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# Articles

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*Beckett G. Cantley*

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Environmental Protection or Mineral Theft: Potential Application of the Fifth Amendment Takings Clause to U.S. Termination of Unpatented Mining Claims

Beckett G. Cantley*

Abstract

The mining claim patent process was much less rigorous in the early days of mining when nearly anyone willing to expend the $500 on “patent improvements,” pay for a mineral survey, and pay the statutory purchase price could patent a mining claim very easily. Over time, the United States government has grown increasingly reluctant to patent mining claims and to allow mining activities to occur on unpatented federal public domain lands. The U.S. government argues that its reluctance to allow mining is simply an environmental concern. However, the U.S. tightening of private mining upon federal lands also coincides with a period of significantly rising mineral values. In the early 1990s, the U.S. government used delay tactics in the patent application process followed by an absolute moratorium on patent application approvals in the mid-1990s. The U.S. began gradually imposing arguably-excessive occupancy and environmental regulations around this time as well, increasing the cost of mining operations significantly. In the early 2000s the U.S. began utilizing a dormant trap in the General Mining Act—a combination of valuable discovery, use, and mine-to-mill site provisions—to retroactively invalidate most of the remaining unpatented mining claims as untenable under the Marketability Test. The U.S. also sought to prevent relocation of such retroactively invalidated claims by currently withdrawing federal lands as national monuments under the Antiquities Act. Claimholders who feel that their claims have been wrongly invalidated and/or denied patenting have looked for redress often by arguing that the government’s actions are unconstitutional. An argument that is more likely to be successful, however, is that the invalidation and withdrawal of an otherwise valid, unpatented mining claim may constitute a compensable Fifth Amendment taking by the

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U.S. government. This article discusses: (1) an overview of the laws governing U.S. mining claims; (2) the process of locating and maintaining an unpatented claim; (3) the process and requirements of claim patenting; (4) the relative benefits of patenting; (5) the federal land withdrawal power under the Antiquities Act; (6) how the a Fifth Amendment takings argument may arise from increased regulatory compliance costs; (7) how a Fifth Amendment takings argument may arise from federal land withdrawals of otherwise valid unpatented mining claims; (8) procedures for litigating mining claim contests; and (9) issues related to a former unpatented claimholder’s standing to sue or intervene in a mining claim contest.

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I. Introduction

The mining claim patent process was much less rigorous in the early days of mining when nearly anyone willing to expend the $500 on “patent improvements,” to pay for a mineral survey, and to pay the statutory purchase price could patent a mining claim very easily.1 Thus, “the [General Mining Act] ha[d] traditionally been interpreted as granting miners a near-carte blanche right to develop federal lands for mining.”2

Over time, the federal government has grown increasingly reluctant to patent claims and to allow mining activities to occur on unpatented federal public domain lands.3 The U.S. government argues that its reluctance to allow mining is simply an environmental concern.4 However, the U.S. tightening of private mining upon federal lands also coincides with a period of significantly rising mineral values.5 In the early 1990s, the U.S. government used delay tactics in the patent application process,6 followed by an absolute moratorium on patent application approvals in the mid-

1. See ROCKY MOUNTAIN MINERAL LAW FOUND., AM. LAW OF MINING § 51.05 (2d ed. 1999) [hereinafter ROCKY MOUNTAIN MINERAL LAW FOUND.] (noting the investment required to patent a claim).
4. The EPA has reported that more than 40 percent of Western watersheds have mining contamination in their headwaters. The total cost of cleaning up metal mining sites throughout the West is an estimated $32 billion or more. See Oversight Hearing on Hardrock Mining on Fed. Land Before the Senate Comm. on Energy and Natural Res., 110th Cong. 9 (2007) (statement of Dusty Horwitt, J.D., Pub. Lands Analyst, Envtl. Working Grp.).
1990s. The U.S. began gradually imposing, arguably excessive, occupancy and environmental regulations around this time as well, increasing the cost of mining operations significantly. In the early 2000s the U.S. began utilizing a dormant trap in the General Mining Act—a combination of valuable discovery, use, and mine-to-mill site provisions—to retroactively invalidate most of the remaining unpatented mining claims as untenable under the Marketability Test. The U.S. also sought to prevent relocation of such retroactively invalidated claims by withdrawing federal lands as national monuments under the Antiquities Act. Each of these recent government actions will be discussed in much greater detail below.

Claimholders who feel that their claims have been wrongly invalidated and/or denied patenting have looked for redress in the courts, many times by arguing that the government’s actions are unconstitutional. The argument that is most likely to be successful, and the focus of this article, is that the invalidation and withdrawal of an otherwise valid unpatented mining claim may constitute a compensable Fifth Amendment taking by the U.S. government. This article will: (1) provide background on federal mining claims; (2) discuss the process of locating and maintaining an unpatented claim; (3) describe the process and requirements of claim patenting; (4) discuss the relative benefits of patenting; (5) outline the federal land withdrawal power under the Antiquities Act; (6) discuss how the a Fifth Amendment takings argument may arise from increased regulatory compliance costs; (7) discuss how a Fifth Amendment takings argument may arise from federal land withdrawals of otherwise valid unpatented mining claims; (8) describe the procedures for litigating mining claim contests; and (9) outline issues a former unpatented claimholder may have in establishing standing to sue or intervene in a mining claim contest.

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9. See Crown Jewel, supra note 2, at 825 (discussing the cumulative effect of different elements of the Mining Law on certain ore bodies on federal lands).

II. Background on Mining Claims

A. Brief History of the Sources of Mining Claims Law

The current U.S. mining claim law framework started as a series of customary local rules, evolving over time to the detailed federal and state system in place today. Early prospectors adopted their own rules for locating and maintaining mining claims. These informal rules forged local customs, which were enforced by organized mining districts in some areas. This unregulated system worked for some time. Eventually, however, the unbridled mayhem of the California Gold Rush of 1849 created the necessity for a federal mining claims system, leading to the enactment of the General Mining Act of 1872 (“General Mining Act”).

The General Mining Act was the first United States federal law to authorize and govern prospecting and mining for economic minerals on federal public lands. While the General Mining Act was the first direct federal authorization of permissible mining on federal lands, the terms of the General Mining Act were heavily influenced by the majority opinion of various early local mining customs (as were many early court decisions interpreting the General Mining Act). Under the terms of the General Mining Act as originally enacted, all United States citizens eighteen years of age or older had the right to locate a mining claim. The General Mining Act distinguished between the rights and requirements of lode (i.e. hard rock) and placer (i.e. gravel) mining claims (discussed in greater detail immediately below). The General Mining Act authorized unpatented mining claims, which only grant claimholders the right to conduct activities necessary to exploration and mining, so long as the claimholder diligently works the claim and makes at least $100 worth of annual labor improvements. The General Mining Act also authorized the granting, upon the claimholder’s application, of patented mining claims, which

11. See Pruitt, supra note 3, at 1 (discussing early mining in the U.S.).
12. See Pruitt, supra note 3, at 1 (noting the use of local custom in early mining).
13. See Pruitt, supra note 3, at 1 (“The mining claim was born of necessity out of the California Gold Rush of 1849 and other mining booms during the Civil War.”).
15. See generally id. (granting rights to existing and future mining claims).
16. See id. §§ 22, 28 (providing that locatable federal public domain lands shall be free and open to exploration and purchase under regulations prescribed by law, “and according to the local customs or rules of miners in the several mining districts, so far as the same are applicable and not inconsistent with the laws of the United States.”).
17. See id. § 22 (discussing citizenship requirements).
18. See id. § 35 (recognizing a difference between lode and placer).
19. See id. §§ 28, 28-1, 28b (discussing the limits of unpatented claims).
granted the claimholder exclusive use and title to previously federally-owned lands upon which an unpatented mining claim was validly located and maintained with at least $500 of claim improvements and expenditures made thereon.\textsuperscript{20}

Following the enactment of the General Mining Act, most Western states enacted supplemental state laws that assist in determining: (1) the manner for monumenting claim boundaries; (2) the amount and type of discovery work required at the time of locating a claim; (3) the recording requirements of notices of location; and (4) the documentation requirements of annual assessment labor.\textsuperscript{21} The Federal Land Policy and Management Act of 1976 provided the foundation for extensive federal regulation in the field of mining claims.\textsuperscript{22} As a result, U.S. federal regulations are now very relevant authority pertaining to mining claims issues.\textsuperscript{23} For instance, federal regulations require that all mining claims be properly filed and maintained with annual filings with the Bureau of Land Management ("BLM").\textsuperscript{24} This patchwork of federal and state mining claims laws affect specific types of mining claims in different ways, which is a topic addressed immediately below.

\textbf{B. Types of Mining Claims}

Federal and state mining laws and regulations differ depending on the type of mining claim involved. There are four types of mining claims: (1) lode; (2) placer; (3) mill site; and (4) tunnel.\textsuperscript{25} The form of the deposit (and not whether the deposit contains a metal or nonmetal, contrary to popular belief) determines the nature of the claim.\textsuperscript{26} Each type of claim is a distinct and separate entity, having different purposes and holding individualized property interests.\textsuperscript{27} However, multiple types of claim filings

\begin{itemize}
\item \textsuperscript{20} See id. § 29 (discussing the procurement of a patent).
\item \textsuperscript{21} See Pruitt, supra note 3, at 35–154 (indicating differences and other information about state mining laws).
\item \textsuperscript{22} Federal Land Policy and Management Act, 43 U.S.C. §§ 1701–84 (1976).
\item \textsuperscript{23} See id. (creating formal regulations of mining).
\item \textsuperscript{24} Compliance with the filing requirement regulations is relatively difficult and costly. Furthermore, failure to strictly comply has been ruled to completely void previously located mining claims, with relocation as the only solution available to regain the claim rights. See id. § 1744 (discussing filing requirements); see Pruitt, supra note 3, at 2 (discussing the need to file annually with BLM).
\item \textsuperscript{26} See Pruitt, supra note 3, at 2 (discussing the types of deposits).
\item \textsuperscript{27} See Pruitt, supra note 3, at 2 (noting the different effects of various types of claims).
\end{itemize}
are commonly made upon a single geographic area. For instance, mineral deposits are located either by lode or placer claims. In cases where the nature of the deposit is questionable, prudent locators would file doubly on the same ground, first as a placer claim then as a lode claim because Congress recognized lodes within placers, but not vice versa. The remainder of this subsection will discuss the four types of mining claims in greater detail.

1. Lode Claims

The General Mining Act requires a lode claim for “veins or lodes of quartz or other rock in place.” In fact, a lode claim cannot be issued until a vein or lode has been discovered on the land. Therefore, lode claims are generally only validly locatable upon a mineral deposit that is surrounded by hard rock. Any vein, lode, zone, or belt of mineralized rock lying between boundaries that separate the deposit from the neighboring rock, even if these boundaries are gradational, should be located as a lode claim. Examples of mineralized rock deposits that could be subject to a lode claim include vein and fissure deposits of gold, platinum, silver, copper, lead, zinc, uranium, and tungsten. Federal law limits the size of a single lode claim to 1500 feet in length and not more than 300 feet on either side of the centerline of the deposit—amounting to a total area of 10.331

28. See Pruitt, supra note 3, at 3 (noting that, for instance, a tunnel claim can give rise to a lode claim).
30. See Rocky Mountain Mineral Law Found., supra note 1, at § 32.02(4)(b) (discussing the problems with determining the form of a deposit at a given location); see H. Michael Keller, Lode or Placer?—Locating the Distinction, 31 Rocky Mountain Mineral Law Inst. 12-1, 12-42 (1985) (discussing the advantages of double-staking, and the “placer first” rule); A lode claim is void if used to acquire a placer deposit, and a placer claim is void if used for a lode deposit. See Pruitt, supra note 3, at 13 (noting that the claim must be surveyed unless it is a placer claim located in accordance with surveyed legal subdivisions).
34. See Types of Claims, supra note 25 (noting “deposits subject to lode claims include classic veins or lodes having well-defined boundaries.”).
35. See Types of Claims, supra note 25 (“They also include other rock in-place bearing valuable minerals and may be broad zones of mineralized rock.”).
36. See Types of Claims, supra note 25 (stating that examples of lode claims “include quartz or other veins bearing gold or other metallic minerals and large volume, but low-grade disseminated gold deposits”).
acres. However, there are no restrictions on how deep a miner can dig within a load claim site, i.e. no restrictions on “extra-lateral rights.”

2. Placer Claims

Placer claims are defined as “including all forms of deposit, excepting veins of quartz, or other rock in-place.” In other words, “every deposit, not located with a lode claim, should be appropriated by a placer location.” Originally, these included only loose deposits of unconsolidated materials, such as sand and gravel, containing free particles of gold (nuggets) or other minerals. However, many nonmetallic bedded or layered deposits, such as gypsum and high calcium limestone, were also made locatable as placer deposits by Congressional acts and judicial interpretations. Exterior dimensions of placer mining claims are generally expected to conform to subdivisions of the section survey. A single locator may not claim more than 20 acres in each placer claim. However, a claimholder must prove that each ten acres within a placer claim is mineral in character to show the existence of a valid discovery on the entire claim. Placer claims do not enjoy extra-lateral rights.

37. See Types of Claims, supra note 25 (noting that Federal statute limits a lode claim “to a maximum of 1500 feet in length, and a maximum width of 600 feet (300 feet on either side of the vein”).
38. See 30 U.S.C. § 26 (2006) (describing how the right of possession includes both the enjoyment of “all the surface included within the lines of their locations, and of all veins, lodes, and ledges throughout their entire depth, the top or apex of which lies inside of such surface lines extended downward vertically”).
39. Id. § 35; see also Types of Claims, supra note 25.
40. Types of Claims, supra note 25.
41. See PRUITT, supra note 3, at 2 (stating that these claims can be located “upon deposits of loose, unconsolidated material, such as gravel beds”).
42. See PRUITT, supra note 3, at 3 (noting that deposits of “gypsum, limestone and quarry stone are most commonly located as placer claims”).
43. See Types of Claims, supra note 25 (stating that, where practicable, placer claims are located by legal subdivision).
44. See Types of Claims, supra note 25 (explaining that different acreage rules apply to associations of persons that act as a single locator, but corporations may not join associations and are limited to twenty acres).
45. See Am. Smelting & Ref. Co., 39 Pub. Lands Dec. 299, 301 (1910) (“A single placer discovery does not impress the entire area that may be embraced within the location with a placer character, if it be shown as a matter of fact that a definite portion thereof is nonplacer.”).
46. See 30 U.S.C.A. § 26 (2006) (noting that the statute discusses extra-lateral rights in relation to veins, lodes, and ledges without mentioning placer claims); see also Swoboda v. Pala Mining Inc., 844 F.2d 654, 656 (9th Cir. 1988).
3. Mill Site Claims

Mill site claims may be located upon non-mineral rich ground for the purpose of erecting facilities for milling, smelting, and processing minerals, and are limited to five acres in total area, per corresponding lode or placer claim.47

4. Tunnel Claims

A tunnel site claim is valid from the tunnel entrance for 3000 feet along the tunnel’s projected course and up to 1500 feet on either side of the projected tunnel’s centerline.48 A buried lode claim may be located upon discovery from a tunnel claim.49 A tunnel site claim is maintained through active work on the tunnel at least every six months.50 However, tunnel site claims are rarely used today due to the relative economic inefficiency of tunneling exploration activities in comparison to drilling activities.51

Along with noting how the type of potential claim is determined, it is necessary to determine if the federal land the claim resides on is open to private mining claims. Below is a brief discussion of this issue.

C. Lands Open to Location of Mining Claims and Discoverable Minerals

Regardless of the claim type, the General Mining Act52 (and its judicial progeny) only opens certain federal lands to locating mining claims and considers only certain substance deposits locatable. The General Mining Act initially granted free access to individuals and corporations to prospect for minerals in public domain lands and allowed them, upon

47. See Types of Claims, supra note 25.
48. See Types of Claims, supra note 25 (explaining that the maximum distance lode claims may exist is “1,500 feet on either side of the centerline of the tunnel” which gives the mining claimant the right to prospect an area 3,000 feet wide and 3,000 feet long”).
49. See PRUITT, supra note 3, at 3 (“If a buried vein or lode deposit is discovered in the tunnel, the owner may locate conventional lode mining claims to acquire the deposit.”).
50. See PRUITT, supra note 3, at 3.
51. See PRUITT, supra note 3, at 3 (noting that the Tunnel Site claim is not often used today because “of the economics of driving a tunnel versus drill or other methods of exploration”).
52. See Marc Humphries, Mining on Federal Lands, CONG. RESEARCH SERV. (Jun. 11, 2002) http://www.cnie.org/nle/crsreports/mining/mine-1.pdf [hereinafter Federal Lands] (the General Mining Act is one of the major statutes directing federal land management policy) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment); see also Crown Jewel, supra note 2, at 820–21 (2000) (noting that the General Mining Act was passed in the spirit of manifest destiny and generally encouraged the settlement and development of the West).
making a discovery, to locate a claim on that deposit.\textsuperscript{53} However, through a historical process of elimination,\textsuperscript{54} only rare or “distinct” and “valuable”\textsuperscript{55} hard rock mineral\textsuperscript{56} allocations are currently locatable.\textsuperscript{57} Furthermore, only open, un-appropriated federal public domain lands\textsuperscript{58} may have mining claims located upon them.\textsuperscript{59} Privately owned “patented” lands, previously located unpatented lands, and state-owned lands are currently not subject to location of mining claims.\textsuperscript{60} However, most lands subject to regulation by the BLM\textsuperscript{61} and the U.S. Forest Service are claimable, unless such lands are withdrawn,\textsuperscript{62} are classified against mining, or are considered “acquired lands.”\textsuperscript{63}

\textsuperscript{53} See Federal Lands, supra note 52, at 1 (“The Mining Law granted free access to individuals and corporations to prospect for minerals on open public domain lands, and allowed them, upon making a discovery, to stake (or ‘locate’) a claim on the deposit.”).


\textsuperscript{55} Id.; see also 30 U.S.C. § 22 (2000) (noting that the General Mining Act provided that “all valuable mineral deposits in lands belonging to the United States, both surveyed and unsurveyed, shall be free and open to exploration and purchase, and the lands in which they are found to occupation and purchase”).

\textsuperscript{56} See 44 DECISIONS OF THE DEPARTMENT OF THE INTERIOR IN CASES RELATING TO THE PUBLIC LANDS 326 (George J. Hesslerman ed.) (1916) (explaining that the mineral character of the deposit is “established when it is shown to have upon or within it such a substance as a) is recognized as mineral, according to its chemical composition, by the standard authorities on the subject; or b) is classified as a mineral product in trade or commerce”).

\textsuperscript{57} See generally 30 U.S.C.A. §§ 22–47 (2006); see Pruitt, supra note 3, at 17 (describing that “common variety” of certain rock namely sand, gravel, and stone were not subject to the mining laws and only valuable mineral deposits are subject to mining laws).


\textsuperscript{59} See id. (“Only public domain minerals are locatable minerals (those minerals that have never left federal ownership.”).

\textsuperscript{60} See Pruitt, supra note 3, at 6 (describing that only “open, unappropriated, federal ‘public domain’” is open to location for mining claims).

\textsuperscript{61} See Where Can a Claim be Located?, supra note 58 (explaining that the BLM manages the subsurface of all federal administered land, as well as the surface of all federally administered land other than National Forest System land).

\textsuperscript{62} See Where Can a Claim be Located?, supra note 58 (“Claims may not be located in areas closed to mineral entry by a special act of Congress, regulation, or public land order. These areas are said to be ‘withdrawn’ from mineral entry. Areas withdrawn from location of mining claims include: National Parks, National Monuments, Indian reservations, most reclamation projects under the Bureau of Reclamation, military reservations,” and
Upon making a discovery of a locatable and valuable mineral deposit on public lands, a prospector may locate an unpatented mining claim upon the land.\textsuperscript{64} An unpatented mining claim grants a prospector-claimholder the exclusive right to mine the land and sell the minerals without charge, so long as the prospector-claimholder complies with federal and state mining laws and regulations.\textsuperscript{65} Valid unpatented claims are real property interests,\textsuperscript{66} good against the world, and vest equitable and possessory title in the claimholder.\textsuperscript{67} While an unpatented claim gives the prospector-claimholder the right to develop the minerals, a prospector-claimholder may seek conveyance of full title to the surface land and subsurface mineral rights by successfully completing the federal mining claim patenting process.\textsuperscript{68} Unpatented and patented mining claims are discussed in greater detail in Sections III and IV below, \textit{infra}. The remainder of this Article, particularly the Fifth Amendment takings analysis, will only pertain to property interests that constitute either valid unpatented or patented mining claims.

\begin{itemize}
  \item \textsuperscript{63} Unpatented claims that remain compliant with all federal and state mining laws and regulations.
  \item \textsuperscript{64} See Federal Lands, supra note 52, at 2 ("After a prospector has conducted exploration work on public domain land, he or she may locate a claim to an area believed to contain a valuable mineral.").
  \item \textsuperscript{65} See Federal Lands, supra note 52, at 2 ("Mineral production can take place without a patent or revenue payments to the federal government.").
  \item \textsuperscript{66} See Independence Mining Co. v. Babbitt, 885 F. Supp. 1356, 1357 n.2 (D. Nev. 1995) ("Unpatented mining claims . . . are 'real property in the fullest sense.'").
  \item \textsuperscript{67} See id. at 1366 ("Legal title to land remains in the United States, but claimants enjoy valid, equitable, possessory title, subject to taxation, transferable by deed or devise and otherwise possessing incidents of real property," and the right to patent arises when the purchase price is paid); see also Collord v. U.S. Dep’t of Interior, 154 F.3d 933, 936 (9th Cir. 1998) (stating that even though the General Mining Law does not require formal hearings when the Interior Department contests a mining claim, the due process clause of the U.S. Constitution requires a hearing before a mining claimant’s property rights may be extinguished).
  \item \textsuperscript{68} See Federal Lands, supra note 52, at 2 ("Once a claimed mineral deposit is determined to be economically recoverable, and at least $500 of development work has been performed, the claim holder may file a patent application to obtain title to surface and mineral rights.").
\end{itemize}
III. Locating and Validating an Unpatented Mining Claim

Upon making an actual discovery of a valuable mineral deposit on public lands, a prospector may locate an unpatented mining claim upon the land. An unpatented mining claim grants a prospector-claimholder the exclusive right to mine the land and sell the minerals without charge, so long as the prospector-claimholder complies with federal and state mining laws and regulations. Therefore, once a prospector-claimholder locates and validates an unpatented mining claim, federal regulation preventing the prospector-claimholder from exercising their exclusive right to mine could constitute a compensable Fifth Amendment Taking.

The remainder of this Section III discusses the process for locating and validating unpatented mining claims as well as specific issues with maintaining an unpatented mining claim, avoiding abandonment, and BLM environmental and occupancy contests.

A. Federal Requirements in General

Federal regulations require that a conspicuous Notice of the mining claim be posted at the actual point of discovery in order for a location to be considered valid. The Notice should contain: (1) the identity of the locator; (2) the name of the claim; (3) the date of location and/or discovery; and (4) a brief description of the claim boundaries or dimensions. Federal law also requires that claim boundaries be distinctly and clearly marked and readily identifiable in order for a location to be considered valid.

Nearly every state allows a single monument to mark the intersection of multiple claims. State law would then determine: (1) how the claim

69. See 4 PEDIS POSSESSIO, PUB. NAT. RESOURCES L. § 42:9 (2d ed.) (explaining that until prospectors actually discover valuable deposits of qualifying minerals, they are only entitled, by virtue of the pedis possessio doctrine, to exclusive rights of surface occupation for mineral exploration purposes so long as their exploration is active).
70. See Federal Lands, supra note 52, at 2–5 (describing that a prospector may locate a claim to an area after exploration if it is believed to contain a valuable mineral).
71. See Federal Lands, supra note 52, at 2 (stating that a “patent is not necessary to develop the minerals within a claim”).
72. See Federal Lands, supra note 52, at 5 (“If discovery is made and a valid location established, the claimant has a valid possessory right against all other parties.”).
74. PRUITT, supra note 3, at 3.
76. PRUITT, supra note 3, at 5 (“A single monument may represent a common point for several adjoining claims.”).
boundaries must be monumented; (2) the required contents of the Location Certificate; (3) the relevant discovery work requirements; and (4) the relevant recording requirements.\footnote{77. See Staking a Claim, supra note 75 (describing how to properly stake a claim in keeping with both state and federal standards).}

The U.S. government can challenge unpatented mining claims as invalid. Typically the U.S. attacks such claims, where appropriate, by raising (1) the actual discovery requirement and/or (2) the present valuable discovery requirement. The next section of this article will discuss these two requirements.

1. Actual Discovery Requirement

The government often is successful in using the actual discovery requirement to challenge the validity of unpatented mining claims.\footnote{78. See Crown Jewel, supra note 2, at 822 (stating that two elements must be satisfied to establish a valid mineral claim—there must be an actual discovery and that discovery must be of a valuable mineral deposit).} Historically, the courts and the Department of Interior have demanded that a claimholder actually uncover a deposit on each and every claim to acquire a right against the government\footnote{79. See, e.g., Berto v. Wilson, 324 P.2d 843, 845–46 (Nev. 1958) (noting that a less stringent standard of actual discovery is applied in contests between rival locators).} on such claims.\footnote{80. See ROCKY MOUNTAIN MINING LAW INST., AM. L. OF MINING §§ 35.10, 35.11(3)(b)(iii) (2d ed. 1984) (noting that a mere possibility that a vein or lode exists, is not a sufficient basis for a valid claim, and that discovery requires something more); see Rodney D. Knutson & Harold G. Morris, Jr., Locating, Maintaining, and Patenting Groups or Large Blocks of Mineral Claims, 26 ROCKY MOUNTAIN MINING LAW INST. 517, 517–24 (1980) (describing how one locates, and establishes their claim); see E. Tintic Consol. Mining Claim, 40 Pub. Lands Dec. 271, 273 (1911) (establishing a valid discovery requires showing the place of discovery, when the discovery was made, the direction of the lode or vein; all such evidence should be clear and positive); see also George B. Reeves, The Law of Discovery Since Coleman, 21 ROCKY MOUNTAIN MINING LAW INST. 415, 425–26 (1976) (suggesting that it is necessary for the valuable mineral deposit itself to be exposed before one can claim a right against the government).} Therefore, for a lode claim to be valid, a vein or other mineralized body must generally be physically discovered on the claim.\footnote{81. See United States v. McKown, 181 Interior Dec. 183, 196 (IBLA 2011) (“For a lode mining claim to be valid, ‘a vein or other mineralized ore body must be exposed’ on that claim.”).} As noted above, the government has historically taken the stance that a valid discovery requires the actual physical disclosure of a locatable and valuable mineral deposit within the claim.\footnote{82. See Crown Jewel, supra note 2 and accompanying text.} Thus, a high probability of successfully discovering an actual deposit of valuable minerals is generally not a substitute for actual
discovery of the deposit. A geologic inference alone generally cannot be used to establish the existence of a mineral deposit necessary to make a valid location.

If the actual discovery requirement is strictly and narrowly interpreted as requiring an actual physical discovery of valuable mineral deposits, then an actual discovery may not be considered to be made until the mineral deposits are exploited and unearthed through actual mining operations. However, some courts have validated the claimholder’s ability to satisfy the actual physical discovery requirement by employing a geologist to analyze the subsurface mineral composition and to determine the costs of extraction and regulatory compliance. These courts deem an actual physical discovery to have been made if the geologist determines that the mineral value exceeds these costs.

In addition to the actual discovery requirement, the government has also used the “present valuable discovery” requirement (as discussed in the next section of this article) to invalidate unpatented mining claims.

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83. See Barton v. Morton, 498 F.2d 288, 291 (9th Cir. 1974) (“A reasonable prediction that valuable minerals exist at depth will not suffice as a ‘discovery’ where the existence of these minerals has not been physically established.”).

84. See Ernest K. Lehmann & Assoc.’s. of Montana, Inc. v. Salazar, 602 F. Supp. 2d 146, 157 (D.D.C. 2009) (“Geologic inference may be used as a basis upon which to show the extent of a deposit to support a discovery under some circumstances . . . Geologic inference, however, may not be used to show the existence of a mineral deposit in the first place, and only may be used to show its extent.”); see also Del Webb Conservation Holding Corp. v. Tolman, 44 F. Supp. 2d 1105, 1110 (D. Nev. 1999) (“While it is well-established that geologic inference may be used to ascertain the quantity and quality of a known mineral deposit, it alone can never be used to establish the mineral deposit’s existence.”).

85. See Barton v. Morton, 498 F.2d 288, 291–92 (9th Cir. 1974) (noting that the true value of the mineral will remain uncertain until the deposit has been unearthed, and thus, actual discovery is required to determine whether the mineral deposit is valuable or not).

86. Federal agencies may also give weight to reasonable geological inferences in assessing value. See Wilderness Soc’y v. Dombeck, 168 F.3d 367, 376 (9th Cir. 1999). Where values have been high and relatively consistent, geologic inference could conceivably be used to demonstrate sufficient mineralization beyond the actual exposed areas. See Moon Mining Co. v. Hecla Mining Co., 161 Interior Dec. 334, 341 (IBLA 2004). However, it should be noted that where only small quantities of minerals have been found, the likelihood that more minerals of the same quality exist within a claim will remain a matter for immense speculation. Geological inference may not be substituted for a showing of a valuable mineral deposit within the boundaries of each mining claim in question, or to establish that mineral values at depth are higher than those reflected in surface sampling. See United States v. HMI Lenders, L.C., 179 Interior Dec. 117, 127 (IBLA 2010).

87. See United States v. Coleman, 390 U.S. 599, 602–03 (1968) (“Minerals which no prudent man will extract because there is no demand for them at a price higher than the costs of extraction and transportation of hardly economically valuable.”); see also United States v. Pittsburg Pac. Co., 84 Interior Dec. 282, 284 (IBLA 1997) (noting that to meet the “prudent man” test, it must be shown that the mineral can be extracted, removed and marketed at a profit).

2. Present Valuable Discovery Requirement

The government often successfully uses the present valuable discovery requirement to challenge the validity of unpatented mining claims. An unpatented mining claim is conditional in nature. An unpatented claimholder must both discover and maintain a “valuable mineral deposit,” in order to acquire and retain property rights in the unpatented claim. Therefore, an unpatented claimholder risks losing the claim where the minerals deposited in the claim are not continually considered valuable—the claim may be lost anytime the cost-profit analysis of a mining operation tips away from marketability.

To establish the presence of value, an unpatented claimholder must reliably show that the mineral deposit is more valuable than the objectively anticipated costs of extraction, transportation, marketing/sales, and regulatory compliance. A depressed or booming mineral market can greatly affect the rights of an unpatented mining claimholder as well as the government interest in reacquiring unencumbered federal title to the land where unpatented mining claims rest. An unpatented mining claim may be invalidated at any point that the minerals are no longer considered valuable, either due to a depressed mineral market or increased extraction and/or regulatory compliance costs. The Bureau of Land Management generally

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89. See 30 U.S.C. § 22 (2006) (establishing that a valid claim is conditioned on the deposit being composed of “valuable minerals.”); see also Cameron, 252 U.S. at 459 (stating that an unpatented claimholder must demonstrate that his claim for a mining location meets certain standards).

90. The term “valuable mineral deposit,” as used in 30 U.S.C. § 22, is not defined and is fairly vague and subjective. It remains unclear what “valuable mineral deposit” actually means in the context of unpatented mining claims. However, a validity determination generally considers whether there is a reasonable expectation of success in developing a paying mine.

91. See 30 U.S.C. § 22 (2006) (describing a citizen’s rights to explore and purchase lands containing valuable mineral deposits); see also Cameron, 252 U.S. at 460 (explaining that, in order for an unpatented claimholder to assert a claim, they must meet the standards for having a valid claim under the statute).

92. See Coleman, 390 U.S. at 602 (noting that costs of mineral extraction and transportation may weigh in favor of not recognizing the claim).

93. See United States v. Pittsburg Pac. Co., 84 Interior Dec. 282, 283 (IBLA 1977) (“A mining claimant must prove a discovery under the prudent man test, including that the mineral can be extracted, removed and marketed at a profit.”); see also Lara v. Sec’y of the Interior, 820 F.2d 1535, 1540 (9th Cir. 1987) (establishing that the claimant has the burden to show that the land contained minerals of “such quality and quantity as would render their extraction profitable”).

94. See United States v. Garcia, 161 Interior Dec. 235, 258 (IBLA 2004) (concluding that, after assessing all the costs, it was not a valuable mineral deposit).

tests the validity and value of a mineral discovery as of the date the lands were withdrawn from appropriation under the mining laws and at the time of the examination. Subsequent examinations typically occur at the time of patent application and/or patent decision appeal, and each examination would require a separate valuation of the minerals.

The process of patenting an unpatented mining claim requires a finding of a “valuable deposit” which is tested primarily using two distinct tests—the “Prudent Man Test” and the “Marketability Test” (both discussed immediately below). For purposes of analyzing the validity of an unpatented mining claim, the term “valuable mineral deposit,” under 30 U.S.C. § 22, may be interpreted under substantially similar tests because successful completion of the patenting process would close off any future government attempts to challenge the value (and thus validity) of the unpatented claim.

a. Prudent Man Test

In 1894, the Department of Interior created the Prudent Man Test as an alternative definition of “value,” which was necessary to meet the present valuable discovery requirement to validly locate and maintain an unpatented mining claim. Under the Prudent Man Test, a mining claim must be of such character that “a person of ordinary prudence would be justified in the further expenditure of his labor and means, with a reasonable prospect of success, in developing a valuable [paying] mine.” Minerals that no prudent man would extract (e.g. when there is no demand for them due to low grade or limited use) are not economically valuable. However, under the Prudent Man Test, the claimholder need not show

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96. See 43 C.F.R. § 6304.12 (2013) (“BLM will conduct a mineral examination to determine whether your claim or site was valid as of the date that lands within the wilderness area were withdrawn from appropriation under the mining laws.”).
97. See id. (describing the examination process).
98. See 30 U.S.C. § 29 (2006) (inferring from the language of the statute that, for a patent to be granted, the discovered mineral deposit must be valuable).
100. See Castle, 19 Pub. Lands. Dec. at 455 (“A mineral discovery, sufficient to warrant the location of a mining claim, may be regarded as proven, where mineral is found, and the evidence shows that a person of ordinary prudence would be justified in the further expenditure of his labor and means, with a reasonable prospect of success in developing a valuable mine.”).
101. See Castle, 19 Pub. Lands. Dec. at 455 (applying the test to demonstrate when a mineral discovery would not warrant the location of a mining claim).
value by proving an ability to mine the deposit for a profit.\textsuperscript{103} The question under the Prudent Man Test is not whether profits are assured but rather whether a person of ordinary prudence would expend substantial sums in the expectation that a profitable mine might be developed.\textsuperscript{104} The secondary test to the Prudent Man Test is the Marketability Test, discussed below.

\textit{b. Marketability Test}

The Marketability Test was established in 1933 as a corollary to the Prudent Man Test.\textsuperscript{105} The Marketability Test presupposes the established existence of a mineral deposit.\textsuperscript{106} This test also requires a reasonable possibility that the commercial value of the deposit will exceed the cost of extracting, processing, transporting, and marketing the discovered mineral in order for the present valuable discovery requirement to be met.\textsuperscript{107} Obviously, the profit calculation is a moving target because the price for the mineral and the costs of extracting it constantly fluctuate. Furthermore, the reasonable possibility of profit must be evidenced throughout the life of the unpatented claim, in order for the unpatented claim to be validly located and maintained. Nevertheless, the profit calculation is generally only conducted at the time of location, at the time of a government challenge to an unpatented claim’s validity, and/or at the time of patent application. At the time of examination, claimholders cannot rely on speculation about future requirements, prices, and costs.\textsuperscript{108}

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\textsuperscript{103} See Coleman v. United States, 363 F.2d 190, 199 (9th Cir. 1966) (“Since Castle v. Womble . . . the basic, judicially approved, standard of discovery of a valuable mineral requires proof that a person of ordinary prudence would be justified in further expenditure of his labor and means . . . but value, in the sense or proved ability to mine the deposit at a profit need not be shown.”).
\textsuperscript{104} See Barton v. Morton, 498 F.2d 288, 289 (9th Cir. 1974) (“The question is not ‘whether assured profits were presently demonstrated,’ but whether, under the circumstances, a person of ordinary prudence would expend substantial sums in the expectation that a profitable mine might be developed.”).
\textsuperscript{105} See Coleman, 363 F.2d at 201 (noting that the Marketability Test was first conducted in an earlier Interior Department decision, as an alternative to the Castle v. Womble test).
\textsuperscript{106} See United States v. Garcia, 161 Interior Dec. 235, 243 (IBLA 2004) (“Application of this test presupposes the established existence of a mineral deposit . . .”).
\textsuperscript{107} See id. (“[R]equires a showing that the evidence is of such a character that there is a reasonable prospect that the commercial value of the deposit will exceed the cost of extracting, processing, transporting, and marketing the contained mineral.”).
\textsuperscript{108} See ROCKY MOUNTAIN MINING LAW INST., AM. LAW OF MINING § 35.12(4) (2d ed. 1984) (describing the marketability rule and the necessity that there be a market for the mineral); see also Husman v. United States, 616 F. Supp. 344, 347 (D. Wyo. 1985) (“Locations based on speculation that there may at some future date be a market for the discovered material cannot be sustained.”).
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The Marketability Test has been the main test of value employed in cases involving nonmetallic minerals of widespread occurrence, but this test may also apply to rare and valuable deposits. Low-grade or low-demand minerals, whose raw material values are exceeded by the costs of extraction and transportation, are hardly economically valuable. Contrarily, high grade and high-demand deposits, such as gold, are very likely to be found to be economically valuable under the Marketability Test. The Marketability Test has the advantage of analyzing a prospector’s intent—a matter inextricably tied to value. For instance, evidence that a mineral deposit likely cannot be operated at a profit may well suggest that a prospector seeks the land for other purposes.

Although the locator has the ultimate burden of persuasion, the government must first make a prima facie showing of invalidity under the Marketability Test before refusing a patent or refusing to acknowledge the existence of an unpatented claim for lacking present value. Uncontradicted evidence of the absence of production from a mining claim over a period of years is usually sufficient to establish a prima facie case of invalidity. However, the presumption established by the claimholder’s long-time failure to develop the mine could be overcome by evidence of

109. See United States v. Coleman, 390 U.S. 599, 603 (1968) (“While it is true that the marketability test is usually the critical factor in cases involving nonmetallic minerals of widespread occurrence, this is accounted for by the perfectly natural reason that precious metals which are in small supply and for which there is a great demand, sell at a price so high as to leave little room for doubt that they can be extracted and marketed at a profit.”); see also Converse v. Udall, 399 F.2d 616, 621 (9th Cir. 1968) (referring to the same proposition).
110. See Coleman, 390 U.S. at 604 (explaining that building stone must meet the same standards as that for the discovery of other valuable minerals, and if it does not meet this standard, then it is not economically feasible to extract it).
111. See Coleman, 390 U.S. at 604 (applying the Marketability Test to high value deposits).
112. See Converse, 399 F.2d at 621 (“The marketability test also has the advantage of throwing light on a claimant’s intention, a matter which is inextricably bound together with valubleness.”).
113. See United States v. Garcia, 161 Interior Dec. 235, 242 (IBLA 2004) (noting the Interior Board of Land Appeals’ position that “[g]enerally, when a Government mineral examiner, who has had sufficient training and experience to qualify as an expert witness, testifies that he has physically examined a claim and found mineral values insufficient to indicate the discovery of a valuable mineral deposit, the United States has established a prima facie case that the claim is not supported by a discovery.”); see also American Colloid Co., 162 Interior Dec. 158, 172 (IBLA 2004) (explaining that the government may not summarily reject a mineral patent application on the basis of the lack of discovery of a valuable mineral deposit without allowing a contest where there are disputed issues of material fact).
114. See United States v. Martinek, 166 Interior Dec. 347, 404 (IBLA 2005) (“Moreover, this Board has held that “[u]ncontradicted evidence of absence of production from a mining claim over a period of years is sufficient, without more, to establish a prima facie case of invalidity of the claim.”).
Aside from the application of the above tests, other problems may arise for claimholders who seek to maintain unpatented mining claims before discovery for value arises—known as “unperfected” mining claims. Some of these specific problems, as well as one helpful doctrine that may assist in their resolution, are discussed in the next section of this article.

B. Specific Problems in Maintaining Unpatented Mining Claims Prior to Discovery for Value

Specific problems may be encountered in maintaining unpatented mining claims prior to discovery for value. An “unperfected mining claim” is defined as an unpatented mining claim that has been located but not yet defined or assessed for value. An unperfected mining claim may have few property rights. For instance, land classifications and withdrawals, which prohibit the location of certain new mining claims, can prevent the holder of an unperfected mining claim from ever validating the claim. Furthermore, an unperfected mining claim may not even be entitled to due process by notice of invalidation since the claim does not gain the rights of a real property interest until an actual and valuable discovery is made.

One beneficial doctrine that sometimes assists potential claimholders in their pursuit of unpatented mining claims is the pedis possessio (“foot possession”) doctrine. The pedis possessio doctrine allows a claimholder to explore an unpatented claim, regardless of mineralization or motive. However, the pedis possessio doctrine is of limited benefit since the claimholder is required to continuously and

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115. See, e.g., Rodgers v. Watt, 726 F.2d 1376, 1379 (9th Cir. 1984) (“This court has made clear that although lack of actual marketing of the mineral by the claimant may be relevant to the question of marketability, it is not conclusive proof of invalidity of the claim.”).
116. See PRUTT, supra note 3, at 9 (discussing how a right of claim to an unpatented discovery is attenuated, and how easily these rights of claim may be cut off).
117. See PRUTT, supra note 3, at 9 (“Land classifications and withdrawals which prohibit location of new mining claims can cut off rights of a claim owner to ‘perfect’ his existing claims which do not yet meet these stringent requirements.”).
118. See High Country Citizens Alliance v. Clarke, 454 F.3d 1177, 1192 (10th Cir. 2006) (ruling that the GML precludes judicial review of the issuance of a patent if the plaintiff is a person who lacks any property interest in the patented land).
119. See ROCKY MOUNTAIN MINERAL LAW FOUND., supra note 1, at 34-3 (“To protect a prospector’s occupancy prior to discovery and to carry out the intent of the Mining Law of 1872, courts adopted from the customs of miners the doctrine of pedis possessio. . . . Pedis possessio is Latin meaning ‘a foothold,’ . . . .”).
120. See Union Oil Co. v. Smith, 249 U.S. 337, 349 (1919) (“Actual and continuous occupation of a valid mining location based upon discovery is not essential to the preservation of the possessory right. The right is lost only by abandonment, . . . .”).
diligently\textsuperscript{121} occupy and explore many potential claims as part of the process—a burdensome task.\textsuperscript{122} Consequently, even taking account of the pedis possessio doctrine, legitimate prospectors often have very fragile pre-discovery protection.\textsuperscript{123} Once established, an unpatented mining claim may also be lost to abandonment,\textsuperscript{124} an issue that is the subject of the following section of this article.

### C. Specific Problems in Avoiding Abandonment of Unpatented Mining Claims

An unpatented mining claimholder must also satisfy federal and state mining laws and regulations to prevent the claim from being deemed abandoned and, thus, subject to relocation by other claimholders.\textsuperscript{125} State laws relating to unpatented mining claims vary, but generally discuss

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\textsuperscript{121} See Ranchers Exploration & Dev. Co. v. Anaconda, 248 F. Supp. 708, 721 (D. Utah 1965) ("It is held that upon the public domain a miner may hold the place in which he may be working against all others having no better right, and while he remains in possession, diligently working towards discovery, is entitled—at least for a reasonable time—to be protected . . . intrusions upon his possession."); Adams v. Benedict, 327 P.2d 308, 319 (N.M. 1958) ("He may hold it only for such time as he is diligently and persistently conducting his operations in good faith with the intent to make a discovery of mineral.").

\textsuperscript{122} See Ranchers Exploration & Dev. Co., 248 F. Supp. at 724 ("It may be recognized that modern conditions may make desirable, and governing legal principles may in proper cases be hospitable towards efforts on the part of prospectors to hold possession of substantial areas long enough to lay the foundations of, and to practically accomplish, their diligent exploration, . . ."); see Adams, 327 P.2d at 319–21 (explaining that defendant failed to maintain continuous and diligent occupation and exploration and therefore other parties were permitted to take possession); Terry Noble Fiske, Pedis Possessio: Modern Use of an Old Concept, 15 ROCKY MOUNTAIN MINING LAW INST. 181, 209–10 (1969) [hereinafter Modern Use] (explaining pedis possessio is no longer appropriate or effective); James M. Finberg, Comment, The General Mining Law and the Doctrine of Pedis Possessio: The Case for Congressional Action, 49 U. CHI. L. REV. 1026, 1028 (1982) ("In recent years, mining industry representatives have argued that recognition of pedis possessio rights on a claim-by-claim basis no longer provides adequate protection for investment in mineral exploration"); Terry Noble Fiske, Pedis Possessio—New Dimensions or Back to Basics?, 34 ROCKY MOUNTAIN MINING LAW INST. 8–1, 8–33 (1988) ("[A]rbitrary restriction of pedis possessio to parcels of any particular, prescribes size, and especially the uniform, national imposition of such a restriction may, in some circumstances, discourage exploration.").

\textsuperscript{123} See Modern Use, supra note 122, at 208–14 (discussing the vulnerability of locators before discovery is made); see ROCKY MOUNTAIN MINERAL LAW FOUND., supra note 1, at 34–35 (discussing the weak rights afforded a prospector before discovery by the judicial doctrine of pedis possessio).

\textsuperscript{124} See Union Oil Co., 249 U.S. at 349 ("The right is lost only by abandonment, as by nonperformance of the annual labor required by section 2324.").

\textsuperscript{125} See Red Top Mercury Mines, Inc. v. U.S., 887 F.2d 198, 206 (9th Cir. 1989) (affirming the decision of the lower court that six unpatented mining claims had been abandoned because of failure to file notice of intention to hold or notice of assessment work); PRUITT, supra note 3, at 9 (explaining that a failure to timely perform required work pursuant to state and federal laws will subject the claim to relocation by any other party).
recording processes, costs, and documentation requirements. The Federal Land Policy and Management Act of 1976 requires that an unpatented claimholder file either a Notice of Intention to Hold the mining claim or an affidavit of assessment work performed thereon, as the case may require. The claimholder must initially file one of the two at the time of location, then must file annually in the office where the location notice is recorded. The claimholder is only required to file a Notice of Intention to Hold with the BLM when a claim is first located between September 1 and December 31 and if the claimant plans to file a waiver (such as a small miner waiver) for the upcoming assessment year.

The Federal Land Policy and Management Act of 1976 also requires that the unpatented claimholder annually file, in the BLM office designated by the Secretary, a copy of the official record of the instrument filed or recorded, including a description of the location of the mining claim sufficient to locate the claimed lands on the ground. Failure to comply with all of the filing requirements of the Federal Land Policy and Management Act of 1976 constitutes an abandonment of an unpatented mining claim. Courts have found that claims were abandoned for failure


127. See id. § 1744(a) (2006) (“The owner of an unpatented lode or placer mining claim located after October 21, 1976 shall, prior to December 31 of each year following the calendar year in which the said claim was located, file the instrument required by paragraphs (1) and (2) of this subsection:”); Mark Squillace, The Enduring Vitality of the General Mining Law of 1872, 18 ENVTL. L. REP. 10261, 10264 (1988) [hereinafter Enduring Vitality] (“FLPMA requires claimants to file evidence of their assessment work (or notice of their intentions to hold the claim) ‘prior to December 31 of each year following the calendar year in which the . . . claim was located.’”).


129. See Federal Land Policy and Management Act § 1744(a)(2) (1976) (“File in the office of the Bureau designated by the Secretary a copy of the official record of the instrument filed or recorded pursuant to paragraph (1) of this subsection, including a description of the location of the mining claim sufficient to locate the same lands on the ground.”).

130. See id. § 1744(c) (“The failure to file such instruments as required by subsections (a) and (b) of this section shall be deemed conclusively to constitute an abandonment of the mining claim . . . .”); Red Top Mercury Mines, Inc., 887 F.2d at 206 (confirming that when the requirements of FLPMA have not been met, the conclusive presumption of abandonment becomes effective); see generally James K. Aronstein, Simultaneous Amendment and Conditional Relocation: How to Cope with a Possibly Void or Invalid Claim, 33 ROCKY MNT. MIN. L. INST. 10-1 (1988) (discussing the dilemma of whether to choose amendment or relocation).
to file required documents on time, even in cases where there is a showing of substantial compliance with the regulations. After a claim has been abandoned, the original claimholder, generally, may simply relocate the claim, unless the lands have been withdrawn from location or located by a competing claimholder in the interim.

As part of the process of preventing an abandonment of an unpatented claim, an annual assessment of fees or labor needs to be filed for each claim. A discussion of this process is outlined below.

1. Annual Assessment Fees or Labor

Federal law requires that a maintenance fee of $140 per claim be paid to avoid the abandonment of a claim, unless the claimholder is considered to be a small mining operation, holding ten or fewer claims. The small mining exception, however, requires that the miner perform $100 worth of assessment work each year. The assessment work must be done for each lode claim, but associated placer claims require only $100 worth of work. Assessment fee payments apply for the assessment year (September 1 to August 31), not necessarily the ensuing twelve months.

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131. Red Top Mercury Mines, Inc. v. United States, 887 F.2d 198, 204 (9th Cir. 1989) ("In effect, a miner could do everything right but due to misfiling, a filing lost in the mail, or various other problems—could be in violation of the filing requirement, and years later be told that his claim is deemed abandoned.").

132. See George Cameron Coggins & Robert L. Glicksman, Location-Federal Location Requirements-Federal Filing Under FLPMA, 4 PUB. NAT. RESOURCES L. § 42:13 (2d ed. 2007) ("In the ordinary case, however, involving neither a land nor a mineral withdrawal, failure to file in a timely manner will mean only that the claim is subject to relocation by rivals until the original locator relocates and cures procedural deficiencies.").


134. See George Cameron Coggins & Robert L. Glicksman, Diligence-Assessment Work, 4 PUB. NAT. RESOURCES L. § 42:21 (2d ed. 2007) ("The General Mining Law incorporated such local rules and also provided that ‘not less than $100 worth of labor shall be performed or improvements be made during each year’ to hold an unpatented claim.").

135. See Enduring Vitality, supra note 127, at 10265 n.54 ("A 160-acre association placer is one claim. Thus, only $100 worth of work must be performed on the entire claim.").

136. See Benjamin Haimes, 134 Interior Dec. 196, 196 (IBLA 1995) (discussing a provision which requires claimants to pay, on or before August 31, 1993, a $100 fee per claim with the assessment year beginning on September 1). A mining claimant who records a claim in a succeeding year has the entirety of the 90-day recordation period within which to pay the fee for the succeeding assessment year or request a waiver by filing a waiver
Not all expenditures will qualify as “assessment labor,” which is needed to maintain a patented mining claim so as to avoid abandonment. The assessment work requirement assumes that a valid discovery has been made; as such, exploration work does not count toward the assessment work total.\textsuperscript{137} Geological, geochemical, and geophysical work only qualifies for a limited period of time—a maximum of two consecutive years or five years in total for any mining claim.\textsuperscript{138} Furthermore, some states require that special forms be recorded when such work is claimed as the qualifying assessment labor.\textsuperscript{139} The safest way to ensure that the assessment labor requirement is met is to conduct actual mining activities.\textsuperscript{140} The next safest qualifying activity is physical work leading toward development of a mine.\textsuperscript{141} Any other type of work should be carefully analyzed to determine whether the expenditure qualifies as “assessment labor” sufficient to maintain and avoid abandonment of an unpatented mining claim.\textsuperscript{142}

Furthermore, a claimholder performing assessment work in lieu of paying maintenance fees must record evidence of such assessment labor expenditures with the BLM by December 30 of the calendar year in which the expenditures were made.\textsuperscript{143} State mining laws may further require that affidavits be recorded within a specified time after the annual deadline for completing the assessment labor requirements.\textsuperscript{144} There is a $10 per claim charge for recording an affidavit of annual assessment with the BLM.\textsuperscript{145} A certification. See Lisa Tucker, 167 Interior Dec. 82, 86 (IBLA 2005) (explaining that assessment fee payments are dues on or before September 1st of each year).

\textsuperscript{137} See, e.g., Union Oil Co. v. Smith, 249 U.S. 337, 350 (1919) (“And it is not to be doubted that the terms ‘assessments’ and ‘annual assessment labor’ refer to the annual labor required by section 2324”).

\textsuperscript{138} See PRUITT, supra note 3, at 10 (“Prior to 1958, geological, geochemical and geophysical work did not qualify. Even today, such work can be applied only for two consecutive years, or for a total of five years as to any mining claim.”).

\textsuperscript{139} See PRUITT, supra note 3, at 10 n.3 (“In the case of such work a specified form of ‘report’ must be recorded.”).

\textsuperscript{140} See PRUITT, supra note 3, at 10 (“The best qualified assessment work is actual mining . . . .”).

\textsuperscript{141} See PRUITT, supra note 3, at 10 (“[T]he next best is physical work leading towards development of a mine.”).

\textsuperscript{142} See PRUITT, supra note 3, at 10 (“Any other type of work or expenditure, such as surveys, sampling or even construction of improvements, should be checked carefully to confirm that it qualifies under applicable court decisions.”).

\textsuperscript{143} See Maintaining a Mining Claim, supra note 133 (“The annual assessment document must be filed or postmarked by December 30th.”).

\textsuperscript{144} See PRUITT, supra note 3, at 9 (“State mining laws require that an affidavit be recorded within a specified period after the deadline for completing such assessment work.”).

\textsuperscript{145} See Maintaining a Mining Claim, supra note 133 (“The charge for recording an affidavit of annual assessment with BLM is $10 per claim.”).
claim may be voided and relocated due to a failure to timely meet assessment and affidavit filing requirements. 146

Aside from all the procedural issues discussed above, the BLM has several other administrative methods for challenging unpatented mining claims. The next section of this article outlines a few of these methods.

D. Bureau of Land Management Contests in General

Mining on federal lands is also subject to heightened standards and enforcement by the BLM (and by the Forest Service, although the Forest Service standards and enforcement tools are not specifically discussed in this Article). The BLM enforces environmental operations and occupancy standards, such as the General Mining Act’s use limitations (discussed in greater detail in Section V below), the Federal Land Policy and Management Act (“FLPMA”), 147 and the Surface Resources Act. 148 Patented mining claim lands are no longer federally owned, so the heightened standards and enforcement by the BLM pertaining to mining activities on federal lands really only affects unpatented mining claimholders. In Cameron v. United States, the U.S. Supreme Court held that, so long as the legal title remains with the government (i.e. an

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146. See Pruitt, supra note 3, at 9 (“Failure to timely perform the required work will subject the claim to a relocation by any other party who locates his adverse claim after the period for doing assessment work has expired.”); see also Cliffs Synfuel Corp. v. Babbitt, 147 F. Supp. 2d 1118, 1123–24 (D. Utah 2001) (holding that failure of owner to comply with assessment work requirement did not preclude owner from resuming work on claims, absent subsequent relocation of claim by third person or affirmative action by United States towards invalidating claim before assessment work had resumed); Exxon Mobil Corp. v. Norton, 346 F.3d 1244, 1248–52 (10th Cir. 2003) (holding that a claim may be voided and relocated due to a failure to timely meet assessment and affidavit filing requirement as long as the decision was supported by substantial evidence and was not arbitrary or capricious); but see Marathon Oil Co. v. Lujan, 751 F. Supp. 1454, 1459 (D. Colo. 1990) (holding that the completion of assessment work totaling $500 or more, regardless of lapses in assessment years, constituted substantial compliance with the statutory requirements, entitling the claimholder to a patent). However, the holding in Marathon Oil Co. is an outlier and would completely nullify the assessment work requirement if the holding were broadly construed.

147. The Federal Land Policy and Management Act § 1732(b) amended the General Mining Act by requiring the Secretary of the Interior to “prevent unnecessary or undue degradation of the lands, . . . by regulation or otherwise.” See 43 U.S.C. § 1732(b) (2006) (“In managing the public lands the Secretary shall, by regulation or otherwise, take any action necessary to prevent unnecessary or undue degradation of lands). The BLM issued environmental regulations in 1980, amendments in 2000, and final amendments in 2001.

148. The Surface Resources Act makes post-1955 locations expressly subject to federal surface management, such as the prohibition on non-mining uses prior to patenting. See 30 U.S.C. § 612(a) (2006) (“Any mining claim hereafter located under the mining laws of the United States shall not be used, prior to issuance of patent therefor, for any purposes other than prospecting, mining or processing operations and uses reasonably incident thereto.”).
unpatented claim), the government has the power, after proper notice and upon adequate hearing, to initiate contests to determine whether the claim is valid and how the unpatented claimholder may use and occupy such land.

1. Bureau of Land Management Environmental Regulation Contests

The BLM environmental regulations divide mining operations

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149. See Cameron v. United States, 252 U.S. 450, 460 (1920) (explaining that an unpatented mining claim may confer equitable title, but only the patenting of a mining claim confers legal title to the prospector-claimholder).

150. See generally id. at 460 (explaining that the BLM has unconstrained discretion to initiate an examination of the validity of a mining claim at any time before a patent is issued. If the claim is found to be invalid, the government has the power to declare the claim abandoned).

151. See 43 C.F.R. § 3809.601(b)(1)(i) (2006) (declaring that the BLM may suspend part or all of an operation for a significant violation under paragraph (a)); Id. § 3809.602(a) (2006) (declaring that BLM may revoke a plan of operations or nullify a notice upon certain factual findings); Cameron, 252 U.S. at 460 (“If valid, [an unpatented mining claim] gives to the claimant certain exclusive possessory rights . . . .”).

152. Underlying the final amendments to regulations in 2001 was the notion that impacts necessary to mining should not simply be presumptively allowed to occur. See 65 Fed. Reg. 69998, 70001 (2000) (“The definition . . . will more completely and faithfully implement the statutory standard, by protecting significant resource values of the public lands without resuming the impacts necessary to mining must be allowed to occur.”). The 2001 regulations defined “unnecessary and undue degradation” to mean conditions, activities, or practices that: (1) fail to comply with performance standards set forth in the regulations, the terms and conditions of an approved plan of operations, operations described in a complete notice, and “other Federal and State laws related to environmental protection and protection of cultural resources;” (2) are not “reasonably incident” to prospecting, mining, or processing operations; or (3) fail to attain a stated level of protection or reclamation required by specific laws governing areas such as wild and scenic rivers, BLM-administered portions of the national wilderness system, or BLM-administered national monuments. See 43 C.F.R. § 3809.5 (2001) (defining “unnecessary and undue degradation”). The 2001 regulations provide that operators must comply with applicable federal and state laws such as the Clean Air Act, the Clean Water Act, and the Resource Conservation and Recovery Act. See Clean Air Act, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/air/caa/ (last visited Feb. 17, 2012) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment); Summary of the Clean Water Act, U.S. ENVTL. PROTECTION AGENCY (Aug. 23, 2012), http://www.epa.gov/lawsregs/laws/cwa.html (on file with the Washington and Lee Journal of Energy, Climate, and the Environment). See 43 C.F.R. § 3809.420(b) (2001). The 2001 regulations also provide performance standards addressing acid-forming, toxic, and deleterious materials and the standards governing leaching operations and impoundments. See id. §§ 3809.420(c)(3),(4) (2001) (discussing the regulation of acid-forming, toxic, or other deleterious materials and leaching operations and impoundments). The 2001 regulations do require that operators reclaim disturbed areas at the earliest feasible time by taking “reasonable measures” to prevent on and off-site damage to federal lands. See id. § 3809.420(a)(5) (2001) (“You must initiate and complete reclamation at the earliest
into three categories: (1) casual use mines;\(^{153}\) (2) notice mines;\(^{154}\) and (3) plan of operations mines.\(^{155}\) All three categories must be reclaimed,\(^{156}\) but

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153. Claimholders merely involved in casual use operations need not notify the BLM or seek the agency’s approval before commencing such operations. See 65 Fed. Reg. 69998, 70004 (2000) (explaining that a person would not have to notify BLM or seek approval for “casual use”); 43 C.F.R. § 3809.10(a) (2001) (“Causal use, for which an operator need not notify BLM.”). Casual use operations are “activities ordinarily resulting in no or negligible disturbance of the public lands or resources.” See 65 Fed. Reg. 69998, 70004 (2000). The cumulative effect of activities must be taken into account in determining whether the use is casual. See Bales v. Ruch, 522 F. Supp. 150, 156 (E.D. Cal. 1981) (“[P]laintiffs’ use of the land under claim is clearly not a ‘casual use’ inasmuch as plaintiffs are substantially littering the land, discharging waste thereon, fencing off the road leading into the claim and posting ‘no trespassing’ signs . . . .”); 43 C.F.R. § 3809.31(a) (2001) (“Where the cumulative effects of casual use by individuals or groups have resulted in, or are reasonably expected to result in, more than negligible disturbance, the State director may establish specific areas as he/she deems necessary where any individual or group intending to conduct activities under the mining laws must contact BLM 15 calendar days before beginning activities to determine whether the individual or group must submit a notice or plan of operation.”).

154. Claimholders engaged in notice-level operations must notify the BLM of the operations fifteen calendar days before commencing such operations. These operations include those causing surface disturbance of five acres or less of public lands on which reclamation has not been completed. See 43 C.F.R. § 3809.21(a) (2013). Mining operators may not segment a project area by filing a series of notices (each of which covers an area of five or fewer acres) to avoid having to file a plan of operations. See id. § 3809.21(b) (2013). The regulations specify the required contents of a notice, including: (1) a description of the proposed activity; (2) the measures to be taken to prevent unnecessary and undue degradation; (3) a map showing the location of the project; (4) a description of the type of equipment to be used; (5) a schedule of activities, including the dates the operator expects to begin operations and complete reclamation; (6) a reclamation plan; and (7) a reclamation cost estimate. See id. § 3809.301(b) (2013). The entity filing the notice may begin operations fifteen days after the appropriate BLM office receives a complete notice, provided it supplies the BLM with necessary financial guarantees, unless within that time the BLM notifies the entity that: (1) it needs additional time to review the notice; (2) the notice must be modified to prevent unnecessary or undue degradation; (3) consultation with the BLM is necessary about the location of access routes; (4) an on-site visit is necessary; or (5) the operations do not qualify as a notice-level operation. See id. §§ 3809.312–3809.313 (2013). However, the BLM may not disqualify an operation from proceeding as a notice-level operation and force the operation to proceed as a plan-level operation based on concerns about unnecessary or undue degradation. See LKA Int’l Inc., 175 Interior Dec. 225, 235–36 (IBLA 2008). A notice remains in effect for two years, although two-year extensions may be available. See 43 C.F.R. §§ 3809.332–3809.333 (2013). Upon expiration of a notice, the operator must cease operations and complete reclamation promptly. See id. § 3809.335(a) (2013).

155. Claimholders intending to engage in mining operations on federal public domain lands, even if the disturbed area is less than five acres, must submit a plan of operations to the BLM and obtain the BLM’s approval before beginning operations greater than casual use but that are not within the constraints of a notice-level operation. See 43 C.F.R. § 3809.11(a) (2013); George Stroup, 164 Interior Dec. 74 (IBLA 2004); Mining Claims Under the General Mining Laws; Surface Management, 65 Fed. Reg. 69998, 70004 (2000) (providing that exploration operations require submission of a plan only if they will disturb more than
different procedures and substantive requirements apply to each category, particularly as to how and when mining operations may begin. The BLM policy behind the separate categories is that “[a]s mining operations increase in size and complexity, the BLM's up-front involvement should also increase.”

158 The BLM reserves the right to inspect mining operations located on public lands and may conduct such inspections up to four times each year if acid leakage is possible. The BLM may issue a noncompliance order if an operation fails to conform to a notice provision, a plan of operations, or a provision of the regulations. The BLM may suspend all or part of a mining operation if the operator fails to comply in a timely manner with a noncompliance order for a significant violation, which the regulations

five acres). A plan of operations is more detailed than a notice, and the BLM regulations amended in 2000 provide a more comprehensive list of plan requirements than the pre-existing regulations. Each plan of operations should include: (1) a description of the operations, including a map of the project area; (2) designs and operation plans for mining areas, processing facilities, and waste rock and tailing disposal facilities; (3) water management, rock handling, quality assurance, and contingent plans; (4) a schedule of operations from start through closure; (5) a reclamation plan; (6) a proposed plan for monitoring the effect of operations; and (7) an interim management plan to manage the project areas during periods of temporary closure to prevent unnecessary or undue degradation. See 43 C.F.R. § 3809.401(b) (2013). The BLM may require the operator to supply baseline environmental information to assist the agency in analyzing potential environmental impacts under NEPA and to determine whether the plan of operations will prevent unnecessary or undue degradation. See id. § 3809.401(c) (2013). The BLM will review a plan of operations within thirty days and notify the operator whether it is complete or whether approval must be delayed pending collection of additional information, an on-site visit, agency review of public comments, or consultation with the surface management agency. See id. § 3809.411(a) (2013). After completing its review, the BLM will: (1) approve the plan as submitted; (2) approve the plan subject to changes or conditions necessary to meet applicable performance standards and to prevent unnecessary or undue degradation; or (3) disapprove the plan. Disapproval may be based on a variety of grounds, including failure to supply necessary information, location of proposed operations in an area segregated or withdrawn from operation of the mining laws, or inconsistency with the unnecessary or undue degradation standard. See id. §§ 3809.100, 3809.411(d) (2013). The BLM is required to disapprove of the plan if unnecessary or undue degradation cannot be prevented by mitigating measures. See Nez Perce Tribal Exec. Comm., 120 Interior Dec. 34, 36 (IBLA 1991), citing 43 C.F.R. § 3809.2-1(b) (2013). Operations may not begin until the BLM approves a plan of operations and the operator supplies the financial guarantees required by the regulations. See 43 C.F.R. § 3809.412 (2013). An approved plan of operations remains in effect as long as operations continue, unless the BLM suspends or revokes the plan for noncompliance with the regulations. See id. § 3809.423 (2013).


159 43 C.F.R. § 3809.600(b) (2013).

160 Id. § 3809.601(a).
define as “one that causes or may result in environmental or other harm or damage or that substantially deviates from the complete notice or approved plan of operations.” The BLM may revoke a plan of operations or nullify a notice if it finds that an operator has failed to correct a violation within the time specified in a noncompliance or suspension order or if a pattern of violations exists at a particular operation. If an operator fails to comply with a noncompliance, suspension, or revocation order, the BLM may request that the Department of Justice initiate a civil enforcement action. Operators engaged in knowing and willful violations may be subject to criminal penalties. Furthermore, the BLM may use financial guarantees as an important compliance tool where such guarantees are relevant. Lastly, it should be noted that where a prospector-claimholder’s mining plan has been suspended, revoked, or denied for environmental concerns, the regulatory cost of compliance could conceivably be so great that it causes the claim to no longer be considered a presently valuable discovery. Under such a scenario, the BLM’s environmental contest could conceivably render the claim, in itself, wholly invalid and abandoned.

2. Bureau of Land Management Occupancy Regulation Contests

The BLM issued regulations in 1996 to restrict the unlawful use and occupancy of unpatented mining claims for non-mining purposes. Although the BLM had long been aware of certain such abuses of the mining laws, the 1996 occupancy regulations were largely sparked by a 1990 General

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161. *Id.* § 3809.601(b)(1)(i).
162. *Id.* § 3809.602(a).
163. *Id.* §§ 3809.604(a), 700.
164. *Id.* § 3809.700. The 2000 regulations authorized the BLM to assess civil penalties of up to $5000 for each violation of a BLM noncompliance order. *See 65 Fed. Reg. 69998, 70016, 70130 (2000).* However, in 2001, the BLM removed these provisions because it concluded that FLPMA does not expressly authorize the BLM to assess administrative civil penalties. “[T]his is an unsettled area for which it is prudent to await clear guidance from Congress before promulgating rules.” *See 66 Fed. Reg. 54834 (2001).*
165. Casual use operators need not provide the BLM with any financial guarantees; however, operators engaged in notice or plan-level operations generally must do so. *See 43 C.F.R.* § 3809.500. The regulations specify both the timing and content of those guarantees. *See 43 C.F.R.* §§ 3809.503, 3809.505, 3809.551 (2013). The regulations describe three different forms of guarantees—individual guarantees, blanket guarantees, and state-approved guarantees. *See id.* §§ 3809.552–3809.574 (2013); *Great Basin Mine Watch v. Hankins,* 456 F.3d 955, 974–75 (9th Cir. 2006). Upon completion of reclamation, the BLM may approve a reduction in or release of the guarantee. *See 43 C.F.R.* §§ 3809.590–3809.594 (2013). The BLM may initiate forfeiture of all or part of a financial guarantee if the mining operator fails to conduct appropriate reclamation, fails to meet the terms of a notice or approved plan of operations, or defaults on conditions under which it obtained the guarantee. *See id.* § 3809.595.
Accounting Office report confirming that certain holders of unpatented claims were using such unpatented claim lands for unauthorized residences, non-mining commercial operations, illegal activities, and/or speculative activities not related to legitimate mining. The invalid uses contributed to a series of problems, including blocked access to BLM lands, environmental contamination, investment scams, and increased land reclamation costs. Pursuant to its authority under Section 4 of the Surface Resources Act of 1955, the BLM sought to address these problems by issuing regulations that serve to eliminate such invalid uses.

Prospector-claimholders must consult with the BLM before their occupancy begins. A prospector-claimholder’s occupancy may not begin until: (1) the prospector-claimholder complies with the mining operation regulations described above; (2) the BLM completes its review and makes all required determinations; and (3) the prospector-claimholder procures all applicable federal, state, and local permits.

Furthermore, under the 1996 occupancy regulations, a person occupying the public lands for more than fourteen calendar days in any ninety-day period within a twenty-five mile radius of the initially occupied site must be engaged in activities that: (1) are reasonably incident to prospecting, mining, or processing operations; (2) constitute substantially regular work; (3) are

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169. See id. (describing the development of the proposed legislation and the reasons behind it).
171. See 43 C.F.R. § 3715.0-1(a) (2013) (discussing that the BLM will prevent abuse to public lands that could be potential mining targets).
173. Id. §§ 3800, 3802, 3809.
176. See id. (discussing that the mining laws apply to hardrock mining on public lands and make public lands available for hardrock mineral development and case law interpreting those laws).
177. See id. (describing that the regulatory definition of “reasonably incident” is meant to track Section 4 of the Surface Resources Act of 1955). See Austin Shepherd, 178 Interior Dec. 224, 235 (IBLA 2009) (stating that the possessory interest afforded to mining claimants under the 1872 Mining Law does not take the form of an unfettered right to reside on and occupy the public lands, and that the right to exclusive possession lasts only as long as it is
reasonably calculated to lead to the extraction and beneficiation of minerals; (4) involve observable on-the-ground activity that the BLM may verify; and (5) use appropriate and presently operable equipment. In addition, the occupancy must involve protection of accessible valuable minerals or operable equipment from theft or loss, protection of the public from hazardous equipment or surface uses, or location in an isolated area necessitating workers to remain onsite. However, the 1996 occupancy regulations do not apply to persons engaged in recreational activities on the public lands.

The regulations specify what information must be provided to the BLM concerning proposed occupancy as well as the consequences of failing to notify, which may include criminal penalties in certain egregious cases. Upon a determination that a regulatory violation is occurring, the BLM may: (1) issue immediate suspensions, cessation orders, or notices of noncompliance; (2) require corrective action; or (3) request that the
Department of Justice file a civil action for injunctive relief in federal district court.\textsuperscript{189} The BLM may not permanently bar entry to conduct mining operations after determining that the current occupancy is not reasonably incident to prospecting, mining, or processing operations.\textsuperscript{190} This is because, according to the Interior Board of Land Appeals, the validity of a mining claim and permissibility of occupancy of the claim are separate questions.\textsuperscript{191} Therefore, a claimant whose occupancy has been found not to be reasonably incident may retain the right to reenter the claim for mining and milling operations.\textsuperscript{192} However, a valid cessation order (based on violation of the “reasonably incident” requirement) bars occupancy until the BLM approves a new occupancy.\textsuperscript{193} The increased regulatory cost of compliance with the BLM could conceivably make the claim no longer presently valuable.\textsuperscript{194} Therefore, it is conceivable that enforcement of BLM occupancy regulations could render the claim abandoned and subsequently un-locatable.\textsuperscript{195}

Next, this article will focus on the process of patenting a mining claim and the relative rights and advantages enjoyed by patented claimholders. The following section on patented mining claims will also provide the reader with the necessary background to understand the relative benefits enjoyed by patented claimholders in a Fifth Amendment Takings analysis (particularly in the context of federal land withdrawal) since patented land is no longer federal public domain land.\textsuperscript{196}

\textbf{IV. Patenting Mining Claims}

\textit{A. In General}

As previously stated, an unpatented mining claim merely gives the claimholder the limited right to mine federal lands for specific mineral

\hspace{1cm} (affirming a BLM notice of noncompliance after finding that it did not include an improperly vague description of ways to correct the noncompliant occupancy).

\hspace{1cm} 189. 43 C.F.R. § 3715.7-2 (2013).

\hspace{1cm} 190. \textit{See} Cottonwood Gold Co., 178 Interior Dec. 386, 389 (IBLA 2010) (allowing a company to reenter the property for mining purposes because the validity of a mining claim and permissibility of occupation are separate claims).

\hspace{1cm} 191. \textit{Id.} (stating that the questions of mining and occupancy are not mutually exclusive).

\hspace{1cm} 192. \textit{Id.} (finding that Cottonwood could retain the land for mining purposes).

\hspace{1cm} 193. \textit{See} Combined Metals Reduction Co., 170 Interior Dec. 56, 76 (IBLA 2006) (raising the question of how long a company may leave an unpatented mining claim vacant without running afoul of the BLM occupancy regulations).

\hspace{1cm} 194. \textit{See id.} at 76 (noting that compliance with occupancy regulations can be costly during economic downturns).

\hspace{1cm} 195. \textit{See id.} at 77 (identifying the reality that many companies may simply abandon their unpatented mining claims were they required to fully comply with BLM regulations).

deposits (although potentially to exhaustion), but a patented mining claim actually passes title from the federal government to the claimholder. The passing of title gives the claimholder the exclusive title to all locatable minerals and title to the surface lands. Once the federal government issues a patent, the occupancy and claim maintenance (assessment) requirements of unpatented mining claims are no longer necessary. Furthermore, six years after the patent is issued, the issue of title over the claim becomes incontestable. Now that the relative rights and advantages of patented claimholders have been addressed, the following subsection will discuss the federal claim patenting process and requirements.

B. The Traditional Process and Requirements of Obtaining a Patented Mining Claim

1. Process

Patenting is a two-step process. After the claimant files a patent application with the Department of Interior (“DOI”) and pays the requisite fees, the DOI issues a “first half final certificate” if the application is facially regular. Thereafter, the DOI conducts an actual mineral examination to determine whether the discovery has the requisite value and the Secretary then decides patent issuance.

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197. See 30 U.S.C. §§ 22-24, 26-28, 29, 30, 33-35, 37, 39-42, 47 (2006) (containing no time limit as to unpatented claims); see also Mining Claim, supra note 7 (describing the shift in title that occurs during the patenting process).

198. See Mining Claim, supra note 7 (allowing for the mining company to take advantage of all different minerals located within the claim, whereas unpatented claims may only extract predetermined mineral deposits).

199. See Mining Claim, supra note 7 (allowing for the surface rights denied to unpatented claims). However, some patents in wilderness and other especially withdrawn areas may not be in fee simple since the patents would not include the surface estate. In the California Desert Conservation Area, for example, patented lands remain subject to regulation. See 16 U.S.C.A. § 1133(d)(3) (1992); 43 C.F.R. §§ 3809.2, 3809.420 (2013).

200. See Pruitt, supra note 3, at 168 (outlining the owner of an unpatented mining claim’s annual filing requirement that includes evidence of work performed).

201. See Pruitt, supra note 3, at 10 (perfecting the claim against other potential rivals).


203. See id. at 1357 (“Issuance of the FHFC ‘confirms that equitable title is vested in the applicant, subject to the confirmation of a discovery of a valuable mineral deposit by a mineral examiner,’ and ‘certifies that the applicant has satisfactorily complied with all of the ‘paperwork’ requirements of the Mining Law.’”).

204. See id. at 1358 (creating an examiners’ report that documents the field examination’s findings and includes the examiner’s conclusions).
2. Requirements

A mining claim must meet certain requirements to qualify as patentable. Similar to the requirement for obtaining an unpatented mining claim, a prospector-claimholder seeking a patent must make a discovery of “valuable” mineral as determined by applicable tests. The claimant must also comply with specific surveying, filing, inspection, and purchase price requirements, as well as the Multiple Use Act. In order to be patented, a claimholder must: (1) physically discover a valuable, locatable mineral deposit on open, un-appropriated federal land; (2) expend at least $500 worth of labor or “patent improvements” on the claim; (3) comply with other federal and state regulations and procedures relating to unpatented mining claims; and (4) pay a nominal per-acre fee. Each of the four requirements is discussed separately below.

a. Discovery of Valuable, Locatable Minerals

As discussed in Section III above, an actual physical discovery may occur either where the claimholder actually exposes minerals with a value in excess of extraction costs or, possibly in limited circumstances, where a credible geologist determines that the mineral value of the subsurface mineral composition would exceed the costs of extraction. If a claim is actually located and discovered (either through unearthing or valid geological inference), the next question becomes whether such claim has been and is presently valuable. 30 U.S.C. § 29 requires the existence of a “valuable deposit” for a claim to be patentable. As discussed above, the term “valuable deposit” has been interpreted to require satisfaction of two distinct tests—the Prudent Man Test and the Marketability Test. To be valid, a claim must meet both tests.

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205. See id. (qualifying the application for a “first half of mineral entry final certificate” or “FHFC”).

206. See Mining Claim, supra note 7 (outlining the process by which mining claims may be patented when a moratorium is not in existence).

207. See 30 U.S.C. § 29 (2006); 43 C.F.R. § 3860 (2013) (outlining the process for creation of patents through a statutory procurement procedure); see also Patenting, supra note 6 (describing the process by which claimants may purchase a lode claim at five dollars per acre).

208. See generally Barton v. Morton, 498 F.2d 288, 290 (9th Cir. 1974) (describing the “prudent man test” as determined by expert testimony concerning the possibility of value beyond extraction costs); see also Wilderness Soc’y v. Dombeck, 168 F.3d 367, 376 (9th Cir. 1999) (contrasting pre-withdrawal and post-withdrawal data when determining the marketability of a claim).


210. See cases cited supra notes 100–15 (describing the two most important tests concerning the valuation of a potentially patentable claim).
patentable, a mining claim must be of such a character that “a person of ordinary prudence would be justified in the further expenditure of his labor and means, with a reasonable prospect of success, in developing a profitable mine.” To be patentable, a mining claim must also be shown to be economically valuable, with the value of the deposit exceeding the costs of extraction, marketing, and regulatory compliance. Low-grade or low-demand minerals, whose raw material values are exceeded by the costs of extraction and transportation, are hardly economically valuable.

b. Mineral Survey

To be patented, a lode claim must be officially surveyed in accordance with federal and state government regulations. The survey application requires a fee of $750 on the first claim and $300 for each additional claim. Where a survey is required, an approved survey plat must be posted on the claim, alongside the universally required Notice of Intent to patent.

c. Application and Publication

Before a mining claim can be patented, a written application, containing statements and affidavits that clearly evidence title and citizenship, must be filed with the Bureau of Land Management State Office. The service fee for filing an application is $250 for the first claim and $50 for each additional claim. A notice of the patent application must be posted conspicuously on the claim and published in a local newspaper for 60 days.

211. See Barton v. Morton, 498 F.2d 288, 289 (9th Cir. 1974) (describing the need for actual marketability as a protection against purely speculative patenting).
212. See Coleman v. United States, 363 F.2d 190, 199 (9th Cir. 1966) (describing the administrative requirements for discovery of “valuable minerals” as well as those of “widespread occurrence”).
213. See PRUITT, supra note 3, at 13 (describing how a “placer” mining claim located precisely in accordance with surveyed legal subdivisions, does not require a mineral survey prior to patenting); see also 43 C.F.R. § 3860 (2013); Mining Claim, supra note 7 (reciting the steps necessary to patent a claim).
214. See Mining Claim, supra note 7 (defining the governments valuation for initial and subsequent patent purchases).
215. See Mining Claim, supra note 7 (providing notice to other potential claimants).
216. See Mining Claim, supra note 7 (requiring sworn statements and proof of citizenship for compliance with the BLM’s procedures).
217. See Mining Claim, supra note 7 (creating a slightly discounted rate for mining claims in comparison with lode claims).
218. See PRUITT, supra note 3, at 18; Mining Claim, supra note 7 (documenting the notice requirement).
Before a mining claim can be patented, a field inspection conducted by a government expert must confirm the existence of the required discovery of: (1) a locatable, valuable mineral deposit; (2) the $500 in “patent improvements;” and (3) general compliance with all other requirements.\textsuperscript{219}

e. Compliance with the Multiple Use Act

The Multiple Use Act governs claims located after 1955.\textsuperscript{220} The Multiple Use Act requires that a claim not be used for any purpose other than prospecting, mining, or processing operations and uses “reasonably incident thereto” before issuance of a patent.\textsuperscript{221} If unpatented claim land ever fostered an invalid use prior to patenting, the BLM is within its rights to deny the patent for that reason alone.

f. Payment of Statutory Purchase Price per Acre

The final step in patenting a mining claim requires the claimholder to pay the statutorily set purchase price per acre, based upon the acreage approved for patent.\textsuperscript{222} Following this payment, a final certificate, and later, a formal patent will be issued.\textsuperscript{223} Once the certificate is issued, no further assessment work is required because the process of patenting the claim transfers actual title over the surface and subsurface interests to the claimholder owner.\textsuperscript{224}

In recent years, the U.S. has been increasingly less likely to issue such patented claims. The next section of this article discusses the trend against issuance of such patents.


\textsuperscript{220} See 30 U.S.C.A. § 612(a) (2012) (outlining the statutory scheme for unpatented mining claims).

\textsuperscript{221} See id. (forbidding additional use of the land by the claimant, such as removal of timber).

\textsuperscript{222} See Patenting, supra note 6 (authorizing the BLM to issue a patent, for a per-acre fee, upon proof of discovery and procedural compliance). Under current law, a patent applicant can purchase a lode claim at $5 per acre and a placer claim at $2.50 per acre.

\textsuperscript{223} See Pruitt, supra note 3, at 14 (describing the formal grant following the secretarial review).

\textsuperscript{224} See Pruitt, supra note 3, at 170 (rendering the BLM use requirements inapplicable).
C. Government Trend Against Patenting

Regardless of whether the claim patent process has been followed and all patent requirements have been met, the current likelihood of successfully obtaining a new patent is extremely small. Since the 1990s, the U.S. government has restricted opportunities to patent hard rock mining claims. For instance, many lands have been withdrawn from location. In 1993 the Secretary of the Department of Interior issued Order 3163, limiting final patent issuance authority to the Secretary of the Department of Interior, in part, as a means of slowing down the patent issuance process. Furthermore, the Interior and Related Agencies Appropriation Act of 1994 imposed a moratorium on the acceptance of new mineral patent applications. This moratorium has been extended by subsequent Interior Appropriations acts, and remains in effect today. Therefore, any current patent application will be immediately returned to the claimholder. However, the moratorium does not affect patent applications “filed with the Secretary” on the enactment date and otherwise valid. Therefore, the only real chance of currently obtaining a new patent is to: (1) show that the patent application was filed with the Secretary of the Department of the Interior in the Washington office prior to the enactment date of the moratorium; and (2) show that the Secretary has either failed to make a determination of the patent application, or wrongfully denied the patent application. Even if the patent approval was wrongfully delayed or denied, the government may still be able to deny a patent, although such denial could conceivably be considered to be a compensable actual and/or regulatory Fifth Amendment taking.

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225. See Patenting, supra note 6 (describing the push within the courts and Congress to limit the availability of patents).
227. Mining Claim, supra note 7 (“[A]ll mineral patent applications received after October 1, 1994, until the moratorium expires, are to be returned to the applicant without further action.”).
230. But see Swanson v. Babbitt, 3 F.3d 1348, 1353–54 (9th Cir. 1993) (upholding the government’s delay and withdrawal of rights). The Department of the Interior delayed making a determination on a claimholder’s patent application and withdrew the lands in issue subsequent to claimholder’s patent application. The Ninth Circuit ruled that the regulation effectively prohibiting the claimholder from patenting the claim did not constitute a compensable taking because no patent rights vested before that statute withdrawing the land was enacted.
Of course, for a grandfathered patent application to be accepted, the claimholder must presumably have properly taken all required steps in the original patent application process. However, even in the absence of meeting all these requirements, a patent applicant may still be able to argue that the claimant has created a property interest in the claimed land. The potential for establishing such vested rights in the claimed property is the subject of the next section of this article.

D. Patenting as a Vested Property Right

In certain circumstances, courts have held that an unpatented claimant has a vested property interest in the claim, even where the claim itself was defective in some way. For example, in *Cook v. United States*, the Court of Federal Claims held that the claimholder acquired a vested property right consisting of equitable title since the claimholder had complied with all statutory and regulatory requirements for a patent and the BLM had accepted the proffered purchase price (prior to patent application approval), even though the BLM had not yet determined the existence of a valuable deposit. In *South Dakota v. Andrus*, the Eighth Circuit held that issuance of a patent was a nondiscretionary, ministerial duty if the applicant met all patenting requirements. In *United States v. Shumway*, the Ninth Circuit held that issuance of a first half certificate gave rise to a presumption that the claimholder was entitled to a patent, but it was rebuttable upon a showing that the claimholder had “failed to comply with the mining laws.” Assuming such compliance, the claimholder had a vested right to the unpatented claim, even though the patent had not yet

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231. See R.T. Vanderbilt Co. v. Babbitt, 113 F.3d 1061, 1066 (9th Cir. 1997) (denying the grandfather exception because the applicant had not fulfilled all requirements).

232. See Benson Mining & Smelting Co. v. Alta Mining & Smelting Co., 145 U.S. 428, 433–34 (1892) (invoking the doctrine of equitable title to claim a property interest in the land in absence of fulfillment of requirements).

233. See, e.g., Cook v. United States, 37 Fed. Cl. 435, 439 (1997) (“[A]pplicants possessed vested right to receive patent covering land listed in patent application for which applicants satisfied statutory and regulatory requirements for issuance of patent.”); United States v. Shumway, 199 F.3d 1093, 1102 (9th Cir. 1999) (“It has long been established that if the applicants are in compliance with the mining laws, then their right to the unpatented claim . . . is vested even though the Department of the Interior has as yet taken no action at all on their application for a patent.”).

234. See Cook, 37 Fed. Cl. at 439 (explaining that the BLM’s failure to verify the existence of a valuable deposit was not a prerequisite to passage of equitable title since the claimholder had complied with all provisions with which the patent applicant could comply).

235. See South Dakota v. Andrus, 614 F.2d 1190, 1193 (8th Cir. 1980) (“[I]t is well established that the issuance of a mineral patent is a ministerial act.”).

236. Shumway, 199 F.3d at 1102 (citing 30 U.S.C. § 29 (1994)).
been formally issued.\textsuperscript{237} The \textit{Shumway} court reasoned “[t]he owner of a mining claim owns property, and is not a mere social guest of the Department of the Interior to be shooed out the door when the Department chooses.”\textsuperscript{238}

Other courts have not afforded unpatented claimants similar expectancy rights.\textsuperscript{239} In \textit{R.T. Vanderbilt Co. v. Babbitt}, the Ninth Circuit held that an applicant did not fit within the grandfather exception to the moratorium because the applicant did not tender payment of the purchase price before the effective date of that exception.\textsuperscript{240} In \textit{Freese v. United States}, the Court of Federal Claims held that the right to patent a valid unpatented claim is only an expectancy right, which may be cut off without compensation by Congress.\textsuperscript{241} According to the \textit{Freese} court, all the plaintiff lost was the option to apply for a greater property interest.\textsuperscript{242} In \textit{Swanson v. Babbitt}, the government delayed making a determination on a claimholder’s patent application and withdrew the lands in issue subsequent to claimholder’s patent application.\textsuperscript{243} The Ninth Circuit ruled that the regulation effectively prohibiting the claimholder from patenting the claim did not constitute a compensable taking because no patent rights vested before that statute withdrawing the land was enacted.\textsuperscript{244} Similarly, in \textit{Independence Mining Co. v. Babbitt}, the Ninth Circuit held that vested rights do not arise before the Secretary has decided whether to contest a patent claim.\textsuperscript{245} The \textit{Independence Mining} court explained that issuance of a patent is not a mere ministerial act because the determination of validity requires the exercise of judgment and discretion to assess the results of the mineral examination for the existence of value.\textsuperscript{246}

\begin{itemize}
\item[] 237. \textit{Shumway}, 199 F.3d at 1103 (citing Bradford v. Morrison, 212 U.S. 389, 394–95 (1909)).
\item[] 238. \textit{Shumway}, 199 F.3d at 1103.
\item[] 239. See \textit{R.T. Vanderbilt Co. v. Babbitt}, 113 F.3d 1061, 1066 (9th Cir. 1997) (“The fact that Vanderbilt’s application was ‘complete’ when filed does not necessarily mean it ‘fully complied’ with all the statutory requirements referred to in the second prong of section 113.”).
\item[] 240. See \textit{id}. (holding that, since Vanderbilt had not fully complied, it did not fall within the exception).
\item[] 241. See \textit{Freese v. United States}, 639 F.2d 754, 755 (Ct. Cl. 1981) (stating that the plaintiff had no vested property right in patenting an unpatented claim).
\item[] 242. See \textit{id}. at 758 (“At best, plaintiff has suffered a denial of the opportunity to obtain greater property . . . .”).
\item[] 243. See \textit{Swanson v. Babbitt}, 3 F.3d 1348, 1354 (9th Cir. 1993) (explaining the government’s delay in responding to the application).
\item[] 244. See \textit{id}. at 1354–55 (stating that the SNRA prohibition on future patents was not a deprivation of Swanson’s property interest).
\item[] 245. See \textit{Independence Mining Co. v. Babbitt}, 105 F.3d 502, 508 (9th Cir. 1997) (“[N]o rights can vest before the Secretary has decided whether to contest the patent claim.”).
\item[] 246. See \textit{id}. at 508–09 (explaining why patent issuance is more than a ministerial act).
\end{itemize}
Given the uncertainty in the traditional patenting process (as outlined above), it is prudent to seek an alternative route to achieving a patented claim. A limited alternative to the traditional federal claim patenting process, only available to placer claims, is discussed immediately below.

E. A Limited Alternative to the Traditional Patenting Process

Section 38 of the General Mining Law provides another path to patenting placer mining claims. Section 38 provides,

[w]here such person[s] . . . have held and worked their claims for a period of time equal to the time prescribed by the statute of limitations of the state . . . where the same may be situated, evidence of such possession and working of the claims for such period shall be sufficient to establish a right to a patent thereto . . . .

However, as noted above, the scope of Section 38 is limited, only applying to placer claims that the claimant has “worked” and “held” for the requisite period. Most truly valuable claims occur in lode form (hence the term “mother lode”). Furthermore, any claim that actually has been worked for ten years very likely would qualify for a patent under the conventional tests. However, a chance exists that a placer claim would contain enough loose particles or nuggets to be considered truly valuable yet was not patented in the traditional manner prior to government enforcement action.

Regardless of the method for making a patent application, it is always possible (if not likely these days) that the government will deny the application. The last part of Section IV (below) provides a brief description of the procedural actions that must be taken by a claimholder where there

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248. Id.
249. Id.
251. See Pruitt, supra note 3, at 13 (outlining the requirements for certification of a valid patent on a mining claim).
has been a denial of a patent claim and the claimant wishes to challenge the

denial.

F. Mineral Patent Adjudication in General

When the government challenges the sufficiency of a claim’s patent application, an administrative trial must be held, as well as any appeals. Court and administrative decisions have grown progressively tighter, particularly on the issue of what qualifies as a “discovery.” As discussed in Section V, infra, the progressively tighter decisions have made many valuable mineral deposits no longer patentable, or even locatable as an unpatented mining claim. The tighter rulings have caused many claimholders, even prior to the patent moratorium, to be reluctant to expose their claims to the increased governmental scrutiny involved in the mining claim patent process. However, when claimholders have sought a patent to federal land and have been invalidly denied such a patent, the claimholder must seek judicial relief within six years of the denial or lose the right to judicial review.

V. A Trap for the Unwary in Relation to Validating Unpatented Mining Claims and Exercising Vested Rights in Claims Thought to be Ripe for Patent

This section examines a hidden trap for the unwary mining claimholder that may be employed by the federal government, going forward, to invalidate unpatented claims and justify previous patent application denials. For decades, federal agencies essentially ignored several provisions of federal mining law that could severely limit the ability of modern miners to effectively operate for profit on federal lands, including the discovery requirement, use limitations, and the mine-to-mill site provision. Individually, each of these provisions is relatively

253. See Pruitt, supra note 3, at 13 (“The claim may be challenged by the government for lack of a sufficient discovery or other deficiency, in which event an administrative trial may be held, with appeals.”).

254. See Pruitt, supra note 3, at 14 (“Courts and administrative decisions have progressively tightened the interpretation of what qualifies as a ‘discovery’ for a valid mining claim.”).

255. See Pruitt, supra note 3, at 14 (describing the increasing difficulties in patenting mining claims).

256. See Pruitt, supra note 3, at 14 (“Many claim owners are reluctant to expose their claims to the scrutiny of government officials and the challenges which can arise when the patent application is published.”).

257. See Sette v. United States, 42 Fed. Cl. 37, 39 (1998) (“Every claim of which the United States Court of Federal Claims has jurisdiction shall be barred unless the petition thereon is filed within six year after such claim first accrues.”) (citing 28 U.S.C. § 2501).

258. See Crown Jewel, supra note 2, at 820 (outlining the three ignored provisions).
significant; however, the true strength of these provisions lies in their cumulative effect. According to scholar Nicole Rinke, “[t]aken together, these provisions serve as a built-in alarm clock—set to go off when mining on federal land loses its luster.” In recent years, the federal government has severely tightened its willingness to part with federal public domain lands. Going forward, the federal government will likely use the following provisions—the valuable discovery requirement, the use limitations, and the mine-to-mill site provisions (each individually addressed in greater detail immediately below)—in concert, to thwart unwanted modern miners.

A. Valuable Discovery Requirement

The present valuable discovery requirement (previously discussed infra) is the greatest single modern hurdle to the validation of an unpatented claim and/or patenting of a mining claim. The General Mining Act of 1872 requires the discovery of a present valuable mineral deposit. Discovery means “the actual physical disclosure of a valuable mineral deposit” (which, as noted above, may be made either through physical unearthing or geological inference, depending on the authority). The U.S. Supreme Court has also held that in order to qualify as a valuable mineral deposit, “it must be shown that the mineral can be ‘extracted, removed,
transported, and marketed at a profit—the so called ‘marketability test.”

B. Use Limitations

The General Mining Act of 1872 requires that the surface of mining claim land only be used for purposes incident to the extraction of minerals from that claim. In Teller v. United States, the Eighth Circuit reasoned that abusive land appropriations would become widespread if mining claimants were able to use a mining claim for any purpose other than those purposes that are incident to the extraction of minerals. Mining claims may only be used for purposes incident to mining, and the disposal of waste created by mining is not considered a purpose incident to mining.

C. The Mine-to-Mill Site Ratio

Mill site claim lands are not subject to the same use restrictions as are lode or placer claim lands. Mill sites are created for the purposes of smelting and processing minerals, so some waste may be disposed upon mill site claim lands. However, the use of mill site claims is practically limited in size to a modest mining-to-mill site claim lands ratio of over 4:1 because lode claims have historically been made for 10.331 acre areas and mill site claims are limited to an area of five acres per claim.

268. See Rinke, supra note 2, at 820–21 (expanding on the mineral removal purposes as dictated by the General Mining Act of 1872); see also Teller v. United States, 113 F. 273, 280 (8th Cir. 1901) (explaining that a mining claim allows for the holder to work the land, but to do nothing more to the land than is required for surface mining).
269. See Teller, 113 F. 273 at 282 (suggesting the different ways in which Mullison might have abused his mining claim if Congress had left the door open to other uses).
270. See Crown Jewel, supra note 2, at 824–25 (explaining that available waste management on mining land is necessarily limited); see also 30 U.S.C. §§ 612(a)–(c) (2012) (limiting the lawful activities on unpatented claims to prospecting, mining, or processing operations and uses reasonably incidental thereto, not including waste disposal).
271. See Crown Jewel, supra note 2, at 824 (differentiating mill sites from placer and lode sites based on their regulation).
272. See Crown Jewel, supra note 2, at 824 (stating the reasons why mill sites are created).
273. See Crown Jewel, supra note 2, at 825 (describing the small scale of mill sites when the General Mining Act of 1972 was enacted, allowing for some waste disposal).
274. See Crown Jewel, supra note 2, at 824 (stating the ratio of millsite-to-mining claims). Some non-compliant mill sites have enjoyed special protection. For instance, in 1999, Representative Ralph Regula (R-OH) attached a rider to the Kosovo Emergency Supplemental Appropriations that postponed enforcement of the mill site provision until the end of the fiscal year and directed the Departments of Interior and Agriculture to approve a large gold mining project in Washington State. See S. 544, 106th Cong. (1999) (describing the history of the Interior Appropriations Bill). Congress has since allowed some mines to proceed with operations in violation of the use and/or mill site provisions, but agreed to
D. Combined Effects of the Valuable Discovery Requirement, Use Limitation, and Mine-to-Mill Site Ratio As They Relate to Modern Mining Practice

The current reality of mining practice is that only low-grade deposits of significantly inferior quality, or high-grade deposits that are difficult (and hence expensive) to extract, are mined—all other profitable deposits have likely long since been tapped. Deposits that are low-grade and/or deep and difficult to extract require massive infrastructure and produce significantly more waste than their high-grade counterparts. The mining industry currently uses the process of mechanization for low-grade deposits, which involves the handling of large tonnage amounts of overburden or ore. Mechanization requires large plant facilities on the surface and produces a disproportionate amount of waste. The surface areas of federal mill site claims are simply not large enough to house mechanization facilities for claims representing a traditional ratio of over 4:1 in comparison to the size of the mill site claims. The use of heavy deep-drilling machinery generally needed to reach any remaining high-grade deposits obviously takes up significant surface area and produces significant additional waste as well.

Offsite waste disposal can be extremely expensive, which would significantly increase the costs of extracting, processing, and selling the


275. See Crown Jewel, supra note 2, at 825, n.36 (explaining that only low-quality or hard-to-reach minerals remain unmined).


278. See id. at 303 (discussing the requirement of larger areas for plant facilities). The EPA claimed in its annual report for 1998 that the U.S. mining industry produces more waste than all other U.S. industries combined. See Crown Jewel, supra note 2, at 826 (stating the findings of the 1998 EPA annual report).

279. See Flynn, supra note 277, at 303 (“The surface areas of mining claims and mill sites are no longer adequate for [the mining industry’s current processes of mechanization and utilization].”).

280. See Flynn, supra note 277, at 305 (describing the changes in mining today as compared to mining when the Mining Act was enacted).

281. See Flynn, supra note 277, at 303 (explaining the cost and increase of waste disposal areas in mining today).
minerals on an open market. If offsite waste disposal requirements increase costs to a prohibitive amount—making the deposit no longer considered presently valuable—then the amount of waste an operation can produce is necessarily limited to the amount of waste disposable on corresponding mill site claim lands. Five-acre mill site claims would generally be unable to support the waste of a corresponding 10.331 acre lode claim, particularly given the large amounts of waste produced by mechanization and deep-drilling processes. A mining claim may be invalidated where the methods of extraction produce more waste than can be disposed of onsite (with such onsite disposal restricted by the use limitations and mine-to-mill site provisions) and the costs of offsite waste disposal for the remainder of the waste renders the operation unprofitable, and thus, in violation of the discovery requirement. It is likely that only an untapped high-grade motherlode, which has yet to be reached due to its depth, would be able to utilize a proper economy of scale to reduce the relative costs of extraction and regulatory compliance per unit of mineral deposit, to demonstrate the present value requirement. Given this result, it makes sense to explore whether a loophole exists that would avoid this issue (discussed immediately below).

E. Limited Loophole to Enforcement of the Valuable Discovery, Use, and Mine-to-Mill Site Provisions

Claimholders may have a limited opportunity to avoid application of the combined valuable discovery, use, and mine-to-mill site provisions by reducing the size of lode claims, thereby increasing the relative percentage of total land available for mill site land. However, the use of a lode acreage reduction strategy to increase the relative percentage of mill

282. See United States v. Coleman, 390 U.S. 599, 600 (1968) (stating that the cost of extracting the minerals cannot be more than their value on the open market).

283. See, e.g., Lara v. Sec’y of the Interior, 820 F.2d 1535 (9th Cir. 1987) (describing the present value and marketability requirements for mining operations to remain open); see also Crown Jewel, supra note 2, at 824–25 (laying out the ways in which the area available for waste management is limited, with the 4:1 ratio of mining to mill site acres).

284. See Crown Jewel, supra note 2, at 854 (describing why the 4:1 ratio of mining to millsites exists).

285. See Coleman, 390 U.S. at 602 (explaining that if the cost of extraction and transportation is less than the value of the minerals, then the minerals do not meet the discovery requirement).

286. See Coleman, 390 U.S. at 603 (stating that mining operations are required to have a present showing of profits).

287. See Crown Jewel, supra note 2, at 833 (laying out the two main loopholes for miners).

288. See Crown Jewel, supra note 2, at 833 (describing the two alternatives that create loopholes for miners).
site claim lands may face some potential challenges (described in greater detail below). The General Mining Act states that a lode claim may be equal to, but shall not exceed, 10.331 acres. This provision does not set a minimum acreage requirement upon lode claims. However, traditional practice is to patent claims at 10.331 acres.

If a prospector can effectively limit the size of each individual lode claim, the prospector may be able reduce the mining to mill site claim acreage ratio. Decreasing this ratio would allow a greater percentage of total federal land to be reserved for mill sites, which are not subject to the same strict use limitations as mining claim lands. An increased percentage of mill site claims would render more federal land available for waste disposal, making the mining operations once again economically valuable. However, the increased costs of filing and maintaining extra sub-divided claims would have to be factored into an assessment of claim value. Obviously, this proactive planning strategy would only help acquire an unpatented mining claim, since such planning could not be done retroactively to take effect prior to the enactment of the patent application moratorium. There are several pitfalls in undertaking the above lode claim acreage limitation strategy, several of which are described in the next section of this article.

1. Potential Problems Involved With Strategies Limiting the Acreage of Lode and/or Placer Claims

The federal government may challenge a lode claim acreage

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289. See Crown Jewel, supra note 2, at 834 (explaining the problems with attempting to decrease lode claim size in order to increase mining capacity).

290. See Lara v. Sec’y of the Interior, 820 F.2d 1535, 1539 (9th Cir. 1987) (providing details to the dimensions of lode claims).

291. See id. (stating that there is no right to the maximum claim if the entire tract does not contain minerals).

292. See, e.g., id. (providing the maximum length of a lode claim in conjunction with the width from either side of the claim); see also Crown Jewel, supra note 2, at 833 (reiterating the description of a maximum lode claim).

293. See Crown Jewel, supra note 2, at 833 (explaining the effect of limiting lode claim size).

294. See Crown Jewel, supra note 2, at 833–34 (explaining how reducing the size of the lode claim can increase the acreage mineable on mill site claims).

295. See, e.g., Lara, 820 F.2d at 1535 (describing the importance of profit and marketability in making lode and placer claims).

296. See United States v. Coleman, 390 U.S. 599, 602 (1968) (laying out the factors in the “prudent man test” to determine marketability).

297. See Crown Jewel, supra note 2, at 821 (describing the different types of claims that prospectors may make).

298. See Crown Jewel, supra note 2, at 830 (putting forth the possibility that valuable ore might end up buried under piles of waste rock).
reduction strategy in a number of ways. One way to make such a challenge would be based on the effect that upholding it would have on other relevant statutory provisions. In Boise Cascade Corp. v. EPA, the Ninth Circuit held that statutory provisions of the Federal Water Pollution Act Amendments of 1972 (the “Clean Water Act”) must be interpreted as a whole, giving effect to each word and making every effort not to interpret provisions in a manner that renders other provisions of the statute inconsistent, meaningless, or superfluous. It could be similarly argued that the use and mine-to-mill site limitations would be rendered superfluous if claimants were able to avoid the application of the provisions by establishing small lode claims to artificially reduce the mine-to-mill site ratio.

A second way to make this challenge is to apply case law precedent relating to form over substance in the area of federal land grants. In Leavenworth v. United States, the U.S. Supreme Court generally expressed doubt that genius statutory interpretation or tactical maneuvers against industry norms and standards could be validly used as a means of expanding federal land grants. Furthermore, ingenuity of contractual expression was not permitted to thwart the Congressional intent to restrict federal land grants in United States v. City & Cnty. of San Francisco. The use of artificially small lode claims to thwart the invalidating impact of mining waste disposal requirements may similarly be found to be an invalid tactical maneuver against industry norms made in an attempt to expand federal land grants.

In addition to the above, the U.S. could use the concept of good faith as a third means to challenge the lode claim acreage reduction strategy. The General Mining Act implies a good faith requirement. Tactical maneuvers, such as limiting the size of lode claims to effectively

299. Crown Jewel, supra note 2, at 828 (explaining why the Crown Jewel Project was rejected when trying to use the mining loophole).
300. See Boise Cascade Corp. v. EPA, 942 F.2d 1427, 1429 (9th Cir. 1991) (giving the Clean Water Act as an example).
301. See, e.g., id. (explaining that the Clean Water Act had to be applied in full).
302. See Crown Jewel, supra note 2, at 835 (stating that the limit on load claims would be rendered meaningless if it were not upheld).
303. See Crown Jewel, supra note 2, at 833 (laying out the second loophole to the acreage maximum for lode claims).
304. See Leavenworth v. United States, 92 U.S. 733, 740 (1875) (explaining that what is not expressly given cannot be implied).
305. See United States v. City & Cnty. of San Francisco, 310 U.S. 16, 28 (1940) (stating that a company cannot contract out of Section 6 of the Act).
306. See Leavenworth, 92 U.S. at 740 (reiterating that a company cannot tactically find a way around the law).
308. See id. (reiterating the requirement of good faith).
reduce the mining to mill site ratio, could conceivably be found to violate the requirement of good faith. Violation of the good faith requirement could be used to invalidate claims. However, bad faith may be difficult to prove when the claimant has not been shown to have originally located normal sized claims and subsequently relocated smaller claims for the purposes of establishing additional mill sites.

The cumulative effect of all these potential challenges is to make the lode claim acreage reduction strategy a difficult one to sustain. For example, the U.S. may invalidate a mining claim where waste from onsite extraction methods generate high enough costs that the operation becomes unprofitable in violation of the discovery requirement. However, the U.S. has a much more potent and sweeping method for eliminating unpatented mining claims—the Antiquities Act (discussed immediately below).

VI. Constitutionality of the Antiquities Act

A. Antiquities Act Use Against Unpatented Mining Claims

As previously noted, the federal government has gradually tightened the requirements for patenting mining claims, including a recent moratorium on the acceptance of patent applications. Therefore, today

309. See United States v. Nogueira, 403 F.2d 816, 823 (9th Cir. 1968) (“[A]n attempted location for any other purpose than [mining or extracting minerals] is wholly void.”).
310. See id. at 824 (“[T]he district court had jurisdiction to pass on the good faith or lack of good faith in the filing of a mining claim . . . .”).
311. See JOHN D. LESHY, THE MINING LAW: A STUDY IN PERPETUAL MOTION 62–63 (1987) (discussing the subjective nature of assessing good faith); Flynn, supra note 277, at 334 (“Again faced with the realities of the Mining Law, in September and October of 1998, GIC attempted to bypass the millsite acreage and ratio limits by changing its approximately 46 lode claims covering the pit areas into approximately 187 lode claims.”).
312. See Boise Cascade Corp. v. EPA, 942 F.2d 1427, 1431–32 (9th Cir. 1991) (“Under accepted canons of statutory interpretation, we must interpret statutes as a whole, giving effect to each word and making every effort not to interpret a provision in a manner that renders other provisions of the same statute inconsistent, meaningless or superfluous.”); United States v. City & Cnty. of San Francisco, 310 U.S. 16, 28 (1940) (“Mere words and ingenuity of contractual expression, whatever their effect between the parties, cannot by description make permissible a course of conduct forbidden by law.”); Nogueira, 403 F.2d at 823 (“We therefore hold that an attempted location for any other purpose than that thus specified, is wholly void.”).
313. See Hjelvik v. Babitt, 198 F.3d 1072, 1076 (9th Cir. 1999) (noting that the District Court did not err in finding that the costs outweighed the profitability in this case).
314. See infra notes 398–99 (discussing application of the Antiquities Act in unpatented mining claims).
315. See Mining Claim, supra note 7 (“The Interior and Related Agencies Appropriation Act of 1994 included a moratorium on the acceptance of new mineral patent applications [which] was in effect October 1, 1994, through September 30, 1995 [and] has been extended by subsequent Interior Appropriations Acts.”).
unpatented mining claims abound all over the West. The federal government has signaled an intent to more strictly enforce the valuable discovery requirement, use limitations, and mine-to-mill site provisions, which will have the effect of invalidating the interests of many unpatented claimholders (sometimes for failing to maintain a valuable discovery in prior years under the Marketability Test). As such, unpatented claimholders who believe that their claims were previously economically unviable, but became viable due to rising commodity prices, may need to relocate their claims to pre-empt such a retroactive government claim invalidation argument.

The federal government likely realizes that most of the currently located unpatented mining claims may be invalidated under the Marketability Test, perhaps even retroactively if necessary, especially in light of applicable onerous environmental regulations. The federal government also likely understands that many prospectors may try to relocate claims on these deposits, perhaps even using artificially small lode claims to decrease the mine-to-mill site ratio, to effectively lower cost and increase the minerals’ value under the Marketability Test. As commodity prices rise (such as gold), the federal government may move to protect its interest in valuable minerals not subject to currently valid mining claims. In order to prevent the relocation of potentially valid and valuable mining claims, the federal government may seek to have these federal lands withdrawn from the location of mining claims.

316. See Pruitt, supra note 3, at iii (noting that mining laws apply only to thirteen Western states and Alaska, and that mining claims persist in those places).
317. See Crown Jewel, supra note 2, at 824 (“Operating in conjunction, these three aspects of the 1872 Mining Law—the ‘valuable discovery requirement,’ the mine-millsite ratio, and the use restriction imposed on each—serve to severely limit the mining of exceptionally low-grade ore bodies on federal lands.”).
318. See Crown Jewel, supra note 2, at 825 (detailing a greater intent to enforce the valuable discovery requirement, which would make it harder for claimholders to prevail as they once did).
319. See Crown Jewel, supra note 2, at 826 (noting that, although the DOI is conscious of environmental impacts of mining, the agency is no less reluctant to endorse mining on federal lands).
320. See Crown Jewel, supra note 2, at 835 (noting that the IBLA has permitted the aggregation of adjacent claims in order to pass the Marketability Test).
321. See Historical Gold Prices, supra note 5 (noting that, from 2005 to 2013, the price of gold more than tripled); Shumsky, supra note 5 (same).
322. See supra Part V.E (providing an analysis of strategies that limit the mine-to-mill site ratio in order to produce claims that may be considered of marketable value).
323. See Cameron v. United States, 252 U.S. 450, 455 (1920) (stating that to assert a post-withdrawal mining claim within the Antiquities Act, the discovery of such mining claim must have preceded the land’s withdrawal, but that the determination of whether there was a requisite discovery is a question of fact).
One of the federal government’s most powerful federal land withdrawal tools is the declaration of national monuments—such as mountains or buttes—under the Antiquities Act of 1906 (hereinafter “Antiquities Act”).\(^\text{324}\) The Antiquities Act authorizes the President of the United States, in his discretion,

\begin{quote}
  to declare by public proclamation historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon the lands owned or controlled by the Government of the United States to be national monuments, and may reserve as a part thereof parcels of land, compatible with the proper care and management of the objects to be protected.
\end{quote}

Practically speaking, the Antiquities Act authorizes the President to restrict by executive order the use of particular public land owned by the federal government.\(^\text{326}\) The following section will discuss the constitutionality of the government’s likely reaction—the use of the Antiquities Act to withdraw federal public domain land before a mining claim can be successfully relocated. A constitutional challenge may be made either facially or as applied—both are discussed below.\(^\text{327}\)

**B. Facial and As Applied Unconstitutionality Arguments**

If a U.S. President attempts to prevent the successful relocation of claims by withdrawing valuable land from relocation (presumably in a time of rising commodity prices), a plaintiff claimholder may argue that the Antiquities Act is both facially unconstitutional and unconstitutional as applied.\(^\text{328}\) A plaintiff claimholder may argue that the Antiquities Act is facially unconstitutional because: (1) the penal provisions of the Antiquities Act are vague and uncertain\(^\text{329}\) and/or (2) the President is given unfettered discretion to declare a monument in violation of the non-delegation doctrine of the Property Clause of the United States Constitution.\(^\text{330}\)

\begin{footnotes}
\footnote[324]{See American Antiquities Act of 1906, 16 U.S.C. §§ 431–33 (2013) (giving the president authority to declare lands as national monuments).}
\footnote[325]{Id.}
\footnote[326]{See generally id.}
\footnote[327]{See infra Part VI.B.}
\footnote[328]{See infra notes 413–432 and accompanying texts.}
\footnote[329]{See United States v. Smyer, 596 F.2d 939, 940–41 (10th Cir. 1979) (addressing the constitutionality of the Antiquities Act as the defendant argues that it is vague and uncertain).}
\footnote[330]{See Utah Ass’n of Cnty’s v. Bush, 316 F. Supp. 2d 1172, 1190 (D. Utah 2004) (“Plaintiffs contend that Congress violated both the delegation doctrine . . . and the Property Clause by giving the President, under the Antiquities Act, virtually unfettered discretion to regulate and make rules concerning federal property.”).}
\end{footnotes}
Some commentators have argued that the use of the words ‘‘ruin,’’ and ‘‘object of antiquity’’ in the penal provisions of the Antiquities Act are unconstitutionally vague. 331 However, in United States v. Smyer and United States v. Diaz, courts found that the penal provisions of the Antiquities Act were not unconstitutionally vague because common understanding and practice measure the statute’s language. 332 Commentators have also argued that the Antiquities Act gives the President unfettered discretion in declaring a monument, in violation of the non-delegation doctrine of the Property Clause. 333 Congress may delegate its express authority under the Constitution’s Property Clause to dispose of and make all needful rules and regulations respecting the Territory or other Property belonging to the United States, so long as Congress provides standards to guide the authorized action such that one reviewing the action could recognize whether the will of Congress has been obeyed. 334 The plaintiffs in Utah Ass’n of Cntys. v. Bush, an association of counties, contended that Congress violated the non-delegation doctrine of the Property Clause by giving the President virtually unfettered discretion, under the Antiquities Act, to regulate and make rules concerning federal property. 335 However, the Utah Ass’n of Cntys. court held that the Antiquities Act authorizing the President “in his discretion” to establish national monuments upon government lands was facially constitutional. 336 The court determined that the Antiquities Act did not violate the non-delegation doctrine of the Property Clause because the Antiquities Act sets forth clear standards and limitations as to the size of

331. See 16 U.S.C. § 433 (“Any person who shall appropriate, excavate, injure, or destroy any historic or prehistoric ruin or monument, situated on lands owned or controlled by the U.S. Government . . . shall, upon conviction, be fined . . . imprisoned . . . or both . . . .”); Smyer, 596 F.2d at 941 (“The claim of vagueness and uncertainty is based on the use in the statute of the words ‘ruin,’ and ‘object of antiquity.’”).
332. See Smyer, 596 F.2d at 941 (finding that the Antiquities Act is not unconstitutionally vague); United States v. Diaz, 499 F.2d 113, 115 (9th Cir. 1974) (same).
334. See 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.”).
335. See Utah Ass’n of Cntys., 316 F. Supp. 2d at 1176 (alleging that the Antiquities Act is unconstitutional because it violates the delegation doctrine, and plaintiffs claim that only Congress has the authority to withdraw such lands from the federal trust); U.S. CONST. art. IV, § 3, cl. 2.
such monuments, as well as the types of objects that may be included in national monuments.\footnote{337. See id. ("The Act describes the types of objects that can be included in national monuments and a limitation on the size of monuments.").}

The Utah Ass’n of Cnty\'s. court also held that judicial review of the President\’s exercise of delegated discretion to designate a monument (and withdraw land under the Antiquities Act) Therefore, in Utah Ass’n of Cntys., even though the President\’s Proclamation of the Grand Staircase National Monument in Utah involved an immense 1.7 million acres of federal land, the court had no right to determine that the President did not act pursuant to his delegated discretion under Property Clause and the Antiquities Act.\footnote{338. See id. at 1184 (emphasizing that court did not have the authority to review the President\’s decision in this instance).} However, the Utah Ass’n of Cntys. court also held that, although the court may not second-guess the reasons underlying the President\’s exercise of delegated discretion to withdrawal land under the Antiquities Act, the court may still determine whether the President\’s withdrawal Proclamation satisfied the Spending Clause of the United States Constitution and other relevant federal law (see below).\footnote{339. See id. at 1191 (determining whether or not the Spending Clause was violated in this case).} For these reasons, the federal government is likely to overcome an argument that the Antiquities Act is facially unconstitutional.

A plaintiff claimholder may also challenge the Antiquities Act as unconstitutional as applied where the President\’s land withdrawal Proclamation exceeds the President\’s powers under the Spending Clause of the United States Constitution.\footnote{340. See id. at 1177 (alleging a Spending Clause violation).} The Utah Ass’n of Cntys. v. Bush court held that the President\'s withdrawal of the monument at issue did not violate the Spending Clause because no federal monies were expended to acquire private land.\footnote{341. See id. at 1191 (concluding that nothing in the Proclamation supported the plaintiff\’s contention that federal monies were expended to acquire private land and that they, therefore, had no support for their contention of a Spending Clause violation).} Therefore, where no federal monies are expended to acquire private land and all federal laws are complied with, a President\’s Proclamation to withdraw land pursuant to the Antiquities Act is also unlikely to be found constitutional as applied.\footnote{342. See generally id.} In addition to the above constitutional issues, courts have also developed case law on another such challenge by claimholders—the Takings Clause of the Fifth Amendment to the U.S. Constitution (discussed immediately below).\footnote{343. See infra Part VII.}
VII. Fifth Amendment Takings

A. In General

The Takings Clause of the Fifth Amendment to the U.S. Constitution prohibits the United States government from taking private property for public use without “just compensation.” A compensable taking of private property may occur where the government burdens an individual's property for the perceived benefit of society—where fairness and justice dictates that society itself should bear the burden. To show a taking that merits compensation, a plaintiff must show a substantial financial loss. The Tucker Act grants the United States Court of Federal Claims jurisdiction to entertain non-tort Constitution-based suits for money. A taking may occur by physical occupation/invasion or by governmental regulation of private property. A physical occupation/invasion of a private property interest by the federal government may be found to constitute an actual taking. Government regulation of private property interests could also rise to the level of a compensatory regulatory taking. Both actual and regulatory takings will be discussed in greater detail below.

1. Actual Taking

An actual taking refers to the non-temporary physical appropriation of the possession and use of private property by an entity having eminent domain authority (i.e. federal government agencies). Condemnation is the formal process of exercising eminent domain authority. Where the

344. U.S. CONST. amend. V.
345. See Ferrari v. United States, 73 Fed. Cl. 219, 225 (2006) (“A compensable taking of property occurs when society imposes a burden on an individual’s property which, in fairness and justice, society itself should bear.”).
346. See id. at 226 (noting that the plaintiff’s financial burden must be substantial that failing to present evidence of this economic harm is fatal to the takings claim).
347. See id. at 224 (“The Tucker Act grants this Court jurisdiction to entertain suits for money against the United States which do not sound in tort and which are founded upon the Constitution.”).
348. See id. at 225 (defining a taking).
349. See id. (“A taking may occur by physical occupation or invasion and by Government regulation of private property.”).
350. See id. (“[Indicating that a government regulation of private property is a compensable taking] when society imposes a burden on an individual’s property which . . . society itself should bear.”).
federal government, or an agency thereof, makes non-temporary actual use and possession of private property, however slight, an actual taking has occurred and the property owner may seek just compensation through an action for inverse condemnation.\footnote{353}

2. Regulatory Taking

The seminal regulatory takings case is \textit{Pa. Coal Co. v. Mahon}, in which the Supreme Court observed that: “while property may be regulated to a certain extent, if that regulation goes too far, it will be recognized as a taking.”\footnote{354} The Court attempted to answer the question of how far is too far in \textit{Lucas v. S.C. Coastal Council}.\footnote{355} In \textit{Lucas}, the Supreme Court reviewed a South Carolina statute, which prohibited building homes on erodible beachfront areas.\footnote{356} Justice Scalia, writing for the majority, argued that the South Carolina statute rendered such property owners’ interests valueless, adopting a \textit{per se} rule that a statute that deprives a landowner of all economically viable use of land requires just compensation.\footnote{357} However, the Supreme Court carved out an exception to its \textit{per se} rule when the property interests proscribed by the regulation were not initially part of the landowner’s title.\footnote{358} In \textit{Lucas}, the Court acknowledged that a landowner who does not suffer total economic deprivation as a result of a regulation may still have a takings claim depending upon the economic impact of the regulation and the degree to which the regulation interferes with investment-backed expectations.\footnote{359} Broadly, \textit{Lucas} stands for the

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\item 355. \textit{See Lucas v. S.C. Coastal Council}, 505 U.S. 1003, 1007 (1992) (addressing whether legislation prohibiting the building of habitable structures on private property constituted a taking when the state trial court determined that the prohibition rendered the property valueless).
\item 356. \textit{See id}. (describing the legislation’s prohibition on building habitable structures on beachfront property).
\item 357. \textit{See id}. at 1018–24 (describing the uses of eminent domain and determining that when a landowner “has been called upon to sacrifice all economically beneficial uses [of his land] in the name of the common good . . . he has suffered a taking” and compensation is appropriate).
\item 358. \textit{See id}. at 1027 (distinguishing between the \textit{per se} rule and the circumstances that merit compensation, such as when land is deprived of all economically beneficial uses).
\item 359. \textit{See id}. at 1019 n.8 (criticizing the view that all economically beneficial uses must be deprived, Justice Stevens asserted that the fact that someone who has lost 95 percent
\end{footnotes}
ENVIRONMENTAL PROTECTION OR MINERAL THEFT

proposition that regulation may not be grossly inconsistent with a property owner’s reasonable investment-backed expectations without just compensation being paid for the property interest. Where a regulatory taking of mining claim rights is found to have occurred, the government would be required to pay just compensation to the claimholder for the value of the mining rights lost. The following subsection discusses just compensation in the context of valuing mining claims in greater detail.

3. Just Compensation

Following either the exercise of eminent domain or the finding of an actual or regulatory taking, the government must pay just compensation for the property rights taken. In determining just compensation for the taking of land that has access to minerals not yet extracted, the value of minerals is not reflected in the land's fair market value unless the landowner can show that mineral extraction “is the highest and best use of the land and would have been reasonably probable in the reasonably near future.” Furthermore, just compensation for minerals not yet extracted must factor in extraction, waste disposal, regulatory compliance, and marketing costs. The following section will apply the general law of takings to mining claim taking cases, specifically.

would not recover is “wholly arbitrary” as it interferes with “distinct investment-backed expectations”).

360. See id. at 1034 (Kennedy, J., concurring) (“Where a taking is alleged from regulations which deprive the property of all value, the test must be whether the deprivation is contrary to reasonable, investment-backed expectations.”).


363. See Loretto v. Teleprompter Manhattan CATV Corp., 458 U.S. 419, 421 (1982) (determining that a minor but permanent physical occupation constitutes a taking and requires just compensation); see also Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1030 (1992) (acknowledging that just compensation is due when the government regulation of property constitutes a taking that deprives land of all economically beneficial uses).


365. See Rebekah King, Valuation of Minerals in Takings Cases, 42 NAT. RESOURCES J. 185, 188 (2002) (recognizing that the cost of extraction could outweigh expected profits from the minerals).
B. Mining Claim Taking Issues

The remainder of this Section VII.B will discuss specific issues relating to takings of federal mining claims. Takings issues relating to patented mining claims are discussed first, followed by specific takings issues relating to unpatented mining claims, and finally this article will address the issue of determining just compensation.

1. Patented Mining Claims

Patenting a mining claim conveys title to both the surface land and subsurface minerals—a fee interest. As such, patented mining claims are not subject to withdrawal from public land access because the land is no longer public and federally owned. Furthermore, patented claims are not subject to the same federal regulations as unpatented claims. Patented claims are merely subject to nuisance law, zoning requirements, and federal and state environmental regulations such as the Clean Water and Clean Air Acts promulgated by the EPA. The non-temporary physical invasion or occupation of patented mining claim land—fee interest property—is obviously a compensable actual government taking. Furthermore, regulating a patented claimholder’s (i.e. a private property owner’s) right or economic ability to mine or otherwise realize the benefits of his or her reasonable investment-backed expectations (i.e. payment of location notice fees, assessment fees, the per-acre purchase price, and other related expenses), could also constitute a compensable taking—especially where the regulations render the land of no economic value.

366. See Federal Lands, supra note 52 (“[P]atenting a claim gives the holder legal title to both the surface and the minerals.”).
367. See Federal Lands, supra note 52 (indicating that federal land managers lack authority under the Mining Law to reclaim mining sites and withdraw them from development).
368. See Federal Lands, supra note 52 (recognizing that patented claims do not have to follow the same regulations as unpatented claims).
371. See Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1071 (1992) (Stevens, J., dissenting) (recognizing that a takings inquiry requires the court to consider the government action’s “interference with reasonable investment-backed expectations”).
2. Valid Unpatented Mining Claims

Courts have traditionally held that valid unpatented mining claims are fully recognized real property interests within the protection of the Fifth Amendment’s prohibition against the taking of private property for public use without just compensation, since unpatented mining claimholders hold the exclusive right to mineral extraction and such exclusive right is subject to sale and other forms of disposal common to real property interests. Thus, while valid unpatented claimholders do not own fee title to private property, the exclusive right to mineral extraction is generally considered a sufficient private property interest to be subjected to a Fifth Amendment takings claims. Since the only property right of an unpatented claimholder subject to a takings analysis is the right to extract the underground mineral deposit, the government could only commit an actual taking of a valid unpatented mining claim where the government mines the claim itself or grants some other party the right to mine such claim. The remainder of this subsection will focus on a regulatory takings analysis since: (1) the government does not appear intent to conduct actual mining activities of its own; (2) the government has not proposed to sell such federal lands; and (3) the government has not been shown to prefer certain unpatented mining claimholders to others.

A regulation which is so “substantial and burdensome” so as to deprive an unpatented claimholder of all or most of the economically viable use is very likely a regulatory taking. Furthermore, a regulation that

372. An unpatented mining claim grants a prospector-claimholder the exclusive right to mine the land and sell the minerals without charge, so long as the prospector-claimholder complies with federal and state mining laws and regulations. See George Cameron Coggins & Robert L. Glickman, Public Natural Resources Law § 42:20 (2d ed. 2013) (summarizing judicial rulings affecting mining claims).

373. See Skaw v. United States, 740 F.2d 932, 935 (Fed. Cir. 1984) (“[Mineral rights are a] property right in the full sense . . . capably of transfer by conveyance, inheritance, or devise.”); Lockhart v. Johnson, 181 U.S. 516, 520 (1901) (acknowledging the property rights associated with claims and the difference between claims on public and private land).

374. See Michael Graf, Application of Takings Law to the Regulation of Unpatented Mining Claims, 24 Ecology L.Q. 57, 113–15 (1997) (“[Unpatented claimholders sometimes have a private interest subject to takings claims because] judicial precedent has conditioned the status of the unpatented claim as a property interest on the claimant’s ability to both comply with reasonable environmental regulation and turn a profit.”).

375. Neither increased governmental regulation of mining activities nor regulations that withdraw land from public mining access constitute an actual taking of an unpatented mining claimholders subsurface rights. See Idaho Mining & Dev. Co. et al., 132 Interior Dec. 29, 34–35 (IBLA 1995) (finding that the statutory requirements to pay certain fees for mining claims are not a taking).

376. This result seems particularly likely if a balancing of public and private interests reveals a private interest “much more deserving of compensation for any loss actually incurred.” See Fla. Rock Indus., Inc. v. United States, 791 F.2d 893, 904 (Fed. Cir. 1986); see also Whitney Benefits, Inc. v. United States, 926 F.2d 1169, 1176 (Fed. Cir. 1991).
withholds an unpatented claimholder’s access to mine public resources\(^{377}\) or public lands\(^{378}\) may constitute a taking. However, where the limitations proscribed by the regulation were inherently restricted, a taking would never lie.\(^{379}\) Because there exist few black letter regulatory taking rules, ad hoc factual inquiries are necessary, with particular attention paid to: (1) the economic impact of the limitation; (2) the level and reasonableness of investment-backed expectations; and (3) the character of the government action (i.e. whether the government action is for a proper purpose and imposes financial burden in a just manner).\(^{380}\)

Limitations on mining activities that were not really a part of the claimholder’s title to begin with (i.e. inherently restricted) would not be subject to challenge as a taking.\(^{381}\) For instance, the valuable discovery, use limitation, and mine-to-mill site provisions have been in existence in some form since the enactment of the General Mining Act.\(^{382}\) However, only recently has the federal government used these long-standing provisions, in a combined manner, to invalidate an unpatented claimholder’s exclusive right to extract minerals.\(^{383}\) Although the BLM may not have previously challenged the profitability, and thus validity, of an unpatented mining claim under the combined provisions, an unpatented mining claim that was never considered profitable under such combined provisions is inherently invalid.\(^{384}\) This is because the right to extract such minerals was never part of the claimholder’s title.\(^{385}\) Therefore, the federal government’s delayed use of the combined valuable discovery, use, and mine-to-mill site provisions would not be subject to takings analysis where these long-standing provisions could have been used in combination to invalidate an

\(^{377}\) Foster v. United States, 607 F.2d 943, 950 (Ct. Cl. 1979).
\(^{379}\) See Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1027 (1992) (“[Regulations are allowable as long as] some values are enjoyed under an implied limitation.”).
\(^{381}\) See Ferrari v. United States, 73 Fed. Cl. 219, 225 (2006) (reasoning that plaintiffs bringing a takings challenge must demonstrate how they were deprived of their “property or its economic use,” rather than incidental limitations not specifically related to their title claim).
\(^{382}\) See Mining Laws, supra note 369 (summarizing the limitations and regulations under the General Mining Law).
\(^{384}\) See Mining Laws, supra note 369 (requiring that a mineral locator demonstrate that his claim is profitable in order to justify his possession).
\(^{385}\) See Mining Laws, supra note 369 (requiring that certain laws and regulations be followed in order for minerals to be extracted regardless of title to surface rights).
The test for claim profitability under the combined provisions may also subsequently invalidate a previously valid unpatented mining claim, since the test must factor increasing costs of complying with regulations that may not have been in existence at the time of the claim’s location. Subsequent federal regulations that invalidate an otherwise valid unpatented mining claim due to unprofitability would extinguish the unpatented mining claimholder’s only property right—the right to a flow of income from the production of the claim—and thus would constitute a denial of all economically viable use under Lucas. However, the government could argue that an unpatented claimholder was not reasonable in expending funds on a marginally-valuable claim site that could be invalidated by fairly predictable, expected, and widespread increases in environmental and other regulatory costs. Where a claimholder is found to not have been reasonable in expending funds, the claimholder would have no investment-backed expectations. Thus, in such a situation, a regulatory takings claim would be unlikely to lie. The federal government’s argument that a claimholder is unreasonable in expending funds on an unpatented mining claim is likely persuasive and able to bar application of a regulatory takings analysis to a scenario in which increases in regulatory costs were generally

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386. Unfortunately, the determination of whether there was ever a requisite discovery to begin with is a question of fact; the decision of which by the Secretary of the Interior was conclusive in the absence of fraud or imposition. See Cameron v. United States, 252 U.S. 450, 455 (1920) (determining that the federal government can hold full legal title to a claim that is invalidated).

387. See Mining Laws, supra note 369 (requiring that a mineral locator demonstrate that his claim is profitable after the expenses are taken into account).


