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Elizabeth Ann Glass Geltman*

OIL & GAS DRILLING IN NATIONAL PARKS

ABSTRACT

While a great deal of public attention addresses the Halliburton loophole of the Energy Policy Act of 2005 and Bureau of Land Management efforts to regulate hydraulic fracturing on public lands, less attention has been paid to the National Park Service "9B Regulations," which provide a national regulatory framework governing the exercise of oil and gas rights in national parks. This article begins with a review of law pertaining to oil and gas drilling in national parks. The article examines the tension in striking a balance between environmental protection, conservation of national lands, and achieving energy independence, including National Park Service proposals to revise the 9B regulations. The article concludes that because it is impractical to purchase the mineral rights in NPS units, it is critical to revise the 9B rules to: (1) raise the bond and financial assurance requirements; (2) create protocols that bring exempt operations within the 9B regulations (3) create access and user fees that reflect fair use; (4) allow administrative fines to be assessed for minor violations; (5) ensure all drilling meets modern safety standards including measures to preclude park damage after well closure; (6) require a baseline environmental assessment as a permit condition; and (7) require operators to map both surface and subsurface operations and record in land records the exact location of all pipes and other equipment installed in the land.

I. INTRODUCTION

The ability to extract oil and natural gas from shale is transforming both the energy markets and the landscape in the United States.[1] Technological advances are

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1. *See* Monika Ehrman, *Next Great Compromise: A Comprehensive Response to Opposition Against Shale Gas Development Using Hydraulic Fracturing in the United States*, 46 TEX. TECH L. REV. 423, 423, 424, 467 (2013); *see also* Timothy Fitzgerald, *Frackonomics*: *Some Economics of Hydraulic Fracturing*, 63 CASE W. RES. L. REV. 1337, 1341–1342, 1356 (2012); *see also* Henry D., Francis M. O'Sullivan & Sergey Paltsev, *The Influence of Shale Gas on U.S. Energy and Environmental Policy*, 1

changing the way the United States thinks about energy consumption.[2] In just a decade, the United States has gone from an importer of oil and natural gas to a major natural gas exporter.[3] Exports of natural gas are expected to continue to expand as liquefied natural gas (LNG) import terminals are shifted to become export terminals[4] and Congress lifts the ban on crude oil exports in the 2016 Omnibus bill.[5] In addition to exporting fossil fuels, the United States is also exporting the technology to extract

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ECONOMICS OF ENERGY & ENVTL POLICY 37, 50 (2012). *See also* Robert W. Kolb, *The Natural Gas Revolution and the World's Largest Economies*, SOC. SCI. RES. NETWORK, 1 (2012), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2136585.

2. MICHAEL RATNER & MARY TIEMANN, CONG. RESEARCH SERV., AN OVERVIEW OF UNCONVENTIONAL OIL AND NATURAL GAS: RESOURCES AND FEDERAL ACTIONS 13 (Apr. 22, 2015), https://www.fas.org/sgp/crs/misc/R43148.pdf; *see also* RESERVES AND PROD. DIV., OFFICE OF OIL AND GAS, ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, TECHNOLOGY-BASED OIL AND NATURAL GAS PLAYS: SHALE SHOCK! COULD THERE BE BILLIONS IN THE BAKKEN? (Nov. 2006), http://www.eia.gov/pub/oil_gas/natural_gas/feature_articles/2006/ngshock/ngshock.pdf ("Through the use of technology, U.S. oil and natural gas operators are converting previously uneconomic oil and natural gas resources into proved reserves and production."). *See* Anastasia Hudgins & Amanda Poole, *Framing Fracking: Private Property, Common Resources, and Regimes of Governance*, 21 ECOLOGY 222, 1–17 (2014) (for scholarly discussion about public opinion regarding shale gas extraction or "fracking"); Charles Davis & Jonathan M. Fisk, *Energy Abundance or Environmental Worries? Analyzing Public Support for Fracking in the United States*, 31 REV. OF POLICY RES. 1 (2014); Gwen Arnold & Robert Holahan, *The Federalism of Fracking: How the Locus of Policy-Making Authority Affects Civic Engagement*, 44 PUBLIUS: THE J. OF FEDERALISM 344 (2014); Elizabeth Bomberg, *The Comparative Politics of Fracking: Networks and Framing in the U.S. and Europe*, APSA 2013 Annual Meeting Paper 2 (2013), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2301196; *see generally* Erica Brown et al., *The National Surveys on Energy and Environment Public Opinion on Fracking: Perspectives from Michigan and Pennsylvania*, 3 ISSUES IN ENERGY AND ENVIRONMENTAL POLICY 1, 1–26 (May, 2013), *available at* http://closup.umich.edu/issues-in-energy-and-environmental-policy/3/public-opinion-on-fracking-perspectives-from-michigan-and-pennsylvania/; *see generally* Peter Jones et al., *Fracking and Public Relations: Rehearsing the Arguments and Making the* Case, 13 J. OF PUB. AFF. 384, 384–390 (2013); *see generally* Christopher P. Borick & Barry Rabe, *Belief in Global Warming on the Rebound: National Survey of American Public Opinion on Climate Change,* 44 ISSUES IN GOVERNANCE STUD. 1, 1–8 (2012); *see generally* Charles Davis & Katherine Hoffer, *Federalizing energy? Agenda Change and the Politics of Fracking,* 45.3 POLICY SCI. 221, 221–248 (2012).

3. *See, e.g.*, Paul L. Joskow, *Natural Gas: From Shortages to Abundance in the United States*, 103 THE AM. ECON. REV. 338, 346–47 (2013); Kenneth B. Medlock, *Modeling the Implications of Expanded U.S. Shale Gas Production*, 1 ENERGY STRATEGY REV. 33, 37–38 (2012); Stephen P.A. Brown et al., *Abundant Shale Gas Resources: Some Implications for Energy Policy, Resources for the Future* 1, 25 (2010), http://www.researchgate.net/profile/Rudolf_Egging/publication/242555291_Abundant_Shale_Gas_Resources_Some_Implications_for_Energy_Policy/links/00b7d5333e48a82808000000.pdf

4. FED. ENERGY REGULATORY COMM'N., NORTH AMERICAN IMPORT/EXPORT TERMINALS APPROVED (Oct. 20, 2015), *available at* https://www.ferc.gov/industries/gas/indus-act/lng/lng-approved.pdf. *See also* FED. ENERGY REGULATORY COMM'N., LNG (Oct. 20, 2015), *available at* http://www.ferc.gov/industries/gas/indus-act/lng.asp. *Compare* John Hurdle, *Gas industry urges U.S. to speed approval of LNG export terminals*, STATEIMPACT (April 16, 2015), https://stateimpact.npr.org/pennsylvania/2015/04/16/gas-industry-urges-u-s-to-speed-approval-of-lng-export-terminals/.

5. RULES COMM., 114TH CONG., CONSOLIDATED APPROPRIATIONS ACT, 2016 682, 682–683 (Comm. Print 2015), *available at* http://docs.house.gov/billsthisweek/20151214/CPRT-114-HPRT-RU00-SAHR2029-AMNT1final.pdf. *See also* Elana Shore, *Democrats Might Give Big Oil a big Win in Congress*, POLITICO (Dec. 7, 2015), *available at* http://www.politico.com/story/2015/12/big-oil-democrats-congress-216443.

energy resources from shale.[6] In short, natural gas that used to be considered "nuisance gas" is now an energy source that is poised to fuel the near, if not long-term, future.[7]

Expansion of energy resources yields a corresponding expansion of development. Many private landowners, encouraged by oil and gas developers, are currently engaged in a gold rush-style frenzy.[8] Landowners sitting on previously low-valued land (sometimes for generations)[9] now find themselves owners of land that might yield incredible riches.[10] Neighbors with competing interests disagree with each other over land uses[11] because new energy development is often difficult, if not incompatible, with historical land use patterns.[12] For instance, land uses involving recreational activities such as bed and breakfasts, luxury resorts, and camps do not coincide with oil and gas development.

The competition over best land use practices is not limited to use of private lands.[13] As riches from oil and gas grow, developers keenly eye the reserves sitting

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6. *See, e.g.*, Thomas W. Merrill, *Four Questions About Fracking*, 63 CASE W. RES. L. REV. 971, 992 (2012).

7. *See, e.g.*, Edward W. Cook, *Oil-shale technology in the USA,* 53.3 FUEL 146–151 (1974) (describing how interest in developing the technology to extract oil and gas from shale dates back to the energy crisis occurring during the Carter administration); *see also* Gary C. Bryner, *National Energy Policy: Assessing Energy Policy Choices,* 73 U. COLO. L. REV. 341, 344 (2002).

8. Juliet Eilperin, *Forest Lands in the East Attract Oil and Gas Bidders, but Some Question Rush*, WASH. POST (June 8, 2012) ("Private land overlying shale deposits can sell for thousands of dollars an acre; land in the most recent BLM forest leases averaged $47 per acre."), *available at* http://www.washingtonpost.com/national/health-science/forest-lands-in-the-east-attract-oil-and-gas-bidders-but-some-question-rush/2012/06/08/gJQA8lOvNV_story.html (last visited Nov. 7, 2015).

9. Anne Kates Smith, *Cash in on the Natural Gas Shale Boom*, KLIPINGER TODAY (Nov. 2011), http://www.kiplinger.com/article/business/T019-C000-S002-cash-in-on-the-natural-gas-shale-boom.html.

10. *See, e.g.*, Seamus McGraw, *The End of Country: Dispatches From the Frack Zone*, RANDOM HOUSE, 184–85 (2011); *compare* Tom Wilber, *Under the Surface: Fracking, Fortunes, and the Fate of the Marcellus Shale*, CORNELL U. PRESS, 9 (2012); *see also* NAT'L PARK SERV., U.S. DEP'T OF THE INTERIOR, POTENTIAL DEVELOPMENT OF THE NATURAL GAS RESOURCES IN THE MARCELLUS SHALE 1, 3 (December 2008), http://www.nps.gov/frhi/learn/management/upload/GRD-M-Shale_12-11-2008_high_res.pdf ("Development of the natural gas resource from the Marcellus Shale may pose numerous environmental and socioeconomic impacts for the four state area that overlies what may be the most productive areas of the shale.").

11. *See, e.g.*, Kai A. Schafft & Yetkin Borlu & Leland Glenna, *The Relationship Between Marcellus Shale Gas Development in Pennsylvania and Local Perceptions of Risk and Opportunity*, 78 RURAL SOC. 143, 150 (2013). *See generally* Darrick T. Evensen et al., *A New York or Pennsylvania State of Mind: Social Representations in Newspaper Coverage of Gas Development in the Marcellus Shale*, 4.1 J. OF ENVTL. STUD. AND SCI. 65–77 (2014); Charles Davis & Jonathan M. Fisk, *Energy Abundance or Environmental Worries? Analyzing Public Support for Fracking in the United States,* 31 REV. OF POLICY RES. 1, 1–16 (2014); Joseph A. Henderson & Don Duggan-Haas, *Drilling into Controversy: the Educational Complexity of Shale Gas Development,* 4.1 J. OF ENVTL. STUD. AND SCI. 87–96 (2014).

12. *See* Brian Black & Marcy Ladson, *The Legacy of Extraction: Reading Patterns and Ethics in Pennsylvania's Landscape of Energy,* 79 PENNSYLVANIA HISTORY: A JOURNAL OF MID-ATLANTIC STUDIES 377, 380 (2012); Lincoln R. Larson, T. Bruce Lauber & David L. Kay, *Building Local Capacity to Address Natural Gas Development*, CARDI REPORTS, 3 (Dec. 2014), *available at* https://cardi.cals.cornell.edu/sites/cardi.cals.cornell.edu/files/shared/documents/CardiReports/CaRDI%20Reports-16-draft03.pdf#page=7.

13. *See, e.g.*, Barry G. Rabe and Christopher Borick, *Conventional Politics for Unconventional Drilling? Lessons from Pennsylvania's Early Move into Fracking Policy Development*, 30 REVIEW OF

below public lands and waters.[14] In the United States, the government owns and preserves great land resources.[15] For example, the Forest Service (USFS) in the Department of Agriculture manages 154 national forests and 20 grasslands in 44 states and Puerto Rico.[16] The Department of Defense manages 19 million acres.[17] In the Department of Interior, the Fish & Wildlife Service (FWS) manages 150 million acres in the 551 National Wildlife Refuges;[18] the Bureau of Land Management (BLM) manages wilderness areas[19] and national monuments,[20] including over 245 million surface acres and 58 million acres of mineral estate lying beneath public lands;[21] and the National Park Service (NPS) manages over 407 areas covering more

POLICY RESEARCH 321 (2013) (for discussions of shale gas extraction as a land use issue); Charles Davis, *The Politics of "Fracking": Regulating Natural Gas Drilling Practices in Colorado and Texas*, 29 REV. OF POLICY RES. 177 (2012); Michael H. Finewood and Laura J. Stroup, *Fracking and the Neoliberalization of the Hydro-Social Cycle in Pennsylvania's Marcellus Shale*, 147 J. OF CONTEMP. WATER RES. & EDUC. 72, 72–79 (2012); Andrew Blohm et al., *The Significance of Regulation and Land Use Patterns on Natural Gas Resource Estimates in the Marcellus Shal*e, 50 ENERGY POLICY 358 (2012); Sorell E. Negro, *Fracking Wars: Federal, State and Local Conflicts Over the Regulation of Natural Gas Activity*, 35 ZONING & PLAN. L. REP. 1 (2012); Dianne Rahm, *Regulating Hydraulic Fracturing in Shale Gas Plays: The Case of Texas*, 39 ENERGY POLICY 2974 (2011).

14. *See* Robin Kundis Craig, *Hydraulic Fracturing (Fracking), Federalism, and the Water-Energy Nexus*, 49 IDAHO L. REV. 241 (2012); Rahm*, supra* note 13; Davis, *supra* note 13; *see also* Emily C. Powers, *Fracking and Federalism: Support for an Adaptive Approach that Avoids the Tragedy of the Regulatory Commons*, 19 J.L. & POLICY 913 (2010); Barbara Warner and Jennifer Shapiro*, Fractured, Fragmented Federalism: A Study in Fracking Regulatory Policy,* 43 PUBLIUS: THE J. OF FEDERALISM 474 (2013).

15. KATIE HOOVER, CONG. RESEARCH SERV., R43429, FEDERAL LANDS AND NATURAL RESOURCES: OVERVIEW AND SELECTED ISSUES FOR THE 114TH CONGRESS, 7-5700 (2015), http://nationalaglawcenter.org/wp-content/uploads/assets/crs/R43429.pdf [hereinafter HOOVER, CONG. RESEARCH SERV.]; *see also* ROSS. W. GORTE ET AL., CONG. RESEARCH SERV., R42346, FEDERAL LAND OWNERSHIP: OVERVIEW AND DATA 7-5700 (2012), *available at* https://fas.org/sgp/crs/misc/R42346.pdf.

16. U.S. FOREST SERV., U.S. DEP'T OF AGRIC., ABOUT THE AGENCY, http://www.fs.fed.us/about-agency (last visited Oct. 16, 2015).

17. *See* GORTE ET AL., *supra* note 15.

18. U.S. FISH & WILDLIFE SERV., U.S. DEP'T OF THE INTERIOR, ABOUT THE U.S. FISH AND WILDLIFE SERVICE 1395, http://www.fws.gov/help/about_us.html (last visited Oct. 30, 2015) (FWS also operates 70 National Fish Hatcheries, 65 fishery resource offices and 86 ecological services field stations); *see generally* Clinton T. Moore et al., *Adaptive Management in the U.S. National Wildlife Refuge System: Science-Management Partnerships for Conservation Delivery*, 92 J. OF ENVTL. MGMT. 1395, 1395–1402 (2011) (for discussion of the National Wildlife Refuge System); Steven M. Davis, *Preservation, Resource Extraction, and Recreation on Public Lands: A View from the States*, 48 NAT. RESOURCES J. 303, 306 (2008); Robert L. Fischman, *From Words to Action: The Impact and Legal Status of the 2006 National Wildlife Refuge System Management Policies*, 77 STAN. ENVTL. L.J. 78, 78 (2007); Robert L. Fischman, *Significance of National Wildlife Refuges in the Development of U.S. Conservation Policy*, 21 J. LAND USE & ENVTL. L. 1, 1 (2005); Charles G. Curtin, *The Evolution of the U.S. National Wildlife Refuge System and the Doctrine of Compatibility*, 7 CONSERVATION BIOLOGY 29, 30 (1993).

19. *See* BUREAU OF LAND MGMT., U.S. DEP'T OF INTERIOR, WILDERNESS AREAS, http://www.blm.gov/wo/st/en/prog/blm_special_areas/NLCS/Wilderness.html (last visited Oct. 30, 2015); *see also* Robert L. Glicksman, *Wilderness Management by the Multiple Use Agencies: What Makes the Forest Service and the Bureau of Land Management Different*? 44.2 ENVTL. L. 447 (2014).

20. *See* BUREAU OF LAND MGMT. U.S. DEP'T OF INTERIOR, NATIONAL MONUMENTS, http://www.blm.gov/wo/st/en/prog/blm_special_areas/NLCS/monuments.html (last visited Oct. 30, 2015).

21. Federal Land Policy and Management Act of 1976, 43 U.S.C. §§ 1701–1782 (West 2012); Mineral Leasing Act of 1920, 30 U.S.C. §§ 181–287 (West 2012); Mineral Leasing Act for Acquired Lands of 1947, 30 U.S.C. §§ 351–360 (West 2012); *see generally* BUREAU OF LAND MGMT., U.S. DEP'T

than 84 million acres in all 50 states, the District of Columbia, American Samoa, Guam, Puerto Rico, and the Virgin Islands.[22] Included in the areas the National Park Service manages are national parks,[23] monuments, battlefields, military parks, historical parks, historic sites, lakeshores, seashores, recreation areas, scenic rivers and trails, the National Mall and the White House.[24] In total, the United States government owns roughly 640 million acres of land constituting about 28 percent of the 2.27 billion acres of land surface in the United States.[25] Some of this federal land in national parks[26] and national wildlife refuges[27] is subject to split estates, where the federal government owns the surface property and private owners own the mineral rights lying beneath the land.[28] Other federal land is leasable from the BLM.

When available, leased BLM federal land costs developers less than comparable private oil and gas leases. Leases on private property overlying shale deposits typically sell for thousands of dollars an acre. For example, in 2012 private leases in Ohio above a shale play were more than $5,000 an acre.[29] Property in Pennsylvania's Marcellus Shale had reports of $7,000 an acre.[30] Private leases in producing locations often require an additional signing bonus. Bonuses in the Barnett

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OF INTERIOR, WHO WE ARE, WHAT WE DO, http://www.blm.gov/wo/st/en/info/About_BLM.html (last visited Oct. 30, 2015).

22. NAT'L PARK SERV., U.S. DEP'T OF INTERIOR, FREQUENTLY ASKED QUESTIONS, http://www.nps.gov/aboutus/faqs.htm (last visited Oct. 30, 2015). *See* A.S. Leopold et al., *Wildlife Management in the national parks: The Leopold Report* (1963), *available at* http://www.nps.gov/parkhistory/online_books/leopold/leopold.htm (last visited Oct. 30, 2015) (for a historic discussion of the role of national parks in the United States).

23. *See* Sandra B. Zellmer, *Wilderness Management in National Parks and Wildlife Refuges*, 44 ENVTL. L. 521 (2014) (for a history of how the national park system evolved).

24. NAT'L PARK SERV., U.S. DEP'T OF INTERIOR, FREQUENTLY ASKED QUESTIONS, http://www.nps.gov/aboutus/faqs.htm (last visited Oct. 30, 2015). *See* NAT'L PARK SERV., U.S. DEP'T OF INTERIOR, NOMENCLATURE OF PARK SYSTEM AREAS, http://www.nps.gov/parkhistory/hisnps/NPSHistory/nomenclature.html (last visited Dec. 6, 2015) (for an explanation for the NPS nomenclature). *See* NAT'L PARK SERV., U.S. DEP'T OF INTERIOR, ABOUT US, http://www.nps.gov/news/upload/CLASSLST-407-updated-02-25-2015.pdf (last visited Dec. 6, 2015) (for a list of national park regulated sites).

25. GORTE ET AL., *supra* note 15, at 7.

26. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. 65572 (Oct. 26, 2015) (to be codified at 36 C.F.R. pt. 1, 36 C.F.R. pt. 9).

27. Management of Oil and Gas Rights; Proposed Rule, 80 Fed. Reg. 77200 (Dec. 11, 2015) (to be codified at 50 C.F.R. pt. 28, 50 C.F.R. pt. 29).

28. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65572; Management of Oil and Gas Rights; Proposed Rule, 80 Fed. Reg. at 77200.

29. *Landowners dig in, sue over shale leases*, CRAIN'S CLEVELAND BUSINESS, http://www.crainscleveland.com/article/20120305/SUB1/303059993/landowners-dig-in-sue-over-shale-leases (last visited Oct. 31, 2015) ("Farmers were being offered, and were signing into leases, at around $50 per acre" five years ago, Mr. Arnold said. "Now, depending on the resources under the ground, you're seeing leases go for around $6,000 to $6,500 an acre."). *See generally* Sally P. Schreiber, *Before you sign: Natural gas lease tax issues*, JOURNAL OF ACCOUNTANCY (last visited Oct. 31, 2015), http://www.journalofaccountancy.com/issues/2013/nov/20138424.html ("From 2001 to 2011, Americans signed more than a million leases to allow energy producers to drill for natural gas on their land.").

30. Anne Kates Smith, *Cash In on the Natural Gas Shale Boom*, KLIPINGER MAGAZINE, http://www.kiplinger.com/article/business/T019-C000-S002-cash-in-on-the-natural-gas-shale-boom.html (last visited Oct. 31, 2015).

and Haynesville Shales were reported to reach between $30,00 and $40,000.[31] In contrast, land leased in BLM forests averaged only $47 per acre.[32]

Below the surface of some federal land are vast minerals.[33] Interest in leasing federal lands for oil and gas drilling is not new.[34] The nature of the debate has, however, accelerated with the development of new technologies[35] to extract oil and gas from shale,[36] including horizontal drilling[37] and high volume hydraulic fracturing (HVHF).[38] Fossil fuels on federal lands promise great wealth. Fossil fuels on federal land also promise a vast source of energy to fuel the United States economy.[39] In addition to showing the promise of more energy independence,[40] economists are increasingly looking at energy development on federal lands as an important federal asset that can reduce federal debt.[41] In 2012, the Congressional Budget Office estimated that the gross proceeds from the United States government's leasing of federal lands for oil and gas development would total about $150 billion over ten years.[42] As of July 2014, the United States entered into about 47,000 active oil and gas leases on federal land resulting in about 95,000 oil and gas drilled wells across 33 states.[43]

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31. *Shale' leasing activity reaches frenzy level*, THE PINEY WOODS JOURNAL, http://www.thepineywoods.com/ShaleAug08.htm (last visited Oct. 21, 2015).

32. Eilperin, *supra* note 8 ("Private land overlying shale deposits can sell for thousands of dollars an acre; land in the most recent BLM forest leases averaged $47 per acre.").

33. *See* Michael J. Boskin et al., NAT'L BUREAU OF ECON. RESEARCH, *New Estimates of the Value of Federal Mineral Rights and Land* 2 (1984), http://www.nber.org/papers/w1447.pdf ("Federal mineral rights are the single largest item in a complete balance sheet of the federal government, dominating the total value of tangible capital or financial assets. In 1981, for example, we estimate that the value of federal oil and gas rights exceeded $800 billion, which was larger than the privately held national debt.").

34. *See generally* Gary D. Libecap, *The Political Allocation of Mineral Rights: a Re-Evaluation of Teapot Dome*, 44.02 THE J. OF ECON. HIST. 381, 381–391 (1984). *See generally* Federal Land Policy and Management Act of 1976, 43 U.S.C. §§ 1701–1782 (West 1976); Mineral Leasing Act of 1920, 30 U.S.C. §§ 18-1966 (West 1920); Mineral Leasing Act for Acquired Lands of 1947, 30 U.S.C. §§ 351–360 (West 1947).

35. *See* 43 C.F.R. § 3160 (2015).

36. *See, e.g.*, Philip P. Cristaldi III, *Have We Been Looking at This All Wrong-Fracking and the BLM's Proposed Regulations: A Different Idea to Promote Safe Operations*, 2014 FED. CTS. L. REV. 21, 29 (2014).

37. *See* Gary D. Libecap, *The Political Allocation of Mineral Rights: a Re-Evaluation of Teapot Dome*, 44.02 THE J. OF ECON. HIST. 381, 381–391 (1984) (for a discussion of the developments in horizontal drilling); The 1990s saw a new improvements in horizontal drilling). *See, e.g.*, *Method and Apparatus for Horizontal Drilling*, U.S. Patent No. 5,148,875 (filed Sept. 24, 1991); Method of Horizontal Drilling, U.S. Patent No. 5,165,491 (filed April 29, 1991).

38. *See, e.g.*, Method and Materials for Hydraulic Fracturing of Wells, U.S. Patent No. 6,949,491 (filed Sept. 24, 2002). *See also* R. G. Agarwal et al., *Evaluation and Performance Prediction of Low-Permeability Gas Wells Stimulated by Massive Hydraulic Fracturing*, 31.03 J. OF PETROLEUM TECH. 362, 434 (1979).

39. *See* 80 C.F.R. § 16128.

40. David J. Lampe and John F. Stolz, *Current Perspectives on Unconventional Shale Gas Extraction in the Appalachian Basin*, 50 J. OF ENVTL. SCI. AND HEALTH 434, 434 (2015).

41. CONG. BUDGETARY OFFICE, POTENTIAL BUDGETARY EFFECTS OF IMMEDIATELY OPENING MOST FEDERAL LANDS TO OIL AND GAS LEASING 1, 1–9 (August 2012), *available at* http://cbo.gov/sites/default/files/cbofiles/attachments/08-09-12_Oil-and-Gas_Leasing.pdf [hereinafter CBO].

42. *Id.*

43. *See* 80 C.F.R. § 16128.

Federal ownership of land mass is not evenly distributed throughout the states.[44] Nevada has the largest federal ownership within its borders, with the federal government owning about 81 percent of the state.[45] Sixty-seven percent of Utah is managed by the federal government. Alaska and Idaho follow with about 62 percent federal land each.[46] Forty-eight percent of California and 36 percent of Colorado are federal lands.[47] In short, the federal government is the largest single landowner in many of the states with a historic practice of drilling for oil and gas.[48]

National parks are not excluded from the energy frenzy.[49] There are 13 national parks with active energy production currently operating within park borders: Alibates Flint Quarries National Monument, Aztec Ruins National Monument, Big Cypress National Preserve,[50] Big Thicket National Preserve,[51] Big South Fork National River and Recreation Area,[52] Cuyahoga Valley National Park, Fort Union Trading Post National Historic Site, Gauley River National Recreation Area, Lake Meredith National Recreation Area, New River Gorge National River,[53] Obed Wild and Scenic River,[54] Padre Island National Seashore[55] and Tallgrass Prairie National Preserve.[56] Other national parks, such as Theodore Roosevelt National Park in North Dakota,[57] Big Fork National River Recreation Area, and Obed Wild and Scenic River

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44. *See* HOOVER, CONG. RESEARCH SERV., *supra* note 15, at 11–13 (for a list of the acres the federal government owns in each state).

45. CBO, supra note 36, at 4.

46. CBO, supra note 36, at 4.

47. CBO, supra note 36, at 4.

48. CBO, supra note 36, at 4–5.

49. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. 65572 (Oct. 26, 2015) (to be codified at 36 C.F.R. pt. 1, 36 C.F.R. pt. 9).

50. *See* GEOLOGICAL RES. DIV., NAT'L PARK SERV., THE NATIONAL PARK SERVICE 9B OIL & GAS REGULATION REVISIONS: A PICTORIAL OVERVIEW 10, 12 (2014), http://www.nature.nps.gov/geology/oil_and_gas/documents/2014-01-29%20Pictorial%20Overview%20of%20Proposed%20%20Oil%20and%20Gas%20Rulemaking.pdf [hereinafter NAT'L PARK SERV., A PICTORIAL OVERVIEW]. *See also* Enabling Act for the Big Cypress National Preserve, 16 U.S.C. § 698m-4 (1988). General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65573.

51. *See* NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 12. *See generally* Enabling Act for Big Thicket National Preserve, 16 U.S.C. § 698 (1996).

52. *See* NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 12. *See generally* Enabling Act for Big South Fork National River and Recreation Area, 16 U.S.C. § 460ee(d)(2)(A), (3) (1974).

53. Enabling Act for New River Gorge National River, 16 U.S.C. §§ 460m-15–460m-30 (2012).

54. Enabling Act for Obed Wild and Scenic River, 16 U.S.C. § 1274(15) (1972).

55. Enabling Act for Padre Island National Seashore, 16 U.S.C. § 459d(3) (1962).

56. Enabling Act for Tallgrass Prairie National Preserve, 16 U.S.C. §§ 698u–698u-7(2007); Kurt Repanshik, *Oil and Gas Production and the National Parks*, NAT'L PARKS TRAVELER, http://www.nationalparkstraveler.com/2010/05/oil-and-gas-production-and-national-parks5803 (last visited Oct. 31, 2015).

57. *See* Melanie D.G. Kaplan, *Drilling Down*, NAT'L PARKS CONSERVATION ASS'N, http://www.npca.org/news/magazine/all-issues/2014/summer/drilling-down.html (last visited Oct. 31, 2015); Theodore Roosevelt IV, *Preserve our national parks*, USA TODAY, http://www.usatoday.com/story/opinion/2013/08/23/roosevelt-fracking-north-dakota-column/2682773/ (last visited Oct. 31, 2015); *National Parks and Hydraulic Fracturing: Theodore Roosevelt National Park*, NAT'L PARKS CONSERVATION ASS'N, https://npca.s3.amazonaws.com/documents/3213/8be9f7da-05a8-4cf1-9cc5-cdf98dec14a4.pdf?1445978694 (last visited Nov. 7, 2015).

in Kentucky and Tennessee[58] have energy development occurring just outside park borders.[59] Based on currently owned subsurface rights, NPS estimates that 30 more national parks are likely to have oil and gas development.[60]

By both statute and as owner of land, the federal government has the responsibility to balance land stewardship with other use of federal resources.[61] As such, the four agencies with primary control have all promulgated regulations determining how to balance the needs of economic development against development of extraction practices.[62] The scramble for use of federal lands to drill

58. NATIONAL PARKS AND HYDRAULIC FRACTURING: BIG SOUTH FORK, NAT'L PARKS CONSERVATION ASS'N. 1, 1–3 (2013), https://npca.s3.amazonaws.com/documents/2663/a47029a0-efe2-48f4-a363-f13c5fc007cb.pdf?1445978614 (last visited Nov. 7, 2015).

59. NATIONAL PARKS AND HYDRAULIC FRACTURING: BIG SOUTH FORK, NAT'L PARKS CONSERVATION ASS'N. 1, 1–3 (2013), https://npca.s3.amazonaws.com/documents/3214/c28cf261-563c-4f9f-a006-00ba7f75a59e.pdf?1445978695 (last visited Nov. 7, 2015).

60. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65574 (wherein NPS said: "Based on the presence of split estates, exploration and production occurring on adjacent and nearby lands, and likely future increases in energy price, we believe that oil and gas operations within park boundaries could affect up to 30 additional NPS units."). In a separate rulemaking, the Fish and Wildlife Service of the Department of the Interior estimated that future oil and gas development could also occur in many more national wildlife refuges. Management of Oil and Gas Rights; Proposed Rule, 80 Fed. Reg. 77200, 77201 (Dec. 11, 2015) (to be codified at 50 C.F.R. pt. 28, 50 C.F.R. pt. 29) ("Based on Service data from 2011, there are over 5000 oil and gas wells on 107 refuges in a total of 599 refuge units. Based on the presence of split estates (where the Service owns the surface estate and another party owns the mineral estate), exploration and production already occurring on adjacent or nearby lands, and future increases in energy prices, oil and gas operations within refuges potentially could affect many additional refuges.").

61. Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands, 80 Fed. Reg. 16127, 16129 (March 26, 2015) (to be codified at 43 C.F.R. 3160). *See also* M. Frieden, et al., *Hydraulic Fracturing on Federal and Indian Lands: An Analysis of the Bureau of Land Management's Revised Proposed Rul*e, 13-26 RESOURCES FOR THE FUTURE 1, 1 (August 2013), *available at* http://www.rff.org/RFF/Documents/RFF-DP-13-26.pdf.

62. *See* 43 C.F.R. Part 3100 (1992) (for BLM rules pertaining to oil and gas drilling); *see generally* U.S. DEP'T OF THE INTERIOR, BUREAU OF LAND MGMT., OIL AND GAS, *available at* http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas.html (last visited Oct. 3, 2015). *See* 36 C.F.R. Pt. 9B, (1978) (for NPS rules); *see generally*, NAT'L PARK SERV., DEP'T OF INTERIOR, *9B Overview*, http://www.nature.nps.gov/geology/oil_and_gas/9b_index.cfm (last visited Nov. 7, 2015). *See* 36 C.F.R. Pt. 228 (2013) (for USFS rules). *See also* U.S. FOREST SERV., DEP'T OF AGRICULTURE, SECTION 390 CATEGORICAL EXCLUSIONS FOR OIL AND GAS ACTIVITIES 1, 1–10 (2010), http://www.fs.fed.us/geology/June_2010%20guidance%20Sec%20%20390%20CE.pdf. *See also* FOREST & WILDLIFE SERV., DEP'T OF THE INTERIOR, FEDERAL OIL & GAS DEVELOPMENT ON NATIONAL WILDLIFE REFUGE SYSTEM LANDS 1, 1–2 (2015), http://www.fws.gov/refuges/oil-and-gas/pdfs/Oil-Gas-Fact-sheet.pdf; *see generally* NAT'L WILDLIFE REFUGE SYS., U.S. FISH & WILDLIFE SERV., DEP'T OF THE INTERIOR, OIL AND GAS (2015), http://www.fws.gov/refuges/oil-and-gas/index.html.

for oil and gas trapped in shale has caused a reexamination of federal policies in all four agencies: NPS,[63] BLM,[64] USFS[65] and FWS.[66]

This article examines the NPS's so-called "9B Regulations," the specific regulations that NPS promulgated to provide a national regulatory framework governing the exercise of non-federal oil and gas rights in national parks.[67] The study begins with a review of law pertaining to oil and gas drilling in national parks. The article examines the tension in striking a balance[68] between environmental protection, conservation of national lands and achieving energy independence, including a critique of the proposed revisions to the 9B regulations.[69] Finally, the

63. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. 65572 (Oct. 26, 2015). *See* William J. Lockhart, *External threats to our national parks: An argument for substantive protection*, 16 STAN. ENVTL. LJ. 3, 3–73 (1997) (for discussions of the balance of use in national parks)*;* WILLIAM ROBERT LOWRY, THE CAPACITY FOR WONDER: PRESERVING NATIONAL PARKS, (Brookings Inst. Press, 1st ed.) (1995); JOSEPH L. SAX, OUR COMMON LANDS: DEFENDING THE NATIONAL PARKS 1, 177, 185, 206, 233, 229, 390, 410 (David J. Simon, ed., 1988); George Cameron Coggins, *Protecting the wildlife resources of national parks from external threats*, 22 LAND & WATER L. REV. 1, 7 (1987); Robert B. Keiter, *On protecting the national parks from the external threats dilemma*, 20 LAND & WATER L. REV. 355, 366, 368 (1985). *See also* Joseph L. Sax, *Buying Scenery: Land Acquisitions for the National Park Service*, 1980 DUKE L.J.709 (1980). *See generally* Richard J. Ansson Jr., *Funding Our National Parks in the 21st Century: Will We Be Able to Preserve and Protect Our Embattled National Parks*, 11 FORDHAM ENVTL. L.J. 1, 41(1999); *see generally* Andrew Rumbach, *Natural gas drilling in the Marcellus Shale: Potential impacts on the tourism economy of the Southern Tier*, S. TIER CENT. REG'L PLANNING AND DEV. BD. 1, 1– 35 (2011), *available at* http://catskillcitizens.org/learnmore/MarcellusTourismFinal%5B1%5D.pdf; *see generally* Robert W. Turner, *Market failures and the rationale for national parks*, 33.4 J. OF ECON. EDUC. 347, 347–356 (2002). *See also* R.O. Fournier and A. H. Truesdell, *Chemical indicators of subsurface temperature applied to hot spring waters of Yellowstone National Park, Wyoming, USA*, 2 GEOTHERMICS 529 (1970) (for discussions of specific parks); Joseph L. Sax and Robert B. Keiter, *Glacier National Park and its neighbors: A study of federal interagency relations*, 14 ECOLOGY LQ 207, 211 (1987).

64. Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands, 80 Fed. Reg. 16127, 16128 (March 26, 2015) (to be codified at 43 C.F.R. 3160). *See generally*, BUREAU OF LAND MGMT., DEP'T OF THE INTERIOR, MINERAL MATERIALS, http://www.blm.gov/wo/st/en/prog/more/non-energy_minerals.html; *see generally*, BUREAU OF LAND MGMT., U.S. DEP'T OF THE INTERIOR, HOW TO OBTAIN MINERAL MATERIALS FROM BLM ADMINISTERED LAND, *available at* http://www.blm.gov/style/medialib/blm/wo/MINERALS__REALTY__AND_RESOURCE_PROTECTION_/non-energy_minerals.Par.48557.File.dat/sand.pdf.

65**.** *See, e.g.*, Richard Nemec, *USFS Proposes Limited Leasing in Colorado National Forest*, NATURAL GAS INTELLIGENCE (Dec. 10, 2014), http://www.naturalgasintel.com/articles/100683-usfs-proposes-limited-leasing-in-colorado-national-forest (last visited Oct. 31, 2015).

66. Management of Non-Federal Oil and Gas Rights; Proposed Rule, 80 Fed. Reg. 77200 (Dec. 11, 2015). *See, e.g.*, FISH & WILDLIFE SERV., U.S. DEP'T OF THE INTERIOR, NATURAL GAS AND WILDLIFE, http://www.fws.gov/northeast/EcologicalServices/energygas.html (last visited Oct. 31, 2015); U.S. FISH & WILDLIFE SERV., U.S. DEP'T OF THE INTERIOR, MARCELLUS SHALE DRILLING, http://www.fws.gov/northeast/nyfo/fwc/marcellus.htm (last visited Oct. 31, 2015).

67. 36 C.F.R. Pt. 9B; *see also* GEOLOGICAL RES. DIV., NAT'L PARK SERVS., DEP'T OF THE INTERIOR, OPERATORS HANDBOOK FOR NON FEDERAL OIL AND GAS DEVELOPMENT IN UNITS OF THE NATIONAL PARK SYSTEM 1, 1 (2006) [hereinafter NAT'L PARK SERV., OPERATORS HANDBOOK].

68. *See* Robert B. Keiter, *Public Lands and Law Reform: Putting Theory, Policy, and Practice in Perspective*, 2005 UTAH L. REV. 1127, 1172 (2005).

69. Nonfederal Oil and Gas Development Within the Boundaries of Units of the National Park System; Intent To Prepare an Environmental Impact Statement for a Proposed Revision, 75 Fed. Reg. 82362 (Dec. 30, 2010) (to be codified at 36 C.F.R. pt. 9B); Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61596 (Nov. 25, 2009) (to be codified at 36 C.F.R. pt. 9B); *see generally*

article concludes that if drilling in the national parks expands and continues, revisions to the 9B regulations are critical to ensuring the protection of resources for future generations.

II. BACKGROUND

A. The Organic Act

NPS derives the legal authority to regulate oil and gas drilling operations in national parks from the Property Clause[70] and the Commerce Clause[71] of the United States Constitution and from sections 1 and 3 of the NPS Organic Act of 1916.[72] The latter created NPS and charged the service with the authority to *"*make and publish" rules and regulations NPS deems "necessary or proper for the use and management of the parks, monuments, and reservations" under NPS jurisdiction.[73] The Organic Act states the overarching goal of the NPS is to "conserve the scenