or surface water.

BLM has the authority to require disclosure of ingredients. BLM has asserted that the Trade Secrets Act, 18 U.S.C. § 1905, prevents BLM from requiring disclosure of trade secret information submitted to the agency to any party.[79] However, contrary to these assertions, the Trade Secrets Act (TSA) does not prevent BLM from promulgating a rule that would require public disclosure of information that qualifies for common law trade secret protection. The Trade Secrets Act prohibits disclosure of information that is a trade secret only if that disclosure is not "authorized by law."[80] The Act was not meant to prevent agencies from promulgating rules within their statutory authority that require disclosure, but to "forestall casual or thoughtless divulgence – disclosure made without first going through a deliberative process – with an opportunity for input from concerned parties."[81] A disclosure may be authorized by a properly promulgated rule if it meets two criteria: first, the rule must be a substantive rule implementing a statute, and second, the rule must be authorized by a Congressional grant of authority.[82] The first criterion is satisfied as long as the regulation creates substantive rules, rather than merely being interpretive, or a general statement of agency policy or practice.[83] The pending proposed rule clearly fulfills that criterion. As to the second criterion, BLM has appropriate authority under the Federal Land Policy and Management Act, 43 U.S.C. § 1701 *et seq.*, (FLPMA) and the Mineral Leasing Act, 30 U.S.C. § 181 *et seq.*, (MLA), and perhaps other statutes.

Both FLPMA and the MLA stand in marked contrast with statutes that have been held not to authorize disclosure of trade secrets, such as the Freedom of Information Act. These statutes each provide sufficient authority to allow the BLM to promulgate a rule requiring full public disclosure in this context. In a similar context, although the Outer Continental Shelf Lands Act makes no mention of public disclosure or trade secrets, a federal appeals court held that this statute provided authority for the Department of Interior to require public release of trade secret data submitted

---

[77] Pediatric Environmental Health Specialty Units, *PEHSU Information on Natural Gas Extraction and Hydraulic Fracturing for Health Professionals* 3 (Aug. 2011) *available at* aoec.org/pehsu/documents/hydraulic_fracturing_and_children_2011_health_prof.pdf.
[78] 42 U.S.C. § 7414(c) (Clean Air Act); 33 U.S.C. § 1318(b) and 40 C.F.R. § 122.7 (Clean Water Act).
[79] *See* supra note 2 at 31,660.
[80] 18 U.S.C. § 1905.
[81] *CAN Financial Corp. v. Donovan, 830 F.2d 1132, 1141 (D.C. Cir. 1987).*
[82] *See Chrysler Corp. v. Brown*, 441 U.S. 281, 301-302 (1979).
[83] *See Id.* at 301.

by applicants for permits to conduct geophysical and geological exploration of the outer continental shelf.[84] Likewise, a regulation promulgated by the Occupational Safety and Health Administration was upheld which required employers to provide employees and designated employee representatives with trade secret information concerning the medical and exposure histories of employees exposed to toxic substances or harmful physical agents.[85] In that case, the court found that the rules had been promulgated under a statute which required employers to maintain records and make them available to the Secretary, and under the agency's general authority to "prescribe such rules and regulations as [the Secretary] may deem necessary to carry out [his] responsibilities under this chapter."[86] This authority was found sufficient to enable OSHA to disclose trade secret information publicly based on its stated goal of public health protection and the reasonable relation of the rule to the underlying statute.

Collection of trade secret information regarding stimulation chemicals used or to be used on federal lands, and release of this information to the public, is consistent with the goals of FLMPA and the MLA, and the BLM's authority under these statutes. FLPMA requires the Secretary to "manage the public lands under principles of multiple use and sustained yield."[87] This includes "coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment."[88] Additionally, one of the purposes of FLPMA is that "the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values . . . and will provide for outdoor recreation and human occupancy and use."[89] The Secretary is directed by statute to promulgate rules and regulations to carry out the purposes of FLPMA.[90] Because public disclosure of trade secret information is clearly related to the purposes of protecting health, the environment, and public resources, and is necessary to protect and provide for those resources, FLPMA provides sufficient authority to BLM to promulgate rules requiring disclosure of all information it collects under the rule, including information claimed to be a trade secret.

The Mineral Leasing Act also provides sufficient authority to the BLM to require disclosure of all information, including trade secrets. The MLA provides the BLM with authority to lease lands for oil and gas development, to regulate and permit activity that occurs on these lands, and to require "statements, representations, or reports" to fulfill these purposes.[91] Additionally, the Act provides the Secretary with authority to "prescribe necessary and proper rules and regulations and to do any and all things necessary to carry out and accomplish the purposes of [the Act]."[92] Because public disclosure of information about hydraulic fracturing on public lands is clearly related to the purposes of evaluating and permitting activity on public lands, and protecting public lands and resources, the MLA alone provides sufficient authority for BLM to promulgate requirements that all information related to well stimulation on public lands be disclosed publicly. The Mineral Leasing Act also clearly provides the authority to disclose trade secret information to medical and public health professionals and emergency responders when the information is needed to diagnose or treat a patient or respond to an accident or other emergency, as these activities clearly relate to the regulation of oil and gas development on public lands, including ensuring that such development does not jeopardize human health and that first responders can adequately address emergencies on federal lands. Likewise, 25 U.S.C. §§ 396d and 2107 provide similar authority for BLM to require public disclosure of all information relating to well stimulation on Indian lands and to provide trade secret information to medical and

[84] *United States v. Geophysical Corp. of Alaska*, 732 F.2d 693, 699 (9th Cir. 1984), *See* 43 U.S.C. § 1352 (a)(1)(A) (Requiring lessees and permittees to "provide the Secretary access to all data and information . . . obtained from [any exploration for, or development or production of, oil or gas]").
[85] *Louisiana Chem. Ass'n v. Bingham*, 550 F. Supp. 1136 (W.D. La. 1982).
[86] See *Id.* at 1138-39, 1143 (quoting 29 U.S.C. § 657(c)(1), (g)(2) (1976)).
[87] 43 U.S.C. § 1732(a).
[88] 43 U.S.C. § 1702(c).
[89] 43 U.S.C. § 1701(a)(8).
[90] 43 U.S.C. § 1740.
[91] 30 U.S.C. §§ 190, 226.
[92] 30 U.S.C. §189.

public health professionals and emergency responders, providing statutory authorization for the BLM to regulate oil and gas operations and to promulgate rules and regulations to carry out those tasks.

The Trade Secrets Act does not constrain BLM's ability to require public disclosure of all information that the agency collects related to well stimulation on public and Indian lands. Therefore, based on the clear benefits that these additional disclosures would provide for the protection of human health and the environment, BLM should eliminate the trade secret exemptions included in the proposed rule.

iii. <u>If BLM adopts a trade secret exemption to public disclosure requirements, this exemption must be narrowly tailored</u>

If BLM nonetheless declines to remove all trade secret protections in the proposed rule, BLM must revise its handling of trade secrets to provide a robust and transparent system for evaluating and, when necessary, challenging claims of trade secrecy, and for protecting the public's interest in disclosure.

1. BLM must collect trade secret information

BLM's initial proposal required operators to provide all chemical information to BLM; designating information as trade secrets would merely prevent BLM from making this information public. The revised proposed rule alters this regime, proposing to allow operators to unilaterally withhold chemical information from the agency rather than requiring that the agency be provided with all chemical information claimed to be a trade secret. Under the revised proposal, operators must maintain records of withheld information for six years, and BLM has the right to request the information during this period. This revision eliminates safeguards to ensure that claims of trade secret status are legitimate, and must be rescinded.

Requiring operators to submit purported trade secrets to BLM helps ensure, among other things, that claims of trade secrecy are warranted. BLM justifies its proposal not to require this process on the basis that the previous proposed rule would "increase paperwork burdens on operators, and custodial requirements for the BLM."[93] According to BLM, "[b]ecause the BLM could not reveal trade secret information, the benefits of requiring operators to submit all such information would be limited."[94] However, this faulty justification assumes that all information claimed to be a trade secret does, in fact, qualify for the exemption from withholding. In actuality, the change to the proposed rule would indicate to operators that there is little or no risk to claiming trade secrets even when such claims are suspect and encourage claims of trade secret when operators simply do not want the public to know certain information. The "honor system" adopted by the proposed rule has proven to be unreliable and inconsistent: for example, a study by Harvard University Law School noted that trade secret claims by companies in the hydraulic fracturing context were inconsistent across states, finding that in numerous instances companies claimed that a hydraulic fracturing fluid additive was a trade secret in one state despite having disclosed its ingredients in another.[95]

BLM collection and retention of information, even if it is withheld from the public, serves other important benefits. Should emergency responders, government officials, public health officials, medical professionals, or other appropriate persons need specific chemical information, BLM retention of the information would provide them with a way to access this information if companies are not cooperative or are unresponsive. This could be critical in case of an immediate health or safety need.

In addition, BLM records retention avoids the data retention problems likely to arise when BLM seeks previously-withheld information years after well stimulation has occurred. The revised proposal requires operators to maintain

[93] Supra note 2 at 31,660.
[94] *Id.*
[95] Kate Konschnik, Harvard Law School Environmental Law Program Policy Initiative, *Legal Fractures in Chemical Disclosure Laws: Why the Voluntary Chemical Disclosure Registry FracFocus Fails as a Regulatory Compliance Tool* 9 (April 23, 2013).

information for six years. Geological modeling of hydraulic fracturing indicates that fracturing could cause groundwater contamination more than six years after well stimulation.[96] Even if BLM were to extend the period for which private operators were required to maintain this information, with time it becomes increasingly likely that operators will fail to do so. Collecting this information up front, and maintaining it within BLM pursuant to federal data retention standards, avoids this problem. BLM collection of information also facilitates a system for public challenges to trade secret designations via the Freedom of Information Act, as explained below.

Even industry-friendly states like Wyoming and Pennsylvania require that companies submit trade secret information so that the validity of companies' claims that information is proprietary can be evaluated.[97] BLM should follow their lead here, and collect all purported trade secret information, as provided in BLM's initial proposal.

2. BLM must require justification for claims of trade secrecy and weigh individual claims of trade secrecy against the public's interest in disclosure

As explained in part X(d)(ii) above, BLM should categorically determine that the public's interest in full disclosure of chemicals used in well stimulation on public lands, and hence at risk of being discharged into the environment, outweighs any legitimate industry interest in maintaining the secrecy of the chemicals used. If BLM refuses to make this categorical determination in favor of disclosure, BLM must require a full and strong showing of an operator's claim to trade secrecy in every individual case, and must weigh the operator's interest in maintaining secrecy of particular chemicals against the public's interest in disclosure of those chemicals.

The mere affirmations required by the proposed rule are insufficient to ensure that claims of trade secrecy are genuine. The proposed rule allows operators to simply identify the relevant statute or regulation, and affirm that i) the information is not publicly available, ii) the information is not required to be publicly available under any applicable law, iii) the release of information would likely harm the operator's competitive position, and iv) the information is not readily apparent through reverse engineering. BLM states that Colorado provides a model for the type of affidavit to be required.[98] However, experience with the Colorado disclosure rule teaches that this system is inadequate to ensure that trade secret claims are valid. The Harvard Law study cites 10 wells in Colorado where trade secret claims have been made that are obviously unjustified, because the information has been disclosed elsewhere on FracFocus.[99] All of these disclosures were made subject to Colorado's disclosure rules, and thus required that such an affirmation be made.[100] While the public can hope to identify whether the affiant has correctly stated that information has not been previously disclosed, under BLM's proposed rule, without further information the public will likely lack the tools to evaluate the other three required affirmations (and BLM will lack these tools unless it specifically requests the withheld information). Where there is little chance of challenge to or review of assertions of trade secrecy, there is little risk or downside to an operator asserting that the criteria are met in the affirmation, even if the claim is highly suspect.

Accordingly, BLM should require a more extensive showing of the basis for claims of trade secrecy. BLM should follow the lead of states like Wyoming and Illinois, which require operators to submit up-front factual justification of trade secret claims. This system helps ensure that the integrity of the disclosure system is not undermined by illegitimate claims.

---

[96] Myers, T. (2012), Potential Contaminant Pathways from Hydraulically Fractured Shale to Aquifers. Ground Water, 50: 872–882. doi: 10.1111/j.1745-6584.2012.00933.x

[97] Wyo. Admin. Code OIL GEN Ch. 3 § 45(f), 58 Pa. Cons. Stat. § 3222.1(b), (d).

[98] Supra note 2 at 31659.

