August 23, 2013

U.S. Department of the Interior
Director (630)
Bureau of Land Management
1849 C Street NW, Stop 2134 LM
Washington, DC 20240

Dear Secretary Jewell:

The Environmental and Energy Study Institute (EESI) submits the following comments regarding the U.S. Bureau of Land Management Notice of Proposed Rulemaking in *Federal Register* Vol. 78, No. 101 dated May 24, 2013, regarding the proposed rules, "Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands". EESI supports the regulation of unconventional oil and gas production (also referred to as hydrological fracturing) on public and Indian lands, in order to protect both human health and critical natural resources. We appreciate the efforts undergone by the Department of the Interior (DOI) and the Bureau of Land Management (BLM) in proposing updates to the 30 year old federal hydraulic fracturing regulations, especially since BLM is the steward of a vast expanse of Federal and Indian land.

Regulations are not only crucial in protecting Federal and Indian lands; BLM's final ruling will set the tone for future regulations proposed by states and localities. Therefore, it is critical to hold industry to the highest standards, to assure the safety of local communities, to maintain pristine wilderness areas, and to protect groundwater, soil and air quality. Furthermore, forty million individuals in the United States drink from private wells, making it important to take all reasonable measures in order to protect sources of drinking water.[1] These regulations are especially necessary since state regulation is currently uneven, or in some cases, not present at all.

While hydrological fracturing operations on Federal and Indian lands may play a role in securing our energy supplies for the near future, we must weigh the very real environmental and societal impacts this activity will have on generations to come. With that in mind, EESI has concerns with both the limited scope of the proposed regulations, as well as the intent of oil and gas plays occurring on public and Indian lands, with regard to the public's vested interest. A strengthened rule could provide greater protection to human health and our environment than those laid out in the proposed regulation.

Concerns with Draft Regulations:

The proposed regulations do not adequately address several points, including; the stewardship role the BLM holds with regard to Federal and Indian lands, the recommendations laid out by President Obama's Secretary of Energy Advisory Board (SEAB), as well as the establishment of baseline scientific studies concerning water quality that are ongoing at the United States Geological Survey (USGS) and the U.S. Environmental Protection Agency (EPA). Additionally, several technical aspects that would further safeguard human health and water quality are either excluded or significantly weakened as compared to

[1] Vidic, R.D., et al. Impact of Shale Gas Development on Regional Water Quality, Science, May 2013.

the previous drafts, including; water management throughout the process, pre- and post-fracturing chemical disclosure, well integrity, variances and setbacks. These issues are summarized below.

I. Bureau of Land Management and It's Role in Federal Lands Stewardship

The BLM is the appointed steward of public lands and is charged with preventing unnecessary degradation and managing the lands under the principle of multiple use, which dictates, "the management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs for the American people." In the May 24th, 2013 update to the proposed rules, "Hydraulic Fracturing on Federal and Indian Lands", BLM states that the general public has voiced significant concerns concerning the possibility of surface and subsurface water contamination. EESI would like to assert that the public has a right to be concerned and these concerns should not be ignored at the expense of reducing the regulatory burden for the oil and gas industry. Nor do we feel that we should rush to tap unconventional oil and natural gas reserves before we understand the long-term and complex health and environmental ramifications that hydrological fracturing may have. Industry claims that hydraulic fracturing is a safe practice that has been in place for decades and we should not wait for the science to catch up, despite the fact that the USGS has stated that the environmental effects of hydrologic fracturing has received scant scientific study in the United States. At any rate, both the scale and scope of current hydrological fracturing practices are unprecedented. The regulator's primary concerns should be with protecting human health, critical water resources and natural lands, not with easing the regulatory burden placed on operators.

II. Addressing the President's Secretary of Energy Advisory Board Recommendations

We recognize that as part of President Obama's "all of the above" energy strategy, natural gas may play a key role in transitioning our economy from carbon intensive fuels to carbon neutral fuel sources, in addition to reducing our dependence on foreign oil. In his March 30th, 2011 speech on America's Energy Security President Obama commented,

> "We're going to have to find ways to boost our efficiency so we use less oil. We've got to discover and produce cleaner, renewable sources of energy that also produce less carbon pollution, which is threatening our climate. […] We have a few different options. The first is natural gas. But just as is true in terms of us extracting oil from the ground, we've got to make sure that we're extracting natural gas safely, without polluting our water supply."[2]

