Drilling Dysfunction

How the Failure to Oversee Drilling on Public Lands Endangers Health and the Environment

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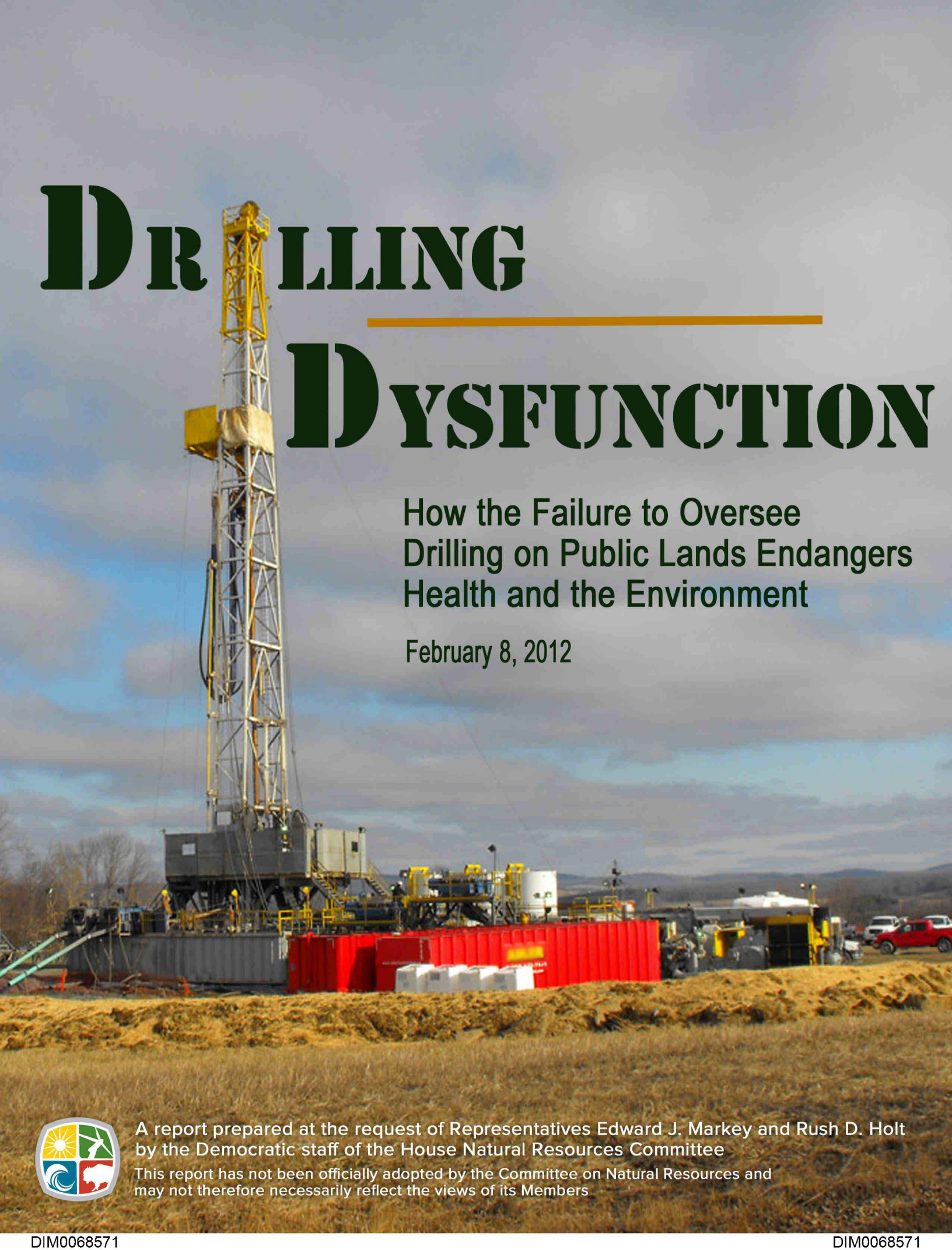

A report prepared at the request of Representatives Edward J. Markey and Rush D. Holt by the Democratic staff of the House Natural Resources Committee

This report has not been officially adopted by the Committee on Natural Resources and may not therefore necessarily reflect the views of its Members

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Executive Summary

Hydraulic fracturing has helped to expand natural gas production in the United States, unlocking natural gas supplies in shale and other unconventional formations across the country. As a result of developments in this technology and the rapid expansion of its use, natural gas production in the Unites States has reached levels not seen in decades.[1] In the last 5 years, more than 90 percent of the natural gas wells drilled on federal lands were accessed using hydraulic fracturing. This technology has helped natural gas production on federal lands to more than double in the last 20 years. Onshore oil production on federal lands also continues to increase and currently accounts for approximately 6 percent of total domestic production.

As the use of hydraulic fracturing has grown, so have concerns about its environmental and public health impacts. One concern is that hydraulic fracturing fluids used to fracture formations contain numerous chemicals that could harm human health and the environment, especially if they enter drinking water supplies. According to the Department of Interior (DOI), approximately one-third of a random sample chosen to represent gas wells on federal lands was hydraulically fractured in, near or below an underground source of drinking water.

In February 2011, Rep. Edward J. Markey (D-Mass.), Ranking Democrat on the Natural Resources Committee, and Rep. Rush D. Holt (D-N.J.), Ranking Democrat on the Energy and Mineral Resources Subcommittee, launched an investigation to examine the practice and oversight of oil and gas drilling on federal lands. As a part of that inquiry, the lawmakers asked the DOI for information regarding safety or drilling violations that have occurred on federal lands over the last ten years. Over several months, the Department provided Committee staff with data responsive to the Markey-Holt request. This report summarizes and analyzes the information provided to the Democratic committee staff.

Short of shutting down a well's operation, the Interior Department's strongest enforcement tool against companies that fail to comply with the rules and regulations of drilling on federal lands is to levy monetary fines. However, in order for these fines to serve as a deterrent for noncompliance they must be: 1) issued consistently to all companies on all federal land, 2) large enough to incentivize compliance, and 3) based on accurate and complete information regarding oil and gas activities occurring on federal lands.

The Democratic Committee staff's analysis shows that only a very small percentage of violations result in fines and that the fines that are levied amount to nothing more than pocket change for billion-dollar oil and gas companies. The majority of the major safety violations stem from the failure of a blowout preventer or casing and cementing of the well, which all became visible deficiencies in offshore oil drilling following the Deepwater Horizon oil spill. This analysis also exposes the fact that oil and gas companies have on dozens of occasions initiated drilling on federal lands before they have received formal approval to do so. Furthermore, many violations were issued because companies failed to keep proper records and conduct routine safety tests, which could potentially conceal

[1] Natural gas production in the U.S. in 2010 reached 21,577 billion cubic feet. Energy Information Administration (EIA), *Natural Gas Monthly (Mar. 2011)*. See: www.eia.gov/dnav/ng/hist/n9070us1A.htm

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significant safety issues, and makes it more difficult for the Department of Interior to conduct effective oversight on drilling operations. Astonishingly, monetary fines issued for all drilling violations occurring on all federal lands, over the decade covered in this report amounted to a total of just $273,875.

One challenge for assessing fines lies in the outdated structure for monetary fines and civil penalties, which was first set in the early 1980s and has never been revised. Nearly 30 years later, these low monetary penalties can be far below a company's daily operating costs and, accordingly, inconsequential to many operators. As a result, oil and gas drillers that pollute groundwater, spill toxic chemicals or break other rules have little to fear from inspectors.

These types of monetary penalties and the inconsistent way in which they are levied do little to ensure accountability and protection of the surface and subsurface environment. As the rapid expansion of natural gas drilling continues, the DOI must revise its drilling and safety regulations to account for more widespread use of technologies like hydraulic fracturing and significantly revise its inspection and enforcement strategies to ensure that extraction of natural gas from deep below the earth's surface does not do irreversible harm to the environment and public health.

Results in Brief

- There were a total of 2,025 safety and drilling violations that were issued to 335 companies drilling in seventeen states between February 1998 and February 2011. Of these, 27 percent were classified by Committee staff as a major environmental or safety violation, 20 percent as a minor safety violation and 53 percent as a minor drilling or operational violation.

- Oil and gas drilling activities on public lands may endanger drinking water. Approximately one-third of a random sample chosen by the DOI to represent oil and gas wells on federal lands was hydraulically fractured in, near or below an underground source of drinking water. The widespread use of this drilling practice at such locations underscores the importance of ensuring that hydraulic fracturing operations be conducted in a fashion which will not threaten drinking water supplies. Anecdotally, and through a casual conversation that occurred with the operator after the well had already been fractured, the DOI was made aware of one case in which diesel fluid was used during hydraulic fracturing in a well in Wyoming that was completed in 2008, without a permit, without prior knowledge of the agency and in potential violation of the Safe Drinking Water Act.

- There were many violations that could endanger health and safety of workers and the environment. An evaluation of the data found many examples of major environmental or safety violations reported during this period, including a 2008 blowout of a well in North Dakota that was not immediately reported to the DOI; an operator in Mississippi that did not install a blowout preventer or any other safety equipment to control the well in the event of a blowout; and an improper casing and cement job in Wyoming that led to leaks of water and gas through the cement of the well.

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- There were 549 violations classified as "major" by Committee staff, 53 percent of which (293 violations) were related to non-functional blowout preventers. In addition, 25 percent of what were classified as minor safety violations (104 out of 410 violations) were issued because of minor problems with the blowout preventer or other device that could impact well control. In all, problems with blowout preventers or other devices responsible for well control constituted 20 percent (397 out of 2,025 violations) of all violations.

- Some operators fail to get approval from DOI prior to drilling on federal lands. In fifty-four instances, operators were given written citations for violations related to drilling on federal lands before they received the appropriate approval. In many instances, according to DOI staff, these violations were given because an operator began drilling on federal lands before the permit to drill was fully processed and approved by the DOI.

- More than one-fifth of major violations involved a compromise of vital casing and cementing. Twenty-one percent of the 549 major cited environmental or safety violations were issued because of deficiencies in casing and cementing programs. Appropriate casing and cementing is the first line of defense in protecting underground sources of drinking water.