[99] *See* Kate Konschnik, Harvard Law School Environmental Law Program Policy Initiative, *Legal Fractures in Chemical Disclosure Laws: Why the Voluntary Chemical Disclosure Registry FracFocus Fails as a Regulatory Compliance Tool* 9 (April 23, 2013) .at 9, 15 note cxiii.

[100] The first fracture job reported at these wells on FracFocus was on April 11, 2012, after the April 1, 2012 effective date of Colorado's disclosure rules.

Where an operator shows that stimulation chemical information meets the criteria for a trade secret, BLM should then weigh the operator's interest in preservation of this secret with the public's interest in disclosure of information regarding use of the chemicals at issue on the public lands. Although the public has an interest in all disclosure of all information for all stimulation, the public will have an even greater interest in disclosure where, for example, the chemicals at issue are particularly hazardous, where geological or other conditions elevate the chance of release, or where areas are particularly sensitive and harm will be greater if a release does occur. BLM must reject the assumption implicit in the proposed rule that any interest in trade secrecy will always outweigh the public's interest in disclosure. The proper course of action is to recognize that the public's interest in disclosure of chemicals used to stimulate production on public lands categorically outweighs industry's interest in preserving the secrecy of chemicals used in this situation, just as other numerous laws categorically require disclosure of all data regarding chemicals introduced into the environment. At minimum, BLM must weigh these competing interests on a case-by-case basis, as some states have done under other public records and disclosure regimes.[101]

3. BLM must ensure that there is a process for public challenges of trade secret claims

If BLM maintains trade secret exemptions in the final rule, it should ensure that there is a process for public challenges of trade secret claims. A public challenge process works in tandem with a requirement that trade secret claims be accompanied by factual justification to create assurances that the information claimed as a trade secret qualifies for withholding. However, even if BLM were to decide that requiring up-front factual justification of trade secret claims by operators is too burdensome, there is an independent benefit to BLM collecting trade secret information and allowing the public to challenge any withholding via the standard process under the Freedom of Information Act (FOIA). For instance, Pennsylvania does not require justification of trade secret claims to be submitted initially, but allows members of the public to challenge withholding under the state Open Records Act. This provision provides the pubic with assurances that they can challenge suspect claims to trade secret status but has proven workable for the oil and gas industry to comply with. BLM should, at minimum, adopt a system whereby it collects trade secret information and allows FOIA requests so that the legitimacy of the withholdings can be tested.

Federal agencies collect trade secrets from many industries and maintain the confidentiality of legitimate trade secrets while providing a standardized process for dealing with public claims that the information should be released. There is also significant legal precedent laying out the contours of the exemption for trade secrets under the Freedom of Information Act. The increased "custodial requirements" that BLM claims would result from the submission of trade secrets are minimal and there is no reason to afford the oil and gas industry special treatment by allowing them to unilaterally determine that information is confidential when it is clear that the process by which trade secrets are protected under the Freedom of Information Act has successfully minimized reporting burdens while also ensuring that an avenue exists to prevent bogus claims of confidentiality.

4. BLM must require immediate disclosure to medical professionals and first responders

Medical and public health professionals require full access to information on what patients may have been exposed to, and in what concentrations, for diagnosis and treatment. First responders similarly need immediate access to all information related to well stimulation to appropriately respond to accidents and emergencies with proper protective equipment. A number of state hydraulic fracturing rules include provisions which allow medical professionals and first responders to obtain trade secret information. These states include Arkansas, Colorado, Montana, Ohio, Pennsylvania and Texas. BLM must also ensure that all information is accessible to medical and public health professionals and first responders regarding well stimulation on public lands.

[101] *See, e.g.*, 18 Alaska Admin. Admin Code § 31.015 (allowing state agency to disclose private trade secrets when "disclosure is in the interests of public health and consumer protection."), California Government Code § 6254, *Black Panther Party v. Kehoe*, 42 Cal. App. 3d 645, 656 (Ct. App. 1974) (state agencies have discretion to disclose public records containing trade secrets "when some dominating public interest favors disclosure.").

As stated above, BLM should require disclosure of all chemicals without trade secret protection. If BLM ultimately decides to allow companies to keep some chemicals secret, given that BLM is not prevented by the Trade Secrets Act or any other law from requiring disclosure of trade secret information,[102] it must ensure that first responders and medical and public health professionals have access to that information upon demand. There should be a clear process that also ensures they can receive the information immediately in the event of an emergency. To ensure that the information is provided without delay, they should be able to obtain the information immediately from both BLM and the company.

5. BLM must require that the chemical family be disclosed for chemicals whose identity is withheld from the public

If BLM continues to allow exemptions from public disclosure for information on chemical identities in the final rule, it should at least require that the chemical family of the substance is identified. This basic information does not implicate an operator's trade secrets, but provides at least some information about what types of chemicals were used by the operator in well stimulation. Such a rule is clearly feasible. A number of states require that the chemical family be disclosed where a chemical's identity is withheld as a trade secret, including: Arkansas, Colorado, Louisiana, Pennsylvania, and Texas.

e. Method of disclosure: FracFocus does not provide an adequate platform for public disclosure of information on well stimulation chemicals on public lands

In the proposed rule, BLM states that the information disclosed will be submitted to and published on the FracFocus website, which is already used by several states for reporting information on chemical disclosure. We have serious concerns about using this third party website for reporting of data on well stimulation operations required by BLM under this rule.

BLM claims in the proposed rule that using FracFocus as the vehicle for public disclosure would be more cost-effective for the agency and less burdensome for oil and gas companies. We are not convinced that use of the website would truly result in significant cost savings. The proposed rule does not require companies to report through the FracFocus.org website, it allows the use of the site and encourages companies to use it for supposed ease of use and other benefits. However, the BLM acknowledges that drilling companies could also submit the information directly to the agency. This means that BLM will have to establish an internal process to receive and manage reported data regardless of the use of FracFocus. This raises questions about how much of a cost savings the use of FracFocus could really be for the BLM. Moreover, it is not clear how cost savings result to companies for reporting the same chemical information to FracFocus instead of BLM, given that companies already have systems in place to report information to BLM.

However, even if the cost savings were real, we would contend that the government's primary obligation to protect public health and the environment demands that BLM collect, review, and post the well stimulation data required under this rule.