In light of the President's comments, EESI would like to pose the question to the DOI, have we exhausted all of our potential energy gains from both energy efficiency and renewable energy? EESI asserts that the United States has not realized the full energy savings that could be provided from these alternatives in our transition to carbon neutrality. Moreover, we are still largely unsure about the

[2] Remarks by the President on America's Energy Security, Georgetown University, March 30th, 2011.

greenhouse gas (GHG) footprint of unconventional gas as compared to other fuel sources.[3] Given the potential environmental costs of unconventional oil and gas development, in addition to reasonable public concerns, natural gas should be considered a "3rd option", behind increases in energy efficiencies, and further deployment of renewable sources of energy. The public's concerns should not be ignored for potential short-term gains in carbon emissions, or to reduce our consumption of oil.

Additionally, EESI would like to point out that the BLM has excluded in its proposal some key recommendations made by the DOE. As part of his energy security strategy, the president charged former Energy Secretary Chu to form a Shale Gas Production Subcommittee (SEAB). The SEAB reported their recommendations to DOE, DOI and EPA as part of efforts to decrease the environmental impact of shale gas production. Their recommendations include the complete disclosure of chemicals used in hydrological fracturing operations, measures to reduce methane emissions, further study on the possible methane migration from shale formations into groundwater as well as the elimination of diesel use in fracturing fluids.[4] Adopting these common-sense measures would bring the proposed regulations in line with the goals of the president's Interagency Working Group to Support Safe and Responsible Development of Unconventional Domestic Natural Gas Resources. Furthermore, these measures are also supported by the U.S. House of Representatives Committee on Natural Resources, Democratic Members, in their September 2012 letter to DOI regarding the initial proposed regulations from BLM.[5]

III. Water Management

A. Establishing Baseline Data

EESI is deeply alarmed with the rush to construct oil and gas plays in the absence of knowledge regarding its potential impacts on regional water quality, ecosystems and human health. In our haste to transition away from carbon intensive fuels, we should not overlook key scientific investigations that will help discern any potential long-term effects of natural gas drilling. In their 2011 recommendations, the SEAB called for establishment of water quality baseline standards at all potential gas and oil well sites.[2] The potential for biogenic (naturally occurring) methane intrusion into sources of drinking water makes the establishment of baseline data at well-sites critical[6]; unfortunately, no such baseline data exists for many municipalities that are already facing elevated levels of methane in their drinking water.[1] These investigations will help to establish water quality baselines that water resource managers can use to assess whether water quality has been impacted, and what the causes are.

The presence of high levels of methane in drinking water may result in oxygen depletion, elevated levels of arsenic and iron, increased turbidity and increased levels of total dissolved solids, all of which contribute to extremely poor drinking water quality.[1] Additionally, according to the DOI, water

[3] Howarth, R.W. et al., Methane and the greenhouse-gas footprint of natural gas from shale formations, Climactic Change, Apr. 2011.
[4] Shale Gas Production Subcommittee Second Ninety Day Report, Secretary of Energy Advisory Board, U.S. U.S. Department of Energy, Nov. 2011.
[5] Letter to Secretary Salazar, DOI, U.S. House of Representatives Committee on Natural Resources, Democrats, September 10th, 2012.
[6] Osborne, S.G. et al. Methane contamination of drinking water accompanying gas-well drilling and hydraulic fracturing. Proceedings of the National Academy of Sciences of the United States of America, May, 2011.

containing over 10 mg/L of methane poses the threat of fire, explosion and asphyxiation in closed spaces, and is therefore considered a significant health risk.[1] The USGS has recently finished collecting water samples from 78,000 groundwater sites and 32,000 subsurface water sites in close proximity to unconventional oil and gas wells, and is still analyzing these samples to understand potential changes in water quality in deep, shallow and surface waters.[7] The EPA is also currently conducting its own study to assess known risks to drinking water throughout the hydraulic fracturing water cycle, and will not publish any results until 2014.[8] The BLM claims that any findings by the EPA study would not conflict with proposed regulations, because they do not focus specifically on the management of public lands and resources. However, the risks to drinking water are across the board, and the proposed regulations put Federal and Indian lands, local populations, farms and ranches as well as treasured National Parks at significant risk in ignoring the research being conducted by both the USGS and the EPA.

