Federal Lands, Federal Authority: The Case for Federal Regulation of Fracking on Public Lands

Matt Pritchett[*]

ABSTRACT

Hydraulic fracturing, or "fracking," continues to grow rapidly as an oil and gas extraction method in the United States, and its growth has recently led to the emergence of natural gas as the nation's new leading energy source for power generation. However, the hydraulic fracturing process carries innumerable environmental and health-related concerns, and federal regulations to address these concerns have struggled to keep up with the blistering pace of fracking's growth and development within the United States.

In 2015, the Bureau of Land Management (BLM), under the Obama administration, promulgated a rule to 'complement' its regulations with respect to hydraulic fracturing on federal and Indian lands, citing the Mineral Leasing Act (MLA) and Federal Land Policy and Management Act (FLPMA) as sources of statutory authority. This 2015 Fracking Rule faced intense opposition, first from industry and state parties within the

[*] J.D. Candidate, Florida State University College of Law, 2019; B.S., Environmental Science, University of Florida, 2012. The author would like to thank Professor Wiseman for her insight and feedback during the research and writing process. The author would also like to thank the members of UCLA's *Journal of Environmental Law & Policy* for their help editing and preparing this Comment for publication. Finally, the author would like to thank his family, friends, and Olivia for their continuous support and encouragement.

federal court system, and later from the BLM itself under a newly-elected President Trump. This Note argues that the Bureau of Land Management has the statutory authority to regulate hydraulic fracturing on federal public lands under the MLA and FLPMA, by cause of the plain language, general history, and reasonable agency interpretation of these statutes. This Note further supports BLM's authority to regulate hydraulic fracturing with justifications related to both natural resource protection and the effectiveness of federal-level regulation.

Legal battles over BLM's authority are ongoing, and the question of whether or not BLM has statutory authority to regulate fracking on federal public lands remains critical as the nation continues to struggle in deciding how to best utilize our commonly-shared lands and resources. Additionally, it will be increasingly important to continue developing and updating federal hydraulic fracturing regulations in order to increase our understanding of this extraction method, while hopefully mitigating its associated environmental and health risks.

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I. INTRODUCTION

The regulation of hydraulic fracturing, or "fracking," is an issue in energy law that is growing rapidly in scope and complexity. While its economic benefits as an oil and gas

extraction method are well-known,[1] hydraulic fracturing also has many associated health risks, both environmental and human-related.[2] As a result, both federal and state governments have worked to update and implement oil and gas regulations that allow for the safe and productive development of hydraulic fracturing procedures in the United States.[3]

On March 26, 2015, the Bureau of Land Management (BLM) issued a final proposed rule (2015 Fracking Rule) to update its regulations applying to hydraulic fracturing on federal and Indian lands.[4] The BLM cited the Federal Land Policy and Management Act of 1976 (FLPMA) and the Mineral Leasing Act of 1920 (Mineral Leasing Act, or MLA), among others, in asserting its statutory authority to enact the 2015 Fracking Rule.[5] However, a group of industry representatives and states

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[1] *See* Daniel Raimi & Richard G. Newell, *US State and Local Oil and Gas Revenues*, RESOURCES FOR THE FUTURE DISCUSSION PAPER 1, 9 (2016) (asserting that state and local governments in general collect 10 percent of the total revenue from oil and gas production, "ranging from a low of roughly 1 percent to a high of nearly 40 percent . . . ").

[2] *See* U.S. ENVTL. PROT. AGENCY, OFF. OF RESEARCH AND DEV., EPA-600-R-16-236Fa, HYDRAULIC FRACTURING FOR OIL AND GAS: IMPACTS FROM THE HYDRAULIC FRACTURING WATER CYCLE ON DRINKING WATER RESOURCES IN THE UNITED STATES § 9.2 (2016), ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=530159 [hereinafter 2016 EPA Report] (giving an overview of hydraulic fracturing and potential impacts on human health); *see also* Katrina S. Korfmacher et al., *Public Health and High Volume Hydraulic Fracturing*, 23 NEW SOLUTIONS 13 (2013) (noting "ground- and surface water contamination, climate change, air pollution, and effects on worker health" as potential risks associated with modern hydraulic fracturing practices).

[3] *See* 43 C.F.R. §§ 3164.1-3179 (2017) (rule taking measures to reduce the amount of natural gas venting, flaring, and leaking from onshore wells located within leases on Federal public and Indian lands); *see also* Hannah J. Wiseman, *Risk and Response in Fracturing Policy* 84 U. CO. L. REV. 729, 752 (2013) (discussing regulatory actions taken by state-level actors to address the range of environmental and human health issues associated with hydraulic fracturing).

[4] Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands, 80 Fed. Reg. 16,128-16,222 (June 24, 2015) [hereinafter 2015 Fracking Rule].

[5] *Id.* at 16,143 ("[T]he Mineral Leasing Act gives the BLM the authority to lease oil and gas resources and to regulate the development of those leases.") (citations omitted); *see also id.* at 16,129. ("Pursuant to the Federal Land Policy and Management Act (FLPMA), . . . the BLM is charged with administering oil and gas operations in a manner that protects Federal and Indian lands while allowing for appropriate development of the resource").

petitioned the rule in the U.S. District Court of Wyoming, asking that the 2015 Fracking Rule be set aside. The district court agreed with the petitioners and concluded that the BLM was not statutorily authorized by FLPMA or the MLA to implement the 2015 Fracking Rule, and entered a final order to set aside the rule.[6] Before the case went to the Tenth Circuit Court of Appeals, the BLM assumed new supervision under the Trump administration, and subsequently announced plans to rescind the 2015 Fracking Rule.[7] On appeal, the Tenth Circuit determined the case to be "prudentially unripe," primarily because of the BLM's new decision to repeal the rule at issue.[8] Accordingly, the Tenth Circuit dismissed the case and vacated the lower District Court's opinion.[9]

While the case concerning the 2015 Fracking Rule has been dismissed from the courts, the question of whether or not the BLM has statutory authority to regulate hydraulic fracturing on federal public lands is an important issue that is likely to resurface. Oil and gas drilling is a well-established use of federal public lands, with the BLM reporting 94,000 production-capable wells on federal lands during the 2016 fiscal year.[10] In this same year, these wells produced a total of 157 million barrels of oil and 3.14 trillion cubic feet of natural gas, yielding approximately $1.6 billion in gross revenue.[11] These days, hydraulic fracturing is an activity almost synonymous with oil and gas development, as some states have reported that 78

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[6] Wyoming v. United States Dep't of the Interior, No. 2:15-CV-041-SWS, 2016 WL 3509415, at *11 (D. Wyo. June 21, 2016), *judgment vacated, appeal dismissed sub nom.* Wyoming v. Zinke, 871 F.3d 1133 (10th Cir. 2017).

[7] *See Trump picks Montana Rep. Zinke for interior post*, THE SPOKESMAN-REVIEW (Dec. 15, 2016) [hereinafter *Trump picks Montana Rep. Zinke*], http://www.spokesman.com/stories/2016/dec/15/trump-picks-montana-rep-zinke-for-interior-post; *see also* Exec. Order No. 13,783, 82 Fed. Reg. 16,093, 16,096 (Mar. 31, 2017).

[8] Wyoming v. Zinke, 871 F.3d 1133, 1142–43 (10th Cir. 2017).

[9] *Id.* at 1146.

[10] U.S. DEP'T OF THE INTERIOR, BUREAU OF LAND MGMT., OIL AND GAS STAT. Table 9 (2016), https://www.blm.gov/sites/blm.gov/files/oilandgas_ogstatistics_t10numberofproducibleandservicewellsfederallands.xlsx (listing the total number of producible well bores by state as of the end of fiscal year 2016).

[11] U.S. GOV'T ACCOUNTABILITY OFF., GAO-17-540, OIL, GAS, AND COAL ROYALTIES 10–11 (2017).

percent to 99 percent of their new wells are hydraulically fractured.[12] Additionally, because of the current administration's desire to raise domestic oil and gas development to historic levels,[13] oil and gas drilling on federal public lands will likely only become more common. As hydraulic fracturing increases in both frequency and scope, newly-developed regulations are required to learn more about, and hopefully mitigate, its associated environmental risks. Due to the plain language, general history, and reasonable agency interpretation of the Federal Land Policy and Management Act and the Mineral Leasing Act, as well as for beneficial reasons related to natural resource protection and federal regulation, the Bureau of Land Management should have authority to regulate hydraulic fracturing on federal public lands.

This paper will first give a general description of the history and background of fracking in Part II, including the development of hydraulic fracturing in the United States and how the federal government has regulated it thus far. Part II will also discuss the history of BLM regulation of oil and gas-related activities on federal public land, and will end with a description of the 2015 Fracking Rule. Part III of this paper will discuss the case history surrounding the industry and states' petition against the 2015 Fracking Rule, and will detail the outcomes of both the district court and Tenth Circuit court cases. Part IV will argue that the BLM should have authority to regulate hydraulic fracturing on public lands under both the Federal Land Policy Management Act and the Mineral Leasing Act, or should at least be given *Chevron*–type deference for its interpretation of these two statutes within the context of the 2015 Fracking Rule. In addition, Part V will argue that the BLM should be authorized to regulate hydraulic fracturing on federal public lands, so we can address the known environmental effects of hydraulic fracturing in addition to improving our overall understanding of these effects. Part VI will also argue

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[12] 2016 EPA Report, *supra* note 2, at 3–31.

[13] Press Release, U.S. Dep't of Interior, Secretary Zinke Announces Largest Oil & Gas Lease Sale in U.S. History (Oct. 24, 2017), https://www.doi.gov/pressreleases/secretary-zinke-announces-largest-oil-gas-lease-sale-us-history.

that a federal regulatory scheme for hydraulic fracturing works more effectively than a state-implemented scheme, primarily for reasons of consistency and funding.

II. HISTORY AND GENERAL BACKGROUND

Hydraulic fracturing, when used in combination with horizontal drilling, was discovered as a method for obtaining 'unconventional' sources of oil and gas that were previously thought to be unrecoverable or cost-prohibitive.[14] These recent discoveries have had enormous impacts on the U.S. energy sector and the nation's energy consumption patterns as a whole. While the injection of hydraulic fracturing fluids fell out of the scope of federal Safe Drinking Water Act regulation with the enactment of the Energy Policy Act of 2005,[15] federal agencies still regulate many aspects of oil and gas drilling, especially those that occur on federal or Indian lands. The BLM promulgated its 2015 Fracking Rule not only to address new technological advancements and associated environmental concerns, but to update its existing regulations for oil and gas extraction on federal public lands.[16]

A. Description of Hydraulic Fracturing Procedures

Hydraulic fracturing is an oil or gas extraction process in which a combination of water and chemicals are pumped into an underground well at extremely high pressures, causing the sedimentary formations at the bottom of the well to crack.[17]

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[14] Alastair R. Lucas et al., *Regulating Multistage Hydraulic Fracturing: Challenges in a Mature Oil and Gas Jurisdiction*, *in* THE LAW OF ENERGY UNDERGROUND 127, 129 (Donald N. Zillman et al. eds., 2014).