389. See Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1018–24 (1992) (determining that it is possible for the government to regulate validly held land to the point where it deprives the “landowner of all economically beneficial uses”).

390. All claimholders should expect that a mining claim must conform to the General Mining Act and subsequent legislation, as well as interpretive judicial decisions, before a defeasible unpatented mining claim can benefit from Fifth Amendment protection. This is because the General Mining Act and its progeny have a long history of generally increasing the regulatory burden on claimholders. Judicial decisions have had no problem upholding these regulations. Therefore, claimholders should not reasonably expect that general increases in regulatory burdens would not render their claims unprofitable, and thus, invalid under the Marketability Test. See Cameron, 252 U.S. at 460 (indicating that unpatented claims are vulnerable); Swanson v. Babbitt, 3 F.3d 1348, 1353 (9th Cir. 1993) (determining that patented rights are protected property rights); Rinke, supra note 2 at 829 (“Mining claims might be invalid for failure to satisfy the valuable deposit requirement of the law.”).

391. See Lucas, 505 U.S. at 1034 (Stevens, J., dissenting) (stating that ‘reasonable’ investment-backed expectations are needed to find no value under the Takings Clause).

392. See id. at 1018–24 (requiring the demonstration of the loss of all economic value in order to constitute a taking, yet basing such economic loss on the reasonable investment-backed expectations rather than unreasonable expectations).
expected to occur on a widespread basis.\textsuperscript{393} The reasonableness of expending funds in furtherance of an unpatented mining claim would vary depending upon the time in which the funds were expended.\textsuperscript{394} Obviously, the government’s argument would be strongest where the value of the claim was marginal to begin with, and either increased environmental regulations and/or the patent moratorium had already begun.\textsuperscript{395}

The statutory authority to generally regulate mining activity is quite different from the regulatory power to withdraw lands from mineral entry or otherwise prohibit mining activities.\textsuperscript{396} The exercise of mere regulatory power may preclude mining activity by invalidating a miner’s “discovery,” while at the same time preserving the possibility of relocation for future mining activities that meet the heightened discovery threshold.\textsuperscript{397} By contrast, withdrawal under the Antiquities Act prevents relocation of a mining claim, and criminalizes the appropriation or excavation of the “prehistoric ruins” and “objects of antiquity” existing on such withdrawn lands.\textsuperscript{398} The permanent withdrawal and criminalization of mining activities under the Antiquities Act eliminates all free mining access of an unpatented claimholder.\textsuperscript{399} A regulation that withholds an unpatented claimholder’s access to mine public resources\textsuperscript{400} or public lands\textsuperscript{401} has been found to constitute a compensable taking. Furthermore, the right to a flow of income from the conduct of mining activities is the only real property right of an unpatented claimholder.\textsuperscript{402} Therefore, the government’s withdrawal of federal land under the Antiquities Act very likely denies an unpatented claimholder of all future economically viable use. A denial of all economic

\begin{itemize}
\item \textsuperscript{393} See id. (implying that reasonable investment-backed expectations consider regulatory costs).
\item \textsuperscript{394} See Mining Laws, supra note 369 (listing some of the expenses associated with a mining claim that should be reasonable to expect and would be more burdensome for less productive claims).
\item \textsuperscript{395} See Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1017 (1992) (reasoning that a regulatory taking has occurred when total deprivation of beneficial use has occurred, but if the beneficial use was marginal, then the landowner may have a more difficult time demonstrating a taking).
\item \textsuperscript{396} See Graf, supra note 376, at 120 (comparing and contrasting mining regulations with withdrawal powers).
\item \textsuperscript{397} See Graf, supra note 376, at 120 (comparing the authority to regulate mining to the authority to withdraw land from mining use).
\item \textsuperscript{398} See 16 U.S.C. § 433 (2012) (“Any person who appropriates, excavates, injures, or destroys any historic or prehistoric ruin or monument, or any object of antiquity situated on land owned or controlled by the United States Government . . . shall, upon conviction, be [subject to a] fine . . . imprisonment, or both.”).
\item \textsuperscript{399} See Graf, supra note 376, at 120 (discussing the result of a withdrawal or prohibition of mining).
\item \textsuperscript{400} Foster v. United States, 607 F.2d 943, 950 (Ct. Cl. 1979).
\item \textsuperscript{401} Utah v. Andrus, 486 F. Supp. 995, 1011 (D. Utah 1979).
\item \textsuperscript{402} United States v. Locke, 471 U.S. 84, 105 (1985).
\end{itemize}
use was found to constitute a compensable Fifth Amendment taking in *Lucas*. 403 Since a withdrawal of federal land under the Antiquities Act is very likely considered a denial of all of an unpatented claimholder’s economically viable use (or at least a prohibition on access), such a withdrawal would likely constitute a compensable Fifth Amendment Taking, unless: (1) the limitations proscribed by the regulation were inherently restricted; 404 (2) the limitations were enacted for a proper government purpose; (3) the claimholder’s investment-backed expectations were unreasonable or insignificant; 405 or (4) fairness and justice dictates that society should not bear the burden. 406

A withdrawal of federal land is unlikely to be considered “inherently restricted.” Although the authority to withdraw federal land under the Antiquities Act may pre-exist the claim, it is the specific withdrawal of land that must be considered “inherently restricted” (i.e. pre-existing). 407 Any contrary interpretation, taken to the extreme, would render all limitations “inherently restricted” to the extent that such limitations (or the authority to limit in such a manner) were authorized or delegated by another law. All U.S. government action is authorized or delegated by the Constitution or some other enabling legislation. Therefore, such an interpretation would give the government near carte blanche to avoid the Fifth Amendment.

Also, it would be difficult to substantiate that a long-standing holder of an extremely valuable unpatented claim was unreasonable in expending funds to maintain such claim, because of the unpredictability of a federal land withdrawal affecting a claimholder’s specific claim. 408 Furthermore, due to the local effect of the exercise of withdrawal powers,

403. See *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1018–24 (1992) (stating that if a property owner is required to sacrifice all economically beneficial uses of their property, then this is a taking); *Graf*, supra note 376, at 120–21 (“As a consequence, withdrawal and prohibition, unlike regulation, are treated as ‘taking’ valid existing mining claims under the Fifth Amendment.”).

404. See *Lucas*, 505 U.S. at 1027 (“[Regulations are allowable as long as] some values are enjoyed under an implied limitation.”).

405. See *id.* at 1034 (Kennedy, J., concurring) (“[The test for whether regulations that deprive property of all value constitute a taking is] whether the deprivation is contrary to reasonable, investment-backed expectations.”).


408. See, e.g., *Skaw*, 740 F.2d at 938–40 (providing The Wild and Scenic Rivers Act of 1968 as an example of the unpredictability of federal land withdrawal).
as compared to the widespread effect of general federal regulations, an unpatented claimholder is disproportionately affected in comparison to the rest of the claim holding population. Since withdrawals are unpredictable and disproportionately affect a few claims, the interests of justice and fairness seem to dictate that the burden should be carried by society, rather than an individual claimholder who held significant investment-backed expectations.

Generally speaking, the U.S. government would usually want to preclude mining activities through general regulation, rather than land withdrawal, so as to avoid the paying of just compensation for a regulatory taking. However, the U.S. may want to withdraw land on which invalid mining claims rest, in order to prevent relocation where the government wishes to retain all mineral rights. Of course, assuming a claimholder has a substantive good faith takings claim, the claimant must still satisfy other more generalized requirements to successfully bring the claim. The remainder of this article discusses certain procedural and litigation issues involved in bringing a Fifth Amendment taking claim in the mining context, with particular focus on the issue of an unpatented claimholder’s standing to litigate.

**VIII. Procedures for Litigating Mining Claims Taking Issues**

As noted above, where the U.S. government has withdrawn land that is subject to a valid unpatented mining claim from federal mining access, the unpatented mining claimholder may seek just compensation by bringing an action for inverse condemnation. A patented claimholder may also bring an action for inverse condemnation where the federal government makes an actual invasion onto private, patented land or where federal mining or environmental regulations prevent all economically

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409. See Graf, supra note 376, at 111 (discussing the benefits of broad regulation for society and environmental policy as compared to the negative impacts on individual miners and mining companies).

410. See Graf, supra note 376, at 111 (asking whether it may be equally valuable to set impractically high technology standards for mining operations instead of using full withdrawal).

411. See Graf, supra note 376, at 120–21 (noting that the presumption that a withdrawal is a Fifth Amendment taking creates a preference for broad regulatory action instead of the use of withdrawals).

412. See Graf, supra note 376, at 120–21 (discussing Congressional power under the Property Clause to withdraw lands from mineral entry or prohibit mining claims).

413. See Skaw, 740 F.2d at 939–40 (providing the questions the Claims Court must address on remand).

valuable uses of the patented land in violation of the patented claimholder’s valid investment-backed expectations.\textsuperscript{415} In either a patented or unpatented situation, any plaintiff making a proper claim for inverse condemnation must follow certain procedural rules and show that they have attempted every other avenue possible\textsuperscript{416} to obtain their rights in the land.\textsuperscript{417} These procedures differ between cases that are new and cases where the claimant is intervening that already exist—both of which are discussed below.

\textit{A. Filing Non-Existing Case}

The procedure for filing a new case for inverse condemnation (a “non-existing case”) of a mining claim varies based upon the type of claim.\textsuperscript{418} If the land involved is private, i.e. a patented mining claim, the mining claimholder must file a claim in the United States Court of Federal Claims, under the Tucker Act.\textsuperscript{419} In order to receive injunctive relief (i.e. an order requiring specific performance conveying title to the land in fee simple absolute or an injunction against federal encroachments), a patented mining claimholder would be required to prove that they suffered a \textit{substantial} injury that is not accurately measurable or adequately compensable by money damages.\textsuperscript{420} A patented claimholder could argue, for instance, that constantly evolving technological advances in mining and


416. Once those avenues are exhausted, a plaintiff can take their claim to the court.

417. \textit{See} Smith, \textit{supra} note 415, at 633 (discussing the Supreme Court’s ruling against Hamilton Bank, which was based on the party’s failure to exhaust its administrative remedies).

418. \textit{See} Hafen v. United States, 47 F.3d 1183, *1 (Cal. Fed. 1995) (“28 U.S.C. § 2501 provides that every claim within the jurisdiction of the Court of Federal Claims shall be barred unless the claim is filed within six years after the claim first accrues.”).


420. \textit{See generally} Ross-Simons of Warwick, Inc. v. Baccarat, Inc., 102 F.3d 12, 18 (1st Cir. 1996); WPIX, Inc. v. iVi, Inc., 691 F.3d 275, 285 (2nd Cir. 2012) (“[H]arm may be irreparable where the loss is difficult to replace or measure, or where plaintiffs should not be expected to suffer the loss”).}
rapidly changing mineral prices make their loss difficult to measure, and thus irreparable and deserving of injunctive relief.\footnote{421} To bring an action for inverse condemnation upon an unpatented mining claim interest, the party would need to first file for a patent with the Secretary of Interior prior to bringing an action.\footnote{422} The process for obtaining a patent as discussed above is generally subject to the provisions of 30 U.S.C.A. § 29.\footnote{423} If a patent is denied (as would likely occur given the current federal patent moratorium), the unpatented mining claimholder may file a claim in the Court of Federal Claims to review the Secretary of Interior’s initial decision to deny the patent.\footnote{424} The party must show that the land is mineral in character using both the Prudent Man Test\footnote{425} and the Marketability Test\footnote{426} (discussed above). The civil litigation discovery process has several tools available to aid in garnering the information needed to establish claim value. Most notably, a claimholder could serve a subpoena duces tecum upon the government’s geological expert,\footnote{427} requiring that expert to bring any documents requested to a deposition, including an expert report on mineral valuation.\footnote{428} There is a chance that the expert report would be privileged as work product, if it is prepared in anticipation of litigation and contains more than mere facts.\footnote{429} However, the expert would still be able to be deposed regarding the factual information

\footnote{421.} Essentially, the patented claimholder would be arguing that owning the specific patented mining claim is a unique investment that offers a wide spectrum of potential returns, based upon an array of factors that are difficult to predict. Due to the uncertainty, the present value of the investment is subject to significant debate, giving the patented claimholder an argument that failure to grant injunctive relief could subject the patented claimholder to the risk of significant risk of financial loss that is difficult to measure.

\footnote{422.} See Hafen, 47 F.3d at *1 (“The Court of Federal Claims has no power to overrule or to ignore the decision of the Department of Interior . . . [in] a suit to recover just compensation for the taking of unpatented mining claims.”) (quoting FreeBSD v. United States, 221 Ct. Cl. 963, 964 (1979)).


\footnote{424.} See Hafen, 47 F.3d at *1 (arguing that Mr. Hafen’s failure to appeal the Department of the Interior’s decision that he did not have a valid claim precluded review by the Federal Claims Court).

\footnote{425.} See Castle v. Womble, 19 Pub. Lands Dec. 455, 457 (1894) (stating that the Prudent Man Test is the proper way to show that the land is mineral in character).

\footnote{426.} See United States v. Garcia, 161 Interior Dec. 235, 243 (IBLA 2004) (“[Requires a showing that] the evidence is of such a character that there is a reasonable prospect that the commercial value of the deposit will exceed the cost of extracting, processing, transporting, and developing a paying mine.”).

\footnote{427.} Preferably, the geological expert would be the field inspection expert at the local Bureau of Land Management State Office.

\footnote{428.} See FED. R. CIV. P. 45 (providing the procedural requirements to issue a subpoena duces tecum).

\footnote{429.} See Hickman v. Taylor, 329 U.S. 495, 509–11 (1947) (“Not even the most liberal of discovery rules can justify unwarranted inquiries into the files and the mental impressions of an attorney.”).
underlying any valuation opinion rendered.\footnote{430} In addition, a claimant could file interrogatories and requests for admission from the government concerning claim value.\footnote{431} If the court upholds the Secretary of Interior’s decision, the plaintiff may file an appeal.\footnote{432} However, if the unpatented claimholder never substantiates that he has a valid unpatented claim, there is no opportunity to establish that a compensable taking has occurred.\footnote{433}

**B. Intervention in Existing Cases**

On numerous occasions, plaintiffs have found themselves bringing a claim against a party that is already involved in a suit dealing with the same claim.\footnote{434} In this instance, plaintiffs will have to follow specific federal rules of civil procedure in order to intervene as a party to the existing claim.\footnote{435} Federal Civil Procedure Rule 24(a) provides that anyone shall be permitted to intervene in an action, upon timely application, when the applicant claims an interest relating to the property or transaction that is the subject of the action.\footnote{436} Federal Civil Procedure Rule 24(a) further requires that the applicant be so situated that the disposition of the action may practically impair or impede the applicant’s ability to protect that interest, unless existing parties adequately represent the applicant’s interest.\footnote{437} Accordingly, an applicant may intervene as of right if: (1) the application is “timely”; (2) the applicant has an interest in the property or transaction at

\footnote{430}{See id. ("Where relevant and non-privileged facts remain hidden in an attorney’s files and where production of those facts is essential to the preparation of one’s case, discovery may properly be had.")}. \footnote{431}{See FED. R. CIV. P. 33, 36 (providing the requirements for interrogatories and requests for admission under the Federal Rules of Civil Procedure).} \footnote{432}{See Hafen v. United States, 47 F.3d 1183, *1 (Cal. Fed. 1995) (discussing the procedures that were available to Mr. Hafen at the time that the Department of the Interior denied the claim).} \footnote{433}{See id. (finding that Mr. Hafen does not have a right to contest the government’s regulatory taking).} \footnote{434}{See Sierra Club v. Espy, 18 F.3d 1202 (5th Cir. 1994) (finding that the associations were entitled to intervene as a matter of right). See generally Utah Ass’n of Cnty’s. v. Clinton, 255 F.3d 1246 (10th Cir. 2001) (finding that the district court improperly dismissed the motion to intervene).} \footnote{435}{See FED. R. CIV. P. 24(a) (providing the procedural requirements for third party intervention).} \footnote{436}{See id. ("On timely motion, the court must permit anyone to intervene who: . . . claims an interest relating to the property or transaction."); see also Utah Ass’n of Cnty’s., 255 F.3d at 1249 (discussing the requirements of third party intervention under the Federal Rules of Civil Procedure).} \footnote{437}{See FED. R. CIV. P. 24(a) ("[A]nd is so situated that disposing of the action may as a practical matter impair or impede the movant’s ability to protect its interest, unless existing parties adequately represent that interest."); see also Utah Ass’n of Cntys., 255 F.3d at 1249 (vacating the order denying the motion to intervene under Rule 24(a) and remanding with instructions for granting the application to intervene as of right).}
issue; (3) the disposition of the action may impair the applicant’s claim; and (4) the applicant is not adequately represented by the existing party. Each of these requirements will be individually discussed in the subsection below.

1. Timeliness

The first requirement for intervention as a matter of right is that the claim be timely filed. In Utah Ass’n of Cnty. v. Clinton, counties filed suit to invalidate a Presidential proclamation establishing a national monument. Environmental organizations and tourism-related businesses attempted to intervene in the litigation. The Tenth Circuit held that the motion was timely applied for; the environmental organizations and tourism-related businesses had sufficient interest in the national monument to warrant their intervention; the existing suit had the potential these organizations’ abilities to protect their interests; and the interests of these organizations were not adequately protected by the existence of the federal government as a party to the existing action.

The Utah Ass’n of Cnty. v. Clinton court held that the timeliness of a motion to intervene is assessed in light of all the circumstances, including the length of time since the applicant knew of his interest in the case, the prejudice to the existing parties, the prejudice to the applicant, and the existence of any unusual circumstances. The requirement of timeliness is not a tool of retribution to punish the tardy would-be intervenor, but rather a guard against prejudicing the original parties by the failure to apply sooner. Federal courts should allow intervention where no one would be hurt and greater justice could be attained.

In Utah Ass’n of Cnty. v. Clinton, there had been no scheduling order, no trial date set, and no cut-off dates for motions set.

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438. See Fed. R. Civ. P. 24(a) (establishing when intervention is not allowed); see also Utah Ass’n of Cnty., 255 F.3d at 1249 (quoting Fed. R. Civ. P. 24(a)).
439. See Utah Ass’n of Cnty., 255 F.3d at 1249 (discussing the intervenors’ allegation that the President violated the Antiquities Act).
440. See Utah Ass’n of Cnty. v. Clinton, 255 F.3d 1246, 1249 (10th Cir. 2001) (noting that the intervenors were seeking to protect the public lands and assure their perpetual integrity).
441. See generally Utah Ass’n of Cnty., 255 F.3d 1246 (addressing the trial court’s denial of intervention de novo and reversing).
442. See id. at 1250 (quoting Sanguine, Ltd. v. U.S. Dep’t of Interior, 736 F.2d 1416, 1418 (10th Cir. 1984)).
443. Sierra Club v. Espy, 18 F.3d 1202, 1205 (5th Cir. 1994).
444. See Utah Ass’n of Cnty. v. Clinton, 255 F.3d 1246, 1250–51 (10th Cir. 2001) (addressing the plaintiff’s contention that the case was ready for disposition).
Prior to the application for intervention, only discovery and motions relating to jurisdictional issues had occurred.445

2. Sufficient Interest of Intervenor

The second requirement for intervention as a matter of right is that the intervenor maintains a sufficient interest.446 Under Rule 24(a)(2) of the Federal Rules of Civil Procedure, an intervenor must claim “an interest relating to the property or transaction that is the subject of the action”447. An intervenor’s interest must generally be “direct, substantial, and legally protectable.”448 The inquiry of whether an intervenor has a sufficient interest is highly fact-specific, and the interest test is meant to dispose of lawsuits by involving as many apparently concerned persons as is compatible with efficiency and due process.449 In Utah Ass’n of Cnty. v. Clinton, the environmental organizations and the tourism-related businesses argued that they had

an interest in the continued existence of the monument and its reservation from public entry, both on the basis of their financial stake in the tourism the monument created and on the basis of their desire to further their environmental and conservationist goals by preserving the undeveloped nature of the lands encompassed by the monument.450

In Coal. of Ariz. v. Dep’t of the Interior, a commercial wildlife photographer, who had a particular interest in the Mexican Spotted Owl, sought to intervene in a suit brought against the U.S. Fish and Wildlife Service, challenging the Wildlife Service’s decision to protect the Mexican Spotted Owl under the Endangered Species Act.451 The court held that the photographer’s involvement with the owl in the wild and his persistent

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445. See id. (noting that the plaintiffs waited to intervene until after the government's dispositive motion to ensure that they would have a suit to intervene in and not waste judicial resources).

446. See FED. R. CIV. P. 24(a) (providing that anyone may intervene who claims an interest relating to the property or transaction that is the subject of the action); Utah Ass’n of Cnty. v. Clinton, 255 F.3d at 1249 (stating that Rule 24 requires an intervenor to claim an interest relating to the property or transaction).

447. FED. R. CIV. P. 24(a)(2).

448. Coal. of Ariz. v. Dep’t of the Interior, 100 F.3d 837, 839 (10th Cir. 1996).

449. See id. at 841 (“The ‘interest’ test is primarily a practical guide to disposing of lawsuits by involving as many apparently concerned persons as is compatible with efficiency and due process.”).

450. Utah Ass’n of Cnty. v. Clinton, 255 F.3d 1246, 1251 (10th Cir. 2001).

451. See Coal. of Ariz. v. Dep’t of the Interior, 100 F.3d at 841 (noting Dr. Silver has been at the forefront of efforts to protect the Owl under the Act).
record of advocacy for its protection amounted to a direct and substantial interest.\footnote{452} Under the rules set forth in \textit{Utah Ass’n of Cntys. v. Clinton} and \textit{Coal. of Ariz. v. Dep’t of the Interior}, the holder of a valid and profitable unpatented claim should have no problem proving its sufficiency of interest in the land in question since its commercial and financial interest in the land is clear.\footnote{453}

3. Potential to Impair Interest of Intervenor

The third requirement for intervention as a matter of right is that the existing litigation has the potential to impair the intervenor’s interest.\footnote{454} Rule 24(a)(2) of the Federal Rules of Civil Procedure further requires that an intervenor demonstrate that the disposition of the action may, as a practical matter, impair or impede the intervenor’s ability to protect their interest.\footnote{455} To satisfy this element of the intervention test, a would-be intervenor must show only that impairment of its substantial legal interest is possible if intervention is denied—a minimal burden.\footnote{456} In \textit{Utah Ass’n of Counties v. Clinton}, the court held that the intervenors’ interests in the preservation and protection of the monument would be significantly impaired by an adverse decision setting aside the creation of the monument, especially considering the fact that many of the intervenors owned tourism-related businesses that completely depend upon the existence of the monument for income.\footnote{457} An unpatented claimholder’s interest potentially could be impaired by litigation between a competing claimholder and the federal government, for instance.

\begin{footnotes}
\footnote{452}{See id. (providing that Dr. Silver’s interest in the Owl, as a photographer, an amateur biologist, and a naturalist, is “direct, substantial, and legally protectable”).}
\footnote{453}{See id. (accepting Dr. Silver’s interest in the owl as a photographer, an amateur biologist, and a naturalist, as sufficient under Rule 24); \textit{Utah Ass’n of Cntys.}, 255 F.3d at 1253 (accepting the intervenors’ financial stake in the tourism the monument created as well as their interest in preserving nature as a sufficient interest under Rule 24).}
\footnote{454}{See \textit{Fed. R. CIV. P. 24(a)} (“[The interest must be] so situated that disposing of the action may as a practical matter impair or impede the movant’s ability to protect its interest.”); \textit{Utah Ass’n of Cntys.}, 255 F.3d at 1253 (stating that an intervenor must demonstrate that the disposition of their action may “impair or impede their ability to protect their interest”).}
\footnote{455}{See \textit{Utah Ass’n of Cntys.}, 255 F.3d at 1253 (acknowledging that Rule 24(a)(2) requires intervenors to demonstrate that the disposition of the action may impair or impede their ability to protect the interest).}
\footnote{456}{See \textit{Grutter v. Bollinger}, 188 F.3d 394, 399 (6th Cir. 1999) (noting that the burden to satisfy the impairment standard is minimal (citing \textit{Mich. State AFL-CIO v. Miller}, 103 F.3d 1240, 1247 (6th Cir. 1997))).}
\footnote{457}{See \textit{Utah Ass’n of Cntys. v. Clinton}, 255 F.3d 1246, 1253 (10th Cir. 2001) (explaining that the intervenors had an economic stake in the monument’s continued existence).}
\end{footnotes}
4. Adequacy of Representation of Intervenor by Existing Parties

The fourth requirement for intervention as a matter of right is that the intervenor’s interest must not be adequately represented by an existing party.\(^\text{458}\) In order to intervene under Rule 24(a) of the Federal Rules of Civil Procedure, a would-be intervenor must show that existing parties to the suit do not adequately represent its interest.\(^\text{459}\) The would-be intervenor bears the burden of proving inadequate representation, but that burden is quite minimal,\(^\text{460}\) therefore, the possibility that the interests of the applicant and the parties may diverge need not be great in order to satisfy this burden.\(^\text{461}\) An intervenor must only show the possibility of inadequate representation.\(^\text{462}\) The possibility of inadequate representation has historically been shown to be quite strong where the representing party is the government because the government must represent the interests of the public at large, and those interests may or may not be coextensive with the intervenor’s particular interest.\(^\text{463}\) It has been said that the government cannot adequately represent private interests since the government is charged with protecting the public interest.\(^\text{464}\)

Even if a claimant properly meets all the above procedural requirements to bring the suit, it is likely that the litigant must also win a challenge by the U.S. as to the standing of the claimant, discussed immediately below.

\(^{458}\) See Fed. R. Civ. P. 24(a)(2) (“[One may intervene] unless existing parties adequately represent [the] interest.”); Utah Ass’n of Cnty’s., 255 F.3d at 1254 (stipulating that an intervenor is not entitled to intervene if his interest is adequately represented by existing parties).

\(^{459}\) See Utah Ass’n of Cnty’s., 255 F.3d at 1254 (noting that there is no right to intervene unless the interest “is adequately represented by existing parties”).

\(^{460}\) See Utah Ass’n of Cnty’s., 255 F.3d at 1254 (stating that the burden is the minimal one of showing that representation may be inadequate).

\(^{461}\) See Natural Res. Def. Council, Inc. v. U.S. Nuclear Regulatory Comm’n, 578 F.2d 1341, 1346 (10th Cir. 1978) (“The possibility of divergence of interest need not be great in order to satisfy the burden.”).

\(^{462}\) See Utah Ass’n of Cnty’s., 255 F.3d at 1254 (noting that the burden is one of showing that “representation ‘may’ be inadequate”) (emphasis added).

\(^{463}\) See Utah Ass’n of Cnty’s., 255 F.3d 1246, 1253 (10th Cir. 2001) (indicating that the burden is easily met when the party is the government, as it has an obligation to also represent the public, and that interest may be viewed as coextensive with the intervenor’s particular interest).

\(^{464}\) See Utah Ass’n of Cnty’s., 255 F.3d at 1255 (“[History of case law states] government representation may not adequately represent private interests because the government protects the public interest.”).
IX. The Government’s Constitutional Standing Defense to an Unpatented Mining Claim Takings Action

The federal government often challenges a plaintiff’s Fifth Amendment inverse condemnation takings claim by arguing that the plaintiff lacks standing to sue and/or the issue is not ripe for judicial decision. To meet the standing requirements of Article III of the Constitution, a plaintiff must allege personal injury fairly traceable to the defendant’s allegedly unlawful conduct and likely to be redressed by the requested relief. Therefore, for a plaintiff to claim standing to sue or intervene, the plaintiff must show: (1) injury in fact; (2) causation; and (3) redressability. Each of these three requirements will be individually discussed in the subsections immediately below.

A. Requirements

1. Actual or Threatened Injury (Injury in Fact)

The federal government has often challenged the standing of plaintiffs for their failure to prove a direct injury. The party bringing the action must have suffered or will imminently suffer, injury due to the action at issue. An “injury” is defined as an invasion of a legally protected interest that is concrete and particularized—not abstract. Courts have consistently held that a plaintiff claiming only a generally available grievance about government, unconnected with a threatened concrete interest of his own, does not state an Article III case or controversy.

465. See Allen v. Wright, 468 U.S. 737, 750 (1984) (providing that standing and ripeness are among the most important doctrines that Article III presents in a government challenge).

466. See id. at 751 (explaining that the injury must be fairly traceable to the challenged action and that relief from the injury must be likely to follow from a favorable decision).

467. See Lujan v. Defenders of Wildlife, 504 U.S. 555, 560 (1992) (holding that a plaintiff must have suffered an injury in fact, the injury must have a causal connection to the conduct complained of, and it must be likely that the injury will be redressed by a favorable decision).

468. See id. at 574 (detailing a history of cases that have been dismissed for a lack of injury in fact).

469. See id. at 560 (stating that an injury must be actual or imminent, not conjectural or hypothetical).


471. See Lujan, 504 U.S. 555 at 573–74 (“[A] plaintiff raising only a generally . . . grievance about [the] government, claiming only harm to his and every citizen’s interest in proper application of the Constitution and laws, and seeking relief that
In the context of unperfected mining claims, regulations that render claims economically non-viable after location is noticed, but before a valuable discovery is made, would leave no cognizable property interest for which to initiate suit.\textsuperscript{472} However, where specific land already subject to valid unpatented mining claims is withdrawn from public mining access, the unpatented claimholder may be found to have standing because the claim is valid and compensable and the effects are local—a particularized injury.\textsuperscript{473} It remains unclear whether environmental regulations that effectively prevent the economic viability of mining operations would constitute a particularized injury.

2. Causation

There must be a causal connection between the injury and the conduct complained of, so that the injury is fairly traceable to the challenged action of the defendant and not the result of the independent action of some third party who is not before the court.\textsuperscript{474} In the context of an unpatented mining claim takings issue, the plaintiff must show that the government’s action caused the loss of property rights and economic value in the unpatented claim.\textsuperscript{475} The government’s causation may be difficult to prove where industry norms and technological limitations also play large parts in the mining operation’s economic non-viability.\textsuperscript{476}

3. Redressability

\textsuperscript{472} See Graf, supra note 376, at 122 (noting that no property rights are formed where the government imposes regulations on a proposed operating plan before valuable discovery takes place).

\textsuperscript{473} See Raines, 521 U.S at 819 (stating that an actionable injury is an invasion of a legally protected interest that is concrete and particularized).

\textsuperscript{474} See, e.g., Mass. v. EPA, 549 U.S. 497 (2007) (stating that the EPA must ground its action or inaction in its own reasoned explanations).

\textsuperscript{475} See Graf, supra note 376, at 129 (explaining that, under a traditional analysis of takings, government regulation that “renders an unpatented mining operation unprofitable could be ruled a taking” in that the government may not regulate property so as to deny an owner all economic use).

\textsuperscript{476} See Graf, supra note 376, at 108 (noting that in some situations, normal mining activities may themselves trigger stricter regulation, resulting in greater government authority to impose any restrictive standards deemed necessary to protect the resource, even if such standards were not achievable through the use of existing technology).
The party seeking judicial relief must show that there is a substantial probability that a favorable decision will redress the injury. The party seeking judicial relief need not show certain redressability, but redress may not be speculative. As such, finding that a compensable taking occurred would likely offer complete redress to such an unpatented claimholder.

X. Conclusion

The U.S. government has begun to enforce existing regulations, such as the valuable discovery requirement, the use limitation, and the mine-to-mill site ratio, in a combined manner that often has the effect of invalidating claims to all but the most highly dense and graded deposits. The U.S. has also sought the withdrawal of many Western lands from public mining access, as national monuments under the Antiquities Act. Presumably some of these lands contain high density, high-grade deposits of valuable minerals and are subject to unpatented mining claims. With the U.S. tightening the reins on federal land mining in the face of rising mineral values, many unpatented claimholders have looked to the U.S. Constitution for redress against the “taking” of valid unpatented mining claims.

Since the only property right of an unpatented claimholder subject to a takings analysis is the right to extract the underground mineral deposit, it is highly unlikely that the government would be found to have engaged in an actual taking. The enforcement of regulations (existing at the time of a claim’s location) to invalidate a claim is not subject to a Fifth Amendment regulatory takings analysis, because the claimholder never held a compensable property interest to begin with. Subsequently enacted mining regulations, which serve to invalidate an unpatented mining claim

477. See Lujan v. Defenders of Wildlife, 504 U.S. 555, 560 (1992) (stating that it must be likely, not merely speculative, that the injury at issue will be redressed by a favorable decision).
478. See id.
479. See Crown Jewel, supra note 2, at 822 (noting that three provisions of the law have emerged to limit greatly the scope of mining: the discovery requirement, the mine-to-mill site ratio, and use restrictions imposed on each).
480. See An Act for the Preservation of American Antiquities, 16 U.S.C. §§ 431–33 (1906) (prohibiting the appropriation, destruction, injury and excavation of any historic or prehistoric ruin or monument, or any object of antiquity).
481. See Mining Claim, supra note 7 (detailing stricter, new requirements for patent applications).
482. See Graf, supra note 376, at 129 (“[T]he characterization of the unpatented mining claim as a conditional property interest did not constitute a ‘sudden and unpredictable’ change in the law, and thus did not upset miners’ reasonable expectations in violation of the Fifth Amendment.”).
483. See Graf, supra note 376, at 129 (explaining that, without a valid property interest, a claimant has no cause of action under the Fifth Amendment).
subject to relocation, are also likely not subject to a Fifth Amendment regulatory takings analysis, because increases in mere regulation are likely predictable and expected and do not prohibit all future economic use.  

However, a withdrawal under the Antiquities Act prevents relocation of a mining claim and criminalizes the conducting of mining activities on such withdrawn lands. Thus, using the Antiquities Act to permanently withdraw federal land eliminates all future economic use of the mining rights (the only property right afforded an unpatented claimholder), constituting a denial of all economic use under Lucas. Since withdrawals are unpredictable and disproportionately affect a small group of claimholders, the interests of justice and fairness dictate that the burden be carried by society, rather than the individual claimholder who likely had significant and reasonable investment-backed expectations related to the withdrawn property. Furthermore, a regulation that withholding an unpatented claimholder’s access to mine public resources or public lands has been found to constitute a compensable taking. Given all of the above, it would behoove holders of valid unpatented claims to take a hard look at whether the use of the Antiquities Act in this manner gives them an appropriate Fifth Amendment taking cause of action.

484. See Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1018–24 (1992) (stipulating that a taking has occurred only when all economically beneficial uses of a property have been prohibited).

485. See 16 U.S.C. § 433 (“[The Antiquities Act penal provision provides] any person who appropriates, excavates, injures, or destroys any historic or prehistoric ruin or monument, or any object of antiquity situated on land owned or controlled by the United States Government, shall, upon conviction, be subject to a fine, or imprisonment, or both.”).

486. See Graf, supra note 376, at 120 (“[A] withdrawal or prohibition eliminates any future free access regardless of how valuable the mineral or how sophisticated the level of mining technology may become.”); Lucas, 505 U.S. at 1018–24 (stipulating that when all economically beneficial uses of a property have been prohibited, a taking has occurred).

487. See Ferrari v. United States, 73 Fed. Cl. 219, 225 (2006) (“[A taking of property occurs when society imposes a burden on an individual’s property which, in fairness and justice, society itself should bear.”).

488. Foster v. United States, 607 F.2d 943, 950 (Cl. Cl. 1979).

Deep Water Offshore Oil Exploration Regulation: The Need For a Global Environmental Regulation Regime

Naama Hasson*

Abstract

Government regulation of deepwater offshore explorations has found it either difficult to evaluate the environmental impact, or too costly to perform the required review.¹ Corporate self-regulation without effective government oversight will not adequately reduce the risk of accidents within the offshore oil exploration industry, nor will it ensure that corporations prepare effectively to respond to a major spill. The potential, near-term, financial benefit for the oil company prevails over the low-probability risk that a major spill will occur.

Recognizing that current domestic regulation lacks effective, continuous monitoring of complex offshore operations, another form of regulation appears necessary. If already-emerging principles were to be recognized within industry and governmental agencies on the international level, this would help achieve safer operations in areas where domestic environmental regulation is weak or non-existent.

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¹ See Nat’l Comm’n on the BP Deepwater Horizon Oil Spill and Offshore Drilling, Report to the President (Jan. 2011) [hereinafter Report to the President], available at http://www.oilspillcommission.gov/final-report (discussing the various policy complications and technological limitations contributing to the failure of effective deepwater monitoring).
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I. Introduction

As of the 1890s, oil companies began drilling offshore from wooden piers connected to shore.2 In the 1940s drilling detached from shore, operating within a few miles at relatively shallow depths.3 Shell was the first company to develop new technology that allowed offshore oil and gas exploration in deep water during the 1960s (at 300–600 feet).4 This opened the door to increased operations and the development of new technologies, which, in turn, allowed for deeper offshore oil explorations.5

Current offshore oil and gas exploration projects are occurring in ever-growing depths of in and over 5,000 feet.6 British Petroleum’s Deepwater Horizon rig was drilling the Macondo well in the Gulf of Mexico at 4,992 feet.7 Noble Energy’s Tamar rig is drilling in the Mediterranean Sea at 5,500 feet.8 Petrobras’ Ocean Clipper rig is drilling offshore Brazil at 8,500 feet.9 Dragon Oil’s Astra rig is drilling in the

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2. See id. at 21 (“Beginning in the 1890s, oil companies had drilled wells in the ocean, but from wooden piers connected to shore.”).
4. See id. at 25 (detailing Shell’s advent of the “floating drilling platform.”).
5. See id. (discussing the far-reaching implications of Shell’s deepwater drilling innovations).
6. See id. at 37 (“Drilling contractors developed a new generation of vessels that took drilling from 5,000 to 10,000 feet of water, and from 20,000 to 30,000 feet of sub-seafloor depth.”).

Deepwater, offshore oil and gas exploration occurs at a significant distance from land and at distances, depths and pressures that require sophisticated inspection systems in order to scan and monitor the operation of mechanics.\footnote{See CHIEF COUNSEL’S REPORT, supra note 7, at 7 (discussing the challenges and opportunities of deepwater drilling).} This operation has the potential to be highly lucrative, but also extremely fraught. Once a major oil spill has occurred at the depth, it is almost uncontainable.\footnote{See Mike Soraghan, \textit{Industry Claims of Proven Technology Went Unchallenged at MMS, N.Y. TIMES} (June 2 2012), \url{http://www.nytimes.com/gwire/2010/06/02/02greenwire-industry-claims-of-proven-technology-went-unch-55514.html?pagewanted=all} (discussing the difficulties of responding to events in a deepwater setting).} It is difficult to identify that a spill has occurred, to locate its origin, and finally to bring the spill to a halt—indeed, deepwater repairs have been described as “open-heart surgery at 5,000 feet, in the dark.”\footnote{See id.} Following the 2010 British Petroleum (BP) blowout, five million barrels of crude oil continued to spill into the ocean water for almost three months.\footnote{See Thomas B. Ryerson, et al., \textit{Chemical Data Quantify Deepwater Horizon Hydrocarbon Flow Rate and Environmental Distribution}, PNAS (Jan. 2012), http://www.pnas.org/content/early/2012/01/04/1110564109.full.pdf+html (discussing the after-effects of the Macondo well blowout) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment).} The damage caused to the ecologic system will take years to assess and overcome.\footnote{See Oil Rig’s Owner Settles With Justice Dept. in Spill Case, N.Y. TIMES, (Jan. 3, 2013), http://topics.nytimes.com/top/reference/timestopics/subjects/o/oil_spills/gulf_of_mexico_2010/index.html (discussing \textit{ex post facto} settlement claims) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment).}

In May 2010, President Barack Obama announced the creation of the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling.\footnote{See Press Release, The White House, Office of the Press Secretary, Weekly Address: President Obama Establishes Bipartisan National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling (May 22, 2010), [hereinafter Press Release] \url{http://www.whitehouse.gov/the-press-office/weekly-address-president-obama-establishes-bipartisan-national-commission-bp-deepwa} (announcing the creation of the Commission).} The Recommendation of the Commission recognized that the oil industry has regional effects beyond state boundaries.\footnote{See NAT’L COMM’N ON THE BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING, RECOMMENDATIONS 36 (Jan. 2011) [hereinafter Recommendations of the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling].} There is
little known on the environmental effect of a major oil spill on deepwater ecologic systems and on aquatic species.\textsuperscript{18} Further, deepwater oil and gas exploration occurs at a distance from the coastal state, which has an effect on a shared global water resource and, as such, becomes a joint interest for the international community.\textsuperscript{19} Finally, since the damage from a major oil spill is likely to be significant and costly, governments may find themselves operating cleanup programs after oil spills, as eventually happened in the BP Oil Spill in the Gulf of Mexico. For all of these reasons, there is an incentive for governments to closely regulate offshore oil and gas explorations in order to decrease, to the extent possible, the risk of a major spill.\textsuperscript{20}

This Paper suggests that offshore oil exploration projects should be administered based on a global environmental regulatory regime. It will examine recent reports regarding environmental regulation of offshore drilling published in the United States\textsuperscript{21} and the United Kingdom,\textsuperscript{22} as well as ‘good oilfield practices,’ developed throughout years of offshore exploration by oil companies, in order to establish a list of preliminary basic principles in establishing a global environmental regulatory regime on deep water offshore oil and gas exploration. Part II will delineate the main existing obligations under the law of the sea in the area where deepwater explorations are being performed. Part III will examine regulation options by the governments, self-regulation by oil companies, and global regulation, drawing from this the justifications to regulating offshore oil and gas exploration on the international level. Part IV will uncover the

\begin{enumerate}
\item See id. at 52–53 (“When the Macondo blowout dumped enormous volumes of oil into the Gulf waters, scientists and policymakers realized how little was known about biological systems, environmental conditions, and even key aquatic and coastal species.”).
\item See id. at 4–6 (emphasizing the importance of working with the international community to develop shared standards regarding drilling, production, and emergency response).
\item See id. at vii (“Deepwater energy exploration and production, particularly at the frontiers of experience, involve risks for which neither industry nor government has been adequately prepared, but for which they can and must be prepared in the future.”).
\item See, e.g., REPORT TO THE PRESIDENT, supra, note 1 (detailing the full sequence of events leading to the blowout of the Macondo well, and the spectrum of measures that might be implemented to prevent future such incidents).
\end{enumerate}
‘good oilfield practices,’ and lessons learned from the 2010 BP blowout, in
search for industry and regulators’ policies and practices that should be
incorporated into a global environmental regulatory regime. Part V will
introduce the main principles the global environmental regulatory regime
should include, as well as a suggested incentive mechanism to complement
it. Part VI will conclude the discussion.

II. Obligations under the Law of the Sea

The status of the adjacent water and, subsequently, the seabed
underneath it has been the subject of international debate for a while. The
General Assembly resolution 2692 (XXV) on Permanent Sovereignty over
Natural Resources of Developing Countries included reference to the right
of states to permanent sovereignty over natural resources in the superjacent
water. This was reaffirmed in a later resolution, recognizing the right of
states to permanent sovereignty over natural resources in the seabed and the
subsoil in the superjacent waters. However, behind the scenes at the
United Nations, the inclusion of the superjacent waters and its definition
were the subject of long discussions in the General Assembly. Some of
the countries there expressed their concern that the law of the sea is still
evolving and being discussed as part of the process of drafting several
conventions on the law of the sea.

divided the sea into zones, each subject to a different legal status and
applicable law. A state’s territorial sea extends out to twelve nautical
miles from the coast where the sovereignty of the coastal state continues
to apply. The contiguous zone stretches to twenty-four nautical miles.
Within this area, the coastal State may exercise its control, as necessary, to

necessity for all countries to exercise fully their rights so as to secure the optimal utilization
of their natural resources, both land and marine, for the benefit and welfare of their peoples
and for the protection of their environment . . .”).
24. See G.A. Res. 3016 (XXVII), 27th Sess., Doc. A/RES/3016 (Dec. 18, 1972), and
G.A. Res. 3171 (XXVIII), 28th Sess. (Dec. 17, 1973) (reaffirming states’ sovereign rights to
natural resources found in the sea-bed and the subsoil within their national jurisdictions and
the superjacent waters).
(Dec. 11, 1970); U.N. GAOR, 28th Sess., 2203d plen. mtg., U.N. Doc. A/PV/2203 (Dec. 17,
1973).
26. See id.
1833 U.N.T.S. 397 [hereinafter UNCLOS] (establishing demarcated territorial zones for
state signers to the Convention).
28. See id. art. 3 (establishing the breadth of territorial waters).
prevent infringement of its customs, fiscal, immigration or sanitary laws and regulations. 29

The Continental Shelf “comprises the seabed and subsoil of the submarine areas that extend beyond its territorial sea throughout the natural prolongation of its land territory to the outer edge of the continental margin, or to a distance of 200 nautical miles from the baselines from which the breadth of the territorial sea is measured where the outer edge of the continental margin does not extend up to that distance.” 30 Jurisdiction over the continental shelf is defined functionally, asserting the state holds exclusive control for limited purposes of exploration and exploitation of natural resources of the seabed and subsoil. 31

The Exclusive Economic Zone (EEZ) is an area beyond and adjacent to the territorial sea, where the coastal state holds sovereign rights for the purpose of exploring, exploiting, conserving, and managing the natural resources. 32 In addition to jurisdiction over seabed and subsoil resources, which are already covered by the continental shelf rule, the EEZ regime establishes state jurisdiction over natural resources in the water (mainly fisheries). 33

Most offshore oil explorations take place within the EEZ, at the continental shelf seabed and subsoil. 34 Within this area, the coastal state has jurisdiction as required for the exploration and exploitation of natural resources. 35 However, this is subject to the state’s responsibility to ensure, through proper conservation and management measures, that the maintenance of the living resources within the EEZ is not endangered by over-exploitation. 36 This suggests that the coastal state has an obligation

29. See id. art. 33 (establishing the rights of a nation to engage in zones contiguous to its territorial seas).

30. See id. art. 76(1) (defining the continental shelf).


32. See UNCLOS, supra note 27, at. 55–56 (defining the area, rights, jurisdiction, and duties of the exclusive economic zone).

33. See Posner & Sykes, supra note 31, at 585 (“In addition to seaborne resources that are in any event covered by the continental shelf regime, the EEZ regime establishes the coastal state's exclusive jurisdiction over natural resources in the water column, notably fisheries.”).

34. See Posner & Sykes, supra note 31, at 585 (“[M]ost exploitable deposits of hydrocarbons are likely to be found within the limits of the continental shelf as defined in UNCLOS . . . .”).

35. See Posner & Sykes, supra note 31, at 585 (noting that exclusive jurisdiction of the continental shelf mitigates inefficient races to control resources there, while UNCLOS grants “similar exclusive rights for the EEZ”).

36. See UNCLOS, supra note 27, art. 61 (“The coastal State, taking into account the best scientific evidence available to it, shall ensure through proper conservation and
under international law to protect and conserve living resources from impacts of development operations occurring within the EEZ.\textsuperscript{37}

\textbf{III. Justifications for regulation of offshore drilling on the International Level}

Recognizing that the current domestic regulation is lacking effective continuous monitoring of complex operations far from land, another form of regulation is required. Still, there is a myriad of regulatory methods regularly used to monitor environmental issues.\textsuperscript{38} This chapter will review available systems of regulation and will draw from this discussion justifications for regulating offshore oil and gas exploration on the international level. First, the paper will turn to examine the traditional government regulation, usually in the form of command and control.\textsuperscript{39} Later, the possibility of incorporating incentives to induce self-regulation by oil companies will be considered.\textsuperscript{40} Finally the characteristics of the offshore oil and gas exploration industry will be analyzed to find whether an international regulation is applicable.\textsuperscript{41}

\textbf{A. Government regulation}

Government oversight alone cannot reduce the risks of overexploitation and environmental impact to the full extent possible.\textsuperscript{42} Resources at the deep sea require regulation to avoid overexploitation, excessive investment in search, and related externality issues.\textsuperscript{43} However, there is an inverse relationship between the value of sea resources and the cost of regulation for land-based actors: as the value of sea resources tends to diminish, the cost of regulating that resource rises with distance from the

\begin{itemize}
\item \textsuperscript{37} See UNCLOS, \textit{supra} note 27, art. 61 (imposing the conservation and management requirement on coastal states).
\item \textsuperscript{38} See \textit{infra} notes 42–92 and accompanying text (discussing modes of regulation using federal, private, and international means).
\item \textsuperscript{39} See \textit{infra} notes 42–65 and accompanying text (discussing the difficulty of government regulation over distant deepwater drilling sites).
\item \textsuperscript{40} See \textit{infra} notes 66–87 and accompanying text (discussing economic and public relations incentives for companies to police themselves).
\item \textsuperscript{41} See \textit{infra} notes 91–93 and accompanying text (discussing prospects for a global environmental regime).
\item \textsuperscript{42} See \textit{Report to the President, supra} note 1, at 217 (stating that effective government oversight is necessary to avoid accidents and to ensure effective response, but insufficient without the reinvention of the oil and gas industry).
\item \textsuperscript{43} See Posner & Sykes, \textit{supra} note 31, at 595 (“[M]any of the resources of the sea require regulation to protect against overexploitation, excessive investment in search, and related externality problems.”).}
\end{itemize}
shore. It follows, therefore, that a coastal state’s “regulatory authority declines with distance from the shore.” This makes it difficult for a state regulator to evaluate a cost of harming fish species, birds, or water quality, where people never go. It is also hard to justify research of deep-sea aquatic ecosystems, as this kind of research requires sophisticated technologies, which are very expensive.

As offshore oil and gas explorations are technologically possible in greater depths and distances with growing technological development, the domestic regulatory authority is less operative. The core challenge for an international agreement on regulatory authority over activities at sea is to allocate that authority to the most efficient regulator. The logic underlined in the law of the sea is that the further away from the coast, the more the international community would be involved in the management of the resource, with the high seas representing total freedom from state sovereignty. While the EEZ is subject to the coastal state sovereignty, the international community has an interest in the activities performed within the EEZ. This interest is reflected in the responsibility of the coastal state to ensure, through proper conservation and management measures, that living resources are maintained within the EEZ.

44. See Posner & Sykes, supra note 31, at 595 (“[T]he value of a sea resource to land-based actors tends to diminish with distance from the shore, and the cost of regulating that resource for land-based actors rises with distance from the shore.”).
45. See Posner & Sykes, supra note 31, at 595.
46. See Posner & Sykes, supra note 31, at 577 (noting that states may be reluctant to expend resources to police a vast area of the high seas without substantial return, while “the environmental costs of activities further out to sea are not (yet) perceived to be as serious”).
47. See Laura Ruth, Gambling in the Deep Sea, 7 EMBO REPORTS 17, 18 (2006) (noting that commercial partnerships are often necessary to support academic deep-sea research, which can cost $30,000 per day and six-figure sums over the course of a year).
48. See REPORT TO THE PRESIDENT, supra note 1, at 250–51 (discussing the inadequacy of current regulatory systems in the face of “the near certainty that the oil and gas industry will seek to expand into ever more challenging environments in the years ahead”).
49. See Posner & Sykes, supra note 31, at 576 (noting that allocating regulatory authority to proximate coastal states is usually the efficient choice, but this assumption may not hold where competing claims and distant resources are involved).
50. See Posner & Sykes, supra note 31, at 578–80 (discussing how state maritime rights and control diminish with distance from shore, and how the principle of freedom on the high seas results in an international regime of rights and duties).
51. See Posner & Sykes, supra note 31, at 585 (noting that UNCLOS grants coastal states exclusive rights of exploitation and conservation of maritime resources in the EEZ, but that foreign states retain high seas rights in these areas, as well as an attenuated interest in fishery resources).
52. See UNCLOS, supra note 27, art. 61 (“The coastal State, taking into account the best scientific evidence available to it, shall ensure through proper conservation and management measures that the maintenance of the living resources in the exclusive economic zone is not endangered by over-exploitation.”).
The above theoretical analysis of the law of the sea can explain the degradation in environmental regulation of offshore oil and gas explorations in the Gulf of Mexico. Compared with other regions in the world, the United States has elaborate government regulation: the National Environmental Policy Act (NEPA)\(^53\) requires all major federal actions that will significantly affect the quality of the human environment to prepare an environmental impact statement (EIS).\(^54\) The Outer Continental Shelf Lands Act (OCSLA) gives the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) in the Department of the Interior the authority and responsibility to approve oil and gas leasing, exploration, and development process in the outer continental shelf.\(^55\) BOEMRE was then split into two separate entities; the new Bureau of Ocean Energy Management (BOEM) and the new Bureau of Safety and Environmental Enforcement (BSEE). The authority and responsibility to approve oil and gas leasing, exploration, and development process in the outer continental shelf remained with BOEM.\(^56\) The process of approval is divided into four stages: (1) preparation of a five year program, (2) planning for specific lease sales, (3) a private company’s exploration plan approval, and (4) approval of a company’s development and production plan.\(^57\) OCSLA requires that BOEMRE only permit offshore oil and gas activities that comply with NEPA.\(^58\) BOEMRE would regularly conduct a NEPA review at each stage of the oil and gas exploration process, requiring an EIS to be submitted by the oil company at each stage of the process.\(^59\)


\(^{54}\) See id. at § 4332 (imposing on federal agencies NEPA’s reporting and consultation requirements, including the EIS).


\(^{58}\) See 43 U.S.C. § 1866(a) (2006) (“Except as otherwise expressly provided in this chapter, nothing in this chapter shall be construed to amend, modify, or repeal any provision of . . . the National Environmental Policy Act of 1969 . . . ”).

\(^{59}\) See OIL AND GAS LEASING ON THE OUTER CONTINENTAL SHELF, supra note 57, at 3 (noting that BOEM prepares an EIS in the course of developing a five-year program and
Gulf of Mexico has been categorically excluded from NEPA review in the approval of offshore lease exploration, development and production plans, and development operation coordination documents.\footnote{See 43 U.S.C. § 1351(l) (2006) (leaving the decision whether to apply NEPA review of leases to the Secretary’s discretion); Lopez, supra note 59, at 95 (stating that Interior Department policy has been to exclude categorically the exploration, development, and production plans from NEPA review).}

According to BOEM, the primary justification for the categorical exclusion of exploration plans in the Gulf of Mexico is that hundreds of Environmental Assessments (EAs) were prepared for oil and gas explorations in the Central and Western Gulf of Mexico.\footnote{See Bureau of Ocean Energy Management, Regulation and Enforcement, National Environmental Policy Act (NEPA)—Categorical Exclusion Reviews, http://www.boem.gov/Environmental-Stewardship/Environmental-Assessment/NEPA/policy/ce/index.aspx (last visited Feb. 8, 2013) (“[H]undreds of Environmental Assessments (EAs) were prepared for approval of certain types of oil and gas exploration and development and production plans in the Central and Western Gulf of Mexico.”) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment).} Previous EAs found no possibility of significant impacts from drilling, therefore, it appears that future drilling would not pose a significant impact.\footnote{See id. (“If a certain type of BOEM action . . . would not normally result in any environmental effects that are potentially significant, it is unnecessary to expend resources to repeatedly document that fact.”); Lopez, supra note 59, at 97 (“[BOEM] appears to have concluded that because the previous EAs found no possibility of significant impacts from drilling, no future drilling would ever pose significant impacts.”).} Others have suggested that the thirty day timeframe for responding to an application of an exploration plan does not allow for a full NEPA review.\footnote{See Lopez, supra note 59, at 97 (“Others have suggested that the categorical exclusion policy is necessary in light of OCSLA Section 11 requirement that the MMS approve or deny an exploration plan within thirty days, which means it only has thirty days to complete an environmental review.”).} Whatever the actual reason, it is clear that there is degradation in environmental regulation of offshore oil and gas explorations in the Gulf of Mexico; despite having an elaborate regulation system, when it came to distant deepwater explorations, the governing authority found it either difficult to evaluate the environmental impact, or too costly to perform the required review to figure it out.\footnote{See COUNCIL ON ENVIRONMENTAL QUALITY, REPORT REGARDING THE MINERALS MANAGEMENT SERVICE’S
B. Self-regulation

Corporate self-regulation is enjoying a growing support as an approach to environmental compliance mechanisms.65 The oil industry has shifted its working model throughout the years: from an industrial culture of evading international standards to a compliance culture, where companies complied with minimum regulation, to the current safety culture, in which companies constantly strive to improve their safety measures as a means to promote productivity and profitability.66 This type of regulation suggests that a mechanism of incentives may be established to enable and require oil companies to regulate their own operation.67

Under domestic jurisdiction the benefits of self-regulation are mainly that corporations may enjoy “tangible benefits of compliance, such as avoiding the high cost and fines of Environmental Protection Agency (EPA) enforcement actions . . . and EPA-mandated compliance programs.”68 Also, corporate managers may rely on the companies’ compliance plan to avoid personal liability.69 However, based on corporate self-regulation alone, “without effective government oversight, the offshore oil [exploration] industry will not adequately reduce the risk of accidents, nor prepare effectively to respond in emergencies” such as a major spill.70

An example of the inability of oil companies to regulate their own activity can be found in a Shell Environmental Impact Assessment (EIA)

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65. See Dennis H. Esposito & Jenna Algee, A Common Sense Approach to Corporate Environmental Compliance, 60 R.I. B. J. 5, 5 (2012) (arguing that environmental compliance policies “should be viewed as a prudent investment and as insurance” against significant monetary fines and personal criminal liability resulting from noncompliance).


67. See id. at 191–92 (stating that because “[e]conomics is a prime motivator for the shipping industry,” imposing costs on polluters and rewarding best practices in accident response produces a safer culture and more effective regulation).

68. Esposito & Algee, supra note 65, at 5.

69. See Esposito & Algee, supra note 65, at 5 (“The best defense against most deficiencies targeted in environmental enforcement actions is an effective Environmental Compliance Program (ECP) with routine compliance.”).

70. REPORT TO THE PRESIDENT, supra note 1, at 217.
from 2000. The report was filed under the OCSLA because Shell found that “the potential for a high-volume blowout during the proposed activities may have highly controversial environmental effects.”

Shell identified in the report that “the likelihood of spills from loss of control (blowouts) in deep water may be different from the risk of spills in shallow water,” and that “[f]urther investigation is required before the consequences of blowouts in deep water can be fully evaluated.” These statements recognize that oil exploration projects in deepwater areas may raise greater risks and difficulties in controlling a spill. Different model assessments were performed from 1995 to 1997 to research the impacts of subsurface spills and the areal extent that the formation oil would reach once at the sea surface. These reports reached distinct results as to the probability oil would reach the water’s surface and how far from the drilling the oil could appear.

The S.L. Ross Environmental Research paper found that in blowouts at depths greater than 900 meters (about 2,950 feet), all discharged gas will quickly convert to solid hydrate (crystalline solids formed under pressure when coming to contact with water). The discharged oil will be shattered into droplets and saturated with gas, later forming a rigid hydrate shell around the oil. These oil droplets will continue rising to the sea surface at a speed of their regular buoyancy

72. Id. at 1.
73. Id. at App. D-3.
74. See id. at App. D-4–D-5, D-9–D10 (describing the measures needed to contain a deepwater blowout and the uncertain behavior of leaking oil in such a scenario).
76. See generally Rye & Brandvik, supra note 75 (discussing the behavior of slicks, and whether they will come to the surface, through numerous case studies).
77. See S.L. Ross Environmental Research, supra note 75, at 20 (“Blowouts at depths greater than 900 meters will result in a very fast conversion of all of the gas to hydrate.”).
78. See S.L. Ross Environmental Research, supra note 75, at 20 (“The discharged oil will be shattered into small droplets and will be saturated with gas. As the gas devolves from the oil as it rises hydrates will likely form a rigid shell around the oil droplet.”).
They will reach the surface within three to fifteen hours of the initial spill, depending on the oil density and release depth.\footnote{See S.L. Ross Environmental Research, supra note 75, at 20 ("Because the density of the hydrate is very close to that of water, it will not affect the buoyancy of the oil droplet.").}

An experiment performed by Rye and Brandvik also examined subsurface oil release and, in particular, the size of the plume a spill would create on the surface. Their results showed that subsurface plume might not reach the sea surface at all.\footnote{See S.L. Ross Environmental Research, supra note 75, at 22 (describing case two of blowouts at depths greater than 900 meters).} If it does reach the sea surface, it is likely to form a relatively thin surface slick spread over a larger area.\footnote{See Rye & Brandvik, supra note 75, at 555 ("Thus the oil droplets may have been trapped within the subsurface plume instead of rising to the sea surface.").} This should eventually accelerate the rate of oil dissolution.\footnote{See Rye & Brandvik, supra note 75, at 555 ("However, the thickness was found to be about 10 to 30 µm, accounting for only 15% to 20% of the total amount of oil released.").} However, the trials they performed were at a depth of up to 107 meters (about 351 feet),\footnote{See Rye & Brandvik, supra note 75, at 551 ("The first field exercise involved the release of 25 m³ of oil at 107-m depth . . . and the 1996 field exercise . . . at 102-m depth . . .").} which is not nearly as deep as the exploration permit Shell is requesting.

Despite recognizing that the likelihood of blowouts in deep water may be different from the likelihood in shallow water, their highly controversial environmental effects, and lack of scientific knowledge on the behavior of oil and gas chemicals following a subsurface blowout, Shell submitted an EA requesting a permit for an even deeper exploration of 2,895 feet.\footnote{See Shell Deepwater Development Inc., supra note 71, at 2 (proposing a development site 2,895 feet below sea level).} The potential financial benefit in the near future for the oil company prevailed over the low risk a major spill will occur. The option of relinquishing potential financial benefits for some vague and distant risk would almost seem irrational for an oil company to consider. From the industry point of view, the probabilities are favorable.\footnote{See Oliver A. Houck, Worst Case and the Deepwater Horizon Blowout: There Ought to be a Law, 40 ENVT. L. REP. NEWS & ANALYSIS 11033, 11034 (2010) ("From the industry point of view, and indeed from any gambler’s point of view, the probabilities were favorable. Not one major blowout had occurred in 37 years from American operations in the deep Gulf, they would claim, before and after the event.").}
C. Global regulation

The characteristics of the oil industry entail a unified global approach to assess, regulate, and develop safety measures.87 Global oil and gas companies operate in various locations under different regulatory regimes.88 This could create a situation where companies exploit weak countries’ lack of regulation, exploring recklessly and applying old technology.89 The offshore oil exploration industry has long been considered a global industry and should be regarded as such by regulating authorities.90 The United Kingdom report also recognized the need to work with regulators in other offshore oil and gas provinces to ensure that the highest standards of safety can be achieved globally through an exchange of best practice lessons.91 Therefore, a global environmental regime can empower governments when regulating the industry, making information from regulators around the world available to them.

ExxonMobil’s announcement that it has incorporated a marine well containment system improving capabilities for containing an underwater well control incident in the U.S. Gulf of Mexico is an example for companies employing different measures under different regulatory regimes.92 This innovative safety measure only operates in the Gulf of Mexico, and could indicate that oil companies apply different means in different explorations.

93 The Gulf of Mexico was subject to a moratorium following the 2010 BP blowout, and oil companies operating there tried to prove that they were employing groundbreaking technologies to avoid

87. See Report to the President, supra note 1, at 43–44 (describing the movement toward global restructuring and mergers of oil companies in the late 1990s).

88. See Report to the President, supra note 1, at 66 (“What began as a policy allowing offshore drilling in the Gulf under a more relaxed regulatory regime than applied elsewhere gradually became a policy of allowing offshore drilling, as a practical matter, almost only in the Gulf.”).

89. See Report to the President, supra note 1, at x (“To date, we have made the decision as a nation to exploit the Gulf’s offshore energy resources—ruling much of the Florida, Atlantic, and Pacific coasts out of bounds for drilling.”).

90. See Report to the President, supra note 1, at 44 (“During this era, offshore oil exploration and production became an increasingly global enterprise.”).

91. See UK Report, supra note 22, at 20 (“We would urge the Government to work with regulators in other offshore oil and gas provinces to ensure that the highest standards of safety can be achieved globally through an exchange of best practice lessons.”).


93. See Marine Well Containment System, supra note 92 (stating that the Marine Well Containment System only operates in the Gulf of Mexico).
similar blowouts in the future.\textsuperscript{94} The problem with giving special attention to one region is that projects in other regions are left behind or their safety development is held back to cover the expenses for developing safety mechanisms for highly-regulated regions.\textsuperscript{95}

The argument is not that global regulation should completely replace government authority or oil company's safety development policies. But a global regime can guide governments and oil companies in establishing practices, reviewing processes, and preventing degradation in regulation practices.\textsuperscript{96} In the ExxonMobil example, this regime could encourage companies to apply the same policies globally and could direct the governments to compare safety policies employed in their region to those employed in other regions.

In conclusion, a global regime would minimize existing difficulties in government regulation and in self-regulation by oil companies. The international community holds a significant interest in preserving living resources within the EEZ, where the coastal state lacks competence to evaluate harm. Where oil companies cannot rationally hold back their operations for distant risk in fear of being left behind by other companies, it will assure equal limitations (so that when Shell reports a risk, all such explorations will be affected, and not only its lease). Finally, it will prevent the risk of over-exploitation and use of old technologies in regions where regulation is weak or non-existent.

\textit{IV. Best Practices and Procedures}

Existing environmental safety practices are a good place to start exploring for principles to guide the practice of oil and gas explorations. Later, we can consider whether they should constitute part of the global environmental regulation regime. This chapter will review industry practices, as well as regulatory recommendations reached following the BP blowout.

\textit{A. Industry 'good oilfield practice'}

The oil industry has developed its own safety model and regulation over the years. Although clearly not sufficient to regulate the activity, the

\textsuperscript{94} See \textit{Report to the President}, \textit{supra} note 1, at 152 (describing the moratorium imposed and oil companies’ reactions to it).

\textsuperscript{95} See \textit{Report to the President}, \textit{supra} note 1, at 153 (noting the focus on Louisiana and subsequent failure to adequately provide safety measures for Florida).

\textsuperscript{96} See \textit{Report to the President}, \textit{supra} note 1, at 242 (claiming that an industry-wide commitment to rigorous auditing and continuous improvement would include measurements against global benchmarks).
future global environmental regulation regime can learn and absorb much from these years of practice.

BP indicates three principles at the heart of its safety approach: (1) fostering a culture focusing on safety, on managing and reducing risk and on safe, reliable and compliant operations; (2) establishing an operating management system (OMS) with expectations of conduct and leadership approach; (3) independent, effective checks and balances and self-verification being carried out at all levels of the organization.97 BP is also sharing its experience and knowledge from the recent spill in the Gulf of Mexico to help develop the enhanced capabilities and practices needed to prevent this type of accident from recurring.98

Shell also wishes to create a culture of safety, incorporating ongoing training for employees. The company identifies three principles central to safety: (1) do no harm to people; (2) protect the environment; and (3) comply with internal health, safety, security, and environment laws and regulations.99 The company is also preparing emergency reaction plans, including a global response for major spills.100 Shell’s global emergency reaction plan indicates that once a major spill has occurred it would require all available measures to handle the spill.101 It also shows that in the companies’ view, the operation under different countries is merely a technical one.102

Noble Energy generally concentrates on continuous improvement of environmental performance, internal responsibility, and preservation of


101. See id. at 5 (“For response to larger spills we use global resources and mobilise Shell staff from around the world. Shell has access to oil industry-funded centres that provide equipment and personnel to manage major spills.”).

102. See id. (“Shell ensures that adequate resources are maintained for managing regional and local spills. We cooperate with industry neighbours and local or national authorities.”).
wildlife. ExxonMobil has incorporated a marine well containment system improving capabilities for containing an underwater well control incident in the U.S. Gulf of Mexico.

Industry practice indicates an increasing concern for environmental effects from offshore oil and gas exploration. Oil companies consider possible environmental effects and are progressively more willing to employ safety measures and incorporate safety policies to avoid environmental risk. However, much of the information is not available to the public. There is no doubt that oil companies possess valuable information about safety measures, geologic explorations, and risk assessments. It seems that the competitive oil exploration market has led oil companies to maintain the information, usually disclosing information to the regulating authority only when required to do so. While internal company policies have developed to incorporate innovative safety policies, they are reluctant to share knowledge with other oil companies, or third parties that are not considered directly related to the project.

103. See Environment, Noble Energy, http://www.nobleenergyinc.com/responsibility/environment-301.html (last visited Mar. 14, 2013) ("We are committed to conducting our business in a manner that protects the environment, health and safety (EHS) of our employees and communities. To achieve this, we strive to comply with EHS laws and minimize injuries and incidents while protecting the environment.") (on file with the Washington and Lee Journal of Energy, Climate, and the Environment).


105. See Report to the President, supra note 1, at 293–306 (describing the trend toward considering environmental concerns in the American oil industry).

106. See, e.g., Sustainability Review 2011, supra note 97 (detailing BP’s new safety and environmental policies).

107. See generally Sustainability Review 2011, supra note 97 (showing the information that BP has to disclose about safety and risk balancing concerns).

108. See, e.g., Report to the President, supra note 1, at 144 (“Environmental groups pressured Nalco, the company that manufactures Corexit, to disclose its formula. Although it had given the formula to EPA during the pre-listing process, Nalco declined to make the formula public, citing intellectual property concerns.”).

109. See, e.g., Report to the President, supra note 1, at 241 (“Technology and design apparently are more uniform in nuclear power than in offshore drilling. . . . Director of . . . (the successor to MMS), cautioned that an INPO-like approach might run into problems if companies perceived the potential for inspections of offshore facilities to reveal technical and proprietary and confidential information that companies may be reluctant to share with one another.” (internal quotations omitted)).
B. Lessons from the 2010 BP blowout

Operating offshore oil exploration projects, particularly moving deeper and farther into the sea, increases the risk and scale of a spill. Comprehensive reports were published following the BP blowout in the United States and the United Kingdom, both discussing the regulation of offshore oil and gas explorations. While it would be impossible to completely eliminate oil spills, learning from past spills about industry and regulatory failures could be beneficial in structuring global environmental regulation regime.

Two approaches were historically applied for offshore oil and gas exploration regulation. In the United States, the regulatory approach used is of prescriptive safety standards. In the United Kingdom, the prevailing approach is the safety case approach. The prescriptive safety approach in the United States is founded on specific requirements prescribed by the relevant government agencies. The safety case approach utilized by the United Kingdom involves an abandonment of safety rules developed by government agencies and a placement of the key responsibility on the operator through goal-setting regulations.

The United States’ regulatory approach to offshore oil and gas exploration is the outcome of responses to accidents, short-term political calculations, and lobbying campaigns. Based on the 1953 legislation

110. See Report to the President, supra note 1, at vii (“Deepwater energy exploration and production, particularly at the frontiers of experience, involve risks for which neither industry nor government has been adequately prepared, but for which they can and must be prepared in the future.”)
111. See, e.g., Report to the President, supra note 1, at vii (chronicling the history of U.S. oil and gas regulation).
112. See Report to the President, supra note 1, at 68 (noting that the U.S. Department of the Interior, Minerals Management Service, which was the federal agency responsible for the safety of offshore drilling, “subjected oil and gas activities to an array of prescriptive safety regulations”).
113. See Report to the President, supra note 1, at 69 (“All these foreign regulators—the United Kingdom, Norway, and Canada—had previously relied on the kind of prescriptive approach used in the United States, but in the aftermath of these fatal accidents in harsh, remote offshore environments, authorities elsewhere concluded that adding a risk-based approach was essential.”).
114. See Report to the President, supra note 1, at 72–74 (detailing the requirements posed by MMS in off-shore drilling).
116. See Juliet Eilperin, Troubled Waters: Federal Oversight of Offshore Oil Drilling, 17 ROGER WILLIAMS U. L. REV. 89, 89 (2012) (“As a result, some of the most critical energy decisions policymakers have undertaken in recent years have been driven by a myriad of factors, ranging from short-term political calculations to well-orchestrated lobbying campaigns.”).
governing offshore oil explorations, the Interior Department viewed its authority to prescribe rules “for the prevention of waste and conservation of natural resources” as mostly regarding avoiding waste or destruction of the oil reservoir. Environmental concerns, in particular to wildlife-endangered species, were under the authority of the Fish and Wildlife Service. Following a blowout in a Union Oil Company well in the Santa Barbara Channel in January 1969, the Department of Interior toughened the rules, and Congress began furthering environmental legislation. NEPA was enacted in 1970. The OCSLA was amended a few years later in 1978. This new set of legislation dramatically changed the federal role in overseeing exploration and exploitation of natural resources on public lands—including offshore oil explorations. The amended OCSLA added detailed procedures requiring the Secretary of the Interior to prepare a five year schedule of proposed lease sales, approval of exploration plans submitted by oil companies, and upon discovery of oil in commercial quantities, approval of development and production plans. The act also made clear that environmental considerations were a relevant part of the Secretary’s decision-making. The Secretary would need to balance the potential for discovery of oil with the potential for environmental damage.

118. Report to the President, supra note 1, at 58 (“The Department did announce, however, that the Fish and Wildlife Service would have to approve all offshore drilling in wildlife refuges and that oil and gas leasing there that endangered ‘rare’ wildlife species (like whooping cranes or trumpeter swans) would not be allowed.”).
119. See Report to the President, supra note 1, at 58 (“The Interior Department toughened its rules in response to the spill.”).
120. Report to the President, supra note 1, at 59.
121. See generally Report to the President, supra note 1, at 58–63 (noting the OCSLA’s “particular significance for federal oversight of offshore drilling”).
123. See Outer Continental Shelf Lands Act Amendments of 1978 § 206, 43 U.S.C. § 1340(c)(1) (2012) (“[P]rior to commencing exploration pursuant to any oil and gas lease issued or maintained under this subchapter, the holder thereof shall submit an exploration plan to the Secretary for approval.”).
124. See id. § 208, 43 U.S.C. § 1351(a)(1) (2012) (“Prior to development and production pursuant to an oil and gas lease . . . with respect to which no oil or gas has been discovered in paying quantities prior to September 18, 1978, the lessee shall submit a development and production plan . . . to the Secretary.”).
125. See Report to the President, supra note 1, at 61 (“At the same time, the statute also made clear that environmental safeguards are a relevant, important part of the Secretary’s decisionmaking.”).
126. See Outer Continental Shelf Lands Act Amendments of 1978 § 208, 43 U.S.C. 1344(a)(3) (2012) (“The Secretary shall select the timing and location of leasing . . . so as to obtain a proper balance between the potential for environmental damage, [and] the potential for the discovery of oil and gas.”).
The next major event that led to legislative changes was the 1989 Exxon Valdez oil spill in Alaska’s Prince William Sound.\textsuperscript{128} In response to the Exxon Valdez spill, the Oil Pollution Act (OPA) added additional requirements for facility response plans in worst-case scenarios, including annual training plans, and the identification of facilities technology, and financing.\textsuperscript{129}

The 2010 BP blowout presented a crisis on a scale for which oil companies and the United States regulators had not been prepared to respond. It made clear that changes had to be made in safety and environmental practices, safety training, drilling technology, containment and cleanup technology, preparedness, corporate culture, and management behavior for energy operations to be pursued in the future.\textsuperscript{130} On May 22, 2010, President Obama announced the creation of an independent nonpartisan commission to determine the causes of the disaster, to improve the ability to respond to future spills, and to recommend reforms in offshore oil and gas drilling regulations.\textsuperscript{131}

The commission identified three major issues that would need to be addressed in order to improve the safety of offshore operations: (1) reducing and managing risk effectively using strategies, while keeping pace with the complex and rapidly evolving industry, especially in high-risk and frontier areas; (2) assuring the independence and integrity of government institutions charged with protecting the public interest; and (3) securing resources for leasing functions and regulatory oversight.\textsuperscript{132} These issues represent a delicate balance between the need to strengthen regulation of offshore oil and gas exploration, and the interest in maintaining the conditions for the industry to function and grow, providing the energy needs of the nation.

\textsuperscript{128} See 136 Cong. Rec. 6936 (1990) (statement of Rep. Walter Jones, sponsor of the Oil Pollution Act) (“This biggest oilspill in U.S. history proved what my committee had been saying for years: we had to completely rewrite and update our woefully inadequate oilspill laws.”).

\textsuperscript{129} See Houck, supra note 86, at 11036 (The OPA, responding to the Exxon Valdez spill, added additional prescriptions for facility response plans to a worst-case scenario, including the identification of facilities, technology, and financing.”); see also 30 C.F.R. § 254.5 (2013) (providing general overview of response plan requirements).

\textsuperscript{130} See Report to the President, supra note 1, at 215 (listing changes to industry practices demanded by the Deepwater Horizon disaster).

\textsuperscript{131} See Press Release, supra note 16 (“[T]he purpose of this Commission is to consider both the root causes of the disaster and [to] offer options on what safety and environmental precautions we need to take to prevent a similar disaster from happening again.”).

\textsuperscript{132} See Report to the President, supra note 1, at 250–51 (describing the three issues that must be addressed for a successful overhaul of regulatory policies and organizations).
The conclusions reached by the commission included a list of significant changes to the methods of operation and regulation of offshore oil and exploration. The commission recommended reforming regulatory authorities and requiring the oil industry to take unilateral steps to improve safety throughout the industry, including self-policing mechanisms. The commission also acknowledged the need to incentivize government and industry cooperation in supporting scientific understanding of environmental conditions in deep water, as well as development of innovative technology capable of undertaking the risks associated with deepwater drilling.

Following the BP blowout, the United Kingdom published its own report examining the effect of the BP blowout on offshore oil and gas exploration regulation in the North Sea. The United Kingdom regulatory approach to offshore oil and gas exploration is the result of a continued learning process. After finding natural gas under the continental shelf of the North Sea, the Continental Shelf Act was enacted in 1964. This law merely applied existing onshore oil exploration regulation to offshore explorations. The next year, a spill from the Sea Gem drilling rig led to the development of prescriptive regulations for offshore drilling, enacted as the Mineral Workings (Offshore Installations) Act in 1971.

It was the Piper Alpha disaster, on July 6, 1988, which prompted the United Kingdom to change its approach completely, and to develop the “safety case” approach. This approach is based on an understanding that no matter how flexible, safety rules developed by government agencies cannot provide detailed and comprehensive code covering all aspects of the industry. Since the industry possesses significantly greater knowledge...

133. See Recommendations of the National Commission, supra note 17, at vii–viii (outlining the Commission’s conclusions).
134. See Recommendations of the National Commission, supra note 17, at vii–viii.
135. See Recommendations of the National Commission, supra note 17, at vii–viii.
136. See UK Report, supra note 22, at 3 (explaining the impetus for the report).
137. See Paterson, supra note 115, at 371–72 (stating that upon the discovery of natural gas under the continental shelf, the Continental Shelf Act was enacted in the United Kingdom).
138. See Paterson, supra note 115, at 372 (“Once the Continental Shelf Act of 1964 was passed, the United Kingdom simply lifted the existing onshore regulatory regime for the exploration and production of oil and gas, which dated from the 1930s, and transferred it to the offshore environment.”).
139. See Paterson, supra note 115, at 371–74 (explaining the background of the Mineral Workings (Offshore Installations) Act).
140. See UK Report, supra note 22, at 9 (“[T]he whole concept of the safety case came and the whole concept of independent verification and inspection.”).
141. See Paterson, supra note 115, at 379–80 (“[T]he approach involved an abandonment of any notion that safety rules developed by government agencies, no matter
and expertise than the regulator, and offshore oil exploration projects are characterized by constant technological progress and striving to find and extract oil and gas from ever more difficult conditions, the government finds itself at a disadvantage. Therefore, companies were required to draft a “safety case,” relying mainly on the companies’ self-regulation.

The U.K. commission recommended the government to ensure that the licensing regime takes full account of high consequence, low probability events. They also urge the need that someone offshore has the authority to bring a halt to drilling operations at any time, without recourse to onshore management. While the flexibility of the U.K. safety case approach appears to have worked well so far, the commission recommended that fail-safe devices, such as the blowout preventer, which should be adopted as a minimum prescriptive safety standard. This would suggest that although the operator may be well informed on technology and best practices in the oil industry, there is still room for prescriptive requirements when such measures are clearly effective and necessary for safety operations.

In comparing the United States commission report and the United Kingdom commission report, it seems that each state took a step toward the other regulatory approach. As the United States is requiring more self-policing mechanisms developed within oil companies, the United Kingdom acknowledges the necessity to incorporate a minimum prescriptive safety standard. how flexible the form, could provide a detailed and comprehensive code covering all aspects of the industry.

142. See id. (explaining the rationale of the reforms to the United Kingdom regulatory regime); see also Recommendations of the National Commission, supra note 17, at 1 (“Federal efforts to regulate the offshore oil and gas industry have suffered for years from . . . a deepening deficit of technical expertise.”).

143. See Paterson, supra note 115, at 379 (describing the elements of a safety case).

144. See UK Report, supra note 22, at 23 (“We recommend that as part of the drilling-licence process, the Government require companies to consider their responses to high-consequences, low-probability events. . . . We urge the Government to introduce this requirement as drilling ventures into increasingly extreme environments.”).

145. See UK Report, supra note 22, at 41 (“It is imperative that there is someone offshore who has the authority to bring a halt to drilling operations at any time, without recourse to onshore management.”).

146. See UK Report, supra note 22, at 41 (“[W]e recommend that for fail-safe devices such as the blowout preventer the Government should adopt minimum, prescriptive safety standards or demonstrate that these would not be a cost-effective, last-resort against disasters.”).

147. See Recommendations of the National Commission, supra note 17, at 3 (“[Regulators] should shift their focus . . . to a foundation of augmented prescriptive regulations . . . supplemented by a proactive, risk-based performance approach. . . . This would be similar to the “safety case” approach that is used in the North Sea.”).

148. See UK Report, supra note 22, at 17 (“[T]he Government should adopt minimum, prescriptive safety standards.”).
V. The Global Environmental Regulation Regime

The significant development in technologies of offshore drilling has transformed the offshore oil and gas exploration industry into a high-risk industry, making domestic regulation impracticable. A global environmental regulation regime directing the operation of offshore drilling can address the incapacities of domestic regulation.

Previous chapters have presented an array of principles currently employed in the offshore oil exploration industry. A recurring principle within industry, ‘good oilfield practice’ is the creation and maintenance of a culture of safety operations. The implementation of this principle may include whistleblower’s protection within the oil industry, constant re-evaluation of custom practices, and employees’ orientation.

A second principle arising from industry practice is the consideration of environmental effect from the exploration. This principle could require a significant scientific research learning the ecologic systems in the location prior to beginning exploration and actualizing externalities on the environment into the companies’ decision whether to move forward with the exploration.

Some oil companies are pursuing innovative technologies following the BP blowout. This would suggest the necessity to employ a principle of constant innovation and development. Similar recommendations were made by the U.S. and U.K. commissions following

149. See UK Report, supra note 22, at 20 (“It is important and necessary that the offshore safety culture is cascaded throughout the supply chain, from existing contractors at all levels, through to new-entrants on to the UK Continental Shelf.”); REPORT TO THE PRESIDENT, supra note 1, at 217 (“Government oversight must be accompanied by the oil and gas industry's internal reinvention: sweeping reforms that accomplish no less than a fundamental transformation of its safety culture.”).

150. See UK Report, supra note 22, at 12 (recommending the incorporation of environmental expertise into the management of oil companies); Recommendations of the National Commission, supra note 17, at 18 (describing possible improvements to the U.S. regulatory regime that would better protect the environment).

the BP blowout. This principle would require funding technological research leading to better practices minimizing the risk of major spills in the future.

The commissions’ reports also raise the principle of taking into account high consequence, low probability events. This principle should direct the oil company in assessing the risks posed by its operation, as well as the government’s regulation agencies in approving such operations.

Finally, both industry and commissions’ reports mention the principle of information and knowledge exchange. This could require each project to make available information from environmental assessments performed prior to beginning exploration, as well as sharing knowledge with other oil companies, in furtherance of safety. Although nowadays it may seem illogical that oil companies would share their most innovative technologies, this has actually happened before. In 1961, Shell developed the first floating drilling platform, and decided to share the new technology. For $100,000 each, Shell presented this innovative technology to competitors.

This paper suggests that this list of preliminary basic principles should form the basis for establishing a global environmental regulation regime on deepwater offshore oil and gas explorations. Since this list of general principles has emerged from industry practice and government regulation recommendations, it should be representative of some general agreement within industry and government officials.

152. See Recommendations of the National Commission, supra note 17, at 6 (“The federal government has relevant expertise . . . that could and should be transferred to the offshore industry.”).
153. See UK Report, supra note 22, at 13 (“[W]e are concerned that the offshore oil and gas industry is responding to disasters, rather than anticipating worst-case scenarios and planning for high consequence, low-probability events.”); Recommendations of the National Commission, supra note 17, at 24 (“Oil spill response planning and analysis across the government needs to be overhauled in light of the lessons of the Deepwater Horizon blowout.”).
154. See UK Report, supra note 22, at 42 (“We would urge the Government to work with regulators in other offshore oil and gas provinces to ensure that the highest standards of safety can be achieved globally through an exchange of best practice lessons.”); Recommendations of the National Commission, supra note 17, at 4 (“Transparent information and data sharing within the offshore industry and among international regulators is critical to continuous improvement in standards and risk management practices.”).
155. TYLER PRIEST, THE OFFSHORE IMPERATIVE: SHELL OIL’S SEARCH FOR PETROLEUM IN POSTWAR AMERICA 97 (2007) (describing the successful testing of a system for keeping a floating vessel in place without anchors or mooring lines).
156. See id. at 96 (“Shell had pioneered a whole new frontier in offshore drilling, but it could not go at it alone. . . . Thus, in January and February 1963, Shell held an unprecedented three-week ‘school’ on offshore technology for representatives from industry and government.”).
157. See id. (The company charged tuition of $100,000 per company, a sizeable amount of money for the time.”).
Once the general principles pertinent to a global environmental regulatory regime have been identified, it will be important to consider whether countries and oil companies have an interest in supporting its establishment. The offshore oil and gas industry is clearly a competitive industry and countries have interests in maintaining a healthy oil market both to supply energy needs and to protect the economy. However, a major oil spill poses a threat to those same interests once the risk is realized. The entire industry is continually assessing risk and attempting to anticipate potential liabilities associated with technological developments.\(^\text{158}\)

Recognizing the aspect of risk inherently within the operations of offshore oil and gas exploration, the global environmental regulation regime should suggest proper incentives for countries to sign the new document and for oil companies to incorporate it into their internal policies of operations. One possibility of doing this could be by responding to a difficulty within the industry to purchase proper insurance for their high-risk operations.

Despite the fact major oil spills threaten to cause widespread loss, existing insurance options do not provide sufficient coverage of the losses or liabilities that result from such major spills.\(^\text{159}\) Low-probability risk with catastrophic potential magnitude if it materializes (like pollution caused by a blowout), is not covered by the available insurance.\(^\text{160}\) The largest oil companies often do not purchase the most inclusive insurance to cover their potential pollution liability, in spite of the fact that they are likely to cause the largest harm and incur the largest liabilities.\(^\text{161}\) For example, BP was in a way self-insured, setting up a $20 billion compensation fund to pay for the losses caused by the blowout.\(^\text{162}\)

In the case of a major spill, the government will pay significant amounts for cleanup and liability, effectively rendering the oil company

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\(^{158}\) See W. Kip Viscusi & Richard J. Zeckhauser, Deterring and Compensating Oil-Spill Catastrophes: The Need for Strict and Two-Tier Liability, 64 Vand. L. Rev. 1717, 1727 (2011) (“The mere magnitudes involved imply significant risk, but beyond that, all work at the frontiers of technology involves techniques, systems, and equipment that have not been tested in the field, imposing new risks that are little understood.”).

\(^{159}\) See Kenneth S. Abraham, Catastrophic Oil Spills and the Problem of Insurance, 64 Vand. L. Rev. 1769, 1772 (2011) (“In short, there is a mismatch between the losses resulting from oil spills, the insurance available to the victims of spills, the liability of the parties responsible for losses caused by spills, and the insurance available to the parties who face such liability.”).

\(^{160}\) See id. at 1771 (describing the gaps in available insurance).

\(^{161}\) See Viscusi & Zeckhauser, supra note 158, at 1728 (“Oil spills impose severe external financial and environmental harms that a profit-maximizing firm will not take into full account absent liability and/or government sanctions.”).

\(^{162}\) See Abraham, supra note 159, at 1788 (stating that the fact that BP could set up a compensation fund to pay for losses suggests that very large enterprises often do not need full insurance to cover potential liability).
judgment-proof for extreme accidents. Absent other arrangements, operators will therefore take excessive risks.

A global regime that is able to answer this need of the industry, providing more predictability through insurance-type mechanism could attract countries and companies to join. For example, a similar mechanism to that proposed by Viscusi and Zeckhauser could provide the underlying incentive to join the global environmental regulation regime.

The Viscusi and Zeckhauser two-tier liability system creates strong financial incentives for safety. Applying an analogous mechanism through the global regime would require oil companies to pay an international coordination body a Prospective Excess Liability fee. The fee would be relative to each company’s expected external losses imposed beyond the amount that it will be able to cover by its own funds. Once a company joined the global regime, it would gain access to information, technologies, and the reputation for taking on the most innovative safety measures, in addition to insurance. Countries would gain a safely operated and insured offshore oil and gas exploration industry.

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163. See Viscusi & Zeckhauser, supra note 158, at 1724 (“No corporation has sufficient resources to cover the most extreme potential losses from an accident. In the case of a megacatastrophe, the government will pay significant amounts and/or losses will go uncompensated. The operator is essentially judgment proof for extreme accidents.”).

164. See Viscusi & Zeckhauser, supra note 158, at 1722 (stating that the limited potential for liability leads firms to take excessive risk).

165. See Viscusi & Zeckhauser, supra note 158, at 1722 (“Our proposal jettisons the current structure of a low damages cap coupled with ineffective regulation. It replaces that system with a greatly expanded level of liability coupled with a tax to provide incentives for risks beyond the liability limit, which we call a two-tier liability system.”).

166. See Viscusi & Zeckhauser, supra note 158, at 1722 (“This system creates strong financial incentives for safety.”).

167. See Viscusi & Zeckhauser, supra note 158, at 1753 (explaining that a tax could be routinely assessed on oil companies, and placed in a compensation fund “not unlike the current Oil Liability Trust Fund”).

168. See Viscusi & Zeckhauser, supra note 158, at 1753 (“[F]or the [tax] to be workable, one must be able to ascertain the distribution of possible harms. . . . Our proposed two-tier liability system would rely on . . . the responsible firm to cover damages, with the money raised by the tax only used for . . . damages exceeding the firm’s financial resources.”).

169. See Viscusi & Zeckhauser, supra note 158, at 1753 (“[B]y scaling down the payments to the expected losses rather than the actual losses inflicted, . . . [m]ore companies will pay for the expected prospective damages, including those that do not experience any adverse events, thus creating incentives to foster safe drilling operations.”).

170. It should be mentioned that other insurance mechanisms for major spill risks have been proposed. See, e.g., Abraham, supra note 159, at 1789 (analyzing two such proposals). However, of those I have read, the Viscusi and Zeckhauser proposal seems the most adequately applicable to a global regime.
VI. Conclusions

The offshore oil and gas exploration industry has long operated in different areas of the world under disparate regulation regimes. The 2010 BP blowout has highlighted the entangled interests that emerge during major oil spills. A unified, clear, global environmental regulatory regime is required due to the complexity of these offshore operations, and the difficulties of monitoring them.

By cooperating more widely to recognize and to operationalize the emerging principles discussed above, companies and governments could achieve safer operations in areas where environmental regulation is currently weak or non-existent. A measurable advancement in safety through increased international cooperation is especially likely due to the current weakness of state regulators in developing countries that are interested in competing to attract large development projects.

Considering the general character of these emerging principles, they would not be applicable in a legally-binding convention. However, it might be useful to incorporate the principles into a declaration between states, endorsed by oil companies as good practice. Including an insurance mechanism in such a system would create a significant incentive for countries to sign on to this global regime, and for oil companies to endorse it. Due to its ability to facilitate greater certainty and a safer industry, such a regime would positively influence both public and private interests moving forward.
Fractured Focus: Tribal Energy Development and the Regulatory Contest Over Hydraulic Fracturing in Indian Country

Mitchell Davis*

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I. Introduction

On May 11, 2012, the Bureau of Land Management (BLM) proposed what would be the first new regulations of hydraulic fracturing on federal lands in several decades.¹ The proposed rules would affect, in addition to about 700 million acres of mineral estate across the country managed by BLM, 56 million acres of Indian mineral estate subject to federal oversight.² The proposal received a widely varied response from tribal governments, including strident criticism from both tribes that were enthusiastic about the economic benefits of energy development on tribal land³ and those that were opposed to any and all fracturing on tribal lands.⁴

¹ See Well Stimulation, Including Hydraulic Fracturing, on Federal and Indian Lands, 77 Fed. Reg. 27691, 27691–92 (proposed May 11, 2012) (to be codified at 43 C.F.R. pt. 3160) (“[C]urrent BLM regulations governing hydraulic fracturing operations on public lands are more than 30 years old and were not written to address modern hydraulic fracturing activities.”).
² See id. (stating the scope of BLM’s regulatory authority).
³ See, e.g., Bureau of Land Management’s Hydraulic Fracturing Rule’s Impacts on Indian Tribal Energy Development: Hearing Before the Subcomm. on Indian and Alaska Native Affairs, 112th Cong. (2012) (statement of the Hon. Tex G. Hall, Chairman, Mandan, Hidatsa, and Arikara Nation of the Fort Berthold Reservation) [hereinafter Hall testimony] (criticizing the BLM for its failure to consult meaningfully with affected tribes, and criticizing the regulations themselves for creating additional obstacles in an already overburdened permitting process for resource development on tribal lands).
The extent of comment on the proposal was so great, from both tribal constituencies and the general public, that BLM withdrew its proposal in order to rewrite the rules, releasing a revised version on May 16, 2013. The proposal and tribal responses illustrated the complexity of interests and issues raised by the prospect of hydraulic fracturing and expanded energy extraction on Indian lands: tribal economic development, pollution, environmental protection, tribal sovereignty, and national energy policy all enter into consideration, rendering more complicated an issue that is already contentious outside Indian country. The stakes for energy-producing tribes are substantial, with tribes receiving over $414 million in revenue from oil and gas production royalties in the 2011 fiscal year alone. Moreover, in the area of the Bakken Formation—the focus of this note—six reservations with a total of over forty-five thousand residents stand to be directly affected by hydraulic fracturing and energy production on or near reservation lands. Aside from the revenue directly generated for tribes by production royalties, the rise of substantial oil and gas production on reservation lands has been markedly beneficial for tribal economies, leading to the creation of not only jobs directly involved in extraction and production, but also Indian-owned businesses that service the mining


7. See supra notes 1–4 and accompanying text.


operations. In some areas, energy extraction both comprises a substantial segment of the current reservation economy and represents an important sector for future economic growth. But at the same time, such mining operations pose serious environmental risks, most notably groundwater contamination from the fracturing operation and subsequent wastewater disposal, as well as air pollution from surface operations at the mining site. Such hazards led to the high-profile decision by the Turtle Mountain Band of Chippewa Indians to ban outright hydraulic fracturing, although not all oil production, until such time as mining companies could prove the practice would not endanger limited aquifers available on the reservation. Concerns about groundwater safety also led the Environmental Protection Agency (EPA) to commission a nationwide study of the effects of hydraulic fracturing on drinking water supplies, although the results of that study are not expected until 2014.
This note examines the particular issues presented by hydraulic fracturing and hydrocarbon extraction on Indian lands, focusing on reservations overlapping the Williston Basin in the upper Midwest, an area in which extraction has accelerated significantly. Section Two will describe hydraulic fracturing in a broader context, including the historical use of the practice, a description of the technique, and its importance in relation to national energy policy. This section will also introduce the specific environmental concerns raised by hydraulic fracturing—in particular, toxic chemicals that are involved and the ways that the procedure, as deployed in the Williston Basin, may result in their release. Section Three will discuss state regulatory frameworks and requirements placed on energy producers, which govern operations outside Indian reservations on land under the states’ jurisdiction. Section Four will discuss the Indian lands in the region, the details of the proposed BLM regulations on fracturing, and the current state of tribal jurisdiction over, and regulation of, hydraulic fracturing within the outer bounds of Indian reservations. Section Five will consider the existing tribal regulations, the availability of meaningful private causes of action, and the resulting importance of creating appropriate regulatory frameworks. Section Six will conclude by considering multiple potential solutions aimed at improving tribal control of resource extraction and environmental protection.

II. Hydraulic Fracturing: Technique, Geology, and Unintended Consequences

The basic principle of using hydraulic fracturing, or “fracking,” to stimulate oil and natural gas wells has been employed for several decades, first appearing in 1947 and developing in the years thereafter. In order to access resource-bearing rock strata, a well is excavated to the target depth; drilling then continues horizontally along the stratum, allowing one wellbore to access a larger segment of the deposit than would be possible with a straight well. The recent increase in energy production in which fracting plays a role has been enabled by the development of “slickwater”
hydraulic fracturing techniques during the last decade. In slickwater hydraulic fracturing, the horizontal wellbores are used to inject acid into hydrocarbon-bearing shale formations, cleaning and preparing the rock for the injection of hydraulic fracturing fluid—composed primarily of water, “proppant,” and various other chemicals. The pressure of the injection fractures the surrounding rock, while the proppant—typically a sand-like medium—holds the fractures open to permit extraction of the oil or gas in the shale formation.

This well stimulation process is necessary because the shale formations are not otherwise permeable enough to permit the extraction of oil and gas in quantities that make drilling economically feasible. Hence, the shale formations are considered one of several types of “unconventional” reservoir, which are distinguished from the more porous “conventional” reservoirs in which oil and gas can be extracted from the existing formation. Once the shale has been fractured, oil and gas can migrate through the fracking fluid and proppant to the surface for extraction. When the fracturing operation is completed, a portion of the fracturing fluid flows back toward the surface; this flowback fluid, along with the remaining fracturing fluid, must be disposed of once production at the well is completed. This may be accomplished by underground injection—essentially, returning the fluid to the well and attempting to seal it underground—or by treatment of the fluids, followed by either reuse or discharge into surface waterways.

To the extent that fracturing operations pose a risk to groundwater, that risk arises either from failures in the well casing as it passes through

18. See Stickley, supra note 13, at 324 (stating that slickwater hydraulic fracturing permitted stimulated production in shale formations); Hannah Wiseman, Beyond Coastal Oil v. Garza: Nuisance and Trespass in Hydraulic Fracturing Litigation, 57 THE ADVOC. (TEX.) 8, 8 (2012) (“Slickwater fracturing . . . has allowed an astoundingly large number of new wells to be developed; in some cases, oil and gas companies are drilling and fracturing wells in areas that have not recently experienced heavy oil or gas production.”).

19. See Wiseman, supra note 18, at 8 (describing slickwater hydrofracking).


21. See DOE Primer, supra note 16, at 14 (discussing shale’s low permeability and the limited speed with which it can travel through unfractured rock formations); Well Stimulation, Including Hydraulic Fracturing, on Federal and Indian Lands, supra note 1, at 27692–93 (discussing the commercial need for fracturing in these formations).

22. See DOE Primer, supra note 17, at 15 (describing conventional and unconventional reservoirs).

23. See Well Stimulation, Including Hydraulic Fracturing, on Federal and Indian Lands, supra note 1, at 27692–93 (describing the extraction process).

24. See DOE Primer, supra note 17, at 66–68 (summarizing water management considerations and techniques).

25. See DOE Primer, supra note 17, at 66–68.
aquifers—a hazard not unique to hydraulic fracturing—\textsuperscript{26} or from the release of wastewater used in fracturing operations. \textsuperscript{27} When a well is to be constructed, the hole is drilled first, followed by the installation of steel pipe secured by cement casing, intended to isolate the wellbore from the surrounding groundwater and withstand the stresses of injection and extraction during operation. \textsuperscript{28} Multiple kinds of logging tools can thereafter be employed to judge the status of the well and test for well integrity issues. \textsuperscript{29} Estimates of the likelihood of a well incurring a mechanical integrity failure have varied considerably, ranging from one in fifty million to one in ten. \textsuperscript{30} Purely empirical reviews have shown that two percent of leaks into groundwater supplies are actually due to failures in the mechanical integrity of a well. \textsuperscript{31} Rozell and Reaven estimate that the effects of such a failure would be relatively minimal, peaking at a worst-case release of about 60 cubic meters of water from a breached well. \textsuperscript{32} By comparison, the average fracturing operation uses roughly 11,300 cubic meters of water per well. \textsuperscript{33}

Far more serious are the risks associated with retention and disposal of the large quantities of wastewater—which include the additives and proppants used in fracturing—once they are pumped out of the well, usually into surface impoundments or tanks on site. \textsuperscript{34} Although fracturing water may sometimes be recycled, it is often necessary to store wastewater (which fracturing produces in greater quantities than conventional production) on

\textsuperscript{26} See Jeffrey C. King et al., Factual Causation: The Missing Link in Hydraulic Fracture—Groundwater Contamination Litigation, 22 DUK ENVTL. L. & POL’Y F. 341, 351 (“If there is potential for groundwater contamination resulting from oil and gas production, a more likely source (other than a surface spill) is improper surface well casing. This is true whether or not a well is fracture stimulated.”).

\textsuperscript{27} See Stickley, supra note 13, at 334–35 (“In the case of [fracking] fluids, the selection of the method of disposal raises concern about the contamination of soil and water due to the chemical constituents in the fluid, particularly where the produced water contains petrochemicals or BTEX [benzene, toluene, ethylebenzene, and xylene].”).

\textsuperscript{28} See American Petroleum Institute, Guidance Document HF-1, at 2–4 (describing the process of well construction and engineering aims).

\textsuperscript{29} See id. at 8–10 (describing methods for testing the success of cement casing installation).

\textsuperscript{30} See Daniel J. Rozell & Sheldon J. Reaven, Water Pollution Risk Associated with Natural Gas Extraction from the Marcellus Shale, 32 Risk Analysis 1382, 1386–87 (citing an API finding that the lifetime risk of contamination from an oil & gas well is 1 in 50 million well-years, and a contrary study finding that 1 in 10 oil & gas wells failed a mechanical integrity test).

\textsuperscript{31} See id. at 1387 (citing a 1987 survey of wastewater injection wells by the Underground Injection Practices Council).

\textsuperscript{32} See id. at 1389 (modeling the contamination produced by well casing failure).

\textsuperscript{33} See DOE Primer, supra note 17, at 64 (stating that the average shale gas well using hydraulic fracturing requires three million gallons of water).

\textsuperscript{34} See American Petroleum Institute, Guidance Document HF2, at 17–19 (discussing best practices for fluid handling and storage).
site in preparation for treatment and/or transport for disposal. Industry’s best practices call for storage solutions designed to limit the extent to which wastewater might escape containment and discharge into surface water, including liners for open pits to prevent seepage into the ground or established standards for tanks. Despite these precautions, Rozell and Reaven’s modeling indicates that even in the best-case scenario, it is “very likely that an individual well would generate at least 200 m$^3$ of contaminated fluids,” largely due to wastewater disposal issues; and at worst, a serious failure of a retention pond would result in the release of thousands of cubic meters of wastewater.

The ultimate fate of this wastewater matters for water quality in the vicinity of production sites. Wastewater may include additives used for certain purposes in the fracturing process, such as acids, corrosion inhibitors, and biocides, as well as bacteria, minerals, hydrocarbons, and naturally-occurring radioactive material drawn from the shale strata themselves. The flowback water may also be highly saline, depending on multiple factors including the properties of formation water in the target strata. Not uncommonly, fracking fluid also contains low levels of benzene, ethylene glycol, and naphthalene. Ingestion of these chemicals can have significant negative health effects, and—for benzene and naphthalene—chronic exposure has shown some evidence of carcinogenic effect.

35. Id.
36. Id. at 18–19 (describing the recommended standards, which are often reflected in state-law regulatory requirements).
37. Rozell & Reaven, supra note 30, at 1389–90.
38. See DOE Primer, supra note 17, at 64 (listing common fracturing additives); API, Guidance Document HF2, at 17 (describing the contribution of hydrocarbons, organic compounds, and NORMs to flowback water from formation water).
40. See API, Guidance Document HF2, at 7 (including these chemicals in a list of fracking fluid additives, while noting that they are “seldom used and/or used in very small quantities”).
Although the concerns discussed to this point have dealt with accidental releases of wastewater, and although industry best practices prescribe treatment and disposal methods that account for environmental considerations,42 accidental releases are not the only source of concern. Underground injection for permanent storage is currently the “principal method” of managing wastewater from oil and gas production,43 with the prospect that local water quality could degrade as a result.44 Likewise, the detrimental effects of wastewater discharge can, in principle, be prevented with appropriate terms in drilling permits or local water quality standards.45 But those limitations cannot be considered foolproof, no less because of the practical difficulties of enforcement46 than because of the potential for inadequate permitting standards in the first instance.47

The substantial water requirements of hydraulic fracturing also raise concerns about the availability of this resource, given that use of ordinary surface water sources “can possibly impact other competing uses and will be of concern to local water management authorities,” who will seek to avoid interference with existing community uses.48 In addition to the direct effects of development and oil and gas production, withdrawal and reintroduction of water can substantially reduce the surface water available to other local consumers, while also reducing its quality

42. See API, Guidance Document HF2, at 20–23 (describing recommended approaches to treatment and disposal, including underground injection and treatment for industrial reuse).

43. GROUND WATER PROTECTION COUNCIL, STATE OIL AND GAS REGULATIONS DESIGNED TO PROTECT WATER RESOURCES 30 (2009).

44. See Stephen G. Osborn et al., Methane Contamination of Drinking Water Accompanying Gas-Well Drilling and Hydraulic Fracturing, 108 PNAS 8172, 8174–75 (stating that fracturing water that remains underground could displace formation water into shallow aquifers, increasing the presence of dissolved solids and trace toxins). Cf. Tom Myers, Potential Contaminant Pathways from Hydraulically Fractured Shale to Aquifers, 50 GROUNDWATER 872, 879–80 (discussing hydrological models and the potential for contaminant flow from shale strata toward the surface over a period of years).

45. See API, Guidance Document HF2, at 20–22 (noting that most well permits require eventual removal of all fracture fluids and flowback water, and that municipal or industrial water treatment facilities may face limitations on their handling of flowback water).


47. See Elizabeth Shogren, Loophole Lets Toxic Oil Flow Over Indian Land, National Public Radio, Nov. 15, 2012 (describing how EPA permits oil producers operating on Wyoming’s Wind River Reservation to discharge untreated wastewater containing fracking additives if the water is needed by ranchers or wildlife).

(specifically, changes to sedimentation, temperature, and oxygen content). \(^{49}\) In parts of the arid west, where oil shale extraction is increasing, production could quickly outpace the availability of water, leading either to the constraint of the industry’s growth in that area or the acquisition of additional water rights from other stakeholders in the region. \(^{50}\)

Because the positive economic consequences of increased oil and gas development are so important in Indian Country, \(^{51}\) the social drawbacks for communities in the vicinity of new production sources also bears mention. The oil boomtowns of North Dakota have experienced significant strain on infrastructure—most notably, housing, water and sewage, and roads—as a result of the influx of people and activity associated with quickly expanded extraction activity. \(^{52}\) Law enforcement and the local courts have been “swamped” by the sudden changes. \(^{53}\) Elsewhere, while new production has bolstered local economies, it is also the case that most of the wealth associated with resource extraction has ultimately flowed out of the community, which is left with the costs of maintaining additional infrastructure and coping with any environmental problems that arise. \(^{54}\) This goes to show that expectations of the very real economic gains to be made from capitalizing on new energy production must be tempered by the realities of administering those activities, and simply living with their consequences.

### III. Good Fences: Neighbor States and their Regulations

The Bakken Formation is a large shale formation that overlaps a large portion of the Williston Basin, covering roughly the northeastern quarter of the state of Montana and the western two-thirds of the state of

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50. Id. at 25–26 (noting this problem for oil shale developers in Colorado and Utah).

51. See supra notes 8–12 and accompanying text (describing royalties and economic benefits).


54. See id. at 28–30 (describing West Virginia’s experience with hydraulic fracturing to extract natural gas from the Marcellus Shale).
North Dakota.\textsuperscript{55} This is an area of mostly flat land and rolling hills, shaped by the few large river systems that cover the area.\textsuperscript{56} Because it receives little rain, leaving it a semiarid zone, energy developments are a large and growing consumer of the limited water resources in the region.\textsuperscript{57} The Williston Basin has also historically had problems with brine contamination resulting from unlined mining wastewater pits leaking into groundwater, and the U.S. Geological Survey has indicated concern that further leakage from retention ponds, accidental spills, and surface water discharges could negatively affect wetlands, water quality, and livestock drinking water.\textsuperscript{58}

Fracking in an area like the Williston Basin differs from fracking operations elsewhere, such as those in Pennsylvania’s Marcellus Shale, despite the fact that both involve the hydraulic fracturing and extraction of resources from shale strata.\textsuperscript{59} The particular geology of the region means that most aquifers used are confined to rock strata in the upper 2,000 feet, leaving a significant barrier between water-bearing layers and those strata of the Bakken Formation that would be targeted for resource extraction.\textsuperscript{60} Whereas there is serious debate over whether fractures produced by well stimulation operations in areas like the Marcellus Shale can actually have a direct effect on groundwater supplies,\textsuperscript{61} the fact that the Bakken Formation


\textsuperscript{56} See id. at “Background—Physiography” (describing the topography of the Williston Basin).

\textsuperscript{57} See id. at “Need for Study” and “Background—Physiography” (describing the water resources available in the area and the role of oil and gas production as a water consumer).


\textsuperscript{59} See DOE Primer, supra note 17, at 17 (stating that the Marcellus shale in Pennsylvania begins at a depth of 4,000 feet, or 3,150 feet below the base of the layer of treatable water); Osborn et al., supra note 44, at 8173 (finding a strong relationship between significantly elevated groundwater methane levels and active extraction sites, as opposed to inactive extraction sites, in Pennsylvania); Julie A. LeFever, Montana—North Dakota? Middle Member Bakken Play, at 21 (2005) (showing that the upper member of the Bakken formation begins at a depth of about 10,580 feet) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment).

\textsuperscript{60} See U.S. Geological Survey, Williston and Powder River Basins Groundwater Availability Study, supra note 55, at “Background—Hydrogeology” (discussing the locations of water-bearing strata in the region); LeFever, supra note 59, at 21 (showing the start of the Bakken formation several thousand feet lower).

\textsuperscript{61} Compare King et al., supra note 26, at 350 (“[I]t is physically impossible for hydraulic fracturing to create vertical pathways from oil and gas bearing shale formations into aquifers. There is simply too much vertical separation between the two geological structures.”) and Tarek Saba & Mark Orzechowski, Letter, Lack of Data to Support a
is roughly twice as deep appears to make this a far less likely possibility.52

States are not the only sovereigns with lawmaking and regulatory power in the region: a number of Indian tribes have substantial reservations throughout both Montana and North Dakota.63 Notwithstanding the extent to which tribes have the inherent authority to control activity within the boundaries of their reservations to the exclusion of states (a point that will be discussed later), state law and regulation obtain outside those boundaries.64 The presence of a number of wells in relatively close proximity to reservation boundaries makes it important to consider what oversight protections are afforded by states in which tribes are located.65

North Dakota state agencies have made regulations of general applicability for oil and gas extraction operations that provide legal limits for fracking.66 Applications must be filed, including a description of the

relationship between methane contamination of drinking water wells and hydraulic fracturing, 108 pnas e633, e633 (criticizing osborn et al. and the conclusions of their research) with myers, supra note 44, at 874–75, 880 (arguing that hydraulic fractures could “contact higher conductivity sandstone, natural fractures, or unplugged abandoned wells above the target shale,” permitting upward movement of brine and other fluid over a span of decades) and scott detrow, across pa, abandoned wells litter the land, morning edition, national public radio (nov. 13, 2012), http://www.npr.org/2012/11/13/164139865/across-pa-abandoned-wells-litter-the-land (describing instances of current fracturing causing methane gas leaks and explosions from interaction with abandoned and unregistered wells) (on file with the washington and lee journal of energy, climate, and the environment).

see richard j. davis et al., hydraulic fractures: how far can they go?, 37 marine & petroleum geology 1, 5 (“the maximum upward propagation recorded for a stimulated hydraulic fracture to date is ~588 m [1,929 feet] in the barnett shale in the usa.”).


see cohen’s handbook of federal indian law § 4.01[1][b], at 211 (nell Jessup Newton ed., 2012) [hereinafter cohen] (“tribes have plenary and exclusive power over their members and their territory subject only to limitations imposed by federal law.”); id. § 6.01[5], at 503 (noting that although state jurisdiction may be precluded within indian country, nondiscriminatory state laws apply to events outside indian country “unless federal law provides otherwise”).

fracfocus, a collaborative registry of drilling sites using hydraulic fracturing, indicates that in the williston basin area, there are at least five wells operating within about two miles of the border of the fort peck reservation in montana, and around 40 within two miles of the fort berthold reservation in north dakota. see ground water protection council, find a well, fracfocus, http://www.fracfocusdata.org/fracfocusfind/ (last visited feb. 16, 2013) (displaying well locations of participating operators) (on file with the washington and lee journal of energy, climate, and the environment). outside the williston basin, there are other reservations in similar proximity to wells, such as the uintah and ouray in utah, and the navajo and ute in the four corners area. see id. (same).

see christopher kulander, the states’ legal framework: texas/louisiana region american law and jurisprudence on fracking, rocky mountain mineral law foundation: hydraulic fracturing core issues & trends, at 30 (“although north dakota's regulations do not directly address hydraulic fracturing, certain regulations . . . may effect hydraulic
well’s specifications and the operator’s plan for constructing the well casing, and a permit granted based on that application, before a production well can be drilled. Moreover, an additional application and permit is required in order to conduct well recompletion activities and to drill horizontal wells, and the regulators are entitled to impose on such permits “such terms and conditions on the permits issued under this section as the director deems necessary.” Regulators are also permitted to deny the operator a permit if the well, as proposed, “would cause, or tend to cause, waste . . . .” The rules also provide specific minimum standards for well casing, tubing and cementing, along with the general requirement that all wells—including injection wells—“shall be properly cemented at sufficient depths to adequately protect and isolate all formations containing water, oil, gas or any combination of these” and shall be drilled using only methods “which will protect all freshwater-bearing strata.” Defective casings must be reported to regulators, who have the option to require testing to ensure well integrity, or otherwise to plug the well.

On April 1, 2012, a number of new or amended regulations went into effect with specific relevance for hydraulic fracturing operations. The regulations impose specific limitations on fracturing operations, including requirements for control and diversion of flowback fluids, limitations on treating pressure for some fracking operations to eighty-five percent of API’s maximum rating for a particular well casing, requirements for casing and cement evaluation and inspection, and required pressure testing for intermediate casings and wellheads. Under the rules, operators are also required to make full disclosure to FracFocus all elements of the operation tracked by the registry, and to do so within sixty days of the time the fracturing.”

See generally N.D. ADMIN. CODE art. 43-02 (governing well construction standards, waste handling, and underground injection); id. ch. 32 (governing oil and gas production generally, permitting, exploration requirements, compensation for damages, and carbon storage).

67. See Kulander, supra note 66, at 30–31 (describing the permit application requirement); N.D. ADMIN. CODE § 43-02-03-16 (outlining the requirements).

68. N.D. ADMIN. CODE § 43-02-03-16. See Kulander, supra note 66, at 30–31 (discussing the code standards). This requirement appears to have substantial import for regulation of hydraulic fracturing wells, which typically require horizontal drilling in order to be effective in shale formations. See DOE Primer, supra note 17, at 46–47 (discussing how horizontal drilling is increasingly necessary in more mature shale plays, and is typically a more economical production method than vertical wells).

69. N.D. ADMIN. CODE § 43-02-03-16. See Kulander, supra note 66, at 31 (discussing the code standards).

70. N.D. ADMIN. CODE § 43-02-03-21.

71. Id. § 43-02-03-22.

72. Id. § 43-02-03-27.1 et seq.

73. See id. § 43-02-03-27.1 (enumerating the requirements specifically for hydraulic fracture stimulation).
stimulation is performed. Likewise, operators are required to notify regulators within twenty-four hours if pressure in the casing exceeds a certain threshold. The 2012 regulations include a new provision expressly prohibiting operators from allowing “any spill or leak . . . to flow over, pool, or rest on the surface of the land or infiltrate the soil,” even within containment dikes around the well. This rule complements an older provision requiring notification, within twenty-four hours, and subsequent written reporting in case of any fire, leak, spill, or blowout of more than one barrel.

General regulations also control certain aspects of drilling byproducts, site containment, and waste disposal. Regulators may impose various requirements on the construction of the well site in order to avoid interference with water supplies or the surrounding landscape, including grading of the site, construction of dikes around the well, fencing, distancing from bodies of water or natural drainages, and reclamation of sites within six months of well completion. Fencing is required for open pits and ponds containing saltwater or oil, while screening and netting must also be constructed for oil pits. Perhaps most important, the regulations impose strict limitations on operators’ ability to use open pits to store “saltwater, drilling mud, crude oil, waste oil, or other waste,” permitting such storage only in cases of emergency with express approval of regulators. Temporary use of such pits for storage is permitted “to retain oil, water, cement, solids, or fluids generated in well completion” for no more than seventy-two hours after the completion of the related operations, with the contents thereafter to be removed from the site. Once removed, the contents must be “properly disposed of in an authorized facility” and/or “removed from the pit and disposed of in an authorized disposal well or used in a manner approved by the director.” Any such pits must be sufficiently impermeable to “provide adequate temporary containment” of

74. See id. (“Within sixty days after the hydraulic fracture stimulation is performed, the owner, operator, or service company shall post on the fracfocus [sic] chemical disclosure registry all elements made viewable by the fracfocus website.”).
75. See id. § 43-02-03-27.1(3) (imposing the requirement).
76. Id. § 43-02-03-30.1.
77. See id. § 43-02-03-30 (imposing the requirement).
78. See id. § 43-02-03-19 (imposing the requirements).
79. See id. § 43-02-03-19.1 (imposing the requirements).
80. Id. § 43-02-03-19.3.
81. Id. (emphasis added). The emphasized section would appear to include flowback water from fracturing operations when read alongside the definition of “completion” in § 43-02-03-01(13) of the North Dakota Administrative Code, which states that a well is considered completed when oil or gas begins to flow from the well after the casing has been run.
82. Id. § 43-02-03-19.2. See also id. § 43-02-03-19.3 (providing for disposal of materials temporarily stored in on-site pits in accordance with subsection 19.2).
the relevant material, must be reclaimed within thirty days of cessation of operations unless an extension is granted, and in no case may be left for more than one year thereafter.\footnote{318. \textit{Id.} § 41-02-03-19.3.}

Taking these regulations at face value, there appear to be substantial curbs in North Dakota’s law to prevent the kinds of releases from hydraulic fracturing operations that appear most likely to cause environmental damage. The various regulatory requirements, read together, make it appear that compliance (even for hydraulic fracturing operations) requires operation in such a way as to avoid the releases of pollutants onto surface soil or into groundwater.\footnote{318. \textit{Id.} § 41-02-03-30.1 (prohibiting spills or leaks from flowing over the surface or infiltrating soil). It would thus appear that oil and gas operators would have to fulfill the other requirements imposed on them—such as § 43-02-03-21 (requiring casing and cementing sufficient to protect nearby fresh water), § 43-02-03-19 (governing construction and design of drilling sites), or § 43-02-03-19.3 (governing temporary storage of fracturing fluids at drilling sites)—in such a way as to meet the requirements of subsection 30.1.} However, this assumes that compliance is effectively and rigorously enforced—an assumption that may not be well founded.\footnote{318. See Cox, \textit{supra} note 46, at 25–26 (noting that the EPA has found that states have generally devoted inadequate resources toward compliance inspections and legal enforcement); \textit{New Oil Inspectors to Step Up ND Oversight, THE BISMARCK TRIBUNE}, (May 19, 2011), http://bismarcktribune.com/news/new-oil-inspectors-to-step-up-nd-oversight/article_7ae659c8-8227-11e0-9418-001cc4c03286.html (reporting that the state Department of Mineral Resources intended to increase its inspection staff from fourteen, able to inspect a well every six months, to twenty-four by June 2013, allowing monthly inspections) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment).}

Looking only to what private means are available, state statutes do provide some measure of leverage for private landowners, in close proximity to a well, to seek recourse against polluters.\footnote{318. The viability of common-law causes of action will not be considered here, but are reviewed \textit{infra} at 331–39.} For damages stemming from oil and gas production generally, owners of property adjacent to a well may demand an inspection by the state if hydrogen sulfide is present, in which case the state is authorized to take remedial measures.\footnote{318. See N.D. CENT. CODE § 38-11.1-03.1 (2011) (establishing the right “to protect the health and safety of the surface owner’s health, welfare, and property.”)}. Surface owners of land, but evidently not others near a well,\footnote{318. See Kartch v. EOG Resources, Inc., 845 F. Supp. 2d 995, 1001–02 (D.N.D. 2012) (treating the relevant context of the statute as involving the relationship between surface owners and mineral owners where ownership overlaps, because of the conflicts caused by treating the mineral estate as dominant).} are entitled to damages sustained by the surface owner to his land for “lost land value, lost use . . . and lost value of improvements caused by drilling operations.”\footnote{318. N.D. CENT. CODE § 38-11.1-04 (2011).} Finally, any property owner with property one mile or less
away from an oil or gas well is entitled to costs and damages for diminution of water quality or actions taken to restore water availability.\footnote{90}{See id. § 38-11.1-06 (2011) (outlining the extent of the cause of action).}

A similar scheme exists for damage caused by subsurface exploration, including hydraulic fracturing.\footnote{91}{See id. § 38-11.2-01 (2011) (defining “drilling operations” within the context of the statute as including the drilling of an extraction well “and the injection, production, and completion operations ensuing from the drilling”).} Surface owners and adjacent landowners are entitled to demand inspection of a well by the state “as necessary to ensure compliance with applicable environmental protection laws and regulations . . . .”\footnote{92}{Id. § 38-22.1-02 (2011).} Substantially similar damages are afforded to surface owners from interference by owners of the mineral estate.\footnote{93}{See id. § 38-11.2-04 (2011) (reiterating damages rights for harm and disruption caused by the operator).} But as to groundwater, although damages rights are also afforded to all landowners within one mile of the mineral production site (subject, however, to a six-year statute of limitations), there is also an affirmative requirement on the operator to inventory groundwater wells within one-half mile of exploration sites and one mile of production sites.\footnote{94}{See id. § 38-11.2-07 (2011) (establishing the requirements).} Although these causes of action provide limited, if substantial, rights to landowners against operators, it should also be noted that none of the rights in either section excludes remedies under other causes of action.\footnote{95}{See id. §38-11.1-10 (2011) (“The remedies provided by this chapter do not preclude any person from seeking other remedies allowed by law.”); § 38-11.2-08 (2011) (same).}

Montana law provides a number of requirements analogous to those in North Dakota, with certain key differences, particularly on the issues of holding and disposal of wastewater. In Montana, the state has established a Board of Oil and Gas Conservation that has the authority to oversee injection wells and hydraulic fracturing operations, and is tasked with preventing contamination of surrounding land or extraneous underground strata.\footnote{96}{See Kulanter, supra note 66, at 25 (describing the board as the “primary authority” for Montana’s Underground Injection Control program and hydraulic fracturing); MONT. CODE ANN. § 82-11-111 (2011) (establishing the board’s duties, including “prevent[ing] contamination of or damage to surrounding land or underground strata,” and powers, including revoking, denying, and conditioning permits, as well as inspection and monitoring of production operations).} The statute compels the board to require operators to file well logs, drill and case wells in a way that prevents the movement of oil and gas into other strata and prevents pollution of fresh water, and restore surface land to its previous condition.\footnote{97}{See MONT. CODE ANN. § 82-11-123 (2011) (establishing statutory requirements for oil and gas production).} Issuance of a drilling permit depends on
compliance “in all respects with the applicable rules of the board,” which rules include requirements for well spacing, drilling procedures, well stimulation, and production. A well at which hydraulic fracturing is to be conducted requires an application describing the location of the operation and the geologic conditions of the well, a description of the well casing and cementing (which must be sufficient to prevent fluid migration into potable waters), and a statement if surface pits will be used to store fluids prior to injection.

Montana also imposes certain substantive standards for the quality of wells and casings required of operators. Wells are required to be drilled using freshwater drilling fluid or air when drilling a surface hole or through freshwater aquifers, and to have “sufficient casing . . . to protect all fresh water located at levels reasonably accessible for agricultural and domestic use.” For rotary drilling specifically, the rule requires casing to be set in an “impervious formation” and sufficiently cemented to withstand “a compressive strength of 300 pounds per square inch . . . .” Moreover, operators are required to subject all new wells to a mechanical integrity test (at a pressure between 300 and 800 PSI, depending on actual injection pressure), in order to ensure that there are no significant leaks in the tubing or casing, or “significant movement of injected fluid in vertical channels adjacent to the wellbore” that would threaten fresh water supplies in higher strata.

The rules do not permit a well that has failed a mechanical integrity test or experienced one of several specified mechanical failures in the course of operation to continue operating until it can be repaired, and a successful integrity test completed. Operators are also required to file a report detailing work done on a well within thirty days of the well’s completion.

Montana has also recently revised its oil and gas regulations in order to address issues related to hydraulic fracturing, promulgating several new requirements in 2011 that govern fracking operations. For hydraulic fracturing to be permitted under an operator’s permit, it must have been included in the initial application; or else (in the case of exploratory wells where the need for fracking was not anticipated) information about the

99. See id. 36.22.701–36.22.1245 (establishing these requirements).
100. See id. 36.22.1403 (2012) (enumerating the required components of applications for Class II injection wells).
101. Id. 36.22.1001 (imposing these requirements on rotary-drilled wells), 36.22.1002 (imposing these requirements on cable-drilled wells).
102. Id. 36.22.1001 (describing the casing requirements).
103. Id. 36.22.1416 (describing the required integrity test).
104. See id. 36.22.1416(7)–(8) (barring both classes of failing well from service).
105. See id. 36.22.1011 (requiring the report).
106. See Kulander, supra note 66, at 25 (discussing the new regulations, which took effect Aug. 27, 2011).
proposed operation must be submitted at least forty-eight hours before it is to be commenced. The rules further require the disclosure of the methods used for any and all well treatments, including type of treatment and maximum pressure recorded; and in the case of hydraulic fracturing, disclosure of all treatment fluids used, broken down by type, rate of use, and concentration of each chemical. The fracking disclosure requirements may be satisfied by submission of the required information to FracFocus or “successor . . . publicly accessible Internet information repositories . . . .” A separate casing integrity test is also required before an operator is permitted to conduct a fracturing operation.

Montana’s rules include comparable provisions for the disposal of wastewater from fracturing operations. The rules’ treatment of flowback water is not entirely clear because, as a general matter, the rules prohibit storage of a variety of oil wastes and other “hazardous or deleterious substances” in “earthen storage pits or in open vessels,” which is a definition that might capture flowback water in certain circumstances. Use of open pits to store hazardous substances is limited to emergencies, not including “spills from an improperly or inadequately designed or maintained production facility,” and must be disposed within forty-eight hours “in a manner that will not degrade surface water or groundwater or cause harm to soils.” However, the rules also contain provisions

107. See Mont. Admin. R. 36.22.608 (2012) (discussing the extent to which permits cover well stimulation activities). See also id. 36.22.1010 (discussing prior notification, approval, and subsequent reporting required for chemical stimulation or hydraulic fracturing to be authorized).

108. See id. 36.22.1015 (2012) (describing the disclosure requirements).

109. Id. The rules permit less extensive disclosure in order to protect chemicals that are trade secrets, requiring more extensive disclosure only if needed to respond to a spill or release, diagnosis or treatment of an exposed individual, or treatment of a medical emergency. See id. 36.22.1016 (describing the trade secrets exception).

110. See id. 36.22.1106 (providing for casing pressure testing and other safety requirements prior to a fracturing operation, including use of a fracturing string if the casing fails the integrity test). Compare id. 36.22.1106 (requiring at 30-minute pressure test at the “maximum anticipated treating pressure minus the annulus pressure”) with id. 36.22.1416 (requiring, for ordinary casing, a 15-minute pressure test at the greater of 100 PSI above the actual injection pressure at testing time or 300 PSI, but in no event greater than 800 PSI).

111. See id. 36.22.1207 (prohibiting storage in open pits or vessels); id. 36.22.302(37) (defining “hazardous substance” as any substance so defined in § 75-10-701 of the Montana Code); Mont. Code Ann. § 75-10-710 (defining “hazardous or deleterious substance” as any substance constituting an “imminent and substantial threat to . . . the environment” and designated hazardous under CERCLA); 40 C.F.R. 302.4 (2012) (including benzene, ethylene glycol, and naphthalene among substances designated hazardous under CERCLA). No reported case law has been found interpreting these provisions.

specifically for disposal of produced water with more than 15,000 PPM of dissolved solids that permit disposal into a “board-approved earthen pit” so long as the maximum amount disposed does not exceed five barrels daily over a monthly basis. Alternatively, such water may be disposed of by underground injection into a Class II well or, if the concentration of dissolved solids is at or below 15,000 PPM, through “any manner allowed by law that does not degrade surface waters or groundwater or cause harm to soils.”

Earthen pits, if used, must be expressly permitted by the board, and must be constructed in accord with a number of requirements provided by the rules.

Montana law also includes remedial provisions for surface owners whose use of their land is disrupted by oil and gas development. Oil and gas developers are also made generally liable for all damage to real or personal property resulting from “lack of ordinary care” or from “oil and gas operations and production.” Separate from damages, civil and criminal liability may attach to an individual who violates the state oil and gas statutes or an administrative rule to which the person is subject, although ability to bring suit is vested specifically in the Board of Oil and Gas Conservation. The board is also authorized to take action in cases of emergency involving an actual or impending violation “that, if it occurs or continues, will cause substantial pollution” and produce enduring harmful effects that endanger public health, safety, or welfare. Under that power, the board is entitled to close or shut down a well, or to impose restrictions on operation, and may do so without prior notice or hearing offered to the alleged violator. Although Montana’s law differs from North Dakota’s, in

113. Although the rules do not define this term directly, they define “produced fluid” as “any fluid, including oil, gas, and water, originating from subsurface geologic sources.” Id. 36.22.302(60).
114. Id. 36.22.1226.
115. Id.
116. See id. 36.22.1227 (requiring liners, dikes, use of specified materials, and compliance with fencing and netting provisions of the rules).
117. See MONT. CODE ANN. § 82-10-504 (2011) (providing the owners of surface estates with a cause of action for “loss of agricultural production and income, lost land value, and lost value of improvements from oil and gas operations.”).
118. Id. § 82-10-505.
119. See Kulander, supra note 66, at 26 (describing the violation prohibitions); MONT. CODE ANN. § 82-10-147 (granting the board the right to sue over violations, assess an administrative penalty up to $125K, issue compliance orders, and seek injunctions); id. § 82-10-148 (declaring violations and attempts to falsify records a misdemeanor subject to a maximum $10,000 fine per day an imprisonment up to six months); id. § 82-10-149 (declaring each day of noncompliance a misdemeanor subject to a maximum $10,000 fine per day).
120. MONT. CODE ANN. § 82-11-151(1) (authorizing board action in emergencies).
121. Id. § 82-11-151 (outlining the board’s powers and providing for notice and hearing after the board’s emergency action).
that Montana lacks the North Dakota provision entitling nearby landowners to take action against polluters, \(^\text{122}\) oil and gas operators would nevertheless appear to be subject to the general state requirements for water quality, which entitle the state to issue orders to clean up any spills that may pollute state waters. \(^\text{123}\)

The differences between these regulatory schemes are subtle, but they appear potentially significant. Whereas Montana permits the maintenance of wastewater storage pits in certain circumstances and to a limited extent beyond emergency situations, \(^\text{124}\) North Dakota imposes a largely unqualified proscription of all non-emergency unenclosed surface storage. \(^\text{125}\) Both states provide that their oil and gas regulatory agencies are charged with environmental protection as well as development, and are entitled to use permitting as a way to ensure environmental safety. \(^\text{126}\) But Montana’s rules provide only for environmental regulation by public agencies; there is no analogue in the rules governing mining to North Dakota’s private causes of action for property owners other than the owners of surface estates. \(^\text{127}\) In this regard in particular, Montana’s law appears less favorable than North Dakota’s, in that it would make it more difficult for private property owners, tribal or otherwise, in the border regions of a reservation to exercise leverage over off-reservation polluters without such a legal basis. The difference at least eliminates one potential remedy, were there to be a leak or spill, under Montana law.

**IV. Reservation Jurisdiction, Federal Regulation, and the Trust Relationship**

Although the state regulations discussed above are a necessary consideration—for the sake of comparison, as well as for property along jurisdictional borders where it is directly relevant—most significant for

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122. See supra notes 86–95 and accompanying text (discussing North Dakota law’s private rights of action for damages to water quality and other land uses).

123. See MONT. CODE ANN. § 75-5-601 (“The department may issue an order to a person to clean up any material that the person or the person’s employee, agent, or subcontractor has accidentally or purposely dumped, spilled, or otherwise deposited in or near state waters and that may pollute state waters.”). See also id. §§ 75-5-601 et seq. (outlining the enforcement and penalty provisions).

124. See supra notes 111–16 and accompanying text (outlining the Montana rules for wastewater pits).

125. See supra notes 78–83 and accompanying text (outlining the North Dakota rules for wastewater pits).

126. See supra notes 66–69, 96–100 and accompanying text (discussing agency authority and permitting restrictions).

127. Compare supra notes 86–95 and accompanying text (summarizing the private causes of action in North Dakota) with supra notes 118–23 and accompanying text (imposing liability for property damages, but providing no specific private cause of action).
fracturing in Indian country are the rules directly applicable to reservations. BLM’s new regulations specifically on fracturing are part of these rules, but it is necessary to outline the jurisdictional framework of oil and gas regulation in Indian country before the new regulations may be considered.

In most respects, Indian tribes are in a position of jurisdictional parity with states—that is, state law and regulation does not apply within Indian reservation boundaries, generally leaving the reservations subject only to tribal and federal law. This status reflects tribes’ reserved sovereignty, or those powers of self-government derived from tribes’ original status as independent nations. Where civil and regulatory jurisdiction is concerned, matters relating to tribal member Indians in Indian country are subject to tribal jurisdiction, unless federal law creates an exemption. The property or activities of nonmembers or non-Indians in Indian country also fall outside state regulation if state interference would hinder tribal government or federal law. Tribes’ ability to impose regulations on Indian land or federal trust land, even if it affects non-Indians, is generally unquestioned. Tribes’ ability to regulate may be limited if the regulation affects activities of nonmembers on non-Indian fee lands; however, under Montana v. United States, tribal regulation applies if the nonmembers have entered a consensual relationship with the tribe, or if the relevant activity has “some direct effect on the political integrity, the economic security, or the health or welfare of the tribe.” Given the economic prominence and potential ecological perils of oil and gas production generally, and hydraulic fracturing specifically, it is reasonable to presume that tribal regulatory jurisdiction would survive the Montana

128.  See supra notes 1–5 and accompanying text (introducing the regulations).
129.  See COHEN, supra note 64, § 3.04[1] (“Generally speaking, primary jurisdiction over land that is Indian country rests with the Federal Government and the Indian tribe inhabiting it, and not with the States.” (quoting Alaska v. Native Vill. of Venetie, 522 U.S. 520, 527 n.1 (1998))); id. §6.01[2] (“[S]tate law generally is not applicable to Indian affairs within the territory of an Indian tribe, absent the consent of Congress.”).
130.  See id. § 4.01[1][a], at 207–08 (noting that the basic principle of Indian law is that tribal sovereignty is not a delegated power, but is derived from the incidents of independent nationhood not defeated by the federal-tribal relationship).
131.  See id. § 6.01[1], at 489 (“Congress’s plenary authority over Indian affairs and the tradition of tribal autonomy in Indian country combine to preempt the operation of state law.”).
132.  See id. at 490 (describing the conditions for tribal regulation of non-Indians).
133.  See id. § 6.02[2][a], at 506 (“The Supreme Court has never struck down a tribal tax or regulation of non-Indians engaged in a transaction or activity on Indian land.”). See also Merrion v. Jicarilla Apache Tribe, 455 U.S. 130, 139–41 (1982) (upholding an oil & gas severance tax on a non-Indian company and noting the tribe’s inherent power to tax as “an essential instrument of self-government”).
134.  Id. § 6.02[2][b], at 507–08 (quoting Montana v. United States, 405 U.S. 544, 565–66 (1981)).
But it should also be noted that nonmember conduct or property does not necessarily fall under state jurisdiction simply because it falls outside tribal jurisdiction. The state may not assert its authority when doing so would conflict with preemptive federal law or would interfere with reservation Indians’ right to tribal lawmakers.

Oil and gas development specifically is subject to a complex of federal and tribal interests, laws, and regulations. Mineral estates within reservation boundaries may be owned by tribes or individuals (particularly where lands were alienated from tribal holdings by allotment), while tribes may also have rights in mineral estates that extend outside reservation boundaries where land was ceded for homesteading or federal use. Where lands are held in trust for the tribe or individuals by the federal government, which acts in a fiduciary capacity, the tribe or the individual is the beneficial owner of the mineral estate, and may have enforceable rights in cases of federal mismanagement.

Under the Indian Mineral Development Act (IMDA), tribes may enter into leases or other minerals agreements that provide for the exploration and production of oil and gas, among other resources, from any estate “in which such Indian tribe owns a beneficial or restricted interest,” subject to the approval of the Secretary of the Interior. Secretarial approval depends on a finding that the agreement “is in the best interest of the Indian tribe” or individual Indian parties, based on potential economic returns and “environmental, social, and cultural effects” on the tribe that

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136. See COHEN, supra note 64, § 6.03[2][c], at 528–30 (discussing cases to the effect that tribal jurisdiction and state authority entail separate inquiries).

137. See id. § 6.03[2][a], at 517–18 (citing Williams v. Lee, 358 U.S. 219 (1959)) (discussing the dual barriers to state jurisdiction, beyond Montana’s provisions). States’ rights to exercise civil jurisdiction over Indian country would be different if a reservation has been subject to Pub. L. No. 83-280, which provided a superseding federal vehicle for state jurisdiction; but this is not directly relevant for the purposes of this note, as Montana and North Dakota were not so subject. See id. § 6.04[3], at 537–78 (discussing the history and complex effects of the law).

138. See id. § 17.03[1], at 1120–22 (discussing mineral ownership).

139. See id. § 17.01, at 1106 (discussing generally beneficial rights to natural resources on tribal or allotted land); id. § 17.03[4], at 1137–41 (discussing cases of trust liability and mixed results).


141. 25 U.S.C. § 2102 (2011). See also COHEN, supra note 64, § 17.03[2][b], at 1129–30 (discussing these provisions of the IMDA). Secretarial approval would not be required if a tribe sought to develop such a resource on its own, without the involvement of extrinsic parties. See id. § 17.03[3], at 1134 n.128 (“If a tribe develops its own mineral resources, no secretarial approval is required . . .”).
may result from approval. Liability under the trust relationship could follow from a failure to make a best-interest determination, to conduct royalties accounting so as to maximize tribal interests, to consider potential economic benefit, or to consider factors other than economic benefit. The IMDA also preserved tribes’ ability to enter into minerals agreements under the Indian Mineral Leasing Act of 1938, which had instituted uniform leasing procedures for tribal land: ten-year leases, requiring prior tribal consent and Secretarial approval.

In the context of federal regulation, the authority of the Secretary of the Interior to manage Indian mineral leasing, and oil and gas operations on federal land generally, has been delegated to the Bureau of Land Management. BLM, in turn, has issued seven Onshore Oil and Gas Orders, including orders that govern approval of operations, drilling, and disposal of produced water. These orders apply to oil and gas leases on Indian trust or allotment trust land, as well as agreements under the IMDA. Unlike the states’ regulations, however, BLM’s requirements for oil and gas exploration and production are not made part of the Code of Federal Regulations, but are instead kept as separate orders, and are partly

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142. 25 U.S.C. § 2103 (2011). Because approval by the Secretary constitutes major federal action for the purposes of the National Environmental Policy Act, an Environmental Impact Statement must be prepared before the Secretary may approve a minerals agreement. See COHEN, supra note 64, § 17.03[3], at 1134 (discussing the NEPA implications of Secretarial approval).

143. See id. § 17.03[4], at 1138–39 (summarizing cases and holdings on federal government liability under the trust relationship).


145. See COHEN, supra note 64, §17.03[2][a], at 1124–25 (summarizing the 1938 Act).

146. See Onshore Oil and Gas Order No. 1, 72 Fed. Reg. 10,329, 10,329 (Mar. 7, 2007) ("The Secretary of the Interior has delegated this [management] authority to the Bureau of Land Management . . . ."); 43 C.F.R. § 3164.1 (2011) (authorizing the BLM director to issue onshore oil and gas orders); 25 C.F.R. § 211.4 (2011) (authorizing BLM to approve and enforce drilling permits on tribal land); id. § 212.4 (authorizing BLM to approve and enforce drilling permits on allotted land). While BLM permitting is a practical reality, there are nevertheless credible arguments to be made that the present regulatory structure is unlawful because of the way BLM has come about its delegated authority. See CERT comment, supra note 10, at 4–5 (arguing that the Federal Land Policy and Management Act of 1976, 43 U.S.C. § 1702 et seq., denies BLM authority over Indian land, invalidating the Secretary’s delegation of authority as ultra vires); Tom Fredericks & Andrea Aseff, When Did Congress Deem Indian Lands Public Lands?: The Problem of BLM Exercising Oil and Gas Regulatory Jurisdiction in Indian Country, 33 ENERGY L.J. 199, 136–41 (2012) (arguing that, in addition to the statutory limitations, the secretarial delegation gives BIA, not BLM, authority over Indian minerals management, and that BIA’s delegation of that authority to BLM through a memorandum of understanding was unlawful).


148. See, e.g., Onshore Oil and Gas Order No. 1, supra note 146, at 10,329 (stating that the order applies to onshore leases of “Indian oil and gas,” defined as mineral interests on tribal or allotment trust land, and IMDA agreements).
summarized in the Bureau’s “Gold Book” of standards and guidelines for operators.\textsuperscript{149} With the exception of Order No. 1, concerning the application requirements for oil and gas producers, none of the orders has been updated in the last twenty years or more.\textsuperscript{150}

As a precondition of approval, operators are required first to submit a plan detailing the scope of the project, targeted strata, means for preventing blowouts, proposed casings and cement design criteria, expected pressures encountered in the course of drilling and operation, testing and logging procedures, and any other relevant aspects of the proposal, all of which are expressly required to comply with Order No. 2.\textsuperscript{151} Under that order, casing and cementing must be adequate to “protect and/or isolate all usable water zones” and must run to an adequate depth to contain the pressure experienced during normal operations.\textsuperscript{152} Casing and cementing must also meet a variety of standard specifications and pass pressure testing, subject to compliance remedies also specified in the rule.\textsuperscript{153} Order No. 1 further requires submission of a plan for surface use, which in part must be designed to provide “for safe operations, adequate protection of surface resources, groundwater, and other environmental components;” define locations for reserve pits to be located on site; identify prospective water supplies and intended methods of waste disposal; and make plans for surface reclamation.\textsuperscript{154} Similarly, operators are required to “conduct operations to minimize adverse effects to surface and subsurface resources, prevent unnecessary surface disturbance, and conform with currently available technology and practice,” as well as to comply with applicable statutes, including NEPA and the Endangered Species Act.\textsuperscript{155} The rules affirmatively require “immediate action” by operators to “safeguard life or prevent significant environmental degradation,” as well as notification of the surface managing agency, and surface owner if appropriate, within

\begin{footnotes}
\footnotetext{\textsuperscript{149}} See id. at 10,328 (“The following Order would be implemented by BLM and the [Forest Service,] but will not be codified in the Code of Federal Regulations.”); U.S. DEP’T OF THE INTERIOR AND U.S. DEP’T OF AGRIC., SURFACE OPERATING STANDARDS AND GUIDELINES FOR OIL AND GAS EXPLORATION AND DEVELOPMENT 1 (2007) [hereinafter Gold Book] (“The Gold Book provides operators with a combination of guidance and standards for ensuring compliance with agency policies and operating requirements, such as those found in the Code of Federal Regulations [and Onshore Oil and Gas Orders . . . .”].

\footnotetext{\textsuperscript{150}} See 43 C.F.R. § 3164.1 (listing the effective dates of each order, the most recent revisions being Order No. 1 in 2007 and Order No. 7 in 1993).

\footnotetext{\textsuperscript{151}} See Onshore Oil and Gas Order No. 1, supra note 146, at 10,331 (establishing the drilling plan application requirements).

\footnotetext{\textsuperscript{152}} See Onshore Oil and Gas Order No. 2, 53 Fed. Reg. 46,798, 46,808 (Nov. 18, 1988) (establishing the casing and cementing requirements).

\footnotetext{\textsuperscript{153}} See id. at 46,808–09 (describing the casing requirements, the gravity of violations, and the prescribed remedial action).

\footnotetext{\textsuperscript{154}} Onshore Oil and Gas Order No. 1, supra note 146, at 10,331–33.

\footnotetext{\textsuperscript{155}} Onshore Oil and Gas Order No. 1, supra note 146, at 10,335.
\end{footnotes}
twenty-four hours of the emergency. An environmental review that complies with NEPA and other applicable environmental regulations will be conducted following the agency’s receipt of an application.\footnote{156}{Onshore Oil and Gas Order No. 1, \textit{supra} note 146, at 10,335–36.}

If Indian land is involved, the Bureau of Indian Affairs (BIA) is established as the surface managing agency, and operators are required to go to BIA and tribal offices to obtain the appropriate use or access permits, or an appropriate surface access agreement in cases of divided estates.\footnote{157}{\textit{See Gold Book, supra} note 149, at 2 (“Upon receipt of a complete APD . . . the BLM, the surface management agency, or the agency’s or operator’s environmental contractor will conduct an environmental analysis . . . in conformance with the requirements of NEPA and the regulations of the Council on Environmental Quality . . . .”).}

Applicable statutes may require surveys in order to protect cultural resources prior to approval.\footnote{158}{\textit{See Onshore Oil and Gas Order No. 1, supra} note 146, at 10,336–37 (imposing requirements for Indian oil and gas leases). The rules also make provision for obtaining authorization for staking and surveying on Indian land, authorizing entry if a majority of owners consent or if BIA has approved access in cases of extensive fractionation. \textit{See id.} at 10,330–31 (discussing access arrangements for staking and surveying).}

BLM will also take account of BIA and tribal recommendations for conditions to be placed on permits prior to approval.\footnote{159}{\textit{See Gold Book, supra} note 149, at 9–10 (discussing permit approval plans).}

Order No. 7 provides generally applicable requirements for storage and disposal of water that mirror the regulations imposed by states.\footnote{160}{\textit{See Onshore Oil and Gas Order No. 1, supra} note 146, at 10,336–37 (imposing requirements for Indian oil and gas leases). The rules also make provision for obtaining authorization for staking and surveying on Indian land, authorizing entry if a majority of owners consent or if BIA has approved access in cases of extensive fractionation. \textit{See id.} at 10,330–31 (discussing access arrangements for staking and surveying).}

The Order provides that disposal may be accomplished by underground injection (the preferred means), discharge into pits, or other methods approved by BLM officials including surface discharge pursuant to an NPDES permit; but in any event, no disposal is permitted without approval of the authorized official.\footnote{161}{\textit{See Gold Book, supra} note 149, at 12 (discussing BLM treatment of Indian lands).}

Authorized officers are also entitled to impose additional requirements upon operators’ management of produced water, as when environmental problems have arisen or water quality has degraded so as to require other measures.\footnote{162}{\textit{See Onshore Oil and Gas Order No. 7, 58 Fed. Reg. 47,361, 47,361–65 (providing the final text of the Order).}} Water from well completion activities may be temporarily stored in reserve pits for up to 90 days, with storage thereafter requiring approval of the officer.\footnote{163}{\textit{See Onshore Oil and Gas Order No. 7, supra} note 161, at 47,362 (discussing general requirements for water disposal). \textit{See also} 43 C.F.R. § 3162.5-1 (requiring disposal by subsurface injection, approved pits, or other means approved by the authorized officer).}

The Order also provides a
variety of notice requirements and other provisions governing disposal requests in various circumstances.\textsuperscript{165}

As to the substantive requirements for various disposal methods, the Order requires underground injection to be done in an injection well with a valid Underground Injection Control permit (issued by the relevant agency, which may be a tribe if it has “achieved primacy”), and to comply with the procedural requirements of Order No. 1 and the well engineering requirements of Order No. 2.\textsuperscript{166} Disposal by surface discharge requires submission of the valid NPDES permit, as well as disclosure of a water quality analysis and the design of the disposal site.\textsuperscript{167}

Disposal pits require extensive disclosure to the approving officer, including disclosure of the sources of produced water, a reclamation plan for the site, a contingency plan for emergencies, and samples of water from the discharge source for analysis.\textsuperscript{168} Approval of lined pits requires disclosure of a map of the site, disposal rate, water contents (including dissolved solids and toxic constituents), method of disposing of precipitated solids, and the material used for and installation method of the pit liner.\textsuperscript{169} Unlined pits are subject to a different set of criteria, which include a threshold showing that less than five barrels of water will be disposed per day, the water has no more dissolved solids than existing protected water, the water will not degrade area surface or subsurface waters, or that at least a substantial part of the water is being used for beneficial purposes and meets minimum standards for those uses.\textsuperscript{170} Operators must further make disclosures comparable to those required for lined pits, as well as percolation rate of area soil, known aquifers and mineral deposits in the area, and further disclosures related to the threshold criterion underlying the application.\textsuperscript{171} Applications for emergency pits are dealt with separately;

\textsuperscript{165} See Onshore Oil and Gas Order No. 7, supra note 161, at 47362–63 (establishing different notice provisions depending on the disposal method and whether the disposal site is federal/tribal or state land, on-lease or off-lease).
\textsuperscript{166} See Onshore Oil and Gas Order No. 7, supra note 161, at 47363 (imposing informational requirements for injection wells).
\textsuperscript{167} See Onshore Oil and Gas Order No. 7, supra note 161, at 47365 (imposing requirements for surface discharges). Note that the Order requires unauthorized discharges to be disclosed to the authorized BLM officer. Onshore Oil and Gas Order No. 7, supra note 161, at 47365.
\textsuperscript{168} See Onshore Oil and Gas Order No. 7, supra note 161, at 47363 (imposing informational requirements for disposal pits generally).
\textsuperscript{169} See Onshore Oil and Gas Order No. 7, supra note 161, at 47363 (imposing substantive requirements on lined pits, to be executed by the authorizing officer).
\textsuperscript{170} See Onshore Oil and Gas Order No. 7, supra note 161, at 47363–64 (imposing substantive requirements on unlined pits).
\textsuperscript{171} See Onshore Oil and Gas Order No. 7, supra note 161, at 47364 (imposing substantive requirements on unlined pits).
their use is limited to forty-eight hours unless an authorized officer permits otherwise.\footnote{172. See Onshore Oil and Gas Order No. 7, supra note 161, at 47,364 (discussing requirements applicable to emergency pits).}

The Order also imposes substantive construction standards for pits of both kinds. Pits must be on level ground away from drainage pathways, with adequate storage capacity, fencing and means to prevent entry by birds, and must meet stated criteria for grading and free board.\footnote{173. See Onshore Oil and Gas Order No. 7, supra note 161, at 47,364 (imposing construction requirements for pits).} Lined pits are further required to be lined with impervious materials that will be resistant to the contents of produced water and to have systems in place for the detection of leaks.\footnote{174. See Onshore Oil and Gas Order No. 7, supra note 161, at 47,364 (imposing construction requirements specific to lined pits).} Pits that fall short of these standards are not approved unless a variance is issued.\footnote{175. See Onshore Oil and Gas Order No. 7, supra note 161, at 47,364 (imposing penalty for noncompliant proposals).}

These regulations appear to have already imposed substantial controls on resource extraction from federal and tribal land, albeit not without pushback from some tribes.\footnote{176. See Bureau of Land Management’s Hydraulic Fracturing Rule’s Impacts on Indian Tribal Energy Development: Hearing Before the Subcomm. on Indian and Alaska Native Affairs, 112th Cong. (2012) (statement of Wilson Groen, President and CEO, Navajo Nation Oil & Gas Co.) [hereinafter Groen testimony] (arguing that industry best practices are adequate protection, and that current rules already erect “unique hurdles” to tribal energy development); Bureau of Land Management’s Hydraulic Fracturing Rule’s Impacts on Indian Tribal Energy Development: Hearing Before the Subcomm. on Indian and Alaska Native Affairs, 112th Cong. (2012) (statement of T.J. Show, Chairman, Blackfeet Tribal Business Council) [hereinafter Show testimony] (discussing delays and costs of the current regulatory scheme).} As under state regulations, operators under the federal rules are subject to oversight of the nature and extent of drilling, as well as to substantive requirements for casing and wellbore integrity.\footnote{177. Compare supra notes 151–53 and accompanying text (requiring operators to submit drilling plans and to meet established criteria for well casing, cementing, and pressure testing, in order to protect nearby water) with supra notes 67, 70, and accompanying text (discussing North Dakota’s analogous regulations for well specification and casing plans, as well as casing and cementing requirements sufficient to protect nearby water) and supra notes 97, 100–105, and accompanying text (discussing Montana’s analogous regulations, imposing more stringent standards for drilling so as to prevent water pollution, applications’ requirement of drilling plans, and standards for casing, cementing, and well integrity).} The federal rules also impose broadly comparable requirements on the use of pits to store flowback water, appearing to take a more permissive approach to their use while imposing more specific construction requirements.\footnote{178. Compare supra notes 164, 168–70, 172 (permitting temporary storage for 90 days and emergency storage for 48 hours in reserve pits, but requiring disclosure before approval,}
less rigorous than their state counterparts in their treatment of hydraulic fracturing operations; a comparison of federal rules to state laws and regulations (many of which, on this point, are admittedly of recent vintage) reveal a lacuna in the federal rules, with many provisions of state law having no federal counterpart currently in force. This disparity at least suggests the need for the federal rules to address hydraulic fracturing with specificity—North Dakota and Montana, no less than tribes, have an interest in the economic benefits of increased oil and gas production within their jurisdictions, but have nevertheless seen fit to regulate the practice—although it does not automatically follow that Indian trust land should fall under the same regime as public lands.

compliance with water quality and liner material standards, and fit within one of multiple compliance categories for unlined pits) with supra notes 79–81, 83 (discussing North Dakota regulations, limiting pit use to 72 hour emergency storage, while imposing fencing and screening requirements and only general requirements for pit impermeability) and supra notes 111–12, 114, 116 (discussing Montana regulations, prohibiting use of open pits to store frac fluids; limiting emergency use to 48 hours; and imposing dike, fencing, 5 gallon/day limit, and materials requirements on produced water pits).

Compare 43 C.F.R. § 3162.3-2 (requiring submission of the proposed operation beforehand only for “nonroutine” fracturing jobs, and a completion report for all jobs) with supra notes 73–75 (discussing North Dakota’s specific fracking rules, including limits on treatment pressure, inspection and testing requirements, fracking chemical disclosure, official notification requirements, and prohibition of leaks) and supra notes 107–10 (discussing Montana’s specific fracking rules, including pre-fracking information disclosure, disclosure of treatment methods and fracking chemicals, and requirements for separate casing integrity tests). It should be noted that this comparison does not take account of EPA or state regulation of hydraulic fracturing operations that use diesel fuels or fuel derivatives under the Underground Injection Control program of the Safe Drinking Water Act. See 40 C.F.R. Parts 144–47. With the exception of wells on the Fort Peck reservation, EPA administers the UIC program for all Indian lands in Montana and North Dakota. See 40 C.F.R. § 147.1351 (providing for EPA primacy over UIC wells in Indian Country in Montana, excepting Fort Peck); 40 C.F.R. § 147.1752 (providing for EPA primacy over UIC wells in Indian Country in North Dakota); 40 C.F.R. § 147.3200 (providing for tribal primacy over UIC wells on the Fort Peck reservation). Because EPA has estimated that only two percent of wells in states where it would administer the UIC program use diesel fuel in hydraulic fracturing, these rules are considered outside the scope of this note. See 77 Fed. Reg. 27,453 (May 20, 2012) (“[A] review of data available [through FracFocus] suggested that approximately 2% of wells that hydraulically fracture would be subject to SDWA UIC permitting requirements in states where EPA administers the UIC program.”) Fort Peck’s UIC rules will be discussed alongside other tribal regulation, infra notes 292–330 and accompanying text.

BLM’s proposed regulations were an attempt to fill the void in the federal rules exposed by the rapid increase in the use of fracturing.\textsuperscript{181} Although BLM has been widely criticized for proposing the rules after what was perceived to be inadequate tribal consultation,\textsuperscript{182} the substance of the rules was ostensibly intended to align with the modern requirements of state regulation.\textsuperscript{183} In their original form, the proposed rules required preapproval for all hydraulic fracturing, which may be obtained either during the existing application process for new wells or, for existing wells if fracking has not begun within five years of approval or if “significant new information” about area geology or the operation’s effects has arisen.\textsuperscript{184} The operator submission would now be required to include a description of the geology and formations where the proposed stimulation operation would take place; locations of “usable water” along with logs proving that the water supplies are protected from contamination; water sources or base fracturing fluid used; types of proppant used; and a description of the stimulation, including volume of fluid used, maximum treating pressure, estimated fracture length and height, and proposed methods of handling and disposing flowback water.\textsuperscript{185} Operators are further required to conduct a successful mechanical integrity test of casing or casing string prior to a

\textsuperscript{181} See 77 Fed. Reg. 27,693 (May 11, 2012) (noting that BLM’s current regulations on fracking were last amended in 1988, “long before the latest hydraulic fracturing technologies became widely used,” and that the bureau is following states’ lead in updating their regulations for public lands).

\textsuperscript{182} Compare id. (noting that BLM held four meetings in January 2012 that included 27 of 175 tribes invited to discuss the draft rules) with CERT comment, supra note 10, at 20–21 (arguing that BLM’s initial meetings were inadequate, and that the bureau subsequently failed to respond to tribal inquiries or requests for meetings with their governments).

\textsuperscript{183} See 77 Fed. Reg. 27,693–94 (May 11, 2012) (asserting that BLM attempted to “minimize any duplication between the reporting required for state regulations and for this regulation,” to integrate the disclosure regs with FracFocus, and to give effect to state rules where they are more stringent than federal regulations).

\textsuperscript{184} 77 Fed. Reg. 27709 (Oct. 19, 2012) (to be codified at 43 C.F.R. § 3162.3-3); see also 77 Fed. Reg. 27695 (May 11, 2012) (noting that the new regulation would supersede the current requirement limiting preapproval to “nonroutine” fracking and that the five-year requirement accords with Montana’s regulations).

\textsuperscript{185} 77 Fed. Reg. 27709–10 (Oct. 19, 2012) (to be codified at 43 C.F.R § 3162.3-3); see also 77 Fed. Reg. 27695–97 (May 11, 2012) (discussing the public health and safety purposes of the various requirements). The federal regulations speak in terms of “usable water” because “BLM has sought to protect all usable waters during drilling operations, not just fresh water” with the intention “to be more protective” of lower-quality water. Id. at 27695. Whereas the Montana rules speak in terms of “prevent[ing] . . . pollution of fresh water supplies” in their imposition of administrative duties, MONT. CODE ANN. § 82-11-123(3), the North Dakota rules are broader, requiring confinement of “[a]ll freshwaters and waters of present or probable value for domestic, commercial, or stock purposes,” N.D. ADMIN. CODE 43-02-03-20. The usable water standard has been criticized as imposing inordinate costs by requiring longer casings to provide adequate protection. See CERT comment, supra note 10, at 22–23 (projecting a cost increase of at least $74,000 per well).
fracturing operation.\textsuperscript{186} Pressure must be monitored during the course of the operation, and unexpected increases in pressure reported if they exceed a specified threshold.\textsuperscript{187}

After the fracturing operation is complete, operators would be required to report, within thirty days of the operation, the actual results of the operation, fluid sources used, and actual surface pressure experienced; actual fracture length and height; and the actual method of fluid disposal used from the site.\textsuperscript{188} Use of unlined pits for the storage of recovered fluids is apparently made impermissible, as the proposed rule provides only for storage in tanks or lined pits.\textsuperscript{189} Following completion, operators would also be required to disclose all additives used in the fracturing fluid, organized by trade name and purpose, as well as the chemical makeup by mass of all fracturing fluids used over the course of the completion operation.\textsuperscript{190} The additive components would ultimately be publicly disclosed through FracFocus.\textsuperscript{191}

The revisions to the proposed rules make substantive changes to the original proposal; but with a few exceptions that are significant for the purposes of this note, the amendments do not drastically depart from the original proposal.\textsuperscript{192} The revision expressly requires fracturing operations to

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\item See 77 Fed. Reg. 27710 (Oct. 19, 2012) (to be codified at 43 C.F.R. § 3162.3-3(d)) (deeming said test successful if at least 90 percent pressure is maintained for 30 minutes). BLM has pointed out that this standard is already in effect under Onshore Oil and Gas Order No. 2. See 77 Fed. Reg. 27697 (May 11, 2012) (“This requirement is the same standard applied in Onshore Order Number 2 . . . to confirm the mechanical integrity of the casing.”).
\item See 77 Fed. Reg. 27710 (Oct. 19, 2012) (to be codified at 43 C.F.R. § 3162.3-3(e)) (requiring monitoring of annulus pressure and reporting within 24 hours if pressure exceeds 500 PSI, and a subsequent report within 15 days). See also 77 Fed. Reg. 27697 (May 11, 2012) (“Unexpected changes . . . would provide an early indication of the possibility that well integrity has been compromised.”).
\item See 77 Fed. Reg. 27710–11 (Oct. 19, 2012) (to be codified at 43 C.F.R. § 3162.3-3(g)) (requiring specified disclosures after well completion).
\item See id. at 27710 (to be codified at 43 C.F.R. § 3162.3-3(f)) (requiring recovered fluid to be stored in either lined pits or tanks). See also 77 Fed. Reg. 27697 (May 11, 2012) (noting that this requirement is consistent with API recommendations, and is made necessary by the potential presence of hydrocarbons or additives in flowback water that “might degrade surface and ground water if they were to be released without treatment”). BLM subsequently clarified that the rule was intended to supersede Onshore Order No. 7 in the context of hydraulic fracturing and to permit storage in only lined pits or tanks. See revised rules, supra note 6, at 82 (“Onshore Order No. 7 allows disposal of produced water in unlined pits in certain circumstances. The BLM does not believe that storage of hydraulic fracturing flowback fluids in unlined pits is appropriate . . . .”)
\item See id. (to be codified at 43 C.F.R. § 3162.3-3(g)(4)–(5)) (requiring two tables describing the additive components as part of the post-completion disclosure).
\item See 77 Fed. Reg. 27698 (May 11, 2012) (“The BLM . . . is working with the Ground Water Protection Council in an effort to integrate this information into the existing Web site known as FracFocus.org.”).
\item See revised rules, supra note 6, at 22–23 (summarizing the revisions).
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comply with the performance standard for well operators to isolate usable water sources. It also streamlines the pre-fracturing approval process by eliminating the requirements that a compliance certification and a cement bond log be submitted before fracturing begins, and by allowing multiple similar wells to be considered for approval in tandem. Chemical disclosures may also be made through means other than FracFocus, and the chemical reporting burden has been substantially reduced. Where fracturing chemicals’ composition is a protected trade secret, the revision would permit operators to withhold details of the chemicals used, providing only an affidavit that the chemicals are exempt from disclosure.

The revision also strengthens some aspects of the regulation, creating a new required report on the success of corrections to inadequate well cementing before fracturing operations begin. Operators are also required to run at least one of a number of cement evaluation logs on casing segments that protect usable water, as well as make additional disclosures for fracture mapping and operation monitoring, particularly where fractures approach usable water sources. Tribes are also given authority to specify and exempt aquifers or water-bearing rock strata from the “usable water” classification that triggers some of the heightened requirements for operators. Finally, the revision includes a variance procedure whereby tribes could make Indian land exempt from parts of the federal rules, so
long as the variance is sufficiently protective to “meet or exceed the effectiveness of the rule provision it replaces.”

Although the proposed regulations would bring the federal rules up to speed with their state counterparts, they pose a variety of potential problems for tribes. For those tribes interested in development of their energy resources, new and more stringent federal regulations raise the danger of rendering oil and gas extraction in parts of Indian country uneconomical through delays and increased costs. The extent to which those delays will be significant is in dispute: BLM has asserted that preappraisal for hydraulic fracturing could be included in the existing permitting process without a significant increase in processing time, while tribal parties have projected that the regulations could delay approval by several months at the busiest field offices. Probable costs are similarly disputed: BLM estimates that implementation of the new rules would cost, in the most expensive scenario, about $44 million annually, but could save upwards of $50 million annually in remediation costs; while CERT posits

201. Id. at 33.

202. See, e.g., Groen testimony, supra note 176, at 3 (arguing that federal compliance for extraction on Indian land already involves substantial obstacles, and that a new rule will result in “additional and extraordinary delays” in the approval of tribal projects); Hall testimony, supra note 3, at 9–10 (noting that approval of oil and gas permits on Indian land may take up to twenty times longer than elsewhere and already involves substantial environmental review, and that additional burdens will negatively impact tribal revenue); Show testimony, supra note 176, at 4 (noting that permit applications on the Blackfeet reservation may take up to eighteen months, and could be further delayed by the BLM standards, which leave too much discretion to local officials and require too extensive chemical disclosure to practically implement).

203. See 77 Fed. Reg. 27695 (May 11, 2012) (“The BLM understands the time sensitive nature of oil and gas drilling and well completion activities and does not anticipate that the submittal of additional well stimulation-related information with APD applications will impact the timing of the approval of drilling permits.”).

204. See CERT comment, supra note 10, at 8–9, 13 (interpreting the proposed rule to require preappraisal of acid job stimulation, increasing the number of approvals required by fifty percent, and producing an eight-month delay in the Vernal, Utah field office’s 484-day turnaround time for Indian mineral approvals). CERT notes that delays could cost operators upwards of $25 thousand per day in rental fees for rigs and drilling equipment. See id. at 10–11 (noting that operators pay $25–30,000/day in rental fees even during delay downtime). It is worth noting that in the revised rules, BLM concedes that “some delays may be inevitable,” particularly at high-volume offices, but argues that the streamlining amendments and the availability of remote assistance from other offices will limit such delays. Revised rules, supra note 6, at 40.

205. See 77 Fed. Reg. 27701, table 3 (May 11, 2012) (projecting a $44.18 million annualized cost at a three percent discount rate and a high estimated number of well stimulations, but a $50.27 million social benefit where environmental risk and remediation costs are high). Most of the projected social benefit arises from the requirement that operators line open storage pits, as social benefit drops by about $41 million in the alternative scenario where no pit liners are required; but as BLM points out, the projection does not account for certain benefits that are difficult to quantify, including the public
that these estimates overlook various annual compliance costs on operators in Indian country, including $1.3 million paid to technicians to provide detailed well designs and $41.2 million for longer casing to comply with the usable water protection requirements, as well as the administrative costs to BLM of application processing, and the costs to tribes from depressed drilling demand and diminished royalties.\textsuperscript{206} Review of regulatory requirements for pre-fracturing approval will also impose administrative costs on tribes and the Bureau of Indian Affairs.\textsuperscript{207}

Of more serious concern is the effect of more stringent regulations on tribes interested in resource development. Under the original proposed rule, as a precondition of permit approval, operators would have been required to submit “[a] certification . . . that the proposed treatment fluid complies with . . . all applicable Federal, tribal, state, and local laws, rules, and regulations” to BLM.\textsuperscript{208} BLM purported to apply this regulation to all wells it administers, “including those on Federal, tribal, and individual Indian trust lands,”\textsuperscript{209} and initially expressed its intention to “implement on public lands whichever rules, state or Federal, are most protective of Federal lands and resources and the environment.”\textsuperscript{210} Although this language was susceptible to multiple interpretations, in the context of the rest of the rule, it appeared that BLM intended to apply, for the sake of

benefits of chemical disclosure and “such benefits as avoiding harm to water users that cannot be compensated by later providing alternative water sources,” \textit{Id}. at 27700–02.

\textsuperscript{206} See CERT comment, \textit{supra} note 10, at 10–14 (discussing the various expected costs resulting from the regulations, amounting to $48.9 million annually for operators on Indian land alone). It appears likely that many of CERT’s cost estimates, while not unfounded, are overly generous, anticipating costs that either are already incurred to comply with other regulatory requirements or would be incurred by an operator following the industry’s own best practices. See Onshore Oil and Gas Order No. 2, \textit{supra} note 152, 53 Fed. Reg. 46,808 (requiring, since 1988, that casing and cementing be adequate “to protect and/or isolate all usable water zones”); API, Guidance Document HF1, at 20–22 (establishing that “sophisticated software should be used to design hydraulic fracture treatments prior to their execution,” while pressure should be monitored for the duration of a stimulation and mechanical integrity monitored during the life of a well); \textit{id}. at 8–10 (noting that well logs are “critical data gathering tools” and that cement bond logs are “the most common type of cement evaluation tool that is used”); \textit{id}. at 15 (noting that when a fracturing treatment is designed, “[p]retreatment quality control and testing is carried out in order to ensure a high-quality outcome”); API, Guidance Document HF2, at 7 (describing the various additives that may be included in fracturing fluid, a “carefully formulated product” that service providers must design and compose for specific purposes in each operation); \textit{id}. at 17–18 (suggesting that fracking fluids and flowback water be stored in “tanks or lined pits.”)). This makes it more likely that BLM is correct in its assertion that the new regulations will impose a cost of about $11,833 per well, or 0.3% of the total cost of drilling, and therefore will be “unlikely to have an effect on the investment decisions of firms . . . .” \textit{77} Fed. Reg. 27702–03.

\textsuperscript{207} See CERT comment, \textit{supra} note 10, at 10–11 (discussing tribal and BIA review).

\textsuperscript{208} \textit{77} Fed. Reg. 27710 (to be codified at 43 C.F.R. § 3162.3-3(c)(4)).

\textsuperscript{209} \textit{Id}. at 27693.

\textsuperscript{210} \textit{Id}. at 27694.
uniformity, the most restrictive rule in a jurisdiction to a proposed well under its management. In certain contexts, this approach could be beneficial: by incorporating tribal law and regulation into the federal permit approval rules, it would ensure compliance with tribal rules, where they are more restrictive than federal law; thus, when a tribe like the Turtle Mountain Band decides to prohibit hydraulic fracturing entirely, the federal rule would appear to operate to effectively apply the tribal regulation to operations on federal and fee land, even if its independent applicability would otherwise be in dispute.

The trouble would have arisen in the inverse scenario, where federal or state law would be incorporated into federal permitting requirements so as to impose more stringent effective requirements on tribal or individual Indian land under federal management, thus placing a greater burden on operators than tribes would on their own. BLM has, correctly, mooted this concern by eliminating the offending certification language and making clear that it does not intend to apply state or local laws to Indian land. Because tribal sovereignty would typically prevent the operation of state law and regulation regarding such matters on Indian land, the original language could have had a deleterious and undesirable effect on tribal sovereignty, contrary to national policy.

211. See id. at 27692 (“The BLM proposes to apply the same rules and standards to Indian lands so that these lands and communities receive the same level of protection provided for public lands.”) Thus, although BLM clearly recognizes that Indian and public lands are two separate categories, it nevertheless seemed to propose applying uniform regulations to both. But see CERT comment, supra note 9, at 4 (arguing that because FLPMA excludes Indian and Native Alaskan trust land from its definition of “public lands,” BLM lacks all regulatory authority therein); Bureau of Land Management’s Hydraulic Fracturing Rule’s Impacts on Indian Tribal Energy Development: Hearing Before the Subcomm. on Indian and Alaska Native Affairs, 112th Cong. (2012) (statement of Scott Russell, Secretary, Crow Tribe) (arguing that by imposing regulation, “BLM continues to treat tribal lands like public land”); Bureau of Land Management’s Hydraulic Fracturing Rule’s Impacts on Indian Tribal Energy Development: Hearing Before the Subcomm. on Indian and Alaska Native Affairs, 112th Cong. (2012) (statement of the Hon. Don Young, Chairman) (“It is a rule that wrongly treats land held in trust for the exclusive use and benefit of Indians as public land.”).

212. See revised rules, supra note 6, at 25, 90–91 (creating separate certification clauses for certification on federal and tribal land, and specifying that “the revision is to clarify that this part does not apply State or local law to Indian lands.”).

213. See supra notes 129–37 and accompanying text (discussing the jurisdictional division between tribal and state governments).

214. See COHEN, supra note 64, § 1.07, at 93–107 (discussing the trend of federal policy since the late 1950s toward strengthening of the government-to-government relationship with tribes and greater deference to tribal decisionmaking); Memorandum of Nov. 5, 2009, Tribal Consultation, 74 Fed. Reg. 57,881 (directing executive agencies to collaborate and consult with tribes on federal policies affect tribes, in order to strengthen the government-to-government relationship).
be governed by them.” 215 Application of state law to tribes would be inconsistent with it; BLM was thus correct to heed commenters’ requests for clarification, and reject the interpretation that would have allowed imposition of state law through the certification requirement.216

But even with this correction, the revised rule risks creating a competitive disadvantage for tribes. Even if state law is more stringent than federal or tribal rules, tribes would remain subject to the more complicated permitting regime surrounding federally-managed wells and Indian trust land, limiting their ability to compete effectively. 217 Alternatively, if federal law is more stringent, states would enjoy a competitive advantage by operation of law: the federal rules would not apply to land outside BLM’s asserted authority—“the public mineral estate (including split estate where the Federal Government owns the subsurface mineral estate)” and Indian land subjected to the federal rules—leaving only the relaxed state standards to govern such land, and making it more attractive to developers than Indian land.218 Although the former, rather than the latter, scenario appears to be applicable to tribes in the Williston basin—the rules in Montana and North Dakota apparently being more stringent than the federal regulations on most points219—either situation risks predisposing operators to look to private land, state land, or federal public land (i.e. federal jurisdiction outside Indian country) before seeking to develop tribal or Indian trust land.220

Although BLM’s revision has reduced the competitive disadvantage by not subjecting tribes to both the cumbersome federal permitting procedure and more stringent state law, tribes are still left with the problem of cases where the federal rule is more restrictive than state rules, which could be solved by suspending its operation on tribal or tribal trust land, in which case BLM would defer to tribal regulation and/or allow tribes to opt into the federal regulations. Yet BLM has—needlessly—rejected this option as inconsistent with applicable law.221 The bureau points to the Indian Mineral Leasing Act’s authorization provision, which subjects mineral leases on Indian land to “the rules and regulations

216. See CERT comment, supra note 9, at 5–7 (calling on BLM to clarify its treatment of its authority to implement state law on Indian land and its interpretation of whether state law is “applicable” under the terms of the regulation).
217. See CERT comment, supra note 10, at 8 (discussing current delays in federal permitting on Indian land).
219. See supra notes 179–91 (comparing the proposed federal rules with Montana and North Dakota state regulation).
220. See CERT comment, supra note 10, at 7 (discussing the economic factors leading operators to look outside Indian country for development opportunities).
221. See revised rules, supra note 6, at 17 (discussing commenter proposals for a tribal exemption or an opt-out provision in the regulations).
promulgated by the Secretary of the Interior.”222 The bureau takes the authorization to mean that, because Interior “has consistently interpreted this statutory directive as allowing uniform regulations,” it would be inconsistent with Interior procedures to create a tribal exemption.223

Leaving aside the initial problem that the Department’s permissive authorization of uniform regulations is not the same as a mandate of such regulations, there is nothing in the statutory language indicating that “the rules and regulations promulgated by the Secretary of the Interior” must treat tribal land identically to federal land.224 It makes more sense to read this provision as merely placing Indian mineral leases under the Department’s rulemaking authority in the broadest terms, particularly as the line immediately following gives the Secretary full discretion to subject Indian mineral leases to “any reasonable . . . plan approved or prescribed by said Secretary” before the lease is issued.225 To the extent that the IMLA was concerned with regulatory uniformity, its focus was correcting the “haphazard” complex of legislation that had previously governed Indian mineral leasing up to that point; it sought uniformity in the regulations governing Indian mineral development, not all mineral development.226 The IMLA was a response to the passage of the Indian Reorganization Act, which was itself focused on expanding tribal sovereignty, and merely authorized the Secretary to promulgate “rules and regulations under which the [Indian mineral leasing] program would operate.”227

Given the weakness of BLM’s statutory basis for rejecting a tribal exemption from the new rules, and the policy of tribal self-determination that has only grown stronger in modern times, BLM should recognize that federal regulation must yield to tribal policy on this question. Such an approach would maintain the status quo of allowing tribes to resolve,

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222. Revised rules, supra note 6, at 17 (citing 25 U.S.C. § 396d (2012)).
223. Revised rules, supra note 6, at 17 (emphasis added).
225. Id. BLM cites no authority for its counterintuitive reading of the plain language of the statute; and to the extent that courts have addressed the Department’s ability to delegate authority to or create an exemption for tribes, their decisions provide only weak support, at best, for BLM’s interpretation. See Assiniboine & Sioux Tribes of the Fort Peck Indian Reservation v. Bd. of Oil & Gas Conservation of Montana, 792 F.2d 782, 795-96 (9th Cir. 1986) (questioning BLM’s delegation of authority to state agency, given statute’s silence on subdelegation, but noting that delegations to tribes would differ because tribes have independent jurisdiction, the statute’s purpose was increasing Indian leasing authority and economic returns, and statutes are to be broadly construed in Indians’ favor); Kenai Oil & Gas, Inc. v. Dep’t of Interior, 671 F.2d 383, (10th Cir. 1982) (noting that the Secretary’s authority under § 396d is broadly construed but conditioned by the government’s trust responsibility, which requires profitable management and imposes a duty to maximize revenues).
227. Id.
through their own political processes, how they intend to treat hydraulic fracturing on their land.\footnote{228} It is those decisions—as well as potential and proposed future options for tribes, tribal members, and reservation residents—to which this note now turns.

V. Regulations and Remedies: Tribal and Individual Influence of Fracking

Up to this point, this note has primarily considered oil and gas development or restriction thereof from the perspective of tribal governments; however, given potentially localized effects of fracking operations,\footnote{229} in some circumstances the priorities of tribal governments may diverge from those of non-Indian reservation residents,\footnote{230} as well as individual tribal members.\footnote{231} As such, it is necessary to consider not only tribes’ approaches to regulating hydraulic fracturing, but also the remedies available to affected individuals.

A number of factors—significantly, the historical primacy of the federal government in managing Indian resources, and the lack of institutional and regulatory capacity in tribal governments—have hindered tribes’ abilities to comprehensively manage their natural resources and administer regimes of environmental regulation.\footnote{232} In the area of the Williston basin, a number of tribes have enacted general environmental codes;\footnote{233} of those tribes, the Three Affiliated Tribes at Fort Berthold and the Fort Peck Tribes—where most development and hydraulic fracturing has

\footnote{228. See supra notes 3–4 and accompanying text (discussing the divergence of tribal opinion on fracturing, from enthusiastic development to complete prohibition).}

\footnote{229. See, e.g., Osborn, supra note 44, at 8173 (finding a correlation between proximity to hydraulically fractured active gas wells and methane concentrations in drinking water).}

\footnote{230. See COHEN, supra note 64, § 18.06, at 1185 (“[M]any non-Indians own fee land within reservation boundaries . . . .”); cf. Knight v. Shoshone and Arapahoe Indian Tribes of Wind River Reservation, 670 F.2d 900 (10th Cir. 1982) (affirming partial summary judgment in tribe’s favor where it sued to enjoin non-Indian fee landowners’ development of property, contrary to tribal zoning ordinance).}

\footnote{231. Cf. Dine Citizens Against Ruining Our Env’t v. Klein, 439 Fed. App’x. 679 (10th Cir. 2011) (dismissing, for lack of jurisdiction, Navajo nonprofit’s challenge of Interior agency’s issuance of permit to company who leased mine from Navajo Nation).}

\footnote{232. See MAURA GROGAN, NATIVE AMERICAN LANDS AND NATURAL RESOURCE DEVELOPMENT 42–46 (2011) (discussing tribal challenges in shifting away from federal resource management in the self-determination era); THE HARVARD PROJECT ON AMERICAN INDIAN ECONOMIC DEVELOPMENT, THE STATE OF THE NATIVE NATIONS 165 [hereinafter HARVARD PROJECT] (discussing concerns that tribes “lack the institutional and enforcement mechanisms” and the human capital to properly deal with energy developers); id. at 184–87 (surveying tribal experience with environmental regulation and their efforts to build institutional capacity).}

been concentrated—have adopted regulations for oil and gas development, with implications for hydraulic fracturing.\textsuperscript{234} The explosion in exploration and extraction on the Fort Berthold reservation and in the surrounding area made a legislative response by the tribe urgently necessary.\textsuperscript{235} The reservation’s size and location has meant that, unlike the state of North Dakota, resource development (and the negative externalities associated with boomtowns and inadequate infrastructure) has ubiquitous effects throughout the jurisdiction.\textsuperscript{236} Those effects, in turn, can present acute difficulties because the Three Affiliated Tribes have—as do practically all other Native groups—unique legal ties, as well as social and cultural ones, to their reservation as a homeland.\textsuperscript{237} Because of those unique circumstances, the tribe began taking a more active role in regional oil and gas development, entering into development agreements on more favorable terms with operators, engaging in its own operations, and seeking to construct its own refinery on the reservation.\textsuperscript{238} In 2010, the tribe settled a longstanding dispute with the state over taxation of oil and gas production on the reservation, entering into a permanent agreement that settled applicable tax rates and division of revenues.\textsuperscript{239} The agreement provided for an equal division of revenues from production on tribal trust lands, diversion of twenty percent of state taxes on non-trust reservation lands to the tribe, and a tribal assessment of $100,000 in fees for each new well drilled on trust land.\textsuperscript{240}

\textsuperscript{234.} See CCOJ Title XXII, Ch. 2 (“Underground Injection Control”); Three Affiliated Tribes Tribal Code tit. 15, ch. 15.1 (“Solid and Hazardous Waste Management and Remediation Code”).

\textsuperscript{235.} See Raymond Cross, Development’s Victim or its Beneficiary?: The Impact of Oil and Gas Development on the Fort Berthold Reservation, 87 N.D. L. REV. (2011) 535, 537–38 (noting that the new hydraulic fracking and horizontal drilling technologies, in opening the Bakken formation to drilling, placed the Fort Berthold reservation at the center of the largest oil reserve in the continental United States).

\textsuperscript{236.} See id. at 538–43 (comparing North Dakota’s development approach of providing encouragement to developers and funding for improved infrastructure to Fort Berthold, where small land area results in a “disproportionate environmental burden” on a vulnerable population). But see Hall testimony, supra note 3, at 8–9 (noting that although the tribe “cannot just pick up and move to another reservation if our lands or waters are spoiled,” energy development has improved reservation conditions and the tribal economy).

\textsuperscript{237.} See Cross, supra note 235, at 543–46 (discussing the tribes’ treaty ties to Fort Berthold, legally a central aspect of tribal sovereignty, and the land’s distinctive connection to tribal culture and religion); HARVARD PROJECT, supra note 232, at 106–07 (“Land holds a special significance to Native nations that . . . goes far beyond the need to provide areas for tribal housing, community institutions, and business ventures.”).

\textsuperscript{238.} See Cross, supra note 235, at 552 (describing the tribe’s shifting position).

\textsuperscript{239.} See James MacPherson, North Dakota, Three Affiliated Tribes Garner Millions of Dollars From Oil Tax Accord, MINNEAPOLIS STAR–TRIBUNE, Jan. 15, 2010 (discussing the agreement, which made indefinite a prior temporary accord with the state).

\textsuperscript{240.} See Oil and Gas Tax Agreement Between The Three Affiliated Tribes And State of North Dakota §§ D–F (Jan. 13, 2010), available at
Yet oil and gas development also resulted in the improper disposal and discharge on the reservation of wastes associated with drilling and exploration, for which the tribe had established no regulations as late as 2011. In response, the tribe adopted interim regulations in July 2011 “governing the disposal of waste associated with the exploration and production of oil and gas on the Fort Berthold Reservation.” The tribe based its authority for the regulations on its inherent power, recognized in *Montana v. United States*.

Under the interim regulations, the tribe prohibited disposal of waste “associated with the exploration or production of oil and gas on any lands” within the reservation boundaries, except at an “authorized facility,” so defined to require prior approval by the tribal council of the facility for disposal. The regulations took a broad view of the kinds of activities that could constitute “disposal” and were thus subject to the regulation, including any “discharge”—accidental or intentional “spilling, leaking, pumping . . . [and] injecting”—as well as any deposit or placement “into or on any soil, air or water.” Concurrent enforcement authority was given to six tribal agencies: the Energy Department, Environmental Department, Game and Fish Department, Tribal Employment Rights Office (TERO), Fire Management Department, and tribal law enforcement. The TERO was given additional authority to audit the records of companies conducting oilfield waste disposal operations in order to ensure compliance with the rules. The tribal court was given jurisdiction over complaints and appeals.


241. See Tribal Bus. Council Res. 11-75-VJB, at 1 (2011) (noting that companies engaged in oil production on the reservation have begun improperly disposing of wastes, for which the tribe had no legal framework in place prior to the resolution’s passage on July 14).

242. *Id.*

243. See *id.* at 2 (reciting the *Montana* standard).

244. *Id.* at 2–3.

245. *Id.* at 2. The interim rule, though evidently broad, was not consistent in its terminology, as the definition for “discharge” and the prohibition clause referred to “waste,” and the definition for “disposal” referred specifically to “solid or hazardous waste,” whereas the interim regulation defined “hazardous substance” (not hazardous waste) as any substance, the improper management of which “may pose a substantial present or future hazard to human health or the environment . . . .” *Id.* at 2–3. This discrepancy was probably more formal than functional for present purposes, as the undesirable byproducts of hydraulic fracturing would probably qualify under any of the applicable terminology. Cf. *supra* note 41 (discussing various hazardous substances commonly found in fracturing fluid); *supra* note 111 (discussing the definition of “hazardous substance” in the Montana rules on oil and gas production).

246. See *id.* at 3 (providing “joint responsibility” for enforcement to the six agencies).

247. See *id.* (providing for 24 hours’ notice prior to a compliance audit, except in cases where the tribe was notified of a willful violation, in which case the audit is to be conducted immediately).
The interim regulation also provided substantial civil penalties for violations, categorized based on whether they were willful or merely negligent. Negligent violations were subject to a $5,000 fine for the first offense, which doubled for the second violation and increased to $50,000 for each offense thereafter. Willful violations are treated more severely, with a $10,000 fine levied for the first offense, which increases to $25,000 for the second offense and $1,000,000 for each willful offense thereafter. Violators are also made liable for the costs of remediation needed to prevent environmental damage or risk to public health. Repeated violations, failure to pay a fine, or failure to fulfill a remediation obligation is made grounds for suspension or revocation of an individual or company’s TERO license.

Many of these requirements were ultimately incorporated into the permanent version of the tribe’s Solid and Hazardous Waste Management and Remediation Code, which went into effect in October 2011. Although the permanent chapter has a much broader scope than the interim regulations, it was enacted in large part with oil and gas development in mind, the Tribal Council recognizing the “increasing volume and variety of solid and hazardous waste being generated on the reservation” and the need for appropriate “utilization of natural resources of oil and gas . . . while minimizing any adverse impacts to public health or the environment.”

The regulations adopt substantially the same definitions for approved disposal sites, “discharge,” and “disposal” as in the interim regulations. However, they create a much clearer status for the byproducts of hydraulic fracturing, and oil and gas production generally, by placing most of these under the specified category of “industrial wastes.”

248. See id. (establishing tribal court jurisdiction).
249. See id. (establishing the schedule of fines).
250. See id. (establishing the schedule of fines).
251. See id. (establishing the schedule of fines).
252. See id. at 4 (imposing the remediation requirement).
253. See id. at 4 (authorizing suspension or revocation of the TERO license). A TERO license, under which employers are required to offer employment or contracting preference to tribal members, is mandatory under tribal law to conduct business on the reservation. See Three Affiliated Tribes of the Fort Berthold Reservation, Mandan Hidatsa and Arikara Nation Indian Employment Rights and Contract Preference Ordinance, Titles II, VII, available at http://mhatero.com/attachment/cms/AXT_3_IL6J.pdf (outlining the employment preference and providing for fines or denial of rights to conduct business for noncompliance).
254. See Three Affiliated Tribes Tribal Code tit. 15, ch. 15.1, at 1 (stating that the chapter was passed by the Tribal Business Council on Oct. 20, 2011).
255. Id. §§ 1.04.2–1.04.3.
256. See id. § 2.01 (defining terms).
257. See id. § 8.02.14 (classifying “[o]il and gas exploration and production wastes, to include petroleum or crude-oil contaminated soils” as industrial waste, and thereby subject
Industrial waste may not be stored or disposed of within the reservation boundaries except at a facility specifically authorized and permitted by the Environmental Division (ED).258

The terms of the rules are sufficiently broad to encompass fracturing fluid and flowback water in the scope of their regulation.259 The rules would also capture any storage of fracturing fluid or flowback water in a surface pit or tank and treat such storage as solid waste management.260 This would appear to mean that, as a general matter, such storage would be subject to the permitting requirements for solid waste management facilities;261 however, the rules make specific provision for permits for oil and gas waste “accumulated, stored, or treated at the point of generation.”262 Such facilities are governed by the regulations’ requirements for permits by rule, instead of the general permitting requirements.263

Under those requirements, operators must give the ED ten days’ notice before beginning to generate waste, are limited to 180 days of waste management, and must conduct accumulation and storage in such a way as

to specific compliance requirements). Hydrogen sulfide releases from production facilities are also treated as industrial waste. See id. § 8.02.16 (classifying hydrogen sulfide releases). “Industrial waste” is itself defined to include “residues or spills of any industrial or manufacturing process and waste resulting from . . . petroleum refining; oil and gas exploration and extraction; [and] other mineral extraction . . . .” See id. § 2.01 (defining “industrial waste”).

258. See id. § 8.02 (discussing generally the management of special and industrial wastes). For the purposes of this discussion, and because the rules’ treatment of oil and gas waste appears to so indicate, oil and gas waste is presumed not to be a “hazardous substance,” in which case disposal within the reservation boundaries would be totally prohibited. See id. § 6.02 (enacting the prohibition); id. § 2.01 (defining “hazardous substance” by reference to the designations in CERCLA, the Clean Water Act, the Solid Waste Disposal Act, the Clean Air Act, or an EPA Administrator designation pursuant to the Toxic Substances Control Act).

259. See id. § 2.01 (defining “solid waste” to include “liquid . . . resulting from industrial, commercial, mining, oil and gas development and production”).

260. See id. (defining “storage” broadly to include any “confining, containing, [or] holding . . . . of solid waste for a limited period of time prior to” treatment or ultimate disposal); id. (defining “surface impoundment” to include liquid-bearing depressions used for containment or disposal, including holding, storage, settling, and aeration pits, ponds, and lagoons.”); id. (defining “facility” to mean land, structures, and improvements involved in solid waste management, including surface impoundments).

261. See id. § 13.01(b) (requiring a general permit for solid waste disposal, collection, or transfer); id. § 14.05 (outlining the application requirements for management facilities at which solid waste is to be stored, collected, treated, or otherwise managed).

262. Id. § 13.03.7.

263. See id. § 8.02.14 (providing that oil and gas waste is to be treated as industrial waste and subject to compliance with Section 13’s permit-by-rule requirements); id. § 13.03 (providing that permits by rule entail permission constructively issued without formal application, so long as the operator gives the ED timely notice, pays applicable fees, and remains in compliance with applicable rules).
to create no public nuisance or hazard.264 Public access to the waste management units must be controlled, but the Environment Division director or a designee must be able to access the units at all times, and a sign must be posted identifying the date accumulation began.265 Perhaps most significant, the rules require that the waste management unit be “bermed, lined and covered with an impermeable material which has a nominal thickness of 6 millimeters, at a minimum,” and must also be covered if runoff from the unit is not controlled or a complaint about the unit’s odor has been made.266 The length of time during which a permit by rule shall be valid is left to the discretion of the Environment Division.267 Permits by rule may be modified or suspended by the ED Director, based on the terms of the permit, and are subject to review and public comment at any time.268 Permitees by rule are required to submit any permits or leases issued for operation of the facility, as well as documentation that these fulfill other tribal licensing requirements and that applicable fees have been paid, as well as any other forms or fees required by the ED.269

Presumably, waste that is not stored at the generation site is subject to the general requirements for waste management facilities.270 These rules are somewhat more rigorous than for permits by rule, as prior application and approval pursuant to Section 14 is required.271 Applicants must provide a description of the facilities and equipment to be used for storage, an evaluation of the geology and hydrology of the site, a statement of land uses on adjoining property, procedures in place to avoid leaks and spills, a description of programs used to train employees in proper management, plans for closure and post-closure maintenance of the facility, and other information deemed “necessary” by the ED or Natural Resources Committee.272 These permits may be valid for up to five years.273

Both permits by rule and solid waste management facility permits depend on the ED’s determination that “primary consideration is given to preventing environmental damage or health threats” and that long-term protection thereof has been the “guiding criterion.”274 To achieve these

264. See id. § 13.03.7–13.03.7.1 (outlining the requirements).
265. See id. § 13.03.7.2–13.03.7.3, 13.03.7.5 (outlining the requirements).
266. Id. § 13.04.7.4.
267. See id. § 15.03.3 (“Permit-by-Rule may be issued for a range of time periods to be determined by the TAT ED”).
268. See id. § 15.21 (providing regulations specific to permits by rule).
269. See id. § 14.03 (outlining the permit application requirements).
270. See supra notes 259–62 and accompanying text (analyzing the general requirements and the carve-out for onsite storage).
271. See Three Affiliated Tribes Tribal Code tit. 15, ch. 15.1, § 13.01 (requiring permits for solid waste collection facilities, to be obtained by application pursuant to Section 14).
272. See id. § 14.05 (outlining the permit application requirements).
273. See id. § 15.03.1 (stating length of permit validity).
274. Id. §15.01.
purposes, the Director is authorized to prohibit or place conditions on further waste handling, for the sake of environmental quality; to require compliance by the applicant facility; and to place conditions on the permit, including the implementation of mitigation measures and contingency plans to minimize damage from waste handling. The Director or a designee is entitled to inspect “any permitted premises” during regular operating hours or upon two hours’ notice. The rules expressly authorize denial of a permit in cases where the proposed method of waste handling poses a hazard to the environment, public health, or welfare or natural resources of the tribe; or where the applicant reasonably appears unlikely to comply with the tribal regulations, as because of a history of noncompliance with tribal or analogous state/federal regulations.

If there is a violation, the Director is authorized to take informal action (if the violation does not pose an imminent risk and is non-repetitive); to issue a notice of violation summarizing the compliance issues, schedule of compliance, and potential penalties; and, if noncompliance continues, to issue orders to submit to fines or penalties, to cease and desist construction or operation, or to take remedial action. Failure to comply with an administrative order and remedy a violation is declared grounds for suspension, modification, or revocation of a permit. The Tribal Court is also authorized to issue injunctions and other relief as needed to secure compliance.

Like the interim regulations, the permanent code also provides for civil penalties and liabilities, albeit with some alterations from the interim form. The permanent regulations authorize the Director to impose civil penalties for unauthorized handling/disposal of waste on the reservation, noncompliant waste facilities, or violation of a statutory or administrative regulation. Fines are assessed at a maximum rate of $25,000 per violation, per day that the violation continues, up to a per-incident maximum of $500,000 for negligent violations and $1,000,000 for willful

275. See id. § 15.01.1–15.01.5 (outlining the Director’s permitting authority).
276. See id. § 15.07 (establishing this authority).
277. See id. § 15.11 et seq. (stating grounds for permit denial).
278. See id. § 17.04 et seq. (authorizing enforcement actions).
279. See id. § 17.08 (authorizing the Director to take such action).
280. See id. § 18.04 (establishing Tribal Court jurisdiction and authorization).
281. Compare Tribal Bus. Council Res. 11-75-VJB, at 3 (providing distinct schedules of fines for negligent and willful violations) with Three Affiliated Tribes Tribal Code tit. 15, ch. 15.1, § 18.01.1.1 (providing a single schedule of fines, but different penalty caps for negligent and willful violations).
282. See Three Affiliated Tribes Tribal Code tit. 15, ch. 15.1, § 18.01.1 (stating grounds for civil penalties).
A person may also be required to perform between eight and 200 hours of community service for a violation. Notwithstanding imposition of administrative penalties, a violator may be liable for civil damages, if applicable; and may lose the right, temporarily or permanently, to continue engaging in activity on the reservation. An operator may be required to perform mediation or to reimburse the tribe for the cost of remediation, if remediation is found to be necessary. Finally, the regulations impose a notice requirement on operators if the release meets specified conditions.

Admittedly, it cannot be seriously argued that these regulations are as rigorous as those present in the proposed federal fracking rules; they do not even begin to address substantive drilling requirements, such as those for wellbore integrity, or mandatory disclosure of chemicals used in the stimulation and extraction process. In that sense, the rules take a conservative approach, and may not go as far as they should in the view of some observers. Nevertheless, it rightly falls to tribes as a matter of self-determination to decide the extent to which the industry is to be regulated, just as it falls to tribes to determine the extent to which each tribe will pursue mineral development at all. And as the prior assessment of the Three Affiliated Tribes’ regulations demonstrates, tribes may reasonably choose to take a restrained approach while nevertheless enacting substantive restrictions on extractive industries, even if those restrictions are modest but credible back-end incentives to discourage environmentally

283. See id. § 18.01.1.1 (stating the schedule of fines, assessment of which requires the concurrence of the tribal Public Safety Commissioner, tribal CEO, Tribal Council, or Tribal Court).
284. See id. § 18.01.1.2 (establishing this as an alternative to monetary penalty).
285. See id. §§ 18.01.1.4–18.01.1.5 (imposing liability for civil damages and potential forfeiture of rights to enter or conduct activity on the reservation).
286. See id. § 19.07 (authorizing required mediation and establishing reimbursement liability).
287. See id. § 19.13 et seq. (requiring notification of the tribal response program if a pollutant, contaminant, or hazardous substance is released that threatens health or the environment, is greater than 25 gallons, exceeds tribal or EPA water quality standards, is required by the Superfund amendments, or is otherwise required by the Director).
288. See supra notes 151–91 and accompanying text (making such provision in the current and proposed federal regulations).
289. See Cross, supra note 235, at 569 (arguing, in consideration of the interim regulations, that “the tribe may have to take further and more substantial regulatory steps if it wants to ensure that development is regulated in a legally and socially responsible manner . . .”).
290. See Grogan, supra note 232, at 43 (“This is what tribal self-determination means: the power of individual Indian nations to make meaningful decisions that reflect their own priorities and values, and their own calculations about what best serves their long-term interests. Under conditions of self-determination, different nations may make different strategic choices.”).
irresponsible behavior.291

The tribes at Fort Peck have similarly attempted to exercise some control over energy extraction on their reservation, but by assuming responsibility for underground injection control within their jurisdiction.292 Briefly described, the Underground Injection Control Program was implemented in order to require states—or, in the absence of state primacy, the EPA Administrator—to promulgate permitting regulations for all underground injection wells, in order to “prevent underground injection which endangers drinking water sources . . . .”293 The federal rules establish six categories of injection well, with Class II wells covering hydraulic fracturing for oil and gas extraction.294 Congress added the option for Indian tribes to attain enforcement primacy in 1986,295 and the Fort Peck tribes took over primacy for Class II wells on Nov. 26, 2008.296 However, since 2005, hydraulic fracturing using fluids or proppants other than diesel fuels has been excluded from the scope of the UIC program.297 This has meant that, at least within the context of hydraulic fracturing, the impact of the UIC program has been significantly curtailed.298 It remains significant in the context of the Fort Peck reservation, however, which as of 2011 had 29 Class II wells within the reservation boundaries.299

291. See supra notes 254–87 and accompanying text (outlining the tribal regulations).
292. See 40 C.F.R. § 147.3200 (establishing that the Assiniboine and Sioux Tribes at Fort Peck have assumed responsibility for administration of Class II wells within the reservation boundaries).
293. 42 U.S.C. § 300h(b)(1). See also 42 U.S.C. § 300h-1(c) (providing for EPA regulation in the absence of state primacy).
294. See 40 C.F.R. § 144.6 (establishing the six classifications); id. § 144.6(b)(2) (“Class II. Wells which inject fluids . . . [for enhanced recovery of oil and natural gas”).
296. See 40 C.F.R. § 147.3200 (providing the effective date for the Assiniboine and Sioux program).
297. See 42 U.S.C. § 300h-1(d) (defining underground injection as excluding “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.”); Pub. L. No. 109-58, § 322, 199 Stat. 694 (2005) (amending statute to include the current language).
298. See 77 Fed. Reg. 27,453 (May 20, 2012) (“[A] review of data available [through FracFocus] suggested that approximately 2% of wells that hydraulically fracture would be subject to SDWA UIC permitting requirements in states where EPA administers the UIC program.”).
299. See EPA, UIC Inventory by Tribe—2011, at 3, available at http://water.epa.gov/type/groundwater/uic/upload/uicinventorybytribe2011.pdf (providing a list of tribes and the number of each class of well at each reservation). By way of comparison, Fort Berthold had only three Class II wells in 2011. See id. at 3 (listing tribes and well numbers). A search of FracFocus reveals only four wells in the database where fracking is known to have occurred, three of which used petroleum distillates in their fracking operations. See http://www.fracfocusdata.org/fracfocusfind/Map.aspx (providing access to information on API well numbers 25085218640000, 25085218210000,
The federal regulations impose fairly rigorous minimum standards for state regulations on permitting and conditions for operation. Permitting requires demonstration that casing and cementing is adequate for fluid containment, usually with a cement bond long; plans for plugging and abandonment, and a surety to guarantee completion; limitation on operating pressure, to ensure that no fluid enters drinking water supplies; mandatory monitoring and reporting; and mandatory mechanical integrity tests at least once every five years, failure of which triggers shutdown of operations. For Class II wells specifically, a mechanical integrity test is required after every workover. Injection pressure is not permitted to exceed “that which would initiate and/or propagate fractures in the confining zone adjacent to” a drinking water source. Operators are required to test injection fluid to ensure compliance with permit parameters; to observe injection pressure, flow rate, and cumulative volume at least once monthly for enhanced recovery wells; and to submit an annual report of these observations. A number of other reporting requirements are also imposed, including reporting before integrity tests, after workovers or temporary abandonments, before changes in ownership, and before plugging and abandonment.

The Assiniboine and Sioux, in creating their own set of UIC regulations, have adopted many of the federal regulatory standards wholesale, by reference, but also included a number of original provisions, particularly for civil penalties and hearing procedures. The regulations prohibit any underground injection or construction of a new well without a permit from the Fort Peck Office of Environmental Protection; in this way, they differ from the federal regulations, which would permit injection wells authorized by rule, without a new permit. The tribes have also prohibited outright the operation of any Class I, III, or IV wells, which would include any wells injecting hazardous substances or nonhydrocarbon minerals

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301. See id. at 69 (discussing specifically Class II regulations).

302. Id.

303. See id. at 70 (discussing specifically Class II regulations).

304. See id. at 70 (discussing the reporting requirements for Class II wells).

305. See generally CCOJ, tit. XXII, ch. 2, §§ 200–81 (establishing the tribe’s UIC regulations).

306. Compare CCOJ, tit. XXII, §§ 201, 211(c) (stating that injection wells without a permit are prohibited, and refusing to permit authorization by rule) with 40 C.F.R. §§ 144.22, 144.31(c)(1) (authorizing existing Class II permits by rule for the life of the well, and requiring applications within four years of promulgation of a UIC program).
The tribal regulations adopt many of the federal general provisions by reference, including well classifications, provisions for confidentiality of submitted information, modes of identifying and exempting underground sources of drinking water, noncompliance reporting requirements, and prohibitions regarding Class II wells on the movement of fluid into drinking water sources. Likewise, they adopt most of the federal permitting regulations, including those on area and emergency permits, permit duration and compliance effects, continuation, transfer, permit conditions, monitoring requirements, and corrective action. The tribal regulations, however, set original requirements for operator requirements, monitoring, and notices. Permit applicants are required to include a surety bond, to report all owners of surface and mineral rights and operators of injection wells within ¼ mile of the applicant’s well, and to perform a cement bond log if the well is a converted production well. The tribal rules further require approval by the Office of Environmental Policy (OEP) Director before a permit may be transferred, performance of a cement bond long as a permit condition, and 24 hours’ notice prior to the OEP before corrective action is taken. Most notably, more stringent monitoring requirements are imposed: the rules require monitoring of injected fluids at least annually, as well as on any occasion where the source changes or the operator believes quality may have changed; recording of every observance of injection pressure, flow rate, and volume; and a daily record of volume, hours in service, maximum pressure, average pressure, and annulus pressure for produced fluid operations. The tribal rules substantially assume the federal provisions for permit procedures, public comment, issuance, and state compliance evaluation programs.

In regard to substantive technical requirements, the tribal rules adopt the federal technical criteria for Class II wells required of state enforcement programs, including those for exempted aquifers, mechanical integrity, plugging and abandonment, construction, operation, and monitoring. But the tribe has also imposed additional substantive requirements of its own. Operators are required to maintain gauges of fluid.

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307. See CCOJ, tit. XXII, § 204 (defining the well classes); § 211 (“Any underground injection into a Class I, III, or IV well is prohibited.”).
308. See id. § 211(b) (adopting the CFR provisions on these points).
309. See id. § 221(a) (imposing variations from the adopted federal regulations).
310. See id. § 221(b)(7), (8), (14) (imposing the requirements).
311. See id. § 221(b)(11) (imposing the requirements).
312. See id. §§ 231, 250 (adopting the CFR provisions on these points).
313. See id. § 241 (adopting the CFR provisions on these points). See also supra notes 176–79 and accompanying text (summarizing the federal provisions).
314. See id. § 242 (“Additional Requirements”).
tubing and annulus pressure, and to notify the OEP whenever a well loses integrity or 24 hours before a workover. Operators are also prohibited from commencing injection at any well until the OEP has approved of the submitted cement bond log. Finally, annual inspections of temporarily abandoned wells are required, along with the requirement that owners and operators make a satisfactory showing that the well complies with the requirements for active wells and does not pose a risk to drinking water sources.

In contrast to the other regulations, the tribe’s enforcement provisions are almost entirely original, rather than incorporated by reference from the federal regulations with modification. When a violation is discovered, the OEP may seek to obtain voluntary compliance through any appropriate means available. The OEP is entitled to issue either a notice of the violation and a schedule of compliance requirements, or an administrative order imposing penalties and/or compliance requirements, subject to the opportunity for a hearing on the proposed order at which the alleged violator may contest the allegation or contents of the order. The OEP is also authorized to subpoena alleged violators regarding the violation, or to seek criminal penalties or other judicial relief; and to seek civil penalties as an alternative to administrative order. The Tribal Court is given authority, on application of the OEP, to compel compliance with a subpoena or testimony order, order payment of civil and administrative penalties, restrain or enjoin violations or behavior that endangers the environment or public health, and order compliance with a permit condition or well closure.

Like the Three Affiliated Tribes’ regulations, the Assiniboine and Sioux regulations entail substantial monetary penalties for violations of the injection requirements. Administrative penalties are to be assessed based on the seriousness of a violation, resulting economic benefits accruing to the operator, the operator’s compliance history, good-faith efforts to comply, economic impact of the penalty, and “such other matters as justice may require.” Assessments must be between $1,000 and $5,000 per day of violation, with a maximum cumulative penalty of “$125,000 for all

316. See id. § 242(a)–(b) (imposing the requirements).
317. See id. § 242(d) (imposing the requirement).
318. See id. § 242(c) (imposing the requirement).
319. See generally id. §§ 250–60 (establishing provisions for administrative enforcement, civil and criminal penalties, judicial relief, and appeals).
320. See id. § 251(h) (noting that OEP enforcement authority does not exclude option of soliciting voluntary compliance).
321. See id. § 251(a)–(d) (outlining OEP authority in regard to violations).
322. See id. § 251(f) (outlining courses of action in addition to or as alternatives from an administrative order).
323. See id. §§ 251(g), 255(a) (outlining Tribal Court authority).
324. Id. § 252(b).
Civil penalties may result from failure to comply with permit conditions or well regulations, and may be assessed at a rate between $1,000 and $25,000 per violation, per day. Non-Indian violators may be precluded from conducting business on the reservation, at the OEP’s discretion. Yet the rule goes beyond monetary penalties, declaring each day of violation by an Indian violator to be a Class A misdemeanor, thus punishable by a maximum $500 fine or three months’ imprisonment, and authorizes the OEP to refer violations by non-Indian violators to the EPA for appropriate criminal enforcement.

Although the applicability of these rules in the context of hydraulic fracturing is necessarily limited in scope by the jurisdictional limitations of the SDWA, they nevertheless demonstrate the fact that tribes can make and execute regulatory determinations to the extent they consider necessary. But notwithstanding the importance of tribal regulation and policy judgments about how to treat and deal with energy resource development, tribal oversight may not be enough: tribal jurisdiction only extends so far, and where tribal government priorities are inconsistent with those of states or reservation residents, it may be necessary to look to other sources of protection.

For individuals, the obvious (and perhaps only) mode of recourse other than government regulation is judicial remedy; yet so far, the claims of plaintiffs who have alleged environmental damage from hydraulic fracturing operations have had a dismal track record, principally because of the difficulty of proving causation. To the extent that cases have

325. Id. § 252(a).
326. See id. § 253(a) (“[Compliance failure authorizes] civil penalties of at least $1,000 but not more than $25,000 per day. The maximum civil penalty shall be assessable for each instance of violation and if the violation is continuous, shall be assessable up to the maximum for each day of violation.”).
327. See id. § 253(b) (authorizing the OEP to set a period of time during which the non-Indian violator’s privilege of conducting business on the reservation is suspended).
328. See id. § 254(a)-(b) (outlining criminal penalties for Indian and non-Indian violators); CCOJ tit. VII, § 501(2) (establishing the penalty for a Class A misdemeanor). As a general matter, tribes lack criminal jurisdiction over non-Indians, and have jurisdiction over member and nonmember Indians only to the extent not limited by federal law. See COHEN, supra note 64, § 9.04, at 765–69 (discussing jurisprudential limitations on tribal criminal jurisdiction over non-Indians and federal statutory schemes creating federal jurisdiction for crimes involving only Indian parties); 25 U.S.C. §§ 1302(a)(7), 1302(b) (limiting tribes’ authority to impose fines and terms of imprisonment in criminal cases).
329. See supra note 293 and accompanying text (excluding hydraulic fracturing not involving diesel fuels).
330. See Grogan, supra note 232, at 45–46 (arguing that tribes must build their own management capacities and that “the best way for the government to honor its trust obligations is to stop trying to determine what is in the best interest of tribes and instead support tribal efforts to make that decision autonomously.”).
331. See King et al., supra note 26, at 344 (“To date, not one landowner’s claim has succeeded, and at least two cases were voluntarily dismissed when the plaintiffs realized
concerned the stimulation and extraction operation itself, rather than a collateral part of the development process or legal issue.\textsuperscript{332} They have most typically relied on either common-law causes of action in tort, breaches of contract, or fraud.\textsuperscript{333} Courts have left open the possibility that, at least as a matter of law, fracturing itself could constitute a nuisance or trespass, with at least one court determining that the related activity of underground wastewater injection can constitute a nuisance by creating solely subsurface pollution.\textsuperscript{334} Courts have also refused, when hydraulic fracturing specifically is at issue, to dismiss plaintiffs’ claims when they brought strict liability, medical monitoring, and nuisance claims against an operator whose allegedly faulty well casing resulted in pollution.\textsuperscript{335} A plaintiff may also have a viable cause of action for breach of contract, if the plaintiff has a surface or mineral estate lease with the defendant that includes covenants on water quality testing or condition of the land; or fraud, if a plaintiff can establish harm from “justifiable reliance on a misrepresentation or omission” regarding the risks of fracturing.\textsuperscript{336}

Despite these as-yet hypothetical modes of recovery, no hydraulic fracturing case has been decided in a plaintiff’s favor, and hence, there has been no finding of causality between hydraulic fracturing and an alleged harm; those cases that are not still ongoing have either been dismissed or

\textsuperscript{332} See Neslin, supra note 331, at 11–15 (discussing unsuccessful cases that have hinged on the parties’ ability to obtain treatment as a class, inadequacy of environmental review under NEPA or a state equivalent, or claims based on local ordinances that were preempted by statewide frameworks).

\textsuperscript{333} See Neslin, supra note 331, at 4–8 (discussing the various approaches to claims).

\textsuperscript{334} See Wiseman, supra note 18, at 9 (discussing the Texas case FPL Farming v. Environmental Processing, in which this was held).

\textsuperscript{335} See Wiseman, supra note 18, at 10 (discussing Pennsylvania case Berish v. Southwestern Energy, noting that defendants’ decision only to challenge strict liability and medical monitoring claims may indicate the strength of the nuisance claim). See also Neslin, supra note 312, at 9 (noting that the Berish court, while declining to dismiss the strict liability claim, considered it unlikely to succeed but thought assessment on summary judgment motion post-discovery more appropriate).

\textsuperscript{336} See Neslin, supra note 331, at 7 (discussing these types of claims).
settled. Whether these difficulties in proving defendants’ responsibility for alleged pollution are caused by a substantive lack of merit or simply the evidentiary hurdles of proving causation, the results indicate that litigation is unlikely to be a promising source of protection for landowners seeking redress from fracturing injuries. In the absence of a sea change in the available causes of action or applicable evidentiary standards, individuals will likely be forced to “rely on public law solutions . . . that attempt to minimize and prevent nuisances from oil and gas drilling and fracturing . . .”

VI. Conclusion: Striking a Balance

If government regulatory systems are to be the primary check on hydraulic fracturing practices and the danger of pollution, they must be appropriately structured to provide substantive and adequate protection, while remaining consistent with the principles of tribal self-determination that guide Indian law and policy. As noted previously, one option might be to revise BLM’s proposed regulations to provide a carve-out exemption for wells within reservation boundaries, subjecting them only to more stringent permitting and operating requirements if the tribe opts into the regulations for public land or imposes its own. A similar result might be obtained if the exemption of non-diesel hydraulic fracturing from the UIC program were repealed, which would impose the same minimum standards for all hydraulic fracturing wells. Such an approach would entail significant trade-offs, as it would mean the imposition of certain extra-tribal regulatory standards on the tribal government—a move that tribes often justifiably resist—while affording tribal control over enforcement that may be more

337. See Neslin, supra note 331, at 4 (noting that two water contamination cases were dismissed on defendants’ motion, two on plaintiffs’, and one by a state agency, while four others settled).

338. Compare King et al., supra note 26, at 349–50 (arguing that plaintiff-landowners lack an understanding of fracking technique and embellish the effects of fracking on their property, when the results they argue are “physically impossible”) with Neslin, supra note 331, at 15 (noting that while causation difficulties appear to have discouraged new litigation, “the number of tort cases could increase if scientific studies provide reliable evidence linking hydraulic fracturing to ground water contamination or health impacts”).

339. Wiseman, supra note 18, at 11.

340. See supra note 228 and accompanying text (discussing this approach to the proposed regulations). Taken to its logical conclusion, this principle of tribal control might also counsel the removal of BLM or BIA from the permitting process entirely, or at least to the greatest extent administratively feasible. See Fredericks & Aseff, supra note 146, at 120–24 (discussing the considerable costs and burdens associated with federal permitting, and the uncertain jurisdiction of the agencies in any case).

341. See supra notes 293–98 and accompanying text (discussing the aims of the UIC program and the 2005 amendment).

342. See Comment Letter from Tex Hall, Chairman, Three Affiliated Tribes, to Environmental Protection Agency, at 1–2 (Aug. 23, 2012), available at
difficult to challenge than tribal regulation under inherent powers. In terms of practical politics, however, this appears unlikely to occur; revocation of the non-diesel fracking exception was proposed during the 112th Congress and left to die in committee.

Even these solutions would still leave unresolved the problem of differential regulatory standards in tribal and state jurisdictions, and the possibility for undesirable cross-border effects. A tribe like the Turtle Mountain Band that would elect stronger environmental protections in lieu of economic development has no real means to take preventative action against an operator outside its jurisdiction, and would be forced to rely on remedial action after the fact in case of a spill or leak. In some instances, however, Congress has given tribes the authority to be treated as states under federal environmental statutes for the purposes of administering those programs, as well as setting more stringent regulations than the minimum federal statutory requirements. In some cases, this has meant that tribes can, in effect, project their regulations outside their reservation boundaries in order to give effect to them within the ordinary scope of tribal jurisdiction. A similar approach could be taken in the context of fracturing, whereby federal law would give effect to tribal permitting and operation regulations that are more stringent than a state’s regulations if the wells are sufficiently close to a reservation that a spill or leak would cause environmental degradation or a danger to public health within the

http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OW-2011-1013-2701 (arguing that the proposed UIC guidance should only be applied to tribes if current operations are proved to be dangerous, and rejecting the notion that short-term fracking operations are properly within the scope of Class II well regulation).

343. See Cross, supra note 235, at 554 (noting that use of inherent authority is “more legally uncertain” than using delegated federal authority).


345. See COHEN, supra note 64, § 4.01[2][f], at 222 (noting that “[t]ribes have traditionally had power over both their members and their territory,” and thus have power over non-Indians only once they have entered reservation land) (internal quotations omitted). Cf. id. § 7.02[1][c], at 603 (noting that tribal courts’ subject matter jurisdiction extends outside Indian country only when exercise of off-reservation treaty rights, or other matters involving internal concerns of tribal members or issues of core sovereignty, are under consideration).

346. See id. § 10.03[2][a], at 793–97 (discussing Congress’ amendment of the Clean Water Act, Safe Drinking Water Act, and Clean Air Act to authorize tribal treatment as states, and subsequent court interpretations thereof).

boundaries of the reservation. To avoid creating widespread jurisdictional uncertainty, tribal authority probably must be circumscribed by a bright line, limited to wells within a specified distance from a reservation boundary or water source used on the reservation. While such an approach would provide effective means to enforce the strongest tribal environmental protections, it raises a host of practical difficulties, not the least of which is political infeasibility and the likelihood of extensive litigation.

At the same time, negative environmental results of lower standards could work in both directions, with more relaxed state policies working to the detriment of a reservation like Turtle Mountain, where fracturing is entirely prohibited; while on a reservation like Fort Berthold, less stringent tribal/federal regulations could work to the detriment of the state. Because the tribes and states have a shared area of regulatory concern—orderly administration of energy development and environmental protection in their border regions—each side stands to gain from a cooperative relationship with the other that would provide adequate mutual respect for the regulations of each government.348 Under such an arrangement, states and tribes might be able to negotiate terms that would maximize the ability of the less stringent regulator to foster energy production while assuring the more stringent regulator of the full benefits of its environmental protections. This could, for example, take the form of a buffer zone along a jurisdictional border—where development would be moderated by agreed-upon conditions, with the aim of insulating the more restrictive jurisdiction from air and water pollution on the other side—or a voluntary consensus on permitting and operation requirements for fracturing wells. Given that tribes have already taken steps in this direction, such as Fort Berthold’s agreement resolving taxation schemes with the state, a cooperative agreement on development and environmental protection should not be considered farfetched.349

Wherever the current debate over hydraulic fracturing regulation ultimately leads, it should be clear from the preceding review that a homogenous approach, imposed from the top down by a federal authority, will prove unsatisfactory. While it may provide substantive protections for some stakeholders, it is largely unable to take into account specific tribes’ judgments and goals regarding development of their energy resources. The fact that each tribe faces its own particular economic and environmental

348. See Cross, supra note 235, at 555–56 (noting that Fort Berthold’s new status as a leading energy producer means that “the tribe will have to work with the state to ensure the efficient and responsible development of their shared energy resources” in a way that avoids serious legal/political dispute); Harvard Project, supra note 232, at 72–77 (describing how states and tribes have begun entering into a variety of negotiated intergovernmental arrangements to solve complicated policy problems, which have allowed economic growth for states and expanded services for tribes).

349. See supra notes 239–40 and accompanying text (discussing the tax agreement).
circumstances necessarily means that the appropriate regulations for each will be different. The proper role of the federal government is to enable tribes to make informed judgments for themselves, whether that means providing resources for tribes to develop local regulatory regimes, granting tribes proactive regulatory authority, or brokering voluntary agreements between tribes and states. While prudent environmental management calls for oversight and substantive regulation of fracturing, and while the proposed federal rules fill a void in public lands regulation on the subject, tribal self-determination requires federal restraint, not federal intervention. Each tribe must be left to decide for itself what place, if any, hydraulic fracturing will have in its development of energy resources.