BLM's decisions regarding the method of disclosure will impact the accessibility, accuracy, and completeness of information. BLM must ensure that the information disclosed to the public is accurate and complete, easily accessible, continues to be available when needed, and is easy to search and aggregate. BLM should not adopt the use of FracFocus unless the agency can ensure the site is improved to ensure full, accurate and complete access to all disclosed information and its aggregation capabilities are improved.

1. Use of FracFocus violates President Obama's Open Data Order

[102] *See supra* at section X(d)(ii).

Using FracFocus would violate the executive order President Obama signed on May 9, 2013 requiring new government information to be made available to the public in open, machine-readable formats.[103] According to the executive order, "Openness in government strengthens our democracy, promotes the delivery of efficient and effective services to the public, and contributes to economic growth." By signing the executive order, President Obama sent a clear statement that open and machine readable data should be "the default state of new and modernized Government information resources."[104]

Concurrently, the Office of Management and Budget (OMB) released an Open Data Policy designed to make previously unavailable government data accessible to entrepreneurs, researchers, and the public. OMB's memo on Open Data Policy makes it clear that that the requirements of the new policy applied "to all new information collection, creation, and system development efforts as well as major modernization projects that update or re-design existing information systems."[105] The information reporting proposed in the BLM rule clearly qualifies as a "new collection" and therefore must comply with the Open Data Policy.

Currently, the FracFocus website only allows users to download PDF files of reports, which are not machine-readable. This clearly violates the new policy's requirement that "agencies must use machine-readable and open formats for information as it is collected or created." Because the PDF files are not machine-readable, the site makes it very difficult for the public to use and analyze data on wells and chemicals that the government would require companies to collect and make available.

Americans from many different sectors, including scientific researchers, health professionals, concerned citizens, local policymakers, public interest groups, and industry, would need to undertake redundant, very costly efforts to obtain the data in a usable form, or simply do without the information. For instance, scientific researchers would find it extremely cumbersome to use FracFocus to study regional patterns and trends in the use of chemicals, or to measure and better understand the impacts of well stimulation activity on public health, safety, and environmental indicators.

Many uses of this information require aggregating and analyzing the chemical information obtained from numerous individual well stimulation operations. The Natural Gas Subcommittee of the Secretary of Energy Advisory Board, which was directed by the President to make recommendations about improving the safety and environmental performance of hydraulic fracturing, recommended that regulators ensure that disclosures are "posted on a publicly available website that includes tools for searching and aggregating data by chemical, well, by company, and by geography."[106]

However, FracFocus prevents aggregation, which unnecessarily restricts full public access and use of the information. The Natural Gas Subcommittee noted this issue when it explained that one significant "limitation of FracFocus is that the information is not maintained as a database. As a result, the ability to search for data is limited and there are no tools for aggregating data."[107]

The Open Data Policy requires that agency Chief Information Officers validate that new information systems meet minimum standards and "must be scalable, flexible, and facilitate extraction of data in multiple formats and for a

---

[103] Exec. Order 13642 of May 9, 2013. http://www.whitehouse.gov/sites/default/files/omb/memoranda/2013/m-13-13.pdf.
[104] *Id.*
[105] Memorandum: Open Data Policy – Managing Information as an Asset, May 9, 2013. Sylvia M. Burwell, Steven VanRoekel, Todd Park, Dominic J. Mancini. http://www.whitehouse.gov/sites/default/files/omb/memoranda/2013/m-13-13.pdf.
[106] Natural Gas Subcommittee of the Secretary of Energy Advisory Board, 90-Day Report, 24 (Aug. 18, 2011) available at http://www.shalegas.energy.gov/.
[107] *Id.*

range of uses as internal and external needs change." The significant limitations on searching, downloading, and aggregating data on FracFocus make it clear that it does not meet the standards of being flexible or facilitate the extraction of data in multiple formats.

On June 1, FracFocus improved some of its search features and upgraded to version 2.0. In its proposed rule, BLM indicates that the agency plans to work with the Groundwater Protection Council and the Interstate Oil and Gas Compact Commission to further improve the website's capabilities. While this is an important improvement, the website still only allows data to be read in individual PDF files, and does not provide data in any aggregated format. And BLM makes no assurances that the improvements of the website it will work to secure will allow for the data to be machine-readable or that functionality allowing aggregation will be added. BLM should not use FracFocus in the data collection and dissemination for this rule. BLM should establish its own reporting and dissemination process that ensures full public access to the data collected. If the BLM rule were to maintain FracFocus as a reporting option, it should include provisions to ensure the site be brought into compliance with the Open Data Policy and specifically include minimum functionality on searching, sorting, downloading, and other mechanisms to make complex data usable.

2. FracFocus's limited quality control procedures are inadequate

FracFocus has limited quality assurance procedures to ensure accuracy. In most federal reporting programs, the overseeing agency is able to establish procedures to review submissions, identify outlier filings, and work with filers to correct obvious errors. For instance the Toxic Releases Inventory (TRI) managed by the Environmental Protection Agency has several steps to review and confirm filed information with the submitting facilities. The TRI program has even been able to develop program-specific software, with data quality checks built in, to help filers submit information more quickly and with fewer errors.

FracFocus does not review submissions and does not provide a process for the government to do so either. A recent study by Harvard University Law School highlights the numerous inaccuracies that have been found with the data.[108] For example, the registry is supposed to indicate automatically when certain pieces of information (i.e., an invalid date, API number, or latitude or longitude values that places a well outside of North America) are incorrect on a newly completed form. Nevertheless, incorrect latitude and longitude values are often posted, showing the location of wells listed in U.S. states in the ocean or Canada. In addition, the registry does not seem to reject incorrect Chemical Abstract Services (CAS) numbers, which are intended to identify chemicals. A recent review of FracFocus found that 29% of CAS numbers reported at Texas wells in July 2012 did not exist.[109] In addition, concentration ranges were frequently observed even when a state's rules did not allow the ranges, but required the exact amounts. In other instances, required information is simply omitted from the disclosure.

BLM must create a plan to ensure that each submission is reviewed by BLM for full compliance with the agency's disclosure requirements. There are electronic tools that BLM can use to streamline and even partially automate such data quality checks. But it is the responsibility of the BLM to ensure such a process occurs and that problems are reported back to submitters quickly with a clear requirement to correct the information. If BLM decides to use FracFocus or any other third-party website for disclosure purposes, submissions should be forwarded to BLM for review to ensure that accurate information is provided to the public.