[15] *See* 42 U.S.C. § 300h(d)(1)(B)(ii) (2011).

[16] 2015 Fracking Rule, 80 Fed. Reg. at 16,128 ("The BLM final rule on hydraulic fracturing serves as a much-needed complement to existing regulations designed to ensure the environmentally responsible development of oil and gas resources on Federal and Indian lands, which were finalized nearly thirty years ago, in light of the increasing use and complexity of hydraulic fracturing coupled with advanced horizontal drilling technology").

[17] Terry W. Roberson, *Environmental Concerns of Hydraulically Fracturing a Natural Gas Well*, 32 UTAH L. REV. 67, 67 (2012); John M. Golden & Hannah J. Wiseman, *The Fracking Revolution: Shale Gas as a Case Study in Innovation Policy*, 64 EMORY L.J. 955, 968–69 (2015).

These cracks in rock formation release oil or natural gas, which either come from within formation pore spaces or within the rock itself.[18] The composition of hydraulic fracturing fluids is roughly 90 percent water, 9.5 percent proppant materials, and 0.5 percent chemical additives.[19] Proppant materials usually consist of sand or a similar matter, and are used to "prop" open the formational fractures which allow oil or gas to flow out.[20] Chemical additives typically include, but are not limited to, hydrochloric acid, corrosion inhibitors such as ammonium bisulfate, as well as various biocides, gelling agents, friction reducers, and surfactants.[21] A number of concerns about the environmental effects of hydraulic fracturing stem from the potential for these chemical additives to contaminate groundwater sources, if the additives are injected into a well as fracturing fluids and subsequently leak into the underground formations.[22] Less than twenty percent of the chemical amounts used in hydraulically-fractured wells make it back up to the surface after being injected.[23] The chemicals that do return, however, do so within a wastewater mixture known as "flowback" water.[24] This "flowback" water contains both fracking chemicals and naturally occurring contaminants, and it can lead to environmental risks as well as violations of state law if handled improperly.[25] Other environmental effects of hydraulic fracturing that are sometimes less-recognized, but equally important, are the potential for surface spills of undiluted fracking chemicals[26] and the amount of freshwater used for each hydraulically-fractured well.[27]

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[18] Roberson, *supra* note 17, at 69–70.
[19] MICHAEL D. HOLLOWAY, FRACKING: THE OPERATIONS AND ENVIRONMENTAL CONSEQUENCES OF HYDRAULIC FRACTURING 53 (2013).
[20] *Id.* at 54.
[21] *Id.* at 50–53.
[22] *See infra* Part V.A.1, for more about the possible scenarios in which hydraulic fracturing processes can contaminate groundwater sources.
[23] HOLLOWAY, *supra* note 19, at 62.
[24] R. Timothy Weston, *Water and Wastewater Issues In Conducting Operations in a Shale Play—The Appalachian Basin Experience*, ROCKY MTN. MIN. L. FOUND. 1, 2 (2010); Wiseman, *supra* note 3, at 761.
[25] Weston, *supra* note 24, at 2; Wiseman, *supra* note 3, at 758–75.
[26] Wiseman, *supra* note 3, at 760.
[27] *Id.* at 775–78; *see also infra* Part V.A.2.

B. History of Hydraulic Fracturing in the United States

Hydraulic fracturing for commercial purposes dates as far back as the late 1940s, when oil and gas companies began experimenting with the process as a form of well stimulation to help increase returns.[28] Hydraulic fracturing grew rapidly in the years following, and during the 1950s the practice was used to 'treat,' on average, over 3000 wells per month.[29] Hydraulic fracturing in oil and gas extraction experienced another huge breakthrough in the late 1990s, when George Mitchell in East Texas discovered that the practice could be used to obtain 'shale gas,' or natural gas trapped within shale rock.[30] Shale gas formations are characterized as "dense,"[31] "tighter,"[32] and "low permeability" formations in which the gas is "often sourced from the reservoir rock itself."[33] Shale gas formations share these same general characteristics with 'tight gas' and 'coalbed methane' formations, and thus these three types of "low permeability" formations are often called unconventional reservoirs.[34]

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[28] Carl T. Montgomery & Michael B. Smith, *Hydraulic Fracturing: History of an Enduring Technology*, J. PETROLEUM TECH. 26, 26–27 (2010) ("The first experimental treatment to 'Hydrafrac' a well for stimulation was performed in . . . Kansas, in 1947 . . . "); LeRoy C. Paddock & Jessica Anne Wentz, *Emerging Regulatory Frameworks for Hydraulic Fracturing and Shale Gas Development in the United States*, *in* THE LAW OF ENERGY UNDERGROUND 147, 148 (Donald N. Zillman et al. eds., 2014) ("As early as 1949, Standolind Oil and Gas Company granted Halliburton a commercial license to develop a method of production known as the 'Hydrafrac Process'").

[29] MICHAEL B. SMITH & CARL T. MONTGOMERY, HYDRAULIC FRACTURING 3 (2015).

[30] Golden & Wiseman, *supra* note 17, at 974–75; *see also George Mitchell, 94, dies: Oil man unlocked fracking*, MARKETPLACE'S SUSTAINABILITY DESK (Dec. 7, 2012) [hereinafter *George Mitchell*] [https://perma.cc/RG6F-CS4E].

[31] *See George Mitchell*, *supra* note 30.

[32] Lucas et al., *supra* note 14, at 129.

[33] HOLLOWAY, *supra* note 19, at 5–6.

[34] *Id.* (comparing unconventional reservoirs in which "the gas is sourced from the reservoir rock itself," to conventional reservoirs, which consist of a more "porous or permeable" rock foundation and where the gas is contained in "interconnected pore spaces that allow flow to the wellbore").

Sometime after Mitchell's discovery of shale gas as a potential energy source, hydraulic fracturing was combined with horizontal drilling to further expand the potential for oil and gas production in the U.S.[35] Because horizontal drilling allows the wellbore to align with horizontal layers of shale, a single well using this method can yield "significantly" more oil or gas than a traditional well.[36] Over the past two decades, the combination of horizontal drilling with hydraulic fracturing has greatly expanded the ability of energy producers to profitably recover natural gas and oil from unconventional gas reservoirs, like those found in shale formations.[37] The combination of these two practices have added roughly nine billion barrels of oil and over 700 trillion standard cubic foot (scf) of gas to U.S. reserves "that would have otherwise not been economical to develop."[38]

The use of hydraulic fracturing and horizontal drilling has had widespread effects on industries within the energy sector, as well as the nation's energy usage patterns as a whole. Natural gas has replaced coal as the nation's key energy source for power generation, and its share of production and consumption markets within the U.S. are projected to continue increasing through 2040.[39] This projected increase for natural gas production in the U.S. is driven primarily by a similar growth in production from shale gas and other unconventional gas types, which will account for "nearly two-thirds of U.S. natural gas production by 2040."[40]

The technological advancements in hydraulic fracturing have increased oil and gas development on federal public lands,

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[35] *George Mitchell*, *supra* note 30.

[36] Roberson, *supra* note 17, at 72; *see also* Lucas et al., *supra* note 14, at 129 (noting that horizontal drilling "allowed for maximum contact with the reservoir from a single horizontal wellbore").

[37] SMITH & MONTGOMERY, *supra* note 29, at 1; *see also* U.S. Dep't of Energy, DE-FG26-04NT15455, MODERN SHALE GAS DEVELOPMENT IN THE UNITED STATES: A PRIMER at ES-3 (2009) [hereinafter MODERN SHALE GAS] ("A key element in the emergence of shale gas production has been the refinement of cost-effective horizontal drilling and hydraulic fracturing technologies").

[38] SMITH & MONTGOMERY, *supra* note 29, at 1.

[39] U.S. ENERGY INFO. ADMIN., ANNUAL ENERGY OUTLOOK 2017 at 9–12 (2017), https://www.eia.gov/outlooks/aeo/pdf/0383(2017).pdf [https://perma.cc/6NZD-C4WP].

[40] *Id.* at 57–58.

as well. From 2008 to 2016, the amount of oil production on BLM lands that require a drilling permit has increased by 108 percent.[41] Domestic production from oil and gas wells on BLM-managed lands now account for ten percent of the Nation's natural gas supply and five percent of its oil.[42]

C. Federal Regulation of Hydraulic Fracturing in the United States

The underground injection of hydraulic fracturing fluids, at one time overseen federally through the Safe Drinking Water Act (SDWA), is now an activity regulated largely at the state level. Enacted in 1974, the SDWA authorizes the Environmental Protection Agency (EPA) to establish minimum national heath-based standards to protect against contaminants found in drinking water sources.[43] While the EPA sets these national minimum standards for drinking water contaminants, primary authority for the implementation and supervision of safe drinking water "programs" is delegated to the states.[44] A consistent and important feature of these drinking water programs is the Underground Injection Control (UIC) program, which controls the injection of wastes into ground water by setting standards for safe waste injection practices and banning certain types of injection altogether.[45] The UIC programs are also implemented at the state level and, once the programs are approved by the EPA, states retain primary responsibility for administering the UIC programs unless they fail to meet the minimum requirements.[46]

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[41] *Examining BLM Public Lands Leasing: Hearing before the Subcomm. on the Interior of the Comm. on Oversight and Gov't Reform House of Representatives*, 114th Cong. 5 (2016) (statement of Neil Kornze, Director, Bureau of Land Management, U.S. Department of the Interior).

[42] *Id.* at 6.

[43] U.S. ENVTL. PROT. AGENCY, EPA 816-F-04-030, UNDERSTANDING THE SAFE DRINKING WATER ACT at 1 (2004) [hereinafter SAFE DRINKING WATER ACT REPORT]; *see also* 42 U.S.C. §§ 300f–300j-26 (2012).

[44] SAFE DRINKING WATER ACT REPORT, *supra* note 43, at 2.

[45] *Id.* at 3.

[46] Hannah Wiseman, *Untested Waters: The Rise of Hydraulic Fracturing in Oil and Gas Production and the Need to Revisit Regulation*, 20 FORDHAM ENVTL. L. REV. 115, 142–43 (2009).

Hydraulic fracturing undoubtedly fell within the scope of the UIC program, and consequently EPA regulatory authority, following the Eleventh Circuit Court's decision in *Legal Environmental Assistance Foundation v. EPA* (*LEAF*).[47] In *LEAF*, the Eleventh Circuit found that the SDWA "dictated that all underground injection be regulated under the UIC programs," including those that occur when hydraulically fracturing a well.[48] With the *LEAF* decision, the EPA was vested with the statutory authority and duty to regulate hydraulic fracturing on all lands: federal, state, and tribal.[49]

The effects of the Eleventh Circuit's decision to subject fracking to EPA regulation under the SDWA were relatively short-lived, however. Eight years after the *LEAF* decision, Congress enacted the Energy Policy Act of 2005 ("2005 EPAct"), an omnibus energy development bill with the overall purpose of ensuring jobs through providing "secure, affordable, and reliable energy."[50] The 2005 EPAct included an amendment to the SDWA that clearly excluded all hydraulic fracturing injections, other than diesel fuels, from the SDWA's definition of "underground injection."[51] With this amendment, Congress "conclusively" removed all hydraulic fracturing operations not involving diesel fuels from EPA and federal regulation under the SDWA's UIC program.[52] While parties argued whether the EPAct made the right decision, regulation of the injection of hydraulic fracturing fluids after 2005 generally became the responsibility of the states.[53]

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[47] Legal Environmental Assistance Foundation v. EPA, 118 F.3d 1467, 1469 (11th Cir. 1997).

[48] *Id.* at 1474.

[49] Wyoming v. U.S. Dep't of Interior, 2016 U.S. Dist. WL 3509415, at *9 (D. Wyo. June 21, 2016).

[50] Energy Policy Act of 2005, Pub. L. No. 109-58, 119 Stat. 594 (2005).

[51] *See* 42 U.S.C. § 300h(d)(1) (2012) ("The term 'underground injection'—(A) means the subsurface emplacement of fluids by well injection; and (B) excludes—(i) the underground injection of natural gas for purposes of storage; and (ii) the underground injection of fluids or propping agents (other than diesel fuels) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities").

[52] Wiseman, *supra* note 46, at 145; Wyoming v. U.S. Dep't of Interior, 2016 U.S. Dist. WL 3509415, at *10 (D. Wyo. June 21, 2016).

[53] Wiseman, *supra* note 46, at 145–46.

D. The BLM's Regulation of Oil and Gas Extraction on Federal Public Lands

Federal regulation of oil and gas drilling procedures on public lands has existed for nearly a century. On June 4, 1920, the Secretary of the Interior adopted regulations requiring oil and gas operators to notify federal supervisors before drilling, plugging, or abandoning any well on federal land, and to keep accurate field records of drilling and casing activity for each well and submit copies of these field records to the federal supervisor after well completion.[54] In 1942, the U.S. Geological Survey, a predecessor of the BLM, enacted a regulation restating that drilling, well stimulation,[55] and other well development activities could not occur without prior approval from a federal supervisor.[56] The regulation also required supervisor approval of well casing programs for proposed drill sites on federal lands.[57]

The BLM itself has been relying on its statutorily-delegated regulatory authority and responsibility to oversee all inland oil and gas operations that occur on federal or Indian lands for the past twenty-five years.[58] In 1982, the Secretary of the Interior enacted 43 Code of Federal Regulations part 3160, which firmly established the BLM's authority to govern onshore oil and gas operations.[59] Onshore Oil and Gas Orders 1, 2, and 7 were subsequently enacted within the next eleven years, and together with 43 C.F.R. 3160, these regulations give BLM oversight authority during virtually every stage of the drilling process on federal and Indian lands.[60] Existing section 43 C.F.R.

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[54] *See* Forbes v. United States, 125 F.2d 404, 409 (9th Cir. 1942) (describing and quoting the regulations).

[55] Hydraulic fracturing is recognized as a useful form of well stimulation. *See* MODERN SHALE GAS, *supra* note 37, at ES-5 (Asserting that hydraulic fracturing technology "has proved to be an effective stimulation technique").

[56] 7 Fed. Reg. 4132, 4135 (June 2, 1942).

[57] *Id.* at 4134.

[58] *See generally* 43 C.F.R. § 3160 (2017) (formerly 30 C.F.R. § 221).

[59] *Id.*

[60] 43 C.F.R. § 3164.1 (2017) (providing for the issuance of Onshore Oil and Gas Orders to implement and supplement the regulations found in part 3160); *see also* Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands, 80 Fed. Reg. at 16,134 (June 24, 2015) ("The BLM has existing regulations, including

3612.3-1 and Onshore Order One list the necessary requirements to obtain an Application for Permit to Drill (APD), which an operator must obtain before it begins any oil or gas-related project on federally-owned lands.[61] Onshore Order Two implements national safety measures for operators to follow during the drilling process, such as pressure testing in order to ensure proper casing and cementing of the well.[62] The BLM also has authority to inspect a drilling operation at any time to ensure an operator's compliance with the Onshore Order 2 drilling regulations, the approved permit, and the conditions of approval.[63] Onshore Order 7 regulates the disposal of 'produced' water, and under this Order operators must dispose of produced water through some method pre–approved by the BLM when drilling on federal or Indian lands.[64] After drilling operations have concluded, the BLM also oversees operations related to well plugging and abandonment and the restoration of drilling sites.[65]

E. BLM's Promulgation of the 2015 Fracking Rule

The BLM's 2015 Fracking Rule resulted from several nationwide developments related to hydraulic fracturing. The first was the rapid growth and development of hydraulic fracturing practices across the U.S., coupled with the advent of new horizontal drilling technologies.[66] Second, public awareness and concern about hydraulic fracturing had grown at a similar

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Onshore Oil and Gas Orders, to ensure that operators conduct oil and gas exploration and development in an environmentally responsible manner that protects other resources").

[61] 43 C.F.R. § 3162.3–1 (2017); Onshore Oil and Gas Order Number 1, Approval of Operations, 72 Fed. Reg. 10,308 (Apr. 6, 2007); *see also* 2015 Fracking Rule, 80 Fed. Reg. at 16,134 (June 24, 2015).

[62] Onshore Oil and Gas Order No. 2, Drilling Operations, 53 Fed. Reg. 46,798 (Dec. 19, 1988); *see also* 2015 Fracking Rule, 80 Fed. Reg. at 16,136 (June 24, 2015).

[63] 2015 Fracking Rule, 80 Fed. Reg. at 16,136 (June 24, 2015).

[64] Onshore Oil and Gas Order No. 7: Disposal of Produced Water, 58 Fed. Reg. 47,354 (Oct. 8, 1993); *see also id.*

[65] 2015 Fracking Rule, 80 Fed. Reg. at 16,136–37 (June 24, 2015) ; *see also* 43 C.F.R. § 3162.3–4 (2017) (discussing procedures for well abandonment).

[66] 2015 Fracking Rule, 80 Fed. Reg. at 16,128 (June 24, 2015) ; *see also supra* Part II.B.

pace to the technology, and people were expressing concern particularly about the environmental effects of hydraulic fracturing.[67] Finally, the existing regulations for oil and gas extraction on federal public lands had not been updated for over twenty years, and thus failed to fully address the new developments that had been made in hydraulic fracturing technology.[68]

The BLM began creating a new rule for hydraulic fracturing in November 2010.[69] Before initiating any rulemaking, the BLM gathered input from interested parties through public forums as well as through the creation of a Shale Gas Production Subcommittee within the Secretary of Energy Advisory Board.[70] On May 11, 2012, the BLM published an initial notice of proposed rulemaking with request for comment, titled "Oil and Gas; Well Stimulation, Including Hydraulic Fracturing, on Federal and Indian Lands."[71] The rule as originally proposed hoped to meet the following goals: to enable public disclosure of chemicals used in hydraulic fracturing operations, to implement measures that would improve the structural integrity of wells, and to address issues related to flowback water.[72] This initial proposed rule went through a second round of notice-and-comment rulemaking on May 24, 2013.[73]

The BLM issued its final version of its hydraulic fracturing rule on March 26, 2015, asserting that the final version's regulations were closely related to the objectives of the initial proposed rules.[74] The 2015 Fracking Rule listed several new requirements for prospective operators who planned to hydraulically fracture an oil or gas well on federal public lands. First, operators would have to present "detailed information"

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[67] 2015 Fracking Rule, 80 Fed. Reg. at 16,129 (June 24, 2015) .
[68] *Id.* at 16,131.
[69] *Id.* at 16,128.
[70] *Id.* at 16,131.
[71] *Id.* (discussing the issuance of 77 Fed. Reg. 27,691).
[72] Oil and Gas; Well Stimulation, Including Hydraulic Fracturing, on Federal and Indian Lands, 77 Fed. Reg. 27,692 (proposed May 11, 2012).
[73] Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands, 78 Fed. Reg. 31,636 (proposed May 24, 2013).
[74] 2015 Fracking Rule, 80 Fed. Reg. at 16,128 (June 24, 2015).

about the well's physical properties and location, including wellbore geology, location of faults and fractures, and depths of usable water sources.[75] In addition, operators would have to follow guidelines to improve cementing and casing operations for each well.[76] Potential oil and gas operators would also have to store most drilling fluids, flowback or otherwise, in aboveground covered storage tanks, rather than lined in-ground pits.[77] Finally, the final 2015 Fracking Rule mandated that operators disclose all chemicals used in the hydraulic fracturing processes to both the agency and general public, with limited exceptions for trade secret material.[78] The final 2015 Fracking Rule also included a provision in which the BLM could grant states or tribes a regulation-specific variance from the 2015 rule, as long as the states or tribes already had standards for regulating hydraulic fracturing that met or exceeded those of the 2015 rule.[79] The BLM maintained that this selection of procedures and guidelines would collectively work to improve well construction and integrity, to help protect existing groundwater and surface resources, and to promote safer, more transparent procedures for hydraulic fracturing on federal public lands.[80]

III. DISCUSSION OF THE CASE HISTORY AND PRESENT SCENARIO WITH *WYOMING V. ZINKE*

The BLM's 2015 Fracking Rule was challenged by a group of industry and state petitioners, and the U.S. District Court of Wyoming determined that the rule exceeded the BLM's statutory authority under the MLA and FLPMA.[81] On appeal, however, the case was dismissed for lack of 'prudential ripeness,' and the district court's holding was vacated.[82]

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[75] *Id.* at 16129.
[76] *Id.*
[77] *Id.*
[78] *Id.* at 16,130.
[79] *Id.* at 16,221; *see also* Paddock & Wentz, *supra* note 28, at 161 (discussing the "variance process" for the 2015 Fracking Rule).
[80] 2015 Fracking Rule, 80 Fed. Reg. at 16,128–30 (June 24, 2015).
[81] Wyoming v. U.S. Dep't. of Interior, No. 2:15-CV-043-SWS, 2016 WL 3509415, at *11(D. Wyo. June 21, 2016).
[82] Wyoming v. Zinke, 871 F.3d at 1142–46 (10th Cir. 2017).