- Operators frequently violate safety testing, record-keeping and notification requirements. The majority (628 out of 1,066 total or 60 percent) of the minor drilling or operational violations were issued for safety testing, record-keeping and notification violations. These included written violations for failing to comply with requirements to keep records of operations and to notify the Department of significant activities. Failure to keep such records or reports when required to do so could potentially conceal significant safety issues, and makes it more difficult for the agency to conduct effective oversight on drilling operations occurring on federal lands.

- Monetary penalties are almost never issued and when issued amount to very little. Despite the fact that many of these violations were issued for serious safety and environmental reasons, only 125 (six percent) of all the violations were levied a monetary fine. Although the violations that occurred were spread across 17 states, eight states (AK, AR, LA, ND, NV, OH, SD, and WV) never issued a monetary fine of any amount during the entire period examined. Additionally, only 64 out of the 335 operators with violations were ever levied a monetary fine. The fines that were levied also amounted to very little. In fact, fines issued on all federal lands for violations dating from February 1998-February 2011 amounted to a total of just $273,875. For example, in 2003 an operator was found to be discharging fluids directly from the rig into the Washita River in Oklahoma. As a penalty for this, the operator was issued a monetary assessment of only $2,500, which is less than what some of the largest oil and gas companies can earn in a minute.[2]

[2] In its 2011 3rd quarter financial report the 3 top U.S. Oil and Gas Companies (Exxon Mobil, ConocoPhillips and Chevron Corporation) each reported earnings of over $7 billion. See for example: http://www.chevron.com/chevron/pressreleases/article/10282011_chevronreportsthirdquarternetincomeof78billionupfrom38billioninthirdquarter2010.news

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- The issuance of monetary fines is inconsistent. There were frequent incidences in which a specific activity led inspectors to issue a monetary penalty against one operator, but not against another, when the second operator was found to have committed the identical violation. This occurred even within the same state, even though each state presumably has uniform inspection and enforcement processes and protocols. Even among those operators that were frequent repeat violators, there were four companies that never once received a fine, despite the fact that companies with even fewer violations did receive a fine. This lack of consistency in the issuance of monetary penalties calls into question the adequacy and effectiveness of the oversight of onshore oil and gas drilling operations and the ability of the DOI to ensure safety and environmental performance of hydraulic fracturing as this practice expands on federal lands.

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Background

The Bureau of Land Management (BLM) within the Department of Interior (DOI) oversees approximately 700 million acres of sub-surface mineral estate throughout the nation and issues leases for natural gas development on federal lands.[3] In the last 20 years, natural gas development on federal lands has more than doubled, from 1.2 trillion cubic feet (Tcf) in fiscal year 1991 to nearly 3.0 Tcf in fiscal year 2010.[4] In fiscal year 2010, about 14 percent of domestically produced natural gas and about 6 percent of domestically produced oil came from onshore public lands.[5] Much of the increase in natural gas production comes from increased accessibility to unconventional sources of natural gas, including tight sands, coalbed methane and shale rock. This accessibility is largely credited to advances in drilling technologies, including horizontal drilling and hydraulic fracturing (sometimes referred to as "fracking"). The combined use of these technologies have made vast reserves of natural gas economically recoverable, triggering a wave of new production activities across the United States and an increase in gas production on federal lands.

Hydraulic Fracturing

Hydraulic fracturing is a well stimulation technique used to maximize production of oil and gas in unconventional reservoirs. In order to create additional permeability in the producing oil or gas formation, hydraulic fracturing is used to create spaces (or fractures) in the rock pores enabling the oil or gas to flow more freely to producing wells. To create these fractures, the process of hydraulic fracturing involves pumping millions of gallons of water combined with sand and often-unidentified chemical agents (collectively known as fracturing fluids) down the well bore at extremely high pressures. More recently, this same drilling technique has been used to produce oil from low permeability shale deposits in the United States. According to the BLM, over the last decade, leasing and exploration activities on BLM-managed public lands has focused mainly on the development of natural gas resources. Professional estimates from BLM field offices projected that 90 - 95 percent of gas exploration and development on federal lands over the last five years was accessed using hydraulic fracturing.[6] There has also been an increase in hydraulic fracturing used to access oil deposits. According to the National Petroleum Council hydraulic fracturing accounts for approximately 43 percent of total U.S. oil production.[7]

With increased use of this technology, there has been an increase in public concern about the impacts of hydraulic fracturing on water quality, water quantity, public health, and the environment. Many of the concerns have centered on contamination of drinking water, if fracturing fluids were to seep into groundwater or surface water during the process of hydraulic fracturing. Oil and gas companies use a variety of additives and chemicals in their fracturing fluid with the goal of widening and extending the length of the fractures and transporting large

[3] http://democrats.naturalresources.house.gov/content/files/2011-06-03_LTR_DOIResponseTo2011-02-28Lttr.pdf
[4] http://www.blm.gov/wo/st/en/info/newsroom/Energy_Facts_07.html
[5] http://www.standard.net/topics/business/2011/04/01/blm-hold-forums-natural-gas-fracturing
[6] http://democrats.naturalresources.house.gov/content/files/2011-11-17_LTR_DOIResponseREUSDW.pdf
[7] Prudent Development: Realizing the Potential of North America's Abundant Natural Gas and Oil Resources (2011). National Petroleum Council.

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amounts of material to "prop open" the fractures. While some of these chemicals are generally harmless, such as sand and salt, an investigation by the House Energy and Commerce Committee Democratic staff released by Reps. Henry A. Waxman (D-Calif.), Edward J. Markey (D-Mass.) and Diana DeGette (D-Colo.) found that between 2005 and 2009, 14 leading oil and gas companies used more than 780 million gallons of hydraulic fracturing products containing 750 different chemicals, including carcinogenic and other toxic components such as lead and benzene.[8] In fact, these companies used 29 distinct chemicals that are known or possible human carcinogens, regulated under the Safe Drinking Water Act (SDWA) for their risks to human health, or listed as hazardous air pollutants under the Clean Air Act. The investigation also found that 12 of the 14 companies used more than 32 million gallons of diesel fuel — which often contains benzene, toluene, ethylbenzene and xylenes (the BTEX compounds) — chemicals known for their toxicity and adverse health impacts in 20 states.[9]

In a 2004 report, the Environmental Protection Agency (EPA) stated that the "use of diesel fuel in fracturing fluids poses the greatest threat" to underground sources of drinking water.[10] The Energy and Commerce Committee investigation found that the utilization of diesel by these companies in fracturing fluids occurred without knowledge of the state and federal regulators, a direct violation of the 2005 Energy Policy Act. The law includes a provision that exempts hydraulic fracturing operations from the permit requirements of the Safe Drinking Water Act unless diesel fluid is being used.[11] Whenever diesel fluid is being used in hydraulic fracturing operations, the operators are required to receive prior authorization from state or federal regulators.[12] The EPA recently found chemicals commonly used in hydraulic fracturing in a drinking water aquifer in Pavilion, Wyoming. Through monitoring wells, EPA found several synthetic cancer causing compounds, including 2-butoxyethanol, glycols, naphthalene, toluene as well as benzene, which was found at a concentration 50 times the federal Safe Drinking Water standard.[13] According to an EPA report published in 1987, this was not the first incidence in which drinking water was found contaminated with fracturing fluids. A West Virginia drinking water well was found to be contaminated with fracturing fluids and natural gas from nearby drilling operations in 1984.[14] The EPA also recently began sampling water from approximately sixty homes in Dimock, Pennsylvania after residents raised concerns that their water was contaminated with hazardous substances from nearby drilling activities.[15] The EPA is currently conducting a national study on the impacts of hydraulic fracturing on drinking water resources. Initial results from that study are expected at the end of 2012, with a final report expected in 2014.

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[8] http://democrats.energycommerce.house.gov/index.php?q=news/committee-democrats-release-new-report-detailing-hydraulic-fracturing-products

[9] http://democrats.energycommerce.house.gov/index.php?q=news/reps-waxman-markey-and-degette-report-updated-hydraulic-fracturing-statistics-to-epa

[10] U.S. Environmental Protection Agency, Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coal bed Methane Reservoirs (June 2004) (EPA816-R-04-003) at 4-11.

[11] 42 U.S.C. § 300h(d)

[12] While the SDWA excludes hydraulic fracturing from underground injection control (UIC) regulation, the use of diesel fuel during hydraulic fracturing is still regulated by the UIC program.
See: http://water.epa.gov/type/groundwater/uic/class2/hydraulicfracturing/wells_hydroreg.cfm

[13] See for example: http://www.nytimes.com/2011/12/09/us/epa-says-hydraulic-fracturing-likely-marred-wyoming-water.html

[14] "A tainted Water Well, and Concern There May Be More" *The New York Times,* August 3, 2011

[15] http://yosemite.epa.gov/opa/admpress.nsf/0/8eb78248ce13d9dc8525798a0070f991?OpenDocument

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Disposal of hydraulic fracturing wastewater is another public health and environmental concern. As much as 80 percent of the fluids injected for hydraulic fracturing returns to the surface as "flowback," which can be contaminated with tens of thousands of pounds of chemicals, naturally occurring radioactive material, salt and sand. A deep horizontal shale well can use anywhere from 2 to 10 million gallons of water to fracture a single well.[16] While the percentage of chemical additives in hydraulic fracturing fluid is typically small,[17] the quantity of fluid used in the fracturing process is so large that the United States Geological Survey estimates that three million gallons of fracturing fluid would yield about 15,000 gallons of chemicals in the waste.[18] Earlier this year, The New York Times released results of an investigation[19] that indicated that the recovered fracturing fluid, which flows back up the well after drilling, is loaded with naturally occurring radioactive elements associated with the shale formations. The investigation suggested that millions of gallons of drilling wastewater contaminated with radioactive radium, at levels that far exceed the safe drinking water standards, were dumped into rivers and other U.S. waterways. In several cases, fracturing wastewater was sent to treatment facilities that could not adequately treat it. The New York Times investigation also found that natural gas from hydraulic fracturing operations had seeped into underground drinking water supplies in at least five states, including Colorado, Ohio, Pennsylvania, Texas and West Virginia. Wastewater pumped into disposal wells has also been implicated in small earthquakes in Texas, Arkansas and Ohio.[20] The most recent of this seismic activity, which occurred on December 31, 2011 in Youngstown Ohio, led officials to halt all underground injection of wastewater until further assessment of the earthquakes could be performed.