B. Protecting Critical Groundwater Sources

Any discussion of potential regulation must include the stresses to available water caused by hydraulic fracturing. The EPA estimates that amongst the approximately 35,000 wells that are fractured each year across the United States, water use may range between 70 to 140 billion gallons annually, equaling the water budget of one to two cities of 2.5 million people.[9] Using data from the industry compliance portal, FracFocus.org, the non-profit group Ceres estimates that between January 2011 and September 2012, 65.8 billion gallons of water were used in hydrological fracturing operations. Comparing well locations with areas of high-water stress, they concluded that 47 percent of the wells developed during this period were in areas of high or extremely high water stress.[10] These results are not surprising, given the USGS's recent report on the rate of groundwater depletion in the United States.[10] By assessing 40 aquifer systems in the United States, they found groundwater depletion between 1900 and 2008 to be a total volume of 1,000 cubic kilometers. Significantly, the rate of depletion rose steeply between 2000 and 2008, to 25 cubic kilometers per year, as compared to 9.2 cubic kilometers per year between 1900 and 2000.[11] In general, groundwater depletion is most severe in the dryer areas of the West, Midwest and Southwest.

Ceres also found that in Texas, roughly half of wells are located in areas with high to extremely high water stress, and in Colorado, 97 percent of wells are being developed in high to extremely high water-stressed areas.[7] While hydraulic fracturing may only represent about one percent of Texas' annual water withdrawals, the effects of these withdrawals are highly localized[9] and could more than

[7] Water Quality Studied in Areas of Unconventional Oil and Gas Development, Including Areas Where Hydraulic Fracturing Techniques are Used, in the United States. U.S. Geological Survey, 2012.
[8] Study of the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources: Progress Report, U.S. Environmental Protection Agency, 2012.
[9] Draft Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources, U.S. Environmental Protection Agency, Feb. 2011.
[10] Freyman, M. and R. Salmon, Hydraulic Fracturing & Water Stress: Growing Competitive Pressures for Water, Ceres, May 2013.
[11] Konikow, L.F., Groundwater Depletion in the United States (1900 - 2008), U.S. Geological Survey, 2013.

double the net water use in Texas' rural communities. Hydrological fracturing is placing additional stresses on semi-arid regions that are already facing water shortages due to demands from agriculture, ranching and local populations.[12] Persistent drought occurring throughout the West simply exacerbates an already dire situation. In Texas, there is one town that has literally run out of potable water due to the use hydrological fracturing techniques in an already extremely high stress water area.[13] Stories like this will become increasingly common in the face of continued high-water use energy extraction methods. They highlight the critical need to disclose the sources of water used for hydraulic fracturing, the amounts withdrawn from what sources, and the need to greatly reduce the amount of water used in the cycle. Some states and operators are choosing to use non-fresh water sources and to greatly increase the amount of recycled wastewater.[7] Options to reduce stress on fresh water sources are both available and technologically feasible; these advances should therefore be reflected in the proposed regulations.

While the use of recycled wastewater is growing in hydrological fracturing, recycling efforts will only address part of the water issue, since much of the injected water remains in the formation. For instance, in Pennsylvania, a state that has relatively high wastewater recycling, the amount of water recovered is on average, ten percent.[1] The proposed rules are especially weak regarding protecting critical water sources. The BLM does not adequately protect critical fresh water sources in areas already subject to high water stress. The prior draft rule defined "usable water" as water containing up to 10,000 ppm total dissolved solids. For comparison, the Safe Drinking Water Act (SDWA) defines "underground source of drinking water as an aquifer with fewer than 10,000 mg/L dissolved solids" [14] (For comparison, 10,000 ppm is roughly equal to 10,000 mg/L). Unfortunately, the currently proposed regulations have significantly weakened the protection of potential sources of drinking water by requiring that operators only "isolate usable water containing 5,000 ppm or less of dissolved solids and other mineral-bearing formations and protect them from contamination".[15] Furthermore, Section 3162.3 – 3(b) of the proposed regulations do not protect geologic zones deemed not to contain usable water; the zones that are usable versus not usable is vague in its definition. Communities must be reasonably assured that their usable waters will be isolated and protected from hydrologic fracturing operations through enhanced protection of fresh water.