A. District Court Case—*Wyoming v. United States* Department of Interior

On March 20, 2017, two industry parties, the Independent Petroleum Association of America and the Western Energy Alliance, filed a Petition for Review of Final Agency Action in the U.S. District Court of Wyoming, in response to the BLM's 2015 Fracking Rule.[83] This first petition was soon followed by a second petition filed on March 26th by the states of Wyoming and Colorado.[84] Both petitions sought judicial review of the 2015 Fracking Rule pursuant to the Administrative Procedure Act (APA), and asserted that the rule must ultimately be set aside because it was "arbitrary, not in accordance with law, and in excess of the BLM's statutory jurisdiction and authority."[85] North Dakota, Utah, and the Ute Indian Tribe later intervened in the action as Petitioners while various environmental groups intervened as Respondents, and the court allowed the parties to consolidate the separate actions.[86]

In its review, the district court attempted to determine whether Congress had "directly" given the BLM authority to regulate hydraulic fracturing on public lands within any of the statutes the BLM relied upon in its rulemaking process.[87] Looking at the Mineral Leasing Act, the district court acknowledged that the BLM's 1982 regulation, as the agency's "only regulation addressing hydraulic fracturing," laid out requirements for oil and gas drilling under the MLA, but asserted that the purpose was to "prevent any additional surface requirements and impose reporting requirements," and not to regulate "the fracturing process itself."[88] In essence, the district court distinguished the 1982 regulation from the 2015 Fracking Rule by asserting that the MLA has directed the Secretary of

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[83] Wyoming v. U.S. Dep't. of Interior, No. 2:15-CV-043-SWS, 2016 WL 3509415, at *2 (D. Wyo. June 21, 2016).

[84] *Id.*

[85] *Id.* at *2–*3 (citing 5 U.S.C. § 706(2)(A), (C) (2017)).

[86] *Id.* at *2.

[87] *Id.* at *4.

[88] *Id.* at *6 (referring to 43 C.F.R. § 3162.3-2(b) (2017)).

Interior and the BLM to *only* regulate surface-disturbing activities related to hydraulic fracturing, but no other hydraulic fracturing-related procedures.

To illustrate that the leasing of minerals and environmental protection can be seen as complementary activities under the Mineral Leasing Act, Respondents pointed to other regulations enumerating the BLM's authority to protect surface and subsurface resources during the development of oil and gas leases on public lands.[89] Respondents asserted that these regulations, while primarily related to groundwater protection, still fell within the MLA's purpose of ensuring the "exercise of reasonable diligence, skill, and care in the operation" of federal leases, protecting "the interests of the United States," and safeguarding "the public welfare."[90] However, the district court read this purposive language to mean that the "public welfare," which the MLA was initially written to safeguard, does not pertain to any type of environmental protection but instead to " . . . specific lease provisions [that] appear in all federal oil and gas leases for the safety and welfare of miners and prevention of undue waste," and to "the sale of mined minerals to the United States and the public at reasonable prices."[91] Extending this analogy, the district court concluded that the MLA's purpose was to create a program for leasing mineral resources on federal lands, not to regulate the resource extraction processes themselves, which occur on federal lands.[92]

Turning to FLPMA, the district court acknowledged the Act's delegation of management authority to the BLM pursuant

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[89] *See* 43 C.F.R. § 3162.5-1(b) (1988) ("The operator shall exercise due care and diligence to assure that leasehold operations do not result in undue damage to surface or subsurface resources or surface improvements"); *see also* 43 C.F.R. § 3162.5-2(d) (2017) (protection of fresh water and other minerals).

[90] Brief for Petitioner. at 8, 14, *see also* Wyoming v. U.S. Dep't of the Interior, No. 2:15-CV-041-SWS, 2016 WL 3509415, at *1 (D. Wyo. June 21, 2016) (quoting select portions of 30 U.S.C. § 187 (2017)).

[91] Wyoming v. U.S. Dep't. of Interior, No. 2:15-CV-043-SWS, 2016 WL 3509415, at *7 (D. Wyo. June 21, 2016).

[92] *Id.* at *5–*7 ("The existence of a few regulations requiring notice and approval, and requiring operators to avoid pollution to groundwater, falls short of regulating the fracking process itself and is not determinative of whether BLM has *statutory* authority to engage in comprehensive rulemaking to address the supposed underground environmental effects of hydraulic fracturing").

to the "multiple use and sustained yield" of renewable and nonrenewable resources found on federal lands.[93] Taking a strongly textualist approach, the district court stated that the BLM's statutory authority to manage federal public lands under multiple use and sustained yield principles did not itself delegate BLM with "specific authority to regulate hydraulic fracturing or underground injections of any kind."[94] "At its core," the district court said, "FLPMA is a land use statute," and concluded that BLM's regulation of hydraulic fracturing under FLPMA only extended to the agency's conditional approval of applications for Permit to Drill (APDs) before any drilling operations or related surface disturbances could commence on federal public lands.[95]

The U.S. District Court of Wyoming also declined to grant the BLM a *Chevron*–type deference of its own interpretation of both the Mineral Leasing Act and the Federal Land Policy Management Act.[96] In its *Chevron* analysis, the district court declined to look further at any of the statutes cited by the BLM in 2015 Fracking Rule promulgation, and instead turned to the Safe Drinking Water Act (SDWA).[97] The authority to regulate hydraulic fracturing, the district court reasoned, is an authority related to the environmental protection of underground water resources, which Congress delegated to the EPA in the Safe Drinking Water Act.[98] However, the Energy Policy Act of 2005 (2005 EPAct) was notably passed with an amendment to the Safe Drinking Water Act that clearly exempted "the underground injection of fluids or propping agents (other than diesel fuels) pursuant to hydraulic fracturing operations" from EPA regulation under the Act.[99] The district

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[93] *Id.* at *7 (citing 43 U.S.C. § 1732(a) (2017)).
[94] *Id.* at *8.
[95] *Id.*
[96] *Id.* at *9–*11.
[97] *Id.*
[98] *Id.* at *9 ("Part C of the SDWA establishes a regulatory program specifically for the protection of underground sources of drinking water. This program requires the Environmental Protection Agency ('EPA') to promulgate regulations that set forth minimum requirements for effective State underground injection control ('UIC') programs 'to prevent underground injection which endangers drinking water sources'") (citations omitted); *see also* 42 U.S.C. § 300h(b)(1) (2012).
[99] 42 U.S.C. § 300h(d)(1)(B)(ii) (2012); *see also supra* Part II.C.

court saw this legislation within the SDWA and the 2005 EPAct as a clear expression of Congressional intent to preclude hydraulic fracturing from federal regulation, unless the underground injection involved the use of diesel fuels.[100] Asserting that Congress intended with the 2005 EPAct to clearly eliminate all federal authority to regulate hydraulic fracturing, the U.S. District Court of Wyoming concluded that the BLM had no statutory authority under FLPMA or the MLA to promulgate its 2015 Fracking Rule.[101] The district court also declined to give *Chevron* deference, saying that Congressional intent was clear on this matter and adding that the BLM's interpretation of FLPMA and the MLA was "unreasonable," because the interpretation would lead to a "transformative expansion in . . . regulatory authority without clear congressional authorization."[102] On June 21, 2016, the district court entered its final order to set aside the BLM's 2015 Fracking Rule, and Respondent parties appealed.[103]

B. Tenth Circuit Court Case—*Wyoming v. Zinke* (871 F.3d 1133)

By the time the case involving the BLM's 2015 Fracking Rule reached the Tenth Circuit, a new Secretary of the Interior had been appointed by President Trump.[104] Sensing that the time was not appropriate for substantive review of the 2015 Fracking Rule, the Tenth Circuit dismissed the case as 'prudentially unripe,' and vacated the lower District Court's opinion.[105]

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[100] Wyoming v. U.S. Dep't. of Interior, No. 2:15-CV-043-SWS, 2016 WL 3509415, at *10 (D. Wyo. June 21, 2016) (noting that "the 2005 EPAct indicates clearly that hydraulic fracturing is not subject to federal regulation unless it involves the use of diesel fuels").
[101] *Id.* at *11.
[102] *Id.* at *10.
[103] *Id.* at *12.
[104] *Trump picks Montana Rep. Zinke*, *supra* note 7.
[105] Wyoming v. Zinke, 871 F.3d 1133, 1142–46 (10th Cir. 2017).

1. Procedural Posture and Preceding Events of the Case

While an appeal to *Wyoming v. U.S. Department of Interior* was pending in the Tenth Circuit Court of Appeals, the BLM assumed new leadership under the Trump administration.[106] A few months later, President Trump signed Executive Order 13,783, which declared that the Secretary of the Interior "shall review . . . and, if appropriate, shall, as soon as practicable, suspend, revise, or rescind" several Obama–era regulations, including the 2015 Fracking Rule.[107] On May 5, 2017, the Federal-Respondent-Appellant BLM requested in its brief to the Tenth Circuit that the case be held in abeyance, or suspension, while awaiting further agency action.[108] The Intervenor-Appellants' brief, filed by a partnership of environmental organizations, said that the BLM's request for abeyance was an "end run around the rulemaking requirements of the [APA]," and holding the case in abeyance would keep the district court's "erroneous" decision in place and protect it from appellate review.[109] Acting expeditiously, the BLM just two months later published a Notice of Proposed Rulemaking that began the rescission of the 2015 Fracking Rule, stating that it was "unnecessarily duplicative" of other regulations, and that it enacted "burdensome reporting requirements and other unjustified costs" on oil and gas producers.[110] The publication of the BLM's Notice of Proposed Rulemaking subsequently opened a sixty-day period for notice and public comment, which was still open when the Tenth Circuit Court issued its opinion on September 21, 2017.[111]

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[106] *Trump picks Montana Rep. Zinke*, *supra* note 7.
[107] Exec. Order No. 13,783, 82 Fed. Reg. 16,093, 16,096 (Mar. 31, 2017).
[108] Brief for Appellant at 1, Wyoming v. Zinke, 871 F.3d 1133 (10th Cir. 2017) (Nos. 18-6068, 18-8069), 2017 WL 2001826 at *1; *See also* Black's Law Dictionary (8th ed. 2004) (defining 'abeyance' as "[t]emporary inactivity; suspension").
[109] Brief for Appellant at 1, Wyoming v. Zinke, 871 F.3d 1133 (10th Cir. 2017) (Nos. 18-6068, 18-8069), 2017 WL 2458936 at *1.
[110] Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands; Rescission of a 2015 Rule, 82 Fed. Reg. 34,464 (July 25, 2017).
[111] *Id.*; Wyoming v. Zinke, 871 F.3d 1133, 1140 (10th Cir. 2017).