Proper well construction and operation are necessary for the safe production of oil and natural gas. There have been several notable cases in which hydraulically fractured wells have blown out, due to faulty construction, cementing or defective equipment, spilling large quantities of fracturing fluids and natural gas and causing the evacuation of multiple households.[21] One such event occurred in April 2011 when equipment failure at a well in Pennsylvania that was in the process of being hydraulically fractured, caused tens of thousands of gallons of chemical-laced water to spew out of the well and into a nearby creek, causing evacuation of homes and temporary suspension of drilling activities at nearby sites.[22] These events have highlighted the need for a more holistic approach in determining the environmental impacts of natural gas drilling, an approach that focuses not just on the process of hydraulic fracturing itself, but the entire drilling process from exploration to reclamation.

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[16] Kargbo, D. et al. Natural Gas Plays in the Marcellus Shale: Challenges and Potential Opportunities. *Environ. Sci. Technol.*, 2010, 44 (15), pp 5679–5684

[17] Estimates range between 0.5 and 2% of the total volume of fracturing fluid.
See for example: http://www.gwpc.org/e-library/documents/general/State%20Oil%20and%20Gas%20Regulations%20Designed%20to%20Protect%20Water%20Resources.pdf

[18] http://pubs.usgs.gov/fs/2009/3032/pdf/FS2009-3032.pdf

[19] "Regulation Lax as Gas Wells' Tainted Water Hits River" *The New York Times*, February 26, 2011

[20] See: http://mobile.bloomberg.com/news/2012-01-03/ohio-halts-wells-after-quake-won-t-stop-natural-gas-drilling?category=%2Fnews%2Fenvironment%2F

[21] See for example: http://news.yahoo.com/s/ap/20110305/ap_on_re_us/us_onshore_well_blowouts

[22] http://www.reuters.com/article/2011/04/21/us-chesapeake-blowout-idUSTRE73K5OH20110421

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Management of Federal Mineral Resources

The Bureau of Land Management has leased approximately 42 million acres for oil and gas development,[23] essentially six percent of the entire federal onshore mineral estate. Of these 42 million acres, about 12.2 million acres are currently in production with an estimate of an additional one million acres that will come into production during the next ten years.[24]

Section 604 of the Energy Policy and Conservation Act (EPCA) of 2000, as amended by Section 364 of the Energy Policy Act of 2005, required an inventory report of all onshore Federal lands to identify estimates of the oil and gas resources underlying these lands.[25] The most recent of these reports issued in 2008, demonstrates that 34 percent of the technically recoverable[26] onshore oil resources and 35 percent of the technically recoverable natural gas resources within the United States are on federal lands. This translates to an estimated 30.6 billion barrels of oil and 231 trillion cubic feet of natural gas that are technically recoverable from the federal onshore mineral estate.

Currently, natural gas operations on federal lands are primarily governed by what is known as the Onshore Oil and Gas Order No. 1 and No. 2 (43 CFR 3160). Onshore Order No. 1 (amended in 2007) contains the information an operator must submit to the BLM for the approval of proposed gas exploration and development on federal lands. These submittal requirements include items such as design of casing strings, cementing programs for the casing strings and the type of well control equipment proposed to be used by the operator. Onshore Order No.2 sets the minimal requirements for well design, construction and well control, including minimum casing and cementing requirements. However, Onshore Order No. 2 has not been updated since 1988 and reflects neither the significant technological advances of hydraulic fracturing and associated technologies nor the tremendous growth in its use.

While an operator is mandated to get an approved permit for drilling on federal lands, BLM's current regulations do not require an operator to get additional approvals to undertake hydraulic fracturing operations nor do they contain provisions that would mandate that an operator disclose the chemical components or volumes of fracturing fluids used in wells on public lands. As a result, important information about drilling operations on federal lands is not required to be disclosed by operators. In fact, when asked if BLM was ever aware of an instance in which diesel fluid was used on federal lands as a part of hydraulic fracturing operation, BLM responded that an operator in Wyoming utilized diesel in hydraulic fracturing activities without a permit. BLM only found out about the use of diesel through a casual conversation with the operator after the well had already been hydraulically fractured. This well was completed in 2008 and further details or documentation of the use of diesel on this well was not available. Additionally, in 2001, BLM received a Notice of Intent for the hydraulic fracturing of a well in Anchorage, Alaska. The submitted proposal stated that diesel would be used and provided an initial estimate of 700 barrels of diesel. This procedure was approved by BLM and the well was subsequently

[23] Oil and gas development are not tracked separately and are often produced from the same lease
[24] http://democrats.naturalresources.house.gov/content/files/2011-06-03_LTR_DOIResponseTo2011-02-28Lttr.pdf
[25] http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/EPCA_III.html
[26] Technically recoverable resources are resources that are recoverable using current exploration and production technology without regard to cost or profitability.

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stimulated. Information regarding the actual final volume of diesel used or whether the well was in or near an underground source of drinking water was not available.

In response to escalating public concerns and the anticipated growth of oil and natural gas exploration and production, the DOI began hosting a series of public forums in 2010 to discuss hydraulic fracturing techniques and examine best practices that should be put in place to ensure that development of natural gas on public lands proceeds in a responsible and environmentally sustainable manner.[27] As a part of this process, the BLM also held three regional public meetings in Colorado, North Dakota, and Arkansas — states that have experienced significant increases in natural gas development.[28]

In August 2011, the Secretary of Energy Advisory Board (SEAB) issued a report with recommendations for improving the safety and environmental performance of natural gas hydraulic fracturing from shale formations. The report included 20 recommendations in four key areas: 1) public accessibility to information about gas production, 2) short term and long-term actions to protect air and water quality, 3) systemic approach to development of best operating practices, and 4) research and development to improve safety and environmental performance.[29] Among the recommendations included in the report are:

- disclosure of all chemicals used in fracturing fluid at each well;
- using a life-cycle approach to managing and tracking water and wastewater, including developing best practices for casing and cementing;
- extensive testing, monitoring, and disclosure of air pollution associated with gas development;
- reduction in diesel use;
- improving communication among state and federal regulators; and
- further study of the climate change impacts posed by natural gas development.

In this report, the SEAB also highlighted DOI's unique position to address cumulative impacts of shale gas drilling and cautioned that if concerted and sustained action is not taken "there is a real risk of serious environmental consequences and a loss of public confidence."[30] Secretary of Interior Ken Salazar has also stated "BLM is considering revisions to its current regulations to address disclosure of chemicals used in fracturing fluids."[31] During a meeting of the SEAB, David Hayes, Deputy Secretary of the DOI spoke about the department proposing new rules that would among other things focus on "extending existing well-bore integrity standards to the hydraulic fracturing phase of development" to protect against leaks.[32] Recently, a draft of BLM proposed regulations for hydraulic fracturing on federal lands leaked to the press.[33] In response, DOI stated that the proposed rules seek to ensure disclosure of hydraulic fracturing fluids, improve assurances on well-bore integrity and ensure companies have water

[27] See: http://www.blm.gov/co/st/en/BLM_Information/newsroom/2011/april/blm_to_hold_regional.html
[28] http://www.bismarcktribune.com/news/state-and-regional/article_341d8db6-5ce5-11e0-bf59-001cc4c03286.html
[29] http://www.shalegas.energy.gov/resources/081811_90_day_report_final.pdf
[30] http://www.shalegas.energy.gov/resources/111011_press_release.pdf
[31] Ken Salazar (Secretary of Interior). Quote from: U.S. Congress. Hearing of the House Natural Resources Committee. "The Future of U.S. Oil and Natural Gas Development on Federal Lands and Waters" (Date: 11/16/2011)
[32] http://origin-www.bloomberg.com/apps/news?pid=conewsstory&tkr=APC:US&sid=aO0BaKF5YtlA
[33] "Exclusive: First glimpse of fracking rules" *PoliticoPro Energy.* February 2, 2012

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management plans for fluids that flow back to the surface. The department has no projected date for the draft's official release or finalization of the proposed rules and will continue to gather public input in developing final rules.

Bureau of Land Management Enforcement and Inspections

The mission of BLM's Oil and Gas Inspection and Enforcement Program (I&E Program) is to ensure full compliance with the laws and regulations governing oil and gas companies operating on federal and Indian lands. BLM's Washington, D.C. office headquarters, state offices and field offices design and implement annual inspection strategies. The Washington, D.C. office prescribes guidelines, policies, and procedures for inspections conducted during the year by state and field offices. Inspectors operate out of 32 BLM field offices, located primarily in California, Colorado, Montana, New Mexico, Oklahoma, Utah and Wyoming.[34]

Inspections play an important role in protecting public lands from environmental degradation and help to ensure that oil and gas operations on federal and Indian lands are prudently conducted in a manner that minimizes waste, protects surface and subsurface environment and ensures general public safety. Environmental inspections may be completed in all phases of a well's life cycle, from site construction to final reclamation. If regulatory violations are uncovered, field inspectors issue a notice of Incident of Noncompliance (INC) or a written violation notice, which may include an immediate monetary assessment and can be issued for both major and minor regulatory violations. An example of a major violation may be failure to install the appropriate well control equipment, while a minor violation may include issues such as inadequate fencing around disposal pits or a missing well identification sign. Monetary assessments are fixed at $250 for a minor violation and $500 per day for a major violation. In addition to assessments, BLM inspectors also have authority to issue civil penalties, which involve varying daily dollar fines that are calculated according to the severity of the violation. Civil penalties range from $500 to $10,000 per day depending upon how long the infraction(s) have continued uncorrected. As a last resort, BLM can choose to cancel the operator's lease if an operator fails to comply with previous enforcement actions. However, to date, BLM has never cancelled a lease because of noncompliance.