3. FracFocus fails to meet minimum federal standards for managing government records

[108] Kate Konschnik, Harvard Law School Environmental Law Program Policy Initiative, *Legal Fractures in Chemical Disclosure Laws: Why the Voluntary Chemical Disclosure Registry FracFocus Fails as a Regulatory Compliance Tool* 9 (April 23, 2013).
[109] Konschnik, at 7; Scott Anderson, *A Red Flag on Disclosure of Hydraulic Fracturing Chemicals*, EDF: Energy Exchange (Dec. 12, 2012), http://blogs.edf.org/energyexchange/2012/12/12/a-red-flag-on-Disclosure-of-hydraulic-fracturing-chemicals/.

Government agencies' systems for managing electronic records must generally meet certain minimum standards.[110] FracFocus fails to meet those standards. For instance, federal regulations require protections against unauthorized alteration or deletion, and controls such as audit trails to ensure records are complete and unaltered.[111]

FracFocus records contain no publication date, and operators have full access to change records at any time. And when changes are made to records on FracFocus, the original record is not publically preserved and there is no indication that additions or deletions have occurred. FracFocus even explicitly states that it "assume[s] no responsibility for the timeliness, deletion, misdelivery, or failure to store any" information.[112] If data on the site were lost, corrupted or deleted, neither the government nor the public would have any recourse.

In the proposed rule, well operators are required to disclose chemical information "within 30 days after the hydraulic fracturing operations are completed for each well." If the BLM chooses to use FracFocus, the agency should require each well completion record to include the publication date, so that BLM can track compliance with the reporting deadlines. BLM should also require the operators to send copies of their FracFocus disclosure forms to the agency. The agency should review the form to ensure that it was published on FracFocus by the deadline, and penalize companies for late submittal or failure to submit.

As observed in states that use FracFocus for their mandatory disclosure requirements, states are unable to enforce timely disclosure requirements.[113] FracFocus does not notify a state when it receives a disclosure from a company operating in that state, and most states are not able to determine when a disclosure is made. Reports indicate that FracFocus 2.0 may have resolved this issue by notifying states when a submission has been made, but it is unclear whether the BLM would be notified as well.

In addition, BLM should ensure in the final rule that any subsequent changes to an original submission should create a new record to preserve a full history of the information disclosed on separate occasions. BLM should also require a system which ensures that data will be properly backed up and that public records will not be lost if a problem occurs with a third party website.

There are also no stated privacy protections for visitors to the FracFocus website, and it is not clear how information about the site's visitors could be used or shared with interested parties. There appears to be nothing that would prevent the managers of the site from conveying information to operators about website visitors who view their disclosures, for instance.

4. Information provided by the FracFocus disclosure form is insufficient

In the proposed rule, the chemical disclosure data required to be reported exactly match the information included on the FracFocus submission form, indicating that the BLM is structuring its data requirements around the information already reported to FracFocus. The BLM has apparently adopted the FracFocus form to save well operators any additional burdens, rather than objectively and independently determining what data on hydraulic fracturing operations would be most informative and needed by officials, researchers, and the public.

---

[110] 36 C.F.R. § 1236.10(b),(c). Available at: http://www.gpo.gov/fdsys/pkg/CFR-2010-title36-vol3/pdf/CFR-2010-title36-vol3-sec1236-10.pdf.

[111] 36 C.F.R. § 1236.10(b),(c). Available at: http://www.gpo.gov/fdsys/pkg/CFR-2010-title36-vol3/pdf/CFR-2010-title36-vol3-sec1236-10.pdf.

[112] See Website Terms and Conditions of Use §2 available at http://fracfocus.org/terms-of-use (accessed Aug. 5, 2013).

[113] Kate Konschnik, Harvard Law School Environmental Law Program Policy Initiative, *Legal Fractures in Chemical Disclosure Laws: Why the Voluntary Chemical Disclosure Registry FracFocus Fails as a Regulatory Compliance Tool* 9 (April 23, 2013). *See also* Mike Soraghan, EnergyWire, *One-fifth of FracFocus reports in Colo., Pa. were late in 2012* (June 7, 2013).

FracFocus provides an insufficient source of information needed to ensure public health and the environment. The FracFocus form discloses a limited amount of information: true vertical depth of the well, total water volume used, and for each chemical used (including the base fluid) the trade name, supplier, purpose, ingredients, CAS number, maximum ingredient concentration in the additive, and maximum ingredient concentration in the fracturing fluid.

The public should have access to all of the information regarding hydraulic fracturing on public lands, not just a limited amount of information determined by an existing website designed to encourage voluntary disclosure. For instance, FracFocus fails to include any data on the volume, handling or disposal of recovered fluids, or its management. It also fails to include any information on any potential risks to water and air quality. FracFocus does not allow for pre-disclosure, which, as discussed in section X(c) above, should be required by the final rule. Nor does FracFocus require disclosure of much of the information that we believe should be added to post-disclosure forms, such as base fluid source and type, or actual concentrations in the additive and in the fracturing fluid (rather than the maximum).

BLM must engage in a careful process to identify the best information needed to protect public health and the environment, instead of adopting a pre-determined list developed by a non-governmental source to ease the burden of well operators.

For these reasons, among others, we strongly oppose the use of FracFocus as the vehicle for public disclosure under this rule.

XI. Requesting a Variance

We oppose the BLM's currently proposed variance provision, § 3162-3.3(k).

The BLM proposes to allow variances that would waive any of the obligations imposed by the new section 3162-3.3 where "the proposed alternative meets or exceeds the objectives of the regulation for which the variance is being requested." Proposed § 3162-3.3(k)(2). We agree that a variance from a requirement would never be appropriate where the proposed alternative was less effective in meeting the goals of the requirement in question. This standard will be difficult to apply in practice, however, and the BLM has not provided adequate assurances in this regard. For example, the BLM has not clearly specified the "objectives" of the individual provisions. These objectives must include—at least—protection of groundwater in the vicinity of the well, informing the public and ensuring public participation, and developing the BLM's and the public's knowledge regarding well stimulation in general. Without a clear statement of these objectives, or of the process by which they will be determined, the BLM cannot ensure the efficacy or appropriateness of this standard. Any variance rule must further ensure that a variance is approved only when the alternative meets or exceeds the pertinent requirement with regard to *all* objectives at issue. For example, if an applicant sought a variance from a reporting requirement, the BLM would be required to reject an alternative that would provide identical information to the BLM but less information or less timely information to the public.