C. Management of flowback and produced waters

Flowback waters are fluids returned to the surface when drilling pressure is released, whereas wastewaters emerging from the well after production begins are produced waters. Both contain unknown harmful toxins originating from both the injected fluids and fluids naturally occurring in the

[12] Nicot, J.P. and B.R. Scanlon, Water Use for Shale-Gas Production in Texas, U.S., Environmental Science & Technology, 2012.
[13] Goldenberg, S., A Texan Tragedy: Ample Oil, No Water, The Guardian, August 11th, 2013.
[14] Executive Summary of Safe Drinking Water Act, U.S. Environmental Protection Agency.
[15] Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands; Proposed Rule, 43 C.F.R. § 3162.5-2(d).

formations such as salts, organic hydrocarbons, organic and inorganic additives, and naturally occurring radioactive material. Significantly, little is known about the chemical reactions occurring between the injection mixture and the rock formation. What types of secondary chemicals are produced and subsequently returned to the surface; what reactions are occurring between wastewaters waters with air, and when leaked, with surrounding soils and water?

Improperly managed, these wastewaters can be harmful to human health and that of water sources and surrounding ecosystems. According to the USGS, in established hydrological fracturing operations, 10 barrels of wastewater, or brine, is produced for every barrel of extracted oil. These brines can contaminate groundwater, surface water and soil by elevating salinity levels and introducing toxins to wildlife communities, migratory birds, as well as make waters unsuitable for livestock. Wastewater leakages may happen during routine activities associated with handling, such as during transport in pipelines, storage tanks and tanker trucks, making the proper management of wastewaters crucial.[16]

BLM has taken positive steps to manage these wastewaters, including requiring disclosure of total volume recovered from the well, methods of management and disposal. Yet, we know dangerously little about the chemistry of wastewaters. The storage of the wastewaters in open air pits poses greater chances of leaks, spills as well as increasing air pollution from off-gassing. Open pits may attract wildlife, exposing animals and entire ecosystems to toxic wastewaters. Similar to the Committee on Natural Resources, Democratic Members, we support the use of closed-loop systems for the management of wastewaters.[3] Some states are moving away from open pit storage, with North Dakota having banned all open pit storage methods in favor of closed loop systems as of April, 2012.[17] These measures show that the technologies to move to closed systems are feasible, and should therefore be included in any BLM regulation.

D. "Hydrologic fracturing" versus "well stimulation"

In the revised proposed regulations, the BLM has removed the previously used term "well stimulation" in favor of the more narrowly defined "hydrologic fracturing". This indicates that only the initial process of oil and gas extraction will be covered, as opposed to the entire process. The BLM alludes to major concessions to industry in its remark that that "commenter's stated that the requirements in the proposed rule were too onerous for what they considered to be routine maintenance operations… The BLM agrees with these comments". We again urge BLM to consider the concerns of the American people, and suggest that unchecked and largely unregulated hydrological fracturing near homes, schools, farms, ranches, and National Parks may be considered too onerous by many. Additionally, by narrowing the definition of hydrologic fracturing, BLM is not fulfilling their mandate to modernize regulations, as laid out by former Secretary of the Interior Salazar, who stated;

[16] Examination of Brine Contamination Risk to Aquatic Resources from Petroleum Development in the Williston Basin, U.S. Geological Survey, May 2011.
[17] Industrial Commission OKs rule changes governing oil industry, North Dakota Petroleum Industry, Jan. 2012.

> "The proposed rule will modernize our management of well stimulation activities – including hydraulic fracturing – to make sure that fracturing operations conducted on public and Indian lands follow common-sense industry best practices."[18]

Rather, exclusion of all of the activities covered under well stimulation in the revised proposal does not reflect efforts to modernize the management of the process; instead, the BLM is continuing to use outdated regulatory framework that does not provide adequate protections.

In narrowing the scope of the proposed regulation, several processes that could negatively impact humans and the environment are excluded from potential regulation. They include, but are not limited to the processes of, "enhanced secondary recovery, such as water flooding, tertiary recovery [and] recovery through steam injection […] maintenance fracturing, thermal stimulation" and acidulation.[19] Hydrochloric or hydrofluoric acid (HF) is commonly used in the acidulation process, to both fracture the rock and to clean well bores. Both chemicals are highly toxic, according to the Centers for Disease Control, and there have been numerous reports of toxic exposure to HF in oil refineries across the United States.[20] Yet, the potential human health risks, as well as risks to water quality from acidulation has received scant attention, since operators have not been previously required to disclose any information related to the process; such as type, amount, strength or depth of acids used during the process. Recently, California State legislators called for more information regarding the acidulation process that is commonly used in the Monterey Shale[21], demonstrating the critical need for additional information on this topic. For the health and safety of workers, communities, water and ecosystems, the entire well stimulation process must be regulated, not just the initial portion.