[34] U.S. Department of the Interior, Office of Inspector General. Evaluation Report: Bureau of Land Management's Oil and Gas Inspection and Enforcement Program. December 2010.

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Investigation

In February 2011, Reps. Markey and Holt queried the Department of Interior DOI Secretary Ken Salazar for more information about the practice and oversight of oil and gas drilling activities on federal lands.[35] In response to this inquiry, the Department of Interior (DOI) provided a listing of all oil and gas operators that have received an incident of noncompliance or violation for safety or drilling reasons in the last decade – a total of 2,025 individual violations. The information supplied by the DOI provided the location, operator, date and nature of the violation as well as information about any monetary penalties levied against the operators of a noncompliant well. The DOI provided information for violations covering fiscal year 2000 through March 2011 – spanning 11 years and 5 months. Because some of these violations were not immediately resolved, the actual violations in this report date from February 1998 through February 2011.What follows is the Democratic Committee staff's analysis of the enforcement data provided.

Methodology

Using the data provided by the Department of Interior which catalogued oil and gas operators that have received an incident of noncompliance for safety or drilling reasons and the nature of the violation, Natural Resources Democratic Committee staff classified each of the violations into three main categories: (1) major environmental or safety violations (2) minor safety violations and (3) minor drilling or operational violations.

The classification was made based on an evaluation of the nature of the violation as described by BLM officials at the time the violation was discovered. If the nature of the violation posed an immediate threat to the health and safety of the public (workers on the site) or endangered the surface or subsurface environment, it was classified as a major environmental or safety violation by the Committee staff. If the nature of the violation described did not rise to the level of a major violation, but nonetheless had the potential to impact the safety of the workers or integrity of the well, it was classified as a minor safety violation. The violation was classified as a minor drilling or operational violation if the violation detailed did not threaten worker safety or the environment and dealt primarily with the day-to-day operation of a drill site. Each of these three main categories were further subdivided and grouped into subcategories of violations to reflect the more specific type of violation that occurred. For an explanation of the subcategories used by the Committee staff to analyze the data, see Appendix A.

In some cases there were so few of a particular type of violation or the description of the violation was too cryptic to place into one of the specific subcategories. In these instances the violation was placed into a generic "other" category. Because inconsistent and incomplete descriptions of violations were sometimes used by inspectors, it is possible that some violations were inconsistently or imprecisely categorized by the Committee staff. Additionally, the duration of the violation was not consistently noted by the inspectors in the description of the violation and therefore duration was not used by the Committee staff in classifying a violation. While

[35] http://democrats.naturalresources.house.gov/pr@id=0018.html

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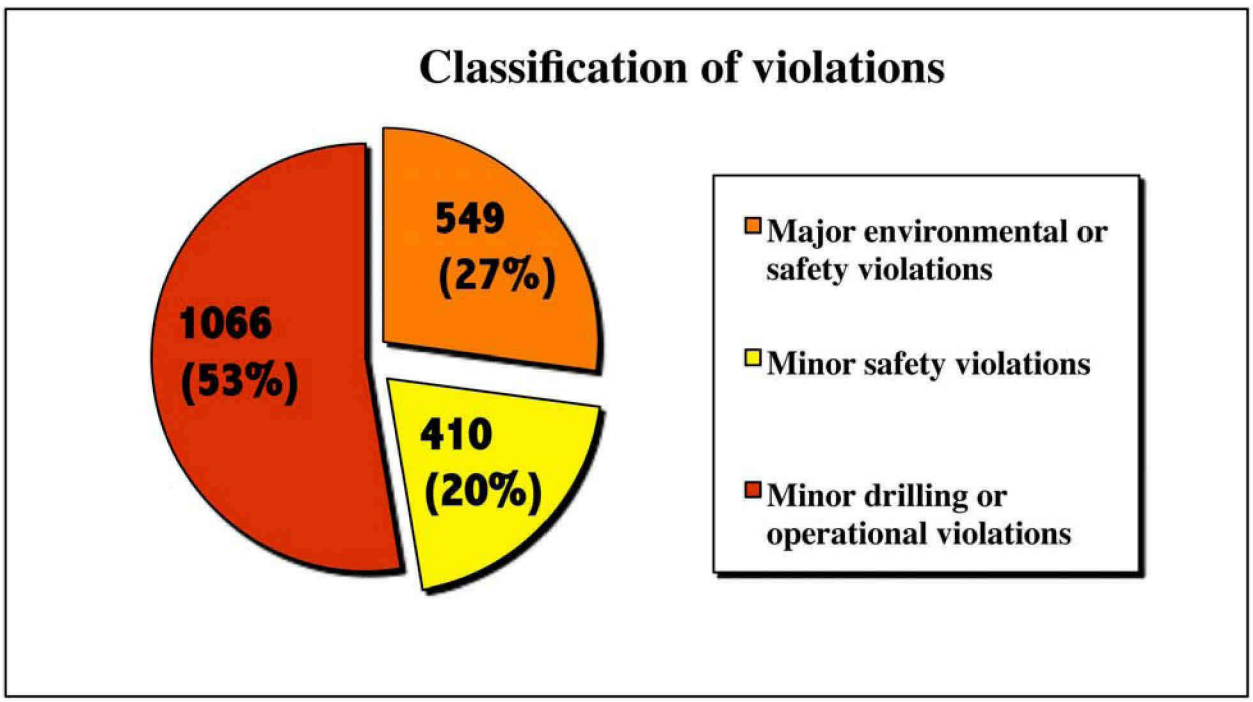
Committee staff attempted to utilize inspectors' own classification of whether a violation was considered a major or minor incident of noncompliance, a review of the data found identical violations that were classified differently by BLM field offices, making the inspectors' classifications of this information inadequate for purposes of our analysis. Addressing these inconsistencies in data entry and the interpretation and classification of violations would be an important step for DOI to take in order to improve its oversight and enforcement of drilling activities.

Findings

There were a total of 2,025 violations for safety and drilling violations issued to 335 companies drilling in seventeen states dating from February 1998 through February 2011. Of these, 27 percent were classified by the Committee staff as a major environmental or safety violation, 20 percent as a minor safety violation and 53 percent as a minor drilling or operational violation.

Figure 1: Classification of Violations



Oil and gas wells on public lands may endanger drinking water

In response to Representatives Markey and Holt's query about the relationship between hydraulic fracturing on public lands and underground sources of drinking water, the BLM conducted a review of 706 randomly-selected wells. This sample was chosen to reflect the more than 86,000 wells present on federal lands and provide a statistical confidence rate of 95

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percent.[36] Information was provided as to whether wells in this sample were hydraulically fractured and if so, if they were located within, near, or below an underground source of drinking water (i.e. aquifer).[37] The BLM does not specifically track the co-occurrence of oil and gas with underground sources of drinking water. However, the BLM does evaluate the potential for groundwater occurrences during the permitting process.[38] In response to Reps. Markey and Holt's inquiry the BLM was able to retrospectively review a sample of randomly selected oil and gas wells to determine if drilling occurred in, near or below an underground source of drinking water.[39] Wells drilled in coalbed formations are of particular concern, since these formations typically contain shallow aquifers that could be used for drinking water. Wells drilled in coal bed formations were considered by BLM to have occurred in an underground source of drinking water.

In total, 210 out of the random sample of 706 oil and gas wells (30 percent) were hydraulically fractured in, near or below an underground source of drinking water. The information provided indicates that 49 out of 706 wells (7 percent) were drilled in an underground source of drinking water[40] and 100 percent of these 49 wells were gas wells stimulated by hydraulic fracturing. Additionally, 113 natural gas wells (16 percent of the sample) and 43 oil wells (6 percent of the sample) were hydraulically fractured below an underground source of drinking water. An additional five hydraulically fractured natural gas wells were located within one-quarter of a mile of an aquifer, an area considered close enough to endanger underground water resources.[41] There were a total of 337 wells (115 oil wells and 222 gas wells) that were hydraulically fractured, but were not located in, near or below an underground source of drinking water.[42] Out of the sample of 706 wells, 158 (22 percent) were not hydraulically fractured. The proximity of these wells to an underground source of drinking water was not provided by BLM.

Information provided by BLM indicated that there were at least two instances in which diesel fuel was used in hydraulic fracturing of a well. One of these instances occurred in Wyoming, where an operator used diesel in the hydraulic fracturing fluid of a well without a permit and without the BLM's knowledge—a potential violation of the Safe Drinking Water Act. It was only after completion of this well in 2008, that BLM learned of the use of diesel through a casual conversation with the operator of this well. Because of this, it is unknown whether this well was in, near or below an underground source of drinking water. Diesel was also used in a well in Anchorage, Alaska in 2001. In this case BLM did know that diesel was being used, since it was noted in the submitted drilling procedure, but information regarding the actual final volume of diesel used or whether the drilling occurred in, near or below a drinking water source

[36] http://democrats.naturalresources.house.gov/content/files/2011-11-17_LTR_DOIResponseREUSDW.pdf
[37] An underground source of drinking water is an aquifer or part of an aquifer which supplies water for human consumption.
[38] Operators are required in an Application for Permit to Drill (APD) to identify all usable water zones.
[39] Coal bed natural gas produced from coal seams containing underground sources for drinking water (USDW) were used as a proxy for determining if drilling occurred in a USDW. Near an USDW was defined as within a fixed radius of not less than one-quarter of a mile.
[40] Coal bed natural gas produced from coal seams containing an underground source of drinking water were used to determine if fracturing occurred in a underground source of drinking water.
[41] The zone of endangering influence is the distance from a well in which the pressures in the injection zone may cause the migration of drilling /fracturing fluid into an underground source of drinking water.
[42] Defined by BLM to mean wells fractured in an area that does not supply a public water system or; in an area that may have sufficient water to supply a public water system but does not currently supply water for human consumption or; does not supply water that is less than 10,000 mg/l total dissolved solids.

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is unknown. Under the 2005 Energy Policy Act, any company that performs hydraulic fracturing using diesel fuel must receive a permit to be in compliance with the Safe Drinking Water Act.