Another deficiency in the proposed variance provision is the lack of detail regarding the variance application process, especially regarding public participation. Any variance provisions should provide an opportunity for public participation in the variance application process, and an opportunity to challenge a variance approval prior to any action pursuant to the variance.

These uncertainties regarding the variance provision are especially worrisome in light of the BLM's proposal to consider variances on statewide, basin-wide, or field-wide variances. Although some efforts at cooperative federalism have been successful, such programs must be carefully designed. Here, the BLM has not addressed many important questions. In evaluating whether a state regulatory framework provides an equally protective alternative to a BLM regulation, the BLM must consider not only the text of the state regulation, but the state's record of enforcement. On some matters, state frameworks must not be allowed to replace federal requirements. The BLM

must also consider the public participation and procedural protections afforded to federal action, such as approval of well stimulation (whether applied for in an application for permit to drill or sundry notice). Similarly, the BLM must ensure that, if it grants a variance to one of its regulations, the BLM retains enforcement authority over the matters within the scope of that regulation. The BLM preserve its role in overseeing production activity on federal lands, and BLM cannot adopt a variance provision that would waive these safeguards.

These are important issues. Because the BLM has not provided full information about how the variance provision will be enacted or the impacts of the provision and an opportunity to comment thereon, the BLM cannot finalize its proposed variance provision.

XII. Areas of Related Risk

a. Geologic site characterization

The BLM proposed rules do not provide sufficient protection of public lands or groundwater because they fail to include adequate site characterization requirements in the permit application or notice of intent sundry.

BLM must take "*any action necessary* to prevent unnecessary or undue degradation" of public lands (emphasis added).[114] Drilling before conducting a thorough investigation of the subsurface and existing penetrations defies common sense and introduces unnecessary and unacceptable risk of such degradation into hydraulic fracturing operations. BLM's rules should incorporate a "look before you drill" provision in the rules requiring establishing an area of review and subsequent site characterization as a cornerstone of minimizing risk to public lands and resources during – and after – hydraulic fracturing. Moreover, BLM should develop rules to mitigate the risk of communication between offset wells during will stimulation (referred to in the press as a "frack hit") by requiring operators of wells to be stimulated to: (a) communicate with operators of adjacent wells about well stimulation plans; and (b) monitor potentially affected adjacent wells identified in the area of review (AoR) *prior to and during* hydraulic fracturing.[115] Communication between offset wells during stimulation is a serious problem, risking blow outs in adjacent wells and/or aquifer contamination during hydraulic fracturing.[116]

To ensure protection of groundwater sufficient to prevent such degradation, BLM must amend 43 C.F.R. § 3162.3-3(d) so that the following requirements are included in a Notice of Intent Sundry:

1. An analysis of the regional structural and stratigraphic geology, hydrogeology and seismicity.
2. A map showing the three-dimensional area of review (AoR) surrounding the well where water may be endangered by drilling, hydraulic fracturing, and production operations. AoR volume should be delineated from the wellhead to the toe of the well, extending outward by a radius greater than the maximum predicted height and length of hydraulic fractures but no less than one quarter mile. One AoR may incorporate multiple wells from a single pad.
3. An analysis of the subsurface geology within the AoR identifying stratigraphic and complicating structural features such as folds and potentially transmissive faults and fractures that transect the well or could be intercepted by hydraulic fracturing.
4. Identification of an independent overlying impermeable confining zone that will protect sources of water above the zone to be fractured and produced from vertical migration of injected fluids and associated brines.

[114] 43 U.S.C. § 1732(b).
[115] See, e.g. Alberta Energy Board. (2013 May). Directive 083: Hydraulic Fracturing – Subsurface Integrity. 15p. available at http://www.aer.ca/documents/directives/Directive083.pdf.
[116] See, e.g. Vaidyanathan, Gayathri. "Canada steps up well monitoring to avoid 'frack hits'". *EnergyWire*. 8 August 2013: n.p. *E&E News.* Web. 23 August 2013.

5. Identification of all active and abandoned wells in the AoR that penetrate the confining zone identified in (4) or that are intersected by transmissive faults or fracture zones identified in (3) that also intersect the well to be drilled.
6. How corrective action will address wells that present risk as a result of being inadequately plugged and abandoned, or affected by faulting and fracturing such that they present a communication risk to the injection well as identified in (5).
7. An analysis of the risk of induced seismicity and, if necessary, a plan describing how the operator will mitigate that risk.
8. A list of adjacent active wells and operators within the AoR including contacts for mandatory notification, shut-in and Bradenhead monitoring prior to hydraulic fracturing.

See our comments submitted in September 2012 for additional information about geologic site characterization.

b. Baseline water testing and ongoing monitoring

Water contamination is one of the most significant environmental and public health risks from oil and gas development. Oil and gas production activities are the suspected cause of groundwater contamination in many communities in which development is occurring. However determining the actual source(s) of water contamination is challenging and subject to significant uncertainty due to a lack of baseline water quality data.

Neither existing nor proposed BLM rules require operators to perform baseline characterization of usable ground water and surface water. In the preamble to the rule, as justification for not requiring baseline testing the BLM stated, "the BLM cannot authorize operators to enter non- Federal land to conduct baseline water testing…"[117] This reasoning is not supported and has not prevented states from requiring baseline water testing, including in Colorado[118] and Idaho.[119] Wyoming has proposed rules requiring baseline water testing as well.[120]

The BLM should require operators to perform baseline characterization of all usable ground water, all surface water, and soil within an appropriately determined radius of the production well, including testing for hydrocarbons and all proposed chemicals, before any activity begins. Such testing should follow consistent, established protocols and be designed to capture multiple samples that reflect seasonal fluxes and variability in water chemistry. For example, methodologies are currently being investigated and developed as part of a RPSEA funded project.[121] Baseline evaluation must be followed by ongoing monitoring at designated testing intervals dictated by the local conditions.

See our comments submitted in September 2012 for additional details.

c. Well construction

Proper oil and gas well construction is paramount in protecting groundwater. The layers of steel casing and cement are what isolate usable water from hydrocarbons and any injected or naturally occurring contaminants. Mechanical integrity refers to an absence of leakage pathways through the casing and cement. Testing for mechanical integrity can reveal problems but only sound well design and construction can ensure that mechanical integrity is achieved in the first place. Improper well construction is frequently cited as a confirmed or potential cause of groundwater contamination.