IV. Chemical Disclosure: Pre- and Post-Fracturing

Unconventional oil and gas drilling uses at least 29 chemical compounds that are known or potential human carcinogens as listed under the SDWA; several of these compounds are also listed as air pollutants under the Clean Air Act (CAA).[3] While the currently proposed regulation has increased the transparency of the process, this rule would only require operators to publicly disclose chemicals used in the fluid mixture until a month after operation was completed.[22,3] While the act of disclosure doesn't make the process any safer, it gives watershed managers, landowners and scientists the opportunity to conduct baseline groundwater testing, the ability to determine potential sources of groundwater contamination, and provide information to first responders. Montana and Wyoming are already requiring the pre-disclosure of the chemical mixture, including both the identity and concentration of chemicals.[3] Moreover, the produced wastewater contents must be divulged for safety and health reasons. Pre- and post-disclosure would also increase the transparency of the process, allowing for future regulators to quantitatively assess the entire hydrological fracturing operation from pre- to post-fracturing.

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[18] Bureau of Land Management News Release Interior Releases Draft Rule Requiring Public Disclosure of Chemicals Used in Hydraulic Fracturing on Public and Indian Lands, May 4th, 2012.
[19] Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands; Proposed Rule, CFR 3160.0-5
[20] A Risk Too Great: Hydrofluoric Acid in U.S. Refineries, United Steelworkers, Apr. 2013.
[21] Reddall, B., California senators want more information on oil well 'acid jobs', Reuters, June 18th, 2013.
[22] Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands; Proposed Rule, CFR 3162.3-3(g)

Additionally, the FracFocus website lacks the transparency expected of a government program. The portal does not capture all the risks associated with the process, nor does it allow data aggregation. The portal is not subject to federal or state open records laws, essentially placing public data into the hands of a private organization.[3] The Committee on Natural Resources, Democratic Members, have suggested either an overhaul of the FracFocus site, or a government-run reporting portal, either of which EESI feels is a reasonable compliance standard.

V. Methane Intrusion, Fugitive Emissions and Well Integrity

The integrity of the well seal or annulus is critical to protecting sources of groundwater from potential methane intrusion. Moreover, sound seals are needed to prevent fugitive methane emissions from gas wells. Faulty seals can lead to gas migration or stray gas entering water sources, despite the large distance between deep shale gas formations and shallow aquifers.[4] It is not uncommon for oil and gas plays to be located in tectonically active areas containing interconnected faults and joints, which can act as pathways for gas flow into shallow aquifers.[4] Faulty seals are one of the more common problems that occur in unconventional wells. While some shallow aquifers have been subjected to methane migration prior to the hydrological fracturing boom, either through previously abandoned gas wells or shallow biogenic sources, it has been shown that up to 3 percent of unconventional oil and gas wells in the Marcellus Shale region of Pennsylvania have had seal issues.[1] In Pennsylvania, 3 percent translates to roughly 219 notices of violation out of 6,466 oil and gas wells, according to the Pennsylvania Department of Environmental Protection.[1] Several factors can lead to methane migration, including; hydrological fracturing can expand pre-existing rock fractures, allowing thermogenic methane to migrate through fracture systems into drinking water wells.[1,4] Additionally, when formations containing high pressure gas are drilled, these gasses may affect the integrity of the cement annulus, causing microchannels in the annulus to form.[1]

While methane has a short atmospheric lifetime of 12 years, it is a more potent GHG than carbon dioxide. The Global Warming Potential (GWP) of one ton of methane is equal to 21 tons of carbon dioxide over 100 years and equal to 75 tons of carbon dioxide over 25 years. In terms of fugitive methane emissions, no reliable method for calculating the amount of methane leaked across the natural gas process exists. [23] It has been calculated that if more than 3.2 percent of the natural gas is leaked across the entire process, the burning of natural gas will then have a larger immediate climate impact than coal.[23] The EPA estimated U.S. methane leakage for natural gas operations were approximately 1.5 percent for both 2011 and 2012.[23] However, the methods for obtaining these numbers have been questioned by outside researchers; with outside evaluations of across the process emissions in the range of 3.6 to 7.9 percent .[3] Recently, scientists measured fugitive methane in the air above and downwind of a natural gas field. These direct measurements showed fugitive methane at the Uintah natural gas field in Uintah County, Utah, to be between 6.2 and 11.7 percent of total natural gas production.[23] This calculation does not include methane leaked during transport or burning, which

[23] Karion, A., et al., Methane emissions estimate from airborne measurements over a western United States natural gas field, Geophysical Research Letters, 2013.

would place the total leakage at even higher levels. Such examples call into question the common assertion that natural gas is an appropriate "bridge fuel" to carbon neutral fuels. Consistent methods for measuring the fugitive methane emissions associated with natural gas must be established. Additionally, regulators must assign acceptable fugitive methane emissions in order to protect human health, as well as make the process acceptable, from a GHG standpoint.

The SEAB has recommended that best practices be established for well development and construction.[2] The current proposal does not comment on specific engineering criteria regarding cement and casing, as well as how deep below aquifers these casings should extend.[3] Significantly, the DOI has already established best practices in offshore drilling operations. Following the BP Deepwater Horizon disaster, DOI updated offshore well construction standards and enacted specific regulations regarding technical requirements for cement and casings used in wellbores.[3] Will it take a similar catastrophe to move BLM to action regarding the safe and effective construction of onshore wells?

In the proposed regulations, BLM will allow operators to submit cement evaluation logs (CEL) after completing all drilling operations, as opposed to cement bonding logs (CBL) prior to drilling, as proposed in the previous draft. Additionally, a "type well" may be used as a proxy for the entire geology of an area. These practices would significantly weaken the oversight over well construction and drilling. First, it is essential to understand the inherent risks prior to the beginning of an operation, making CBLs necessary prior to extraction. Secondly, due to the wide variety of the geologic conditions in a region, it is imperative to understand the conditions particular to each well. While variances, or waivers to the minimal standards provided to operators may be necessary in some cases, depending on unique geological conditions, the process laid out by BLM is vague.[3] In allowing field officers to waive the basic requirements of the proposed regulation, it will be difficult if not impossible to enforce a uniform regulatory framework. EESI suggests that BLM 1) establish best practices for well development and construction to ensure that methane intrusion and fugitive methane emissions from the well are minimized, 2) require CBLs for all wells prior to operations, and 3) clarify the exceptional cases that may call for the allowance of variances.

VI. Establishing Setback Standards

In the hydrological fracturing boom, people increasingly co-exist with oil and gas wells. In West Virginia, a scant 625 feet is all that is required between the center of wellpads and occupied dwellings.[24] Communities are dealing with issues associated with oil and gas wells that most have never faced, including increased traffic, noise and light pollution, as well as increased population and strains on local social services and infrastructure. According to the SEAB, the constellation of factors associated with drilling that have not yet been addressed include, "short and long term community impact range from traffic, noise, land use, disruption of wildlife and habitat".[3] While several states have established setback criteria, the BLM has not set any standard for setbacks from schools, libraries, hospitals as well

[24] McCrawley, M., Air, Noise, and Light Monitoring Results for Assessing Environmental Impacts of Horizontal Gas Well Drilling Operations, May 2013.

as National Parks. EESI recommends that the BLM considers existing state setback laws and allow stakeholders to participate in the planning of setbacks for their own communities.

Conclusions:

The SEAB estimates that perhaps as many as 100,000 wells will be developed in the near future in the United States.[2] Despite grave concerns on the part of the public, federal and state governments have allowed operators to continue in a lax regulatory environment. These rules will be an important starting point to all further regulations, and it is important to weigh both the tangible gains, as well as the tangible and intangible losses that the unconventional oil and gas boom offers the United States. Now is the time to act, to ensure avoiding another environmental legacy such as those left from oil spills, wastewater spills, abandoned coal mines and oil wells.

It is imperative that we protect these public and Indian resources in perpetuity, for their enjoyment and use by the people of the United States long after they will be of use as sites for oil and gas extraction. We strongly urge the BLM to consider the environmental and societal costs of oil and gas extraction in their further revisions. Federal and Indian Lands serve many purposes to many people; as homes and communities, as critical lands for agriculture and ranching, as well as protective areas to wildlife habitats, forests, and watersheds. Additionally, Federal lands are American's backyards, containing scenic byways, trails and nature preserves that contain areas of unparalleled natural beauty; they serve as personal retreats and recreation areas to scores of hunters, fishers, hikers and wildlife lovers. We strongly urge the BLM to consider the trade-offs while they are drafting their regulations; a hundred years' supply of natural gas versus potential grave environmental and public health impacts, and incalculable damage to America's natural lands for generations to come.

Sincerely,

Carol Werner

Executive Director

Environmental and Energy Study Institute