To protect underground water sources, BLM requires operators to develop casing and cementing plans to isolate the injection of hydraulic fracturing fluids and makes it a priority to witness the process to ensure that it occurs in a manner that will not compromise these water supplies. However, as is discussed below, casing and cementing procedures are frequently not followed and operators regularly fail to notify BLM as to when these procedures will occur. As a result, casing and cementing activities are often performed without a BLM witness present to ensure it happens in a manner that would protect water sources.

Many major violations related to non-functional blowout preventers

The blowout preventer (BOP) is a large valve that can be operated remotely to shut down the well if necessary, for example when encountering unexpected flow or erratic pressure. The system is a critically important feature to the safety of the crew, the drilling rig and the wellbore itself. The essential role of the BOP in safeguard drilling operations was dramatically underscored when the failure of the BOP at the Macondo well site in the Gulf of Mexico led to the BP Deepwater Horizon disaster, our nation's worst offshore oil spill.

Of the major environmental or safety violations 477 out of 549 (87 percent) were issued because safeguard systems were not installed or functional. These safeguards were related to drilling mud (used to control pressure in the well), the flare system (used to eliminate waste gas), cementing and casing (used to isolate water zones) and well control equipment, including blowout preventers. For example, in 2009 an operator in Colorado was found to be missing a well control device "that is capable of complete closure of the well bore," according to the BLM violation information provided. Additionally, in 2009 another operator in Mississippi was found operating a well without a blowout preventer or other equivalent well control equipment.

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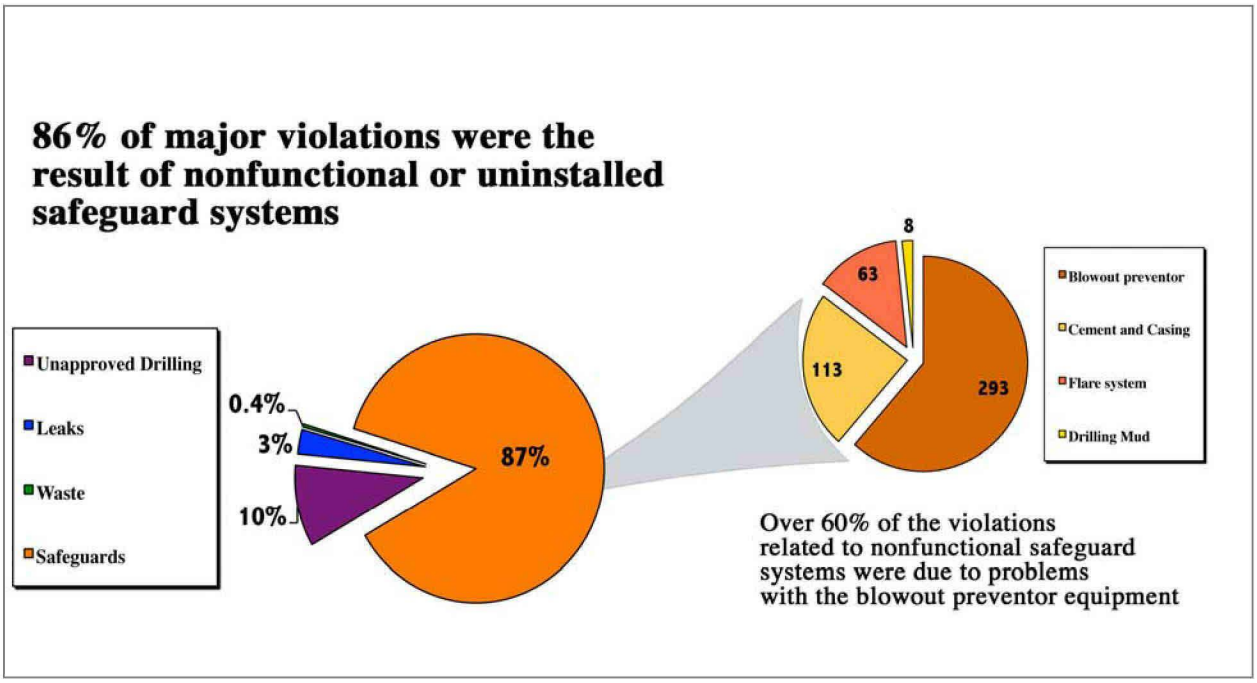
Figure 2: Breakdown of Major Environmental or Safety Violations



Fifty-three percent of the major environmental or safety violations were issued because the blowout preventer (BOP) and related equipment was not installed in a manner that would ensure well control in the event of a blowout. For example, in 2010 an inspector in New Mexico found that one of the valves in the BOP responsible for mitigating excessive pressure and stopping flow was leaking and needed immediate replacement. There are several instances in which operators were drilling thousands of feet below the earth's surface without any method of well control. This often wasn't discovered until after the well had already been completed. In 2008, a well in North Dakota experienced a blowout that was never reported to BLM. As a result, BLM had to issue a request to the operator to find out details about the nature of the blowout and the plans the operator has for future operation on the leased land.

Vital casing and cementing procedures are commonly compromised

Another vital part of the drilling, hydraulic fracturing (stimulation) and well completion process is ensuring adequate casing and cementing. Well casing consists of a series of metal tubes installed in the freshly drilled hole that are cemented into place to create a barrier between the underground water supplies and the well bore. Casing strengthens the sides of the well hole, ensures that no oil or natural gas seeps out of the well hole as it is brought to the surface and keeps other fluids or gases from seeping into the formation through the well. Casing and cementing is the first line of defense in protecting underground sources of drinking water. If done incorrectly, contamination of water sources could occur.

Of the major environmental or safety violations, 21 percent (113 violations out of 549 major violations) were citations that deal with deficiencies in casing and cementing programs. These include failing to follow the DOI's Oil and Gas Order No. 2, which contains minimal basic requirements for casing and cementing quality to protect and isolate usable water zones. In

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at least one instance in Wyoming, an improper casing and cement job led to water and gas leaking through the cement. In another 2010 case occurring in Colorado, an operator was given a written notice of noncompliance because they were conducting hydraulic fracturing operations too close to the top of the cement, an activity that put natural resources and environmental quality at risk.

Some operators fail to get approval prior to drilling on federal lands

In 54 instances, operators were given written notices of noncompliance for drilling on federal lands without first getting approval to do so. These types of violations were the ones that were most likely (65 percent) to be assessed a monetary penalty. These penalties ranged from $500 to $20,000, depending on the length of time the well was in operation prior to being discovered. In some instances fines were issued for physically locating a rig and drilling on federal lands before the BLM had received proper documentation to fully process and approve a permit, while other instances involved operators who were approved to drill only vertically, but instead dilled a horizontal well without approval from the BLM. In two instances, an operator was found to have drilled a water well to collect water for use in drilling and completion operations without approval from the BLM. In another case, an operator installed a pipeline without approval. In a few instances, these violations were issued because operators were told by the BLM to suspend drilling activity for a specified period of time, usually to protect wildlife, and operators violated this mandate.

Problems with power supply and well control equipment are common

Of the 410 violations that committee staff classified as minor safety violations, 25 percent were issued because of problems with the BOP or other well control device configuration that could impact well control. These violations were typically issued for infractions relating to the set up or assembly of the BOP-related equipment. This included violations for missing bolts on the wellhead equipment, valves that were not properly installed or plugged, or drilling pipes that were not correctly positioned.

Improper air supply or inoperable backup power systems were responsible for 31 percent of the 410 violations in this category. These systems are used to operate the blowout preventer and if not properly supplied could result in a BOP never being activated when needed.

Problems with storage and disposal of drilling fluids are occasionally found

Forty out of the 410 minor safety violations (10 percent) were because the storage containment vessels for chemicals, drilling fluids or waste were not designed or constructed properly to ensure environmental protection. In some cases the storage vessels were not of adequate size or located to close to the well bore, while in other cases the vessels were not adequately lined to protect surface and subsurface resources in the event of a leak.

In a few instances (19 out of 410 minor safety violations), operators were issued a written notice for soil contamination with hydrocarbons, diesel or other chemicals, likely occurring from a leak from one of the storage vessels or from otherwise sloppy rig operations.

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Operators frequently violate safety testing, record-keeping and notification requirements

As a part of onshore oil and gas operations, the operator must supply certain written requirements to BLM. Once approved, BLM issues the operator an approved permit to drill (APD) which specifies the drilling plan (as required in Onshore Order No. 1) and certain Conditions of Approval (COA). The operator of a lease is required to comply with any orders and instructions contained within the COA. These conditions include requirements for operators to keep certain records of operations and to notify BLM of certain operational activities in a timely fashion. Failure to keep such records or reports when required to do so could potentially conceal significant safety issues, and makes it more difficult for the agency to conduct effective oversight on drilling operations occurring on federal lands. Additionally, failure to notify BLM of activity that requires a federal official to witness keeps the BLM in the dark about drilling operations. The majority (628 out of 1,066 total or 60 percent) of the minor drilling or operational violations were issued for various safety testing, record-keeping and notification violations. These included written violations for lack of or incorrect well signs, failing to record or perform routine safety and equipment tests, not supplying BLM with required reports or not notifying BLM prior to changing elements of the approved permit or prior to conducting an activity in which a BLM inspector was to be present.

For example, it is a BLM priority to witness casing and cementing activities to verify that the process happens adequately enough to isolate any underground water sources. However, 184 of the 628 violations (29 percent), classified here as record-keeping issues were because the operator never told BLM that they were about to undertake a procedure in which a BLM representative was required to be present. Furthermore, there are other instances in which an operator changed the approved casing or cementing design without ever notifying the BLM. When and if this is discovered, BLM field officers will typically request that the operator provide additional technical information regarding the cementing and casing protocol that was utilized.

The remaining 438 drilling or operational violations (out of total 1,066, or 41 percent) were given because of excess surface disturbance (62 violations), inadequate fencing, netting or other security measures (193 violations), disturbing wildlife or archeological habitats (19 violations), improperly disposing of trash (66 violations), failing to conduct a mechanical integrity test (24 violations), inadequate warning signs or measurements for excessive hydrogen sulfide vapors (67 violations) and other minor drilling or operational violations (7 violations).