While the BLM's proposed rules for mechanical integrity testing are important, mechanical integrity issues cannot be meaningfully addressed without addressing well construction. The BLM's well construction rules are outdated

[117] *Id.* supra note 2 at 31649.
[118] 2 Colo. Code Regs. § 404-1:609.
[119] IDAPA 20.07.02 – 055.07.c.
[120] See proposed rules at http://wogcc.state.wy.us/downloads/Groundwater%20Baseline%20Sampling%20and%20Monitoring%20-%20DRAFT%20Rule%20(6-6-13).pdf.
[121] See: http://www.gwpc.org/sites/default/files/event-sessions/Smith_AnnOpening.pdf

and inadequate. The BLM must revise and update its well construction rules to reflect technological advancements in oil and gas extraction techniques. See our comments submitted in September 2012 for additional details.

d. Air and climate impacts

Well stimulation and unconventional production of federal oil and gas causes significant air pollution, which adversely affects federal lands and the broader environment. Oil and gas production enabled by well stimulation, and processes involved in well stimulation in particular, cause emissions of conventional pollutants, hazardous air pollutants, and greenhouse gases. Under FLMPA and the MLA, BLM has the obligation and authority to address these emissions. Several environmental commenters raised air issues in comments on BLM's initial proposed rule. BLM did not respond to these comments in its announcement of the reproposed rule. Air pollution remains a critical issue regarding well stimulation and unconventional production. See our comments submitted in September 2012 for additional details.

XIII. Descriptions of Organizations Submitting These Comments

The **Allegheny Defense Project** is dedicated to the protection and restoration of the Allegheny National Forest, the only national forest in Pennsylvania. Through grassroots organizing and forest watch activities, the Allegheny Defense Project strives to be a voice for the wildlife species that call the Allegheny home and citizens that depend on the Allegheny for remote recreation opportunities. We also work to ensure that the Allegheny is managed first and foremost for watershed protection, the primary purpose for creating the Allegheny in 1923.

American Rivers is the leading organization working to protect and restore the nation's rivers and streams. Rivers connect us to each other, nature, and future generations. Since 1973, American Rivers has fought to preserve these connections, helping protect and restore more than 150,000 miles of rivers through advocacy efforts, on-the-ground projects, and the annual release of *America's Most Endangered Rivers*®.

Biodiversity Conservation Alliance is based in Laramie, Wyoming, with a mission to protect wild places and wild species in Wyoming and surrounding states, primarily on public lands. We have been actively tracking oil and gas activity in the biodiversity-rich Red Desert and its spectacular landscapes, including Adobe Town, the Powder Rim, and the the Ferris Dunes.

The **Buckeye Forest Council** (BFC) is a membership-based, grassroots organization dedicated to protecting Ohio's native forests and their inhabitants. We seek to instill in Ohioans a sense of personal connection to and responsibility for Ohio's native forests and to challenge the exploitation of land, wildlife and people.

Californians for Western Wilderness is an unincorporated citizens group founded to secure protection for the remaining wilderness areas and other public lands in the western United States. The organization works to encourage and facilitate direct citizen democracy through participation in administrative and legislative actions.

The **Center for Effective Government** is a nonprofit organization dedicated to building an open, accountable government that advances the priorities defined by an informed citizenry.

Clark Resource Council is a grassroots organization in Northern Wyoming whose members are heavily impacted by groundwater contamination caused from oil and gas development. The Windsor Energy, LLC development includes conventional wells that have been stimulated multiple times using hydraulic fracturing. The Wyoming state run investigation that began in 2006, includes over 100 monitor points, 25 private drinking water wells, six springs that flow into Line Creek, and five points on the creek.

Clean Air Task Force is a nonprofit organization dedicated to reducing atmospheric pollution through research, advocacy and private sector collaboration, and is actively involved in state and federal efforts to reduce environmental and climate impacts from oil and gas operations.

Clean Water Action is a national citizens' organization, founded in 1972, of over 1million members and is active in over a dozen states. Clean Water Action works for strong public health and environmental protections with an emphasis on those that impact water resources.

Delaware Riverkeeper Network is a private, non-profit organization with over 12,000 members working to defend and restore the river and its watershed to secure the rights of our communities to a Delaware River and tributary streams that are free-flowing, clean and healthy in the four states that flow to the Delaware River: Pennsylvania, New York, New Jersey and Delaware.

Earthjustice is a non-profit public interest law firm originally founded in 1971. Earthjustice works to protect natural resources and the environment, and to defend the right of all people to a healthy environment. Earthjustice is actively addressing threats to air, water, public health and wildlife from oil and gas development and hydraulic fracturing in the Marcellus Shale and Rocky Mountain regions.

Earthworks is a nonprofit organization dedicated to protecting communities and the environment from the impacts of irresponsible mineral and energy development while seeking sustainable solutions. The organization fulfills its mission by working with communities and grassroots groups to reform government policies, improve corporate practices, and influence investment decisions. Earthworks has been working specifically on hydraulic fracturing issues for more than a decade.

EcoFlight educates and advocates for the protection of remaining wild lands and wildlife habitat through the use of small aircraft. The aerial perspective and our educational programs encourage an environmental stewardship ethic among citizens of all ages.

Environment America is a federation of state-based, citizen funded environmental advocacy organizations, with affiliates in many states with public land that is vulnerable to fracking – e.g., Environment Colorado. From the Grand Canyon to the Great Lakes to the Chesapeake Bay, we work to protect America's natural heritage and the water, air, and health of our citizens. We also are in the forefront of advocating for clean energy – including wind, solar, clean cars, and energy efficiency. www.environmentamerica.org

Environmental Defense Center (EDC) is a California public benefit, non-profit corporation and law firm with offices in Santa Barbara and Ventura. The EDC represents itself and other organizations in protecting coast and ocean resources, open spaces and wildlife, and human and environmental health within its service area of Santa Barbara, Ventura, and San Luis Obispo Counties.

Georgia ForestWatch Inc. is a 501 (c) 3, not-for-profit forest conservation organization, now in its 26th year of operation. Georgia ForestWatch's overall mission is to promote sustainable management that leads to naturally-diverse and healthy forests and watersheds within the 867,000 acres of Chattahoochee-Oconee National Forests in Georgia; to engage and educate the public to join in this effort; and to promote preservation of this legacy, particularly wild and scenic areas, for future generations.

Grassroots Coalition (GC) has been engaged in oil/gas field activities and protection to the public and environment for over 20 years. GC has a lengthy library on dangerous and proven deleterious effects--including acidization techniques-- of oil/gasfield practices.

Heartwood is a cooperative network of grassroots groups, individuals, and local businesses working to protect and sustain healthy forests and vital human communities in the nation's heartland, from the Appalachian Mountains to the river valleys of the Great Plains, and from the Great Lakes to the Deep South.

Los Padres ForestWatch is a nonprofit conservation organization working to protect public lands along California's central coast, including the Los Padres National Forest, the Carrizo Plain National Monument, and the Hopper Mountain National Wildlife Refuge. More than 300 active oil and gas wells occur in and adjacent to these public lands, with hydraulic fracturing occurring with increased frequency. ForestWatch uses legal advocacy, scientific collaboration, and community awareness to ensure responsible oil development practices, and advocates for a complete moratorium on fracking until sufficient regulatory oversight exists to ensure that this controversial oil extraction technique does not pose adverse hazards to the environment.

The **Natural Resources Defense Council** (NRDC) is a non-profit environmental membership organization with more than 565,000 members throughout the United States. NRDC members use and enjoy public lands across the country. NRDC members use and enjoy these lands for a variety of purposes, including: recreation, solitude, scientific study, conservation of natural resources, and sources of clean drinking water. NRDC has had a longstanding and active interest in the protection of public lands and national forests, the responsible development of oil and gas resources, and the protection of public health from environmental threats.

Northern Plains is a grassroots conservation and family agriculture group that organizes Montana citizens to protect our water quality, family farms and ranches, and unique quality of life.

The **Ouachita Watch League** is a conservation coalition for oversight and protection of resources of the Ouachita National Forest of Arkansas & Oklahoma.

Pavillion Area Concerned Citizens is a grassroots organization in central Wyoming, located within the boundaries of the Wind River Reservation. The Pavillion area development is owned and operated by EnCana Oil and Gas Corporation, and has been under investigation to identify groundwater contamination since 2008; first conducted by the EPA, the investigation was turned over to the State of Wyoming this year.

The **People's Oil & Gas Collaborative - Ohio** (POGCO) formerly known as NEOGAP from 2008-2011 represents the original Ohio grassroots movement focusing 100% on oil and gas issues. Our multi-tiered approach involves people who are directly affected by the impacts of oil and gas development working in a nonpartisan effort for reform at local, state and federal levels. We utilize public education, legislative initiatives and community partnerships in our mission to provide surface owners, oil and gas employees and citizens living near operations fair and equal treatment under the law with regard to health, safety and property rights. www.ohiogasdrilling.com

The **Powder River Basin Resource Council** (PRBRC) was founded in 1973 by ranchers and citizens dedicated to ensuring the viability of Wyoming's agricultural heritage and rural lifestyle. The Council, along with its over 1,000 members throughout the state, is dedicated to promoting the responsible development of Wyoming's valuable mineral resources.

Riverkeeper is a member-supported watchdog organization dedicated to defending the Hudson River and its tributaries and protecting the drinking water supply of nine million New York City and Hudson Valley residents. Riverkeeper is actively involved in litigation, advocacy, and public education surrounding the issue of shale gas extraction and ancillary activities, particularly because of the potential impacts on New York State's drinking water supplies.

The **San Juan Citizens Alliance** organizes people to protect our water and air, our lands, and the character of our rural communities in the San Juan Basin.

The **Shenandoah Valley Network** works to maintain healthy and productive rural landscapes and communities and to protect and restore natural resources in Virginia's Shenandoah Valley.

The **Sierra Club** is America's largest and most influential grassroots environmental organization, with more than 2.1 million members and supporters nationwide. Sierra Club members and supporters live near and recreate on public lands throughout the country. Reducing the harmful effects of oil and gas production on the environment and our public lands is a priority for the Sierra Club's Beyond Natural Gas, Beyond Oil, and Our Wild America campaigns, which work on both state and federal levels. For more information, visit http://www.sierraclub.org.

The **Southern Environmental Law Center** is a regional non-profit organization working to conserve the environment and health of the Southeast, including the national forests and other public lands. The national forests in the Southern Appalachian mountains, in particular, support globally significant levels of plant and animal diversity, shelter the headwaters of the South's major rivers, supply drinking water to many cities, and provide outstanding recreation opportunities within a day's drive of half of the U.S. population.

Virginia Forest Watch is a grass-roots based coalition of individuals and environmental groups organizing throughout the Commonwealth of Virginia. Our mission is to maintain and restore the natural ecology and biodiversity of woodlands across Virginia through education and citizen participation.

The mission of the **Virginia Wilderness Committee** is to permanently protect the best of Virginia's wild places for future generations, foster understanding and appreciation of Wilderness, and promote enjoyment and stewardship of our last remaining wildlands.

The **Western Environmental Law Center** is a non-profit public interest law firm that works to protect and restore western wildlands and advocates for healthy environments on behalf of communities throughout the West.

The **Western Organization of Resource Councils** (WORC) is a regional network of seven grassroots community organizations that include 10,000 members and 38 local chapters. WORC is committed to building sustainable environmental and economic communities that balance economic growth with the health of people and stewardship of their land, water, and air resources.

Wild Virginia is a grassroots non-profit organization dedicated to preserving wild forest ecosystems in Virginia's National Forests.

Wilderness Workshop (WW) is a 501(c)(3) dedicated to preservation and conservation of the wilderness and natural resources of the White River National Forest and adjacent public lands, including BLM's Colorado River Valley Field Office. WW engages in research, education, legal advocacy and grassroots organizing to protect the ecological integrity of local landscapes and public lands. WW focuses on the monitoring and conservation of air and water quality, wildlife species and habitat, natural communities and lands of wilderness quality. WW is the oldest environmental nonprofit in the Roaring Fork Valley, dating back to 1967 with a membership base of 700. Many of our members live, work, recreate and otherwise use and enjoy lands managed by the Bureau of Land Management and on lands with minerals managed by the BLM. All members have a great interest in the protection and enhancement of natural values in our service area. WW has been closely monitoring proposals, developments, and management actions affecting local public lands and public minerals for many years.