2. Holding of the Tenth Circuit Court

Before addressing the merits of the lower district court's decision, and independently concluding whether the BLM held legal authority under FLPMA and MLA to regulate hydraulic fracturing on federal lands, the Tenth Circuit first decided whether or not it should hear the appeal for reasons of prudential ripeness.[112] The Tenth Circuit explained the two-fold benefit of the prudential ripeness doctrine: it is not only used to shield courts "from entangling themselves in abstract disagreements over administrative policies," but also to "protect the agencies from judicial interference" until an agency's decision on a subject has been solidified.[113]

The Tenth Circuit Court considered two factors when analyzing the prudential ripeness of *Wyoming v. Zinke*: first, the Court considered the fitness of the issues for judicial review; and second, it considered the hardship to the parties of withholding review.[114] In evaluating the first factor, the court initially acknowledged that there were multiple arguments supporting the idea that the case was "ripe for review."[115] However, the Tenth Circuit took significant issue with the fact that it would be questioning the validity of a final agency rule that was currently being rescinded by the very same agency.[116] The Court declared that the substantive issue of the appeal had become "a moving target," and subsequently found the appeal to have "unusual circumstances" that, barring all else, would authorize the Court to withhold judicial review.[117] Turning to the second factor of prudential ripeness analysis, the Tenth Circuit summarily concluded that withholding judicial review of the 2015 Fracking Rule would not impose a substantial hardship on either the BLM

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[112] Wyoming v. Zinke, 871 F.3d at 1141.
[113] *Id.* (citing Nat'l Park Hosp. Ass'n v. U.S. Dep't of Interior, 538 U.S. 803, 807–08 (2003)).
[114] *Id.* at 1141–44.
[115] *Id.* at 1142 ("These appeals do present a clear legal issue: whether the BLM had statutory authority to promulgate the Fracking Regulation. In addition, there is no dispute that the Fracking Regulation went through notice and comment and thus is final") (citations omitted).
[116] *Id.*
[117] *Id.* (citing Abbott Labs. v. Gardner, 387 U.S. 136, 153 (1967)).

or the Environmental Intervenors as the two parties requesting the appeal.[118] Thus, the Tenth Circuit concluded that the appeals were "prudentially unripe and . . . unfit for judicial review."[119]

Rather than abating the case for a short period of time, the Tenth Circuit chose to dismiss the case entirely, acknowledging that holding the case in abatement while the BLM continued to rescind the 2015 Fracking Rule would be ineffective.[120] In addition, the Tenth Circuit Court vacated the lower district court's opinion, asserting that vacatur was "appropriate" since the district court's reviewing ability was also restricted until the BLM finished rescinding the regulation at issue.[121]

IV. BLM'S AUTHORITY TO REGULATE HYDRAULIC FRACTURING ON FEDERAL LANDS ACCORDING TO THE FLPMA AND MLA

Wyoming v. Zinke has been vacated from the courts, but the question of whether or not the BLM has statutory authority to regulate hydraulic fracturing on federal public lands remains undecided. Furthermore, this unresolved issue will only become increasingly important as new wells continue to be developed and fracked on federal lands.[122] Part IV of this paper disputes the conclusions made in the district court's opinion, and argues that, based upon statutory interpretation of the MLA and FLPMA, the BLM is statutorily authorized to implement its 2015 Fracking Rule. This part will also argue that, even if these Acts do not clearly grant the BLM authority to regulate hydraulic fracturing on federal lands, the district court should have granted the agency *Chevron*–type deference in its promulgation of the 2015 Fracking Rule, and that the district

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[118] *Id.* at 1142–43. The Tenth Circuit Court noted that the Environmental Intervenors would be the only party to suffer hardship here, as oil and gas development on federal lands would resume pre–2015 regulations. The Court added that was "not a 'hardship' contemplated by the prudential ripeness rubric." *Id.* at 1143.

[119] *Id.* at 1143.

[120] *Id.* at 1143–45.

[121] *Id.* at 1146.

[122] *See supra* notes 10–13 and accompanying text.

court's reasons for withholding *Chevron* deference in this case were flawed.

A. The Mineral Leasing Act—History and Statutory Interpretation

Formally named the Mineral Leasing Act of 1920, the MLA was created to "promote the mining of coal, phosphate, oil, oil shale, gas, and sodium on the public domain."[123] When enacted, the MLA also took oil and gas resources from the purview of the General Mining Act of 1872, which continues to regulate mining for hardrock minerals.[124] This promotion of oil, gas, and non-hardrock mineral development on federal public lands was to be primarily done through a lease-and-permit system overseen by the Secretary of the Interior.[125] Under the MLA, oil and gas companies can obtain leases through a competitive bidding process and pay pre–determined royalties amount in exchange for the mineral lease.[126] Also inherent in this leasing system is the authority for the Secretary of Interior to regulate "all surface-disturbing activities" which result from oil and gas leases on federal lands. Additionally, all drilling permits granted by the Secretary under the MLA are conditioned on a "plan of operations" that address any proposed surface-disturbing activities within the lease area.[127]

Both the plain language and scope of the MLA are incredibly broad. Under the Act's general provisions, the Secretary of the Interior is delegated authority to "prescribe necessary and proper rules and regulations and do any and all

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[123] Act of Feb. 25, 1920, 66th Cong. Ch. 85, 41 Stat. 437 (2nd Sess. 1920) (codified at 30 U.S.C. §§ 181 *et seq.* (1988)).

[124] Bruce C. Netschert, *Better Management of Nonfuel Minerals on Federal Land: A Look at the Issues*, *in* PUBLIC LANDS AND THE U.S. ECONOMY 189, 190 (George M. Johnston & Peter M. Emerson eds., 1984).

[125] *See* 30 U.S.C. § 223 (2012) (describing terms for federally-owned oil and gas leases, including how much land can be surveyed within a single lease, the time length for leases, and the terms for royalties and annual rental payments); *see also* 43 C.F.R. § 3100.0-3 (2017) (declaring oil and gas resources in federal public lands to be "subject to lease under the Mineral Leasing Act of 1920").

[126] 30 U.S.C. §§ 223 (2012).

[127] *Id.* At § 226(g).

things necessary to carry out and accomplish the purposes of [the MLA] . . . "[128] Courts and scholars alike have construed this 'necessary and proper' language to clearly grant the Secretary a great deal of authority to carry out the enumerated purposes of this chapter.[129]

Even if the language of the Mineral Leasing Act is construed strictly to limit the Secretary of Interior's authority only to the leasing of minerals on federal public lands, the MLA itself still recognizes that oil and gas companies only exist as leaseholders of federal property and mineral rights, and therefore are subject to regulation from the ultimate title-holder, in this case the United States.[130] This language characterizing the sale and disposition of mineral leases under the MLA underlines the idea that the United States government owns federal public lands both outright[131] and in trust for the

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[128] 30 U.S.C. § 189 (2012).

[129] *See* Forbes v. United States, 125 F.2d 404, 410 (9th Cir. 1942) (concluding that a regulation requiring "the plugging of abandoned wells drilled on the public lands is in accordance with the provisions of the [MLA], subordinate to its provisions, and not in conflict therewith, nor unreasonable in itself"); Getty Oil v. Clark, 614 F. Supp. 904, 916 (D. Wyo. 1985) (holding that under 30 U.S.C. § 189, the Secretary of Interior is authorized to deny a request for a suspension of federal mineral lease "when reasonably necessary to protect the environmental values of the leased property"); *see also* James B. Martin, *The Interrelationships of the Mineral Lands Leasing Act, The Wilderness Act, and the Endangered Species Act: A Conflict in Search of Resolution*, 12 ENVTL. L. 363, 377 (1982) ("The Secretary's power to prescribe necessary rules and regulations that effectuate the [MLA] and other public land laws is now extraordinarily broad"); Bruce M. Pendery, *BLM's Retained Rights: How Requiring Environmental Protection Fulfills Oil and Gas Lease Obligations*, 40 ENVTL. L. 599, 629–30 (2010) (Noting that "[t]he courts have recognized that [30 U.S.C. Sect. 189] grants broad authority to the Secretary of the Interior to regulate oil and gas development . . . " and adding that the MLA "obviously allows great discretion in rulemaking" (footnote omitted)).

[130] 30 U.S.C. § 181 (2012) (declaring that coal, oil, gas, and mineral deposits, "and lands containing such deposits owned by the United States . . . shall be subject to disposition in the form and manner provided by this chapter to citizens of the United States").

[131] U.S. Const. art. IV, § 3, cl. 2 ("The Congress shall have Power to dispose of and make all needful Rules and Regulations respecting the Territory or other Property belonging to the United States"); *see also* Brief of Interested Public Lands, Natural Resources, Energy, and Administrative Law Professors as Amici Curiae In Support Of Respondent-Appellants at 4, Wyoming v. Zinke, 871 F.3d

American people,[132] as part of the "public trust doctrine." This doctrine has origins beyond this nation's history,[133] but its theory remains the same in modern American law: any property commonly owned by the nation's government is held in trust for the benefit of its citizens, who have a collective, inviolable interest in this property.[134] While the historic case *Railroad Co. v. Illinois* only relied on the public trust doctrine to grant federal and state sovereignty over submerged lands,[135] the Supreme Court has since invoked the doctrine to conclude that the federal government has the authority to conserve and manage public lands for national forests, parks, and other public use "classifications."[136] Similarly, the public trust doctrine has evolved in recent years to mean that all federally-owned public lands should be managed in a way that accounts for values of environmental conservation.[137] As owner of federal lands and their subsurface resources,[138] the U.S. government has a duty to

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1133 (2017) (Nos. 16-8068, 16-8069) ("The federal government plays two roles relevant to this action—regulator, and property owner").

[132] U.S. v. Trinidad Coal & Coking Co., 137 U.S. 160, 170 (1890) ("They were held in trust for all the people; and, in making regulations for disposing of them, [C]ongress took no thought of their pecuniary value, but, in the discharge of a high public duty, and in the interest of the whole country, sought to develop the material resources of the United States. . . . ").

[133] John Meyer, *Using the Public Trust Doctrine to Ensure the National Forests Protect the Public from Climate Change*, 16 HASTINGS W.-N.W. J. ENVTL. L. & POL'Y 195, 211–12 (2010) (asserting that "most scholars trace [the doctrine's roots] to a 1500-year-old textbook known as the Institutes of Justinian"); *see* Joseph L. Sax, *Liberating the Public Trust Doctrine From its Historical Shackles*, 14 U.C. DAVIS L. REV. 185, 185–86 (1980).

[134] Illinois Cent. R. Co. v. Illinois, 146 U.S. 387, 453 (1892).

[135] *See generally id.*

[136] ROBERT L. GLICKSMAN ET AL., ENVIRONMENTAL PROTECTION: LAW AND POLICY 49–50 (7th ed. 2015) (citing Light v. United States, 220 U.S. 523 (1911)).

[137] Netschert, *supra* note 124, at 191.