Monetary penalties are almost never issued and when issued are inconsistently applied

Of all the violations that were issued over the last decade only six percent (125 out of 2,025) issued to sixty-four companies were ever assessed a monetary fine in conjunction with the written incidence of noncompliance. The majority of the fines that were levied were because of a major safety or environmental violation (60 percent), while the remaining forty percent of monetary assessments were split between minor safety violations (18 percent) and minor drilling or operational violations (22 percent).

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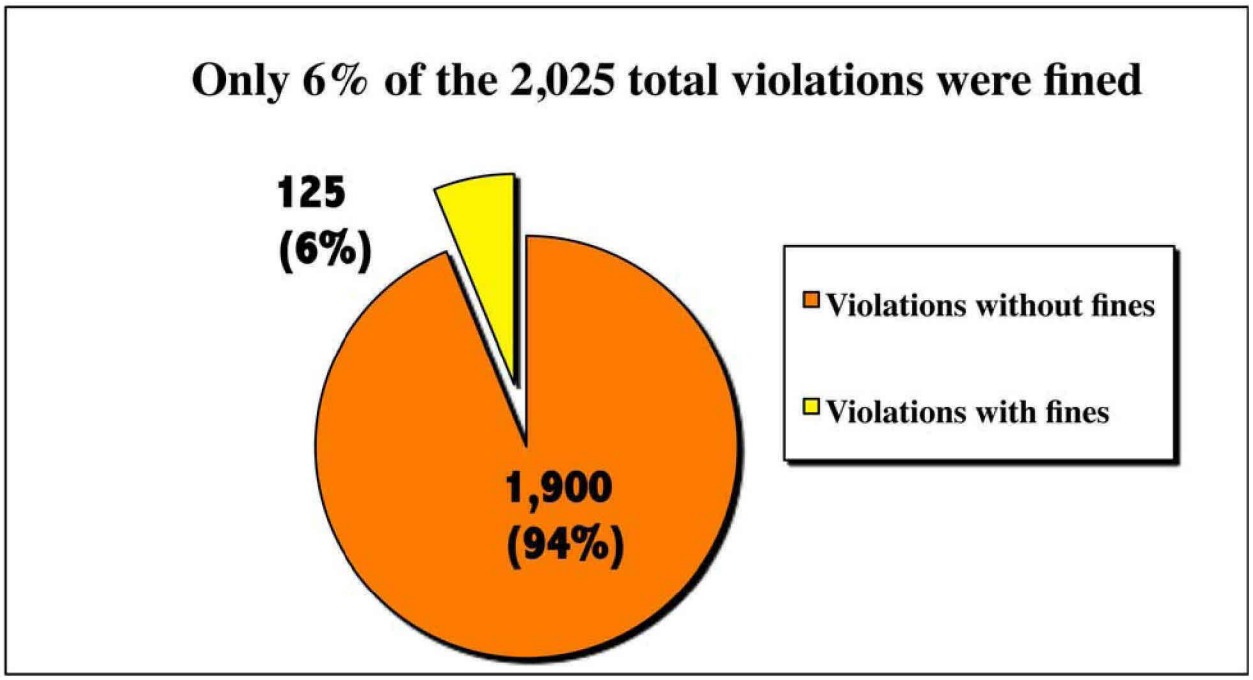
Figure 3: Percentage of Violations that Incurred Fines



Monetary fines were levied on just 64 of the 335 companies responsible for violations occurring on federal lands in the last decade and ranged in cost from $125 to $20,000 (average penalty of $2,191). There were only two violations that incurred $20,000 penalties and both were because the companies drilled into federal estate without first getting an approved permit from the BLM. While one may reasonably assume that companies with repeated incidences of noncompliance were more likely to receive a monetary penalty, this did not in fact hold true. The issuance of a monetary fine or amount of the monetary fine was not correlated to companies who were frequent violators. Five out of the twenty-one companies (24 percent) that were repeat offenders (defined by Committee staff as companies with 20 or more violations[43]) never once received a monetary penalty – despite the fact that companies with even fewer violations did receive a fine. For more information about the companies issued written violations and fines, see Appendix B.

[43] Companies with 20 or more violations in the years covered by this report include: Anadarko, Ballard Petroleum Holding, Bill Barrett Corp, BP America Production, Burlington Resources, Cabot Oil and Gas Corp, Chesapeake Operating, COG Operating, Devon Energy Production, Encana Oil and Gas, Energen Resources Corp, EOG Resources, Laramie Energy, Nearburg Producing, Newfield Exploration, Noble Energy, North Finn, Questar Exploration and Production, Ultra Resources, Williams Production RMT, XTO Energy, and Yates Petroleum Corporation.

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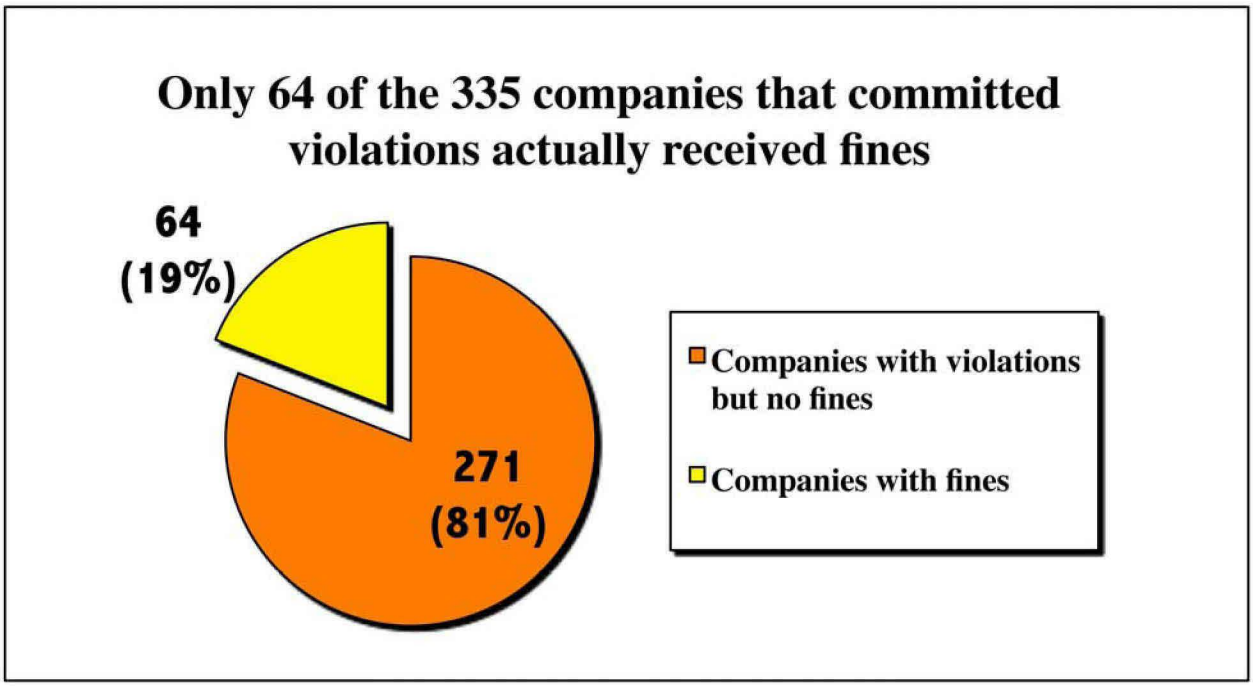
Figure 4: Percentage of Companies that Received Fines



Although the violations that occurred were spread across 17 states, eight states (AK, AR, LA, ND, NV, OH, SD, and WV) never issued a monetary fine at all, despite the fact that these states cumulatively accounted for 9 percent of all the violations that were issued. Wyoming, the state in which the most fines were issued for drilling activities on federal lands (810 violations), collected monetary fines over the entire ten year period that amounted to a total of just $120,500. In fact, collectively, fines issued on federal lands in all states for violations dating from February 1998 - February 2011 amounted to just $273,875.

There were frequent incidences in which a specific violation led inspectors to issue a monetary penalty against one operator, but not against another, when the second operator was found to have committed the identical violation. There was no apparent consistency in the BLM's issuance of monetary penalties throughout its jurisdiction, calling into question the adequacy and effectiveness of the BLM's oversight of onshore oil and gas drilling operations and the ability of the BLM to ensure safety and environmental performance of hydraulic fracturing as this practice expands on federal lands. In one of the most egregious environmental violations, an operator was cited in 2003 for discharging fluid from the drilling rig directly into the Washita River in Oklahoma and was ordered to pay a fine of only $2,500.

Even within the same state, which presumably has uniform inspection and enforcement processes, there was no consistency as to whether a particular violation received a monetary assessment or not. For instance, a violation issued in New Mexico for a failure to install the appropriate pressure gauge for well control elicited a $1,500 fine for one operator, but a different operator in the same state, with the identical violation occurring just a week prior received nothing more than a written notice of violation.

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Drilling Violations on Federal Lands

Wyoming	810 violations, 56 fines
New Mexico	438 violations, 23 fines
Colorado	312 violations, 24 fines
Utah	156 violations, 11 fines
California	37 violations, 3 fines
Oklahoma	33 violations, 1 fine
Montana	32 violations, 3 fines
Mississippi	15 violations, 3 fines
Texas	7 violations, 1 fine
Louisiana	111 violations, 0 fines
North Dakota	55 violations, 0 fines
Ohio	7 violations, 0 fines
Nevada	5 violations, 0 fines
Arkansas	2 violations, 0 fines
Alaska	2 violations, 0 fines
South Dakota	2 violations, 0 fines
West Virginia	1 violation, 0 fines

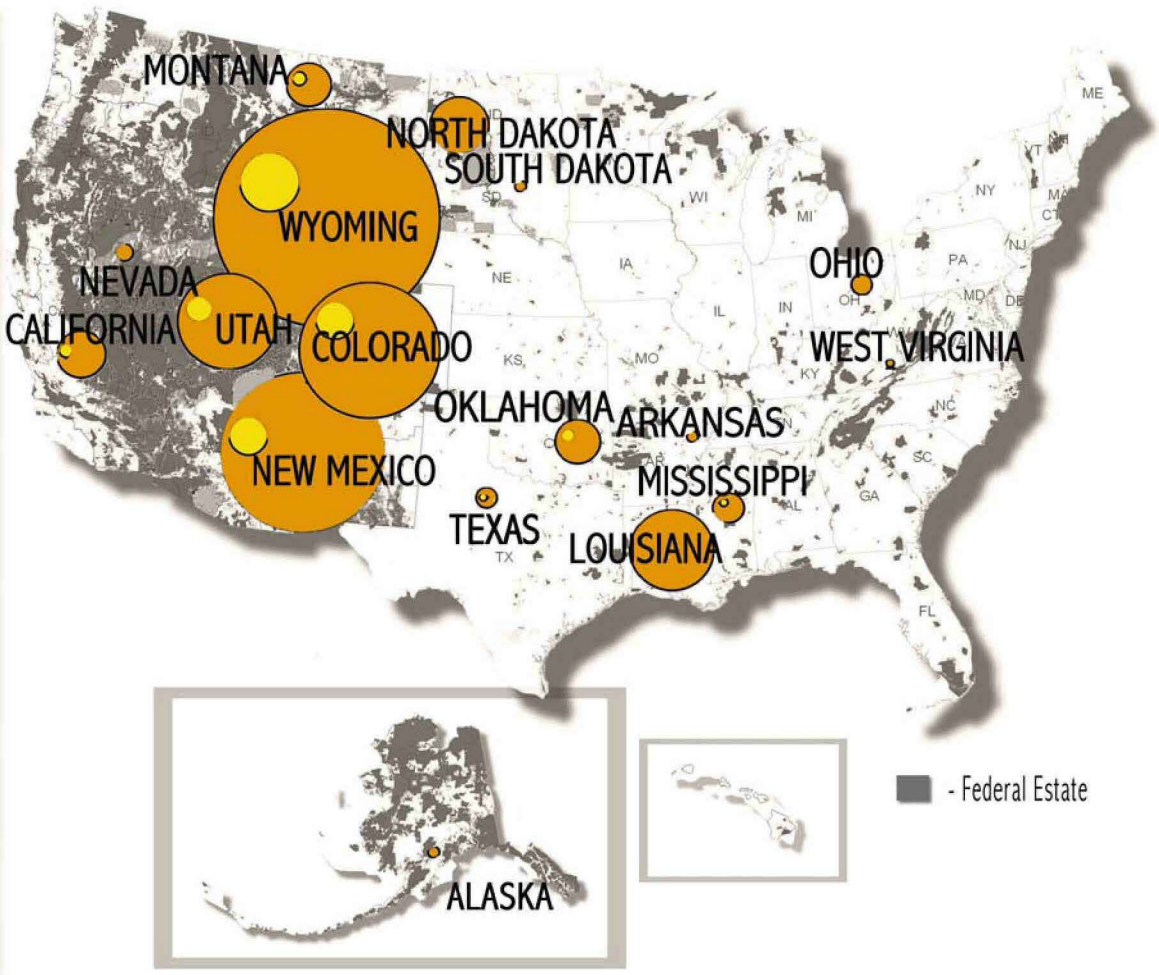

Figure 5: Violations and Fines by State

Prepared by the Democratic Staff of the Natural Resources Committee

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Appendix A: Explanation and Breakdown of Violations

Major Environmental or Safety Violations (549 Violations = 27% of Total)			
Code	**Description of Violation**	**Number of Violations**	**Percentage within Category***
FA	Failure to get approval for drilling or other significant activity	54	10%
LK	Gas leaks, well head leaks, blowouts	16	3%
SG	Safeguard measures not in place	477	87%
SG/BOP	Related to the blowout preventer (BOP) system	*293*	*53%*
SG/CM	Related to well cement and/or casing	*113*	*21%*
SG/FS	Related to flare system used to eliminate waste gas	*63*	*11%*
SG/MD	Related to mud weight or mud flow	*8*	*2%*
WM	Waste material from drilling operations not disposed of properly	2	0.4%

Minor Safety Violations (410 Violations = 20% of Total)			
Code	**Description of Violation**	**Number of Violations**	**Percentage within Category***
AS	Air supply to pumps, pressure accumulator or backup power systems missing, inoperable or improperly maintained	129	31%
CT	Soil/area contamination with oil, chemicals or cuttings	19	5%
PG	Pressure gauge, leak detector or mud gauge/monitoring equipment is not installed or is improperly maintained	33	8%
PT	Pit/storage unit not constructed to sufficient volume, improper location, or failure to maintain adequate empty space in the unit	40	10%
WC	Minor well containment issue (ie: missing bolts, problems with BOP assembly/ configuration or missing handles)	104	25%
WD	Wind direction socks or indicators not in place or inoperable	85	21%

**Percentages were rounded to the nearest whole number*

Prepared by the Democratic Staff of the Natural Resources Committee

Appendix A: Explanation and Breakdown of Violations

Minor Drilling or Operational Violations (1066 Violations = 53% of Total)			
Code	**Description of Violation**	**Number of Violations**	**Percentage within Category***
RK	Record-keeping violations	628	60%
RK/SN	Signs, markers or permit not present/visible in location required	*208*	*20%*
RK/NT	Failure to submit test results, reports or provide sufficient notification to BLM regarding upcoming activity	*184*	*17%*
RK/SD	Change in sundry conditions or operations without notifying and receiving approval from BLM	*52*	*5%*
RK/RC	Failure to perform routine tests or to record test results	*177*	*17%*
RK/OT	Other type of record-keeping violation	*7*	*0.7%*
HS	Hydrogen sulfide sign, testing, or calculations needed	67	6%
MIT	Mechanical Integrity Test on equipment in the well is required to be performed	24	2%
RD	Excess surface disturbance or roads/pad not constructed as approved	62	6%
SV	Fencing, netting, belt guards, protective weather, or other security and safety violations	193	18%
TS	Improper disposal of trash, construction, septic or other waste or improper handling of weed infestation	66	6%
WL	Failure to avoid disruptive activity in certain prescribed time frames to comply with wildlife or archaeological conditions	19	2%
OT	Other minor drilling or operational violation	7	0.7%

**Percentages were rounded to the nearest whole number*

Appendix B: List of Companies with Violations and Fines

Companies with Violations	Number of Violations	Number of Fines
Aera Energy LLC	2	0
Agate Petroleum Incorporated	1	0
Amoco Production Co.	1	0
Amtex Energy Incorporated	1	0
Anadarko E & P Company LP	61	1
Anchor Bay Corp	1	0
Anschutz Exploration Corp	9	1
Antero Resources Piceane Corp	7	0
Apache Corporation	8	3
Apollo Energy L P	1	0
Area Energy LLC	1	0
Asher Associates Inc.	1	0
Aspen Operating LLC	4	1
Aurora Gas LLC	2	0
Autry C Stephens	1	0
Ballard Petroleum Holding LLC	21	3
Basin Resources Corporation	2	0
Bass Enterprises Production Co	3	0
Beartooth Oil & Gas Company	2	0
Becker Clyde M	1	0
Bellevue Resources Inc	1	0
Benson Montin Geer Drilling Corp	4	0
BEPCO LP	1	1
Berry Petroleum Company	14	1
Bill Barrett Corporation	45	0
Billy B Oil Company	1	0
Black Bear Oil Corporation	2	0
Black Diamond Energy Inc	17	0
BOPCO LP	3	0
BP America Production Co.	30	1
Breitburn Energy Company LLC	2	0
Brigham Oil & Gas LP	2	0
Brothers Production Co Inc	1	0
BTA Oil Producers	2	0
Burlington Resources O&G Co LP	34	0
Burnett Oil Company Inc	4	1
Burr Oil & Gas Inc.	1	0
C & H Well Servicing Inc	1	0
Cabal Energy Corporation	1	0
Cabot Oil & Gas Corporation	25	2
Campbell & Hedrick	2	0
Camwest II LP	1	0
Carl H Nordstrand	1	0
Case Sales Company Inc.	1	0
CBS Operating Corporation	1	0
Central Resources Inc	11	0
CH4 Energy LLC	15	0
Chesapeake Operating Inc	57	2
Chevron USA Incorporated	3	0
Chi Operating Incorporated	13	0
Chisos Ltd	1	0
Chizum Oil LLC	2	0

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Companies with Violations	Number of Violations	Number of Fines
Choctaw II Oil & Gas Ltd	1	0
Cimarex Energy Co	7	0
Citation Oil & Gas corporation	12	0
Coastal Oil & Gas Corp	11	0
Cog Operating LLC	25	3
Coleman Oil & Gas Incorporated	6	0
Combined Resources Corporation	1	0
Comet Energy Services LLC	1	0
Concho Oil & Gas Corporation	6	0
ConocoPhillips Company	17	0
Continental Resources Inc	18	1
Cook Oil Co.	1	0
Crawley Petroleum Corp	2	0
Davis Petroleum Corporation	2	0
Decker Operating Company LLC	1	0
Delong Oil & Gas Co	1	0
Delta Petroleum Corporation	6	0
Denbury Onshore LLC	1	0
Derrick Petroleum	1	0
Devon Energy Production Co L P	54	3
Diversified Operating Corp.	1	0
Dominion Expl & Production Inc	5	0
Doral Energy Corp	1	0
Double Eagle Petroleum	4	0
Dudley & Associates LLC	2	0
Dugan Production Corporation	8	0
Duke Oil & Gas Inc	1	0
Duncan Oil INC	2	0
Eagle Operating Incorporated	6	0
East Resources Incorporated	1	0
Edge Petroleum Operating Co, Inc	1	0
Edward H Everett Co	1	0
EGL Resources Inc	2	0
El Paso E&P Co LP	19	0
Ellora Operating LP	4	0
Elm Ridge Resources Inc	9	0
Emerald Operating Company	8	0
Emergent Value Group LLC	2	0
Encana Oil & Gas Inc	63	4
Encore Operating LP	5	0
Endeavor Energy Resources LP	1	0
Enduring Resources LLC	6	1
Energen Resources Corporation	20	1
Energytec Inc	3	0
Enervest Operating LLC	8	0
Entek GRB LLC	1	0
EOG Resources Incorporated	51	3
Equity Oil Co	2	0
Exxon Mobil Corp	10	5
F & M Oil & Gas Company	1	0
Fairway Resources	1	0
Fancher Oil LLC	1	0