[138] In property law, there is the well-established maxim *cujus est solum, ejus est usque ad coelum et ad inferos*, or "whoever's is the soil, it is theirs all the way to Heaven and all the way to hell." This principle simply means that the rights derived from owning a land parcel extend not only from the surface of the land itself, but up to the sky above and below the ground. *See* Barry Barton, *The Common Law of Subsurface Activity: General Principle and Current Problems*, *in* THE LAW OF ENERGY UNDERGROUND 21, 22 (Donald N. Zillman et al. eds., 2014). Relying generally on this rule, a person who owns land surficially can claim subsurface ownership as well, including ownership of mineral rights. *Id.*

lease these lands and resources in a balanced manner that preserves the lands' biological and environmental integrity.[139]

B. The Federal Land Policy and Management Act—History and Background

While the MLA gives the BLM sweeping authority to issue and regulate oil and gas leases on federal public lands as both governing entity and landowner, the Federal Land Policy Management Act complements this authority, as it grants the BLM broad authority to oversee and regulate virtually any activity that occurs on federal lands. Enacted in 1976, the Federal Land Policy and Management Act, or FLPMA, set guidelines for the BLM's management of "public lands," or those lands owned by the federal government within the contiguous forty-eight states.[140] The BLM currently manages approximately 248 million acres of public land, along with 700 million acres of federally-owned subsurface mineral estate.[141] Most of these lands were acquired by the federal government in the time period from 1750 to 1850, and are located in the western half of the mainland United States.[142] With the advent of FLPMA in 1976, the Secretary of the Interior and the BLM

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at 23 (adding "[t]hat there are many exceptions to [this] general rule is often the real legal issue"); *see also* Paddock & Wentz, *supra* note 28, at 154 ("[T]he "federal government . . . retains authority over all resources located beneath federal lands").

[139] *The Future of Hydraulic Fracturing on Federally Managed Lands: Hearing Before the Subcomm. on Energy and Mineral Resources of the H. Comm. on Natural Resources*, 114th Cong. 24, 24–25 (2015) [hereinafter Wiseman, *Written Testimony*] (statement of Prof. Hannah J. Wiseman).

[140] 43 U.S.C. § 1702 (2012). The United States owns these federal lands by way of title and holds these lands in trust for the American general public. *See supra* notes 130–139 and accompanying text; *see also* D. Michael Harvey, *Public Land Politics in the 1980s*, *in* PUBLIC LANDS AND THE U.S. ECONOMY 81, 81–82 (George M. Johnston & Peter M. Emerson eds., 1984) (discussing the implementation of FLPMA's decisionmaking processes to successfully balance the different uses of federal lands). The United States owns these federal lands by way of title, and holds these lands in trust for the American general public.

[141] CAROL H. VINCENT, ET AL., CONG. RESEARCH SERV., R42346, FEDERAL LAND OWNERSHIP: OVERVIEW AND DATA 1 (2017).

[142] MANAGING THE NATION'S PUBLIC LANDS, U.S. DEP'T. OF INTERIOR'S BUREAU OF LAND MGMT. ANN. REP. 1 (1992).

received statutory authority to manage these federal public lands through the development of 'land use plans' for each respective parcel.[143]

C. The Federal Land Policy and Management Act—Statutory Interpretation

The breadth of FLPMA's statutory language surpasses even that of the Mineral Leasing Act. In its Congressional declaration of policy, FLPMA asserts that all public lands, unless determined otherwise, exist under federal ownership, and in accordance with the nation's best interest, should be "periodically and systematically inventoried . . . through a land use planning process coordinated with other Federal and State planning efforts . . . "[144] Congress further states that the "goals and objectives" of these land use planning efforts should be achieved by land management practices based on principles of "multiple use and sustained yield," unless otherwise specified.[145]

While courts have historically been reluctant to interpret the precise meanings of the terms "multiple use" and "sustained yield,"[146] respective definitions of these terms can be found within Section 103 of FLPMA:

> (c) "The term "multiple use" means 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

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[143] *See* 43 U.S.C. § 1712 (2012) (discussing the management of federal public lands by the Secretary of Interior, through the development and maintenance of land use plans); *see also* George Cameron Coggins, *The Developing Law of Land Use Planning on the Federal Lands*, 61 U. COLO. L. REV. 307, 324 (1990) ("furthermore, the Secretary is authorized to issue management decisions to implement the plans").

[144] 43 U.S.C. § 1701 (a)(1)–(2) (2012).

[145] 43 U.S.C. § 1701 (a)(7) (2012); 43 U.S.C. § 1732(a) (2012).

[146] George C. Coggins, *Of Succotash Syndromes and Vacuous Platitudes: The Meaning of "Multiple Use, Sustained Yield" For Public Land Management*, 53 U. COLO. L. REV. 229, 243–44 (1982) (noting a "surprising dearth" of court cases interpreting federal multiuse statutes "despite the thousands of administrative decisions" that are made each year under the multiple-use and sustained-yield standard).

> future needs of the American people . . . a combination *of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources*, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and *not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output*."
>
> (h) The term "sustained yield" means the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the public lands consistent with multiple use.[147]

Therefore Congress, when declaring that federal public lands should be managed according to the principles of "multiple use and sustained yield," meant that the federal public lands should be managed according to "a combination of balanced and diverse resource uses," and "not necessarily to the combination of uses that will give the greatest economic return."[148] The importance of managing public lands to ensure a 'balanced' diversity of uses is further emphasized in other sections of FLPMA:

> The public lands are to be managed in a manner "that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values," while at the same time recognize "the

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[147] 43 U.S.C. § 1702(c), (h) (2012) (emphasis added).
[148] *Id.*

> Nation's need for domestic sources of minerals, food, timber, and fiber from the public lands[.]"[149]

The Act's repeated testimony to the importance of ensuring a range of diverse resource uses within the public lands overall indicates that a "multiple use and sustained yield" approach under FLPMA is one that balances a wide range of uses to ensure the long-term ecological health and wellbeing of these federal public lands.

In carrying out the purposes of FLPMA, the statute's provisions delegate authority and discretion solely to the Secretary of the Interior. The Act's Congressional declaration of policy states that "in administering public land statutes and exercising discretionary authority granted by them, the Secretary be required to establish comprehensive rules and regulations after considering the views of the general public . . . "[150] This broad allocation of regulatory authority is further clarified in subsequent sections of the Act.[151] Additionally, the Act sets no limit to the types of regulatory tools the Secretary of the Interior can use in the management of federal public lands:

> "In managing the public lands, the Secretary shall, subject to this Act and other applicable law and under such terms and conditions as are consistent with such law, regulate, *through easements, permits, leases, licenses, published rules, or other instruments as the Secretary deems appropriate,* the use, occupancy, and development of the public lands[.]"[152]

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[149] 43 U.S.C. § 1701(a)(8), (12) (2012).
[150] 43 U.S.C. § 1701(a)(5) (2012).
[151] 43 U.S.C. § 1740 (2012) (stating that **"**[t]he Secretary, with respect to the public lands, shall promulgate rules and regulations to carry out the purposes of this Act and of other laws applicable to the public lands").
[152] 43 U.S.C. § 1732(b) (2012) (emphasis added).

Even in its assignment of regulatory authority to the Secretary, FLPMA retains an underlying purpose of preserving the ecological health and safety of public lands.[153]

While the district court in *Wyoming v. U.S. Department of Interior* confidently stated that FLPMA is "[a]t its core . . . a land use planning statute,"[154] this assertion ignores the plain text of FLPMA that details both the Act's scope of authority and its delegation of power to the Secretary of the Interior. FLPMA requires that federal public lands be managed on the basis of 'multiple use and sustained yield,' meaning that these lands should be managed for a broad range of commercial and recreational uses while simultaneously ensuring the health and wellbeing of the public lands for the future. Interpreting the Act's plain language, it is clear that FLPMA is a land-management statute, not only a 'land use planning' statute. Additionally, FLPMA delegates plenary authority and discretion to the Secretary of the Interior to use any regulatory device necessary to carry out these land and resource management objectives.[155]

D. The 2015 Fracking Rule—Chevron Deference Granted to the BLM's Interpretation

In *Wyoming v. U.S. Department of Interior*, the U.S. District Court of Wyoming declined to give *Chevron* deference to the BLM's interpretation of the MLA or FLPMA when reviewing the agency's promulgation of the 2015 Fracking Rule, saying the BLM clearly lacked authority under either statute to regulate hydraulic fracturing.[156] The district court supported this conclusion by asserting that the 2005 EPAct's amendment of the Safe Drinking Water Act (SDWA) to exclude regulation of underground injections "pursuant to hydraulic fracturing

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[153] *Id.* ("In managing the public lands the Secretary shall, by regulation or otherwise, take any action necessary to prevent unnecessary or undue degradation of the lands").

[154] Wyoming v. U.S. Dep't. of Interior, No. 2:15-CV-041-SWS, 2016 WL 3509415, at *8 (D. Wyo. June 21, 2016); *see also supra* Part III.A.

[155] *See supra* notes 150–152 and accompanying text.

[156] *Wyoming v. U.S. Dep't. of Interior*, No. 2:15-CV-043-SWS, 2016 WL 3509415, at *11 (D. Wyo. June 21, 2016); *See also supra* Part III.A.

operations" was a clear indication of Congress' intent to preclude the federal government from regulating hydraulic fracturing altogether.[157]

One issue with the district court's reasoning is that it overlooks the clear limiting language of the hydraulic fracturing exemption that was passed within the 2005 EPAct. The plain language of the exemption is the following:

> *or purposes of this part:*
> (1) Underground injection
> The term "underground injection"—
> (A) means the subsurface emplacement of fluids by well injection; and
> (B) excludes—
> (i) the underground injection of natural gas for purposes of storage; and
> (ii) the underground injection of fluids or propping agents (other than diesel fuels) pursuant to hydraulic fracturing operations
> related to oil, gas, or geothermal production activities.[158]

Reading this exemption as written, it is clear that Congress only aimed to exclude hydraulic fracturing from regulation under the underground injection control (UIC) framework that is laid out in SDWA, and did not intend to implement a hydraulic fracturing "blanket exemption" from all federal regulation and oversight.[159]

The district court in *Wyoming v. U.S. Department of Interior* also failed to read any language within MLA or FLPMA that clearly prohibited the BLM from regulating hydraulic fracturing under these statutes, and thus incorrectly failed to defer to the BLM's "reasonable" interpretation of the enabling statutes.[160] Under examination, neither the MLA nor FLPMA,

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[157] *Id.* at *10–*11 (citing 42 U.S.C. § 300h(d)(1)(B)(ii) (2012)).
[158] 42 U.S.C. § 300h(d)(1) (2012) (emphasis added).
[159] Wiseman, *Written Testimony*, *supra* note 139, at 8.
[160] *See* Chevron, U.S.A., Inc. v. Nat. Res. Def. Council, Inc., 467 U.S. 837, 842–43 (1984).

in any instance, mention hydraulic fracturing as a development activity that would be exempt from regulation on federal public lands. Under the MLA, the Secretary of Interior is authorized to " . . . do any and all things necessary to carry out and accomplish the purposes of [the MLA] . . . [,]" which include leasing public lands for oil and gas development under pre–approved conditions.[161] In addition, the Secretary has authority to regulate "all surface-disturbing activities" that result from oil and gas leases on federally-owned lands.[162] In managing the federal public lands under FLPMA, the Secretary "shall . . . regulate . . . the use, occupancy, and development of the public lands" based on principles of multiple use and sustained yield.[163] Additionally, under FLPMA the Secretary "shall . . . take any action necessary to prevent unnecessary or undue degradation" of these federal public lands.[164] Under both Acts, the use of hydraulic fracturing procedures in oil or gas well drilling could reasonably be considered a "surface-disturbing" activity that relies on the "use, occupancy, and development" of public lands and resources.[165] If anything, the statutes are "silent or ambiguous" with respect to their grant of authority to the BLM to regulate hydraulic fracturing, and the district court should therefore have granted *Chevron* deference to the BLM's 2015 Fracking Rule as a "permissible construction" of the agency's regulatory authority under the MLA and FLPMA.[166]

The district court's reasoning for denying *Chevron* deference to the BLM's 2015 Fracking Rule is further undermined by the fact that the court also ignored the BLM's and its predecessors' longstanding history of issuing regulations related to nearly all aspects of oil and gas extraction.[167] BLM's promulgation of 43 C.F.R. 3160, along with Onshore Oil and Gas Orders 1, 2, and 7 over the past twenty-five years, have granted the BLM oversight authority for every stage of the drilling

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[161] 30 U.S.C. §§ 189–226 (2017).
[162] *Id.* at § 226(g).
[163] 43 U.S.C. § 1732(a), (b) (2017); 43 U.S.C. § 1701(a)(7) (2017).
[164] 43 U.S.C. § 1732(b) (2017).
[165] 30 U.S.C. § 226(g) (2017); *id* at § 1732(b).
[166] *See* Chevron, U.S.A., Inc. v. Nat. Res. Def. Council, Inc., 467 U.S. 837, 842–43 (1984).
[167] *See supra* notes 54–58 and accompanying text.

process on federal and Indian lands, from the application of drilling permits, to the casing and cementing of wells, and the disposal of produced drilling wastewater.[168] The 2015 Fracking Rule also falls squarely in line with previous oil and gas regulations as an effective regulation of the surface-disturbing activities that result from hydraulic fracturing on public lands, and allows for the effective "restoration of any lands or surface waters adversely affected" by hydraulic fracturing.[169]

As stated above, the BLM's 2015 Rule and its other drilling regulations are the result of a longstanding precedent of the federal government regulating oil and gas extraction on public lands. In addition, the BLM's proposed regulations in the 2015 Fracking Rule that ensure, *inter alia*, safe practices of cementing and casing wells and storage of wastewater, can exist without encroaching on Congress' intent for only EPA to regulate injections related to hydraulic fracturing under the SDWA.[170] Furthermore, these regulations were properly implemented under the statutory mandates of MLA and FLPMA, which both set guidelines for the federal management of public land and resources to provide a wide range of long-term social and environmental benefits for the American public. For all of these reasons, a level of *Chevron* deference should have been granted to the BLM in its promulgation of the 2015 Fracking Rule under MLA and FLPMA authority.

V. POLICY REASONS FOR AUTHORIZING BLM TO REGULATE HYDRAULIC FRACTURING ON FEDERAL LANDS

The Bureau of Land Management should be authorized to regulate hydraulic fracturing on federal public lands for reasons beyond statutory authority, including beneficial reasons related to both natural resource protection and federal-level regulation.

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[168] *See supra* notes 58–65 and accompanying text.
[169] 30 U.S.C. § 226 (2017);*see also* 43 C.F.R. § 3162.5–1(b) (2017) ("The operator shall exercise due care and diligence to assure that leasehold operations do not result in undue damage to surface or subsurface resources or surface improvements").
[170] Wiseman, *Written Testimony*, *supra* note 139, at 8.

A. Environmental Effects of Hydraulic Fracturing

While the increase in hydraulic fracturing activities brought forth economic growth and prosperity for the U.S. energy sector, its development near urban and rural populations inevitably brought conflict, including public concerns about environmental effects of fracking.[171]

1. Contamination of Surface and Groundwater Sources

Contamination of surface and groundwater sources is the most frequently discussed environmental effect associated with hydraulic fracturing activities. However, the extent that these fracking processes affect sources of freshwater has been somewhat of a debated topic. There have been multiple nationwide reports based on the environmental effects, realized or potential, that hydraulic fracturing has on groundwater,[172] but parties have different opinions as to what these reports say.[173]

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[171] Wiseman, *supra* note 46, at 121–27.

[172] *See generally* GROUND WATER PROT. COUNCIL, SURVEY RESULTS ON INVENTORY AND EXTENT OF HYDRAULIC FRACTURING IN COALBED METHANE WELLS IN THE PRODUCING STATES (1998), [hereinafter 1998 GWPC Survey]; U.S. ENVTL. PROT. AGENCY, EPA 816-R-04-003, EVALUATION OF IMPACTS TO UNDERGROUND SOURCES OF DRINKING WATER BY HYDRAULIC FRACTURING OF COALBED METHANE RESERVOIRS (2004), https://hero.epa.gov/hero/index.cfm/reference/details/reference_id/1774186 [https://perma.cc/8QZR-3LLZ] [hereinafter 2004 EPA Report]; 2016 EPA Report, *supra* note 2.

[173] *Compare* David B. Spence, *Federalism, Regulatory Lags, and the Political Economy of Energy Production*, 161 U. PA. L. REV. 431, 450 (asserting the EPA 2004 Report found that injecting hydraulic fracturing fluids into coalbed methane wells "poses little or no threat to drinking water sources") *with Hydraulic Fracturing 101*, EARTHWORKS, https://www.earthworksaction.org/issues/detail/hydraulic_fracturing_101 [https://perma.cc/ELK9-XJRQ] (asserting that the EPA's 2004 Report reveals that hydraulic fracturing within the study's selected coalbed methane basins will lead to the underground injection of chemicals that both contaminate the quality of nearby underground drinking water sources, as well as pose long-term threats to human health).

A possible reason for the differing opinions about the effects of hydraulic fracturing on surface and groundwater sources is that water source contamination from hydraulic fracturing can be the result of one of several possible scenarios. One possibility is that fracking activity produces fractures that extend directly into surrounding shallow rock formations that contain drinking water supplies.[174] Alternatively, the well's casing could fail, causing fluids to escape into sources of drinking water or groundwater.[175] A final possibility for contamination occurs when fracturing fluids are accidently spilled at the surface, which allows the fluids to contaminate surface water or seep into groundwater.[176] The range of possibilities for ground and surface water contamination are due not only to the fracking fluids themselves containing hazardous chemicals, but also to the large quantities of wastewater created by hydraulic fracturing activities, which themselves contain both fracking fluids and trace amounts of naturally occurring but hazardous substances such as heavy metals, chlorides, radioactive materials.[177]

As previously stated, while there have been multiple nationwide reports based on the environmental effects that hydraulic fracturing has on groundwater, no real consensus has been reached among parties about these effects. One of the first major studies of the effects of hydraulic fracturing on groundwater resources was conducted by the Groundwater Protection Council (GWPC) in 1998.[178] This study surveyed the twenty-five state natural gas regulatory agencies of major coal-producing states in which coalbed methane gas was also produced in 1997.[179] Of the states that produced coalbed methane gas and had active methane wells, Alabama was the only state to report a complaint of drinking water contamination, which was not substantiated after "hydrologic and reservoir

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[174] Roberson, *supra* note 17, at 117.
[175] *Id.*
[176] *Id.*
[177] Paddock & Wentz, *supra* note 28, at 152; *see also* Wiseman, *supra* note 3, at 758–75 (discussing the risks associated with "flowback" water, the wastewater that flows back up out of the well after fracturing).
[178] *See* 1998 GWPC Survey, *supra* note 172.
[179] *Id.* at 3.

investigations and tests" by several agencies were conducted."[180] However, the GWPC report probably cannot be labeled as definitive, as it only addressed fracturing in coalbed-methane gas reservoirs and "did not address fracing in shale," thereby overlooking the most common source of gas for hydraulic fracturing today.[181]

In 2004, the EPA released a study to "[assess] the potential for contamination of underground sources of drinking water (USDWs) from the injection of hydraulic fracturing fluids into coalbed methane (CBM) wells."[182] In this 2004 study, the EPA concluded that "the injection of hydraulic fracturing fluids into CBM wells poses little or no threat to USDWs and does not justify additional study at this time."[183] However, this study was also later criticized for its inconsistencies. One noted discrepancy in this study was that its scope was limited to only one component of hydraulic fracturing, the underground injection of fluids, and only addressed one potential environmental effect of fracturing, the contamination of underground sources of drinking water.[184] Also, like the GWPC report, the EPA's 2004 report limited its review to hydraulic fracturing in coalbed methane gas wells and ignored hydraulic fracturing in shale gas reservoirs.[185] A former assistant EPA administrator who oversaw the 2004 report later echoed these sentiments, saying that the study's conclusions about the "safety" of hydraulic fracturing were "exaggerated," and that a new study was necessary due to the growing prevalence of fracking in shale gas formations.[186] Still, others argue that the EPA purposefully limited its scope in this study because coalbed

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[180] *Id.* at 9–10.
[181] Wiseman, *supra* note 46, at 128; *see also supra* Part II.B.
[182] 2004 EPA Report, *supra* note 172, at ES-1.
[183] *Id.*
[184] Wiseman, *supra* note 46, at 128.
[185] *Id.*
[186] Mike Soraghan, *Frack Study's Safety Findings Exaggerated, Bush EPA Official Says*, N.Y. TIMES (May 20, 2011), http://www.nytimes.com/gwire/2011/05/20/20greenwire-frack-studys-safety-findings-exaggerated-bush-65374.html [https://perma.cc/CYS3-GT4F].

methane gas production was seen at the time as the "greatest threat" to drinking water sources.[187]

The 2004 EPA report was also notable for its documentation of local and personal accounts of "water quality incidents" that occurred within four of the eleven major coal basins reviewed in the report.[188] These "water quality incidents" included elevated levels of methane in wells and homes, discoloration of tap water, and even rash outbreaks from showering.[189] The EPA acknowledged these incidents and stated that, despite its overall conclusion that hydraulic fracturing fluids into CBM wells did not pose any threat to drinking water sources, the collection and consideration of 'water quality incidents' "collectively suggest that water quality (and quantity) problems might be associated with some of the production activities common to coalbed methane extraction."[190]

In June 2015, the EPA released a draft plan to study potential impacts of hydraulic fracturing on drinking water resources.[191] The scope of the EPA's 2015 draft was to review and analyze information related to the potential impacts of hydraulic fracturing on drinking water resources at each stage of the hydraulic fracturing water cycle; from water acquisition through the mixing of chemicals and actual fracturing to the post–fracturing stage.[192] Similar to its 2004 counterpart, the EPA 2015 draft did report "specific instances" of harmful impacts on drinking water resources, but concluded that there was no evidence of hydraulic fracturing leading to "widespread, systemic impacts" on drinking water sources.[193] However, the report acknowledged the possibility that its findings may have also been due to other "limiting factors," including "insufficient

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[187] Roberson, *supra* note 17, at 110.
[188] Wiseman, *supra* note 46 at 11.
[189] 2004 EPA Report, *supra* note 172, at 6-3-14.
[190] *Id.* at 6–16.
[191] U.S. ENVTL. PROT. AGENCY, EPA/600/R-15/047A, ASSESSMENT OF THE POTENTIAL IMPACTS OF HYDRAULIC FRACTURING FOR OIL AND GAS ON DRINKING WATER RESOURCES, EXTERNAL REVIEW DRAFT (2015), ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=523539 [hereinafter EPA 2015 Draft].
[192] *Id.* at ES-3.
[193] *Id.* at ES-6.

pre–and post–fracturing data on the quality of drinking water resources[,] the paucity of long-term systematic studies[,] . . . and the inaccessibility of some information on hydraulic fracturing activities and potential impacts."[194] The 2015 draft was published as a final report in December 2016, and reached similar conclusions.[195] The 2016 report was able to record or estimate the impacts of hydraulic fracturing on drinking water sources in a limited manner, but "data gaps and uncertainties" prevented the study from calculating these impacts on a national scale.[196] In general, the 2016 report stressed the need to "further our understanding of the potential for [fracking-related activities] to impact drinking water resources and the factors that affect the frequency and severity of those impacts."[197]

2. Amount of Water Use for Hydraulic Fracturing Operations

While concern about the effects of hydraulic fracturing generally seems to be focused on protection of surface and groundwater sources from contamination, the quantity of freshwater used in hydraulic fracturing operations is an equally important environmental protection issue. As hydraulic fracturing operations in the United States have rapidly increased both in size and complexity during the past seventy-five years,[198] the resource amounts used in these operations have grown as well.[199] Drilling and fracturing a horizontal shale gas well can be a particularly resource-intensive process, requiring an average of two to four million gallons of water per well.[200]

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[194] *Id.*
[195] *See* EPA 2016 Report, *supra* note 2.
[196] *Id.* at ES-4, ES-46–47.
[197] *Id.* at ES-46.
[198] *See supra* Part II.A.
[199] *See* SMITH & MONTGOMERY, *supra* note 29, at 28 ("After the first few jobs, the average fracture treatment consisted of about 750 gal of fluid and 400 lb of sand for about a year. Treatments today average about 60,000 gal of fluid and 100,000 lb of propping agent with the largest treatments exceeding 1 million gal of fluid and 5 million lb of proppant").
[200] Modern Shale Gas, *supra* note 37, at ES-4, 64; *see also* U.S ENVTL. PROT. AGENCY, EPA/600/D-11/001, DRAFT PLAN TO STUDY THE POTENTIAL IMPACTS OF HYDRAULIC FRACTURING ON DRINKING WATER SOURCES 19 (2011),

While its recognition has not reached the level of concern associated with drinking water contamination, the issue of water quantity-usage related to oil and gas fracturing has not been entirely overlooked by the general public.[201]

3. Air Pollution and Greenhouse Gas Emissions

Fugitive emissions of methane, VOCs, and other hazardous air pollutants (HAPs) are another environmental concern of hydraulically-fractured wells, particularly during the flowback period that occurs after injection.[202] Additionally, there is potential for large quantities of HAPs to be generated during the processing, transport, and storage of natural gas.[203] One study has recorded over 50 non-methane hydrocarbons (NMHCs) near unconventional wells in Colorado; some of these NMHCs have known health effects, and many of them could be traced back to the industrial equipment used during the gas production process.[204] On a broader scale, the use of hydraulic fracturing as an extraction method also contributes to the production and consumption of fossil fuels, which account for up to 90 percent of human-caused carbon dioxide (CO2) emissions worldwide.[205]

4. Impact of 2015 Fracking Rule on Environmental Protection

The 2015 Fracking Rule will help to address a broad range of environmental and human health issues associated with hydraulic fracturing. The rule's new guidelines for improving

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https://www.epa.gov/sites/production/files/documents/HFStudyPlanDraft_SAB_020711.pdf (noting that "2 to 4 million gallons of water are typically needed per well" for shale gas drilling).

[201] *See* EPA 2004 Report, *supra* note 172, at 6–9 (discussing reports from the Powder River Basin how "the biggest concern among people in the area is loss of water," due to the amount of complaints received relating to water quantity issues originating from oil and gas fracturing).

[202] Paddock & Wentz, *supra* note 28, at 153.

[203] *Id.*

[204] *See* Theo Colborn, et al., *An Exploratory Study of Air Quality near Natural Gas Operation*, HUM. & ECOLOGICAL RISK ASSESSMENT: AN INT'L J. 86 (2012).

[205] *See generally* R.B. Jackson, et al., *Warning signs for stabilizing CO_2 emissions*, ENVTL. RES. LETTERS 12, 12 (2017).

cementing and casing[206] will help prevent leaks of fracturing fluid and flowback water from wells, thereby reducing the possibility of surface or groundwater contamination. The quality of nearby water sources will also benefit from the 2015 Rule's requirement of storing most drilling fluids in aboveground covered storage tanks,[207] as this will help to prevent fluid spills or leaks that occur with open-air storage tanks or in-ground pits.

In addition, many requirements found in the BLM's 2015 Fracking Rule can be considered "informational," as they only involve submitting information about the geology surrounding proposed wells, the nearby sources of usable water, the cement evaluation logs prepared, and the fracturing chemicals used in each operation.[208] For uncertainties like those expressed in the 2004 or 2016 EPA Reports,[209] additional informational requirements will only help us to increase our understanding of what the effects of hydraulic fracturing are beyond localized incidents and to understand the full extent of these effects on the surrounding natural environment.

B. Lack of Consistency, Regulatory Ability When Left at State-Level

The management of hydraulic fracturing processes related to oil and gas drilling on U.S. public lands will be more effective at a federal, rather than a state-wide, level. Those familiar with managing federal public lands note that coordinating federal activity with state and local land use plans "often involve multistate and national interests" which surpass the capabilities of individual state governments.[210] In addition, most states have inclusive regulations to oversee conventional drilling practices, but have still not addressed the "specific concerns associated with horizontal drilling and hydraulic fracturing."[211]

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[206] 2015 Fracking Rule, 80 Fed. Reg. at 16,129.
[207] *Id.*
[208] Wiseman, *Written Testimony*, *supra* note 139, at 11–12.
[209] *See supra* Part V.A.1.
[210] Harvey, *supra* note 140, at 92–93.
[211] Paddock & Wentz, *supra* note 28, at 151.

Federal management of public lands and resource use is a better alternative to state management for two additional reasons. First, the federal government simply has more resources, human and monetary, at its disposal than state governments. For example, a federal agency can conduct a far greater number of oil and gas well inspections per year than its state counterparts.[212] Second, federal regulation of hydraulic fracturing can provide consistent requirements for extraction methods, like running a cement bond log when installing casing[213] or for use of tanks for flowbacks,[214] requirements that have shown to be inconsistent when implemented at a state level. Consistent federal requirements will lead to less bureaucratic confusion for oil and gas operators when drilling on public lands, and will help to parallel the BLM's statutorily-defined objective of multiple-use management of public land and resources for the benefit of all U.S. citizens.

In addition, if states or localities want to deviate from the BLMs' fracking requirements under the 2015 Fracking Rule, they can rely on the variance provision set forth in the final rule, as long as their standards meet or exceed those of the 2015 Fracking Rule.[215] Thus, the federal regulations proposed in the 2015 Fracking Rule serve as a complement to its state counterparts, helping to bring consistency and additional resources in areas of state regulatory schemes when needed.

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[212] *Compare* Hannah J. Wiseman, *Regulatory Risks in Tight Oil and Gas Development*, 29 NAT. GAS & ELECTRICITY 6 (2012) ("For example, in 2012 Colorado had approximately 36 oil and gas inspectors and 49,062 active conventional and unconventional oil and gas wells, whereas New Mexico had approximately 12 inspectors for 56,366 active conventional and unconventional wells") *with* U.S. GOV'T. ACCOUNTABILITY OFFICE, OIL AND GAS DEVELOPMENT, GAO-13-572, BLM NEEDS BETTER DATA TO TRACK PERMIT PROCESSING TIMES AND PRIORITIZE INSPECTIONS (2013), http://www.gao.gov/assets/660/657176.pdf ("To mitigate the environmental impact of oil and gas development, BLM increased the number of environmental inspections it conducted of federal oil and gas wells and facilities from 10,941 in fiscal year 2007 to 17,866 in fiscal year 2012").

[213] Wiseman, *Written Testimony*, *supra* note 139, at 11.

[214] *Id.*

[215] 2015 Fracking Rule, 80 Fed. Reg.at 16,221.

VI. CONCLUSION

Hydraulic fracturing is a technological breakthrough that has transformed natural gas into a relatively inexpensive and abundant energy source in the United States. The United States government should take all steps necessary to ensure the safe and controlled use of hydraulic fracturing when developing our oil and gas resources, including those found in federal public lands. Nevertheless, federal agencies should only be allowed to regulate hydraulic fracturing activities within the bounds of their statutorily-delegated authority. The BLM's promulgation of its 2015 Fracking Rule to regulate hydraulic fracturing on federal public lands was undoubtedly a proper use of its governing authority under the MLA and FLPMA, and should have been upheld by the U.S. District Court of Wyoming. In addition, the 2015 Fracking Rule was set to bring enormous benefits to the general public as it sought to provide a much-needed update to federal regulations on oil and gas extraction and looked to address many of the existing environmental and health-related problems stemming from hydraulic fracturing.

The development of land and mineral resources on U.S. federal public lands has a history almost as old as the nation itself. Yet, in deciding whether or not the BLM has authority to regulate hydraulic fracturing on federal public lands, we must remind ourselves of what and who these lands are for. A concluding sentence from Hope Babcock, written during her time as a deputy general counsel for National Audubon Society and director of its Public Lands and Water Program, summarizes this critical reminder: "[I]t is important to remember that these lands belong to all citizens, not just to the few who wish to exploit their underlying mineral wealth for private gain."[216] Written in 1984, this quote remains just as prevalent today as ever, as we continue to face important decisions on whether to implement and enforce energy resource regulations that will benefit all citizens, or only the few.

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[216] Hope Babcock, *Explaining and Defending the Existing Federal Lands Energy Management System*, *in* PUBLIC LANDS AND THE U.S. ECONOMY 275, 281 (George M. Johnston & Peter M. Emerson eds., 1984).