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Companies with Violations	Number of Violations	Number of Fines
Fasken Oil & Ranch Ltd	1	0
Ferry Lake Oil Co LLC	5	0
FH Petroleum Corp	3	0
Fidelity Expl & Prod Co	3	0
FIML Natural Resources, LLC	3	0
Flying J Oil & Gas Inc	1	0
Forest Oil Corporation	3	0
Fossil Energy Group, LLC	7	2
Frank Eblen Syndicate Inc	1	0
Fredonia Resources Inc	2	0
G & H Production Co, LLC	1	0
G R Contractors	1	0
Gasco Energy Inc	4	1
Genesis Gas & Oil, LLC	4	3
Gilbreath Norman L	3	0
Glen Plemons	1	0
GMT Exploration Company LLC	3	0
GPE Energy Inc	2	0
Gruy Petroleum Management Co	2	0
Grynberg Jack J	10	2
Guadalupe Operating LLP	2	0
H C M	1	0
Hart Oil & Gas Inc	1	0
Harvey E Yates Co	1	0
Headington Oil, LP	4	1
Hegco Canada Inc	1	0
Heinrich Carl	1	0
High Plains Petroleum Corp	1	0
Howell Petroleum Corporation	2	0
HRM Resources LLC	1	0
Hunt Petroleum Corporation	9	0
Infinity Oil & Gas of Wyoming	1	0
Inland Production Company	2	0
Integrated Energy LLC	2	0
Ivanhoe Energy USA Inc	1	1
J & J Jackson O & G Inc	1	0
J & J SERVICES INC	1	0
Jed Oil (USA) Inc.	2	0
Jehovah Jireh Oil Co	3	0
JM Huber Corp	8	0
JN Expl & Prod Ltd Ptnrship	2	0
Joe Melton Drilling Co, Inc	1	0
JP Oil Company Incorporated	1	0
Julander Energy Company	1	0
Justin Energy LLC	1	0
J-W Operating Company	12	0
K2 America Corporation	1	0
Kennedy Oil	18	2
Kerr-McGee Oil & Gas Onshore L P	9	2
KLT Gas Inc	3	0
Koch Exploration Company	1	0
KWB Oil Property Management	1	0

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Companies with Violations	Number of Violations	Number of Fines
L & J Operating Incorporated	5	0
Lance Oil + Gas Co Inc	19	0
Laramie Energy LLC	20	0
Latigo Petroleum Inc	2	0
Limark Corporation	3	0
Louis Dreyfus Natural Gas Corp	1	0
Lowry Exploration Inc	1	0
M & K Oil Company Incorporated	1	0
Mack Energy Corporation	12	0
MacPherson Oil Company	7	0
Mak-J Energy Wyoming LLC	5	0
Manzano Oil Corp	3	0
Mar Oil & Gas Corporation	1	0
Maralex Resources Incorporated	6	0
Marathon Oil Company	6	0
Marbob Energy Corporation	7	0
Marion Energy Incorporated	8	0
Marks & Garner Production Co	1	0
Markus Production Inc	2	0
Marmac Petroleum Co	2	0
Matador Resources Company	2	0
Matrix Energy LLC	2	1
McAdamas J F	1	0
McElvain Oil & Gas Prop Inc	1	0
McKay Oil Corporation	3	0
McMurry Oil LLC	6	0
Medallion Exploration	5	0
Medicine Bow Operating Co	18	8
Merit Energy Company	17	0
Meritage Energy Partners LLC	1	0
Mewbourne Oil Company	6	0
Midland Operating Inc	1	0
Momentum Operating Co Inc	1	0
Mont Rouge Inc	1	0
Mountain States Petro Corp	4	0
MTG Operating Co	2	0
Murchison Oil& Gas Inc	1	0
Murphy Exploration & Prod Co	2	0
Nadel & Gussman	9	0
Nance Petroleum Corporation	11	2
National Pride Oper Co Inc	1	0
NBI Services Inc	2	0
Nearburg Producing Company	2	0
Newfield Exploration Company	21	5
Noble Energy Inc	32	0
Nordstrand Engineering Inc	2	0
North Flinn LLC	21	2
Northern Lights Oil Co LC	1	0
Northwood Energy Corp	1	0
Nuevo Energy Company	1	0
O'Brien Energy Resources Corp.	6	0
Occidental Elk Hills Inc	1	0

Appendix B: List of Companies with Violations and Fines

Companies with Violations	Number of Violations	Number of Fines
Ohio Valley Energy Sys Corp	1	0
Oilfield Salvage	1	0
Osborn Heirs CO	4	1
Oxy USA Incorporated	11	1
Pannonian Energy Inc	3	0
Parawon Operating LLC	1	0
Patina Oil and Gas Vcorp	1	0
Paul B Rankin Inc	3	0
Penn Virginia MC Energy LLC	5	0
Pennaco Energy Inc	3	0
Petco Petroleum Corporation	2	0
Petro Mex LLC	7	0
Petro-Canada Res(USA) Inc	14	1
Petroglyph Operating Co Inc	1	0
Petrogulf Corporation	9	0
Petrohunt LLC	1	0
Petrol Industries Inc	3	0
Petroleum Development Corp	9	1
Petrox Resources Inc	11	0
Phillips Petroleum Co	1	0
Phoenix Production Company	1	0
Pinnacle Gas Resources, Inc	12	2
Pioneer Natural Resources USA	3	0
Plains Expl & Prod Company	8	0
Plantation Operating LLC	1	1
Pogo Producing Company	4	0
Prairie Energy Inc	1	0
Premier Oil & Gas Incorporated	5	2
Pride Energy Company	2	0
Prima Oil & Gas Co	2	0
Primary Natural Resources INC	5	1
Probity Operating LLC	2	0
QEP Energy Company	1	0
QEP Uinta Basin Inc	1	0
Questar Expl & Prod Co PNDL	27	1
R C Taylor Companies Inc	1	0
Rancher Energy Corporation	1	0
Ranken Energy Corporation	2	0
Read & Stevens Incorporated	5	0
Remuda Operating CO	2	0
Retamco Operating Incorporated	1	1
RHCJ Enterprises LLC	1	0
Riata Energy Incorporated	2	1
Richardson Operating Company	7	2
RIM Offshore Inc	3	0
RKI Exploration and Production	5	2
RME Petroleum Company	5	0
Robert L Bayless Producer LLC	4	2
Roddy Production Company Inc	1	0
RSC Resources Limited	1	0
Ryder Oil & Gas LLC	2	1
S G Interests I LTD	3	0

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Companies with Violations	Number of Violations	Number of Fines
Saga Petroleum	3	0
Sam Enterprises Inc	2	0
Samedan Oil Corp	1	1
Samson Resources Company	18	0
Sannes Ronald M & Margaret A	1	0
SDX Resources Incorporated	3	0
Shackelford Oil Co	3	0
Shenandoah Energy Inc	14	2
Sitta R E	1	0
Slawson Exploration Co Inc	13	1
Snow Operating Company Inc	2	0
Sonoma Energy Corporation	1	0
Southern States Oil Prod LLC	12	0
Southwest Energy Production	2	0
Southwest Royalties Inc	3	0
Southwestern Production Corp	2	0
Spence Energy CO	2	1
St. Mary Land & Exploration Co	2	0
Staghorn Resources LLC	1	0
Stephens & Johnson Oper Co	1	0
Stocker Resources INC	7	0
Stone Energy LLC	2	0
Summit Resources INC	1	0
SWEPI LP	8	0
Synergy Operating LLC	1	0
Tandem Energy Corp	3	0
Texaco Exploration & Production Inc	4	0
The Houston Exploration Company	3	1
The Termo Company	3	0
Thomas Operating Company, Inc	3	0
Thompson J Cleo	11	1
Thorofare Resources Inc	1	0
Threshold Development Company	1	0
Timberline Production Company	1	0
Titan Resources Corporation	2	0
Tom Brown Inc	12	0
Torch E&P Company	1	0
Trend Exploration I, LLC	8	0
Tripperary Oil & Gas Corp	2	0
True Oil Company	12	3
Twin Arrow Incorporated	3	0
U S OIL GAS INC	1	0
Ultra Resources Inc	52	0
United Energy Incorportated	6	2
Ursa Major (Crow OG) LLC	1	0
Vantage Energy Uinta LLC	1	0
Venture Oil and Gas Inc	14	3
Viking Resources Corp	1	0
Vintage Drilling, LLC	3	0
Wagner & Brown Limited	2	0
Walsh & Watts Inc	1	0
Ward Williston Company	3	0

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Companies with Violations	Number of Violations	Number of Fines
Warren American Oil Company	1	0
Warren E&P, Incorporated	6	0
Wascana Oil and Gas Inc	1	0
Webb Oil Company	1	0
Wellstar Corporation	1	0
Westall Ray	4	0
Western Natural Gas Inc	2	1
Western Operating Co	1	0
Westport Oil & Gas Company LP	10	0
Wexpro Company	7	0
Whiting Oil & Gas Corporation	8	0
Whitmar Exploration Company	1	1
Wildfire Partners INC	3	0
Williams Production RMT Co	98	7
Williamson J C	3	1
Windsor Energy Group LLC	4	1
Wold Oil Properties, Inc	4	1
Wolverine Gas & Oil CO of UT	2	0
XTO Energy Co.	47	3
Yarhola Production Co	1	0
Yates Petroleum Corporation	39	5
Zenergy Inc	1	0
ZIA Energy INC	1	0
TOTAL (335 companies)	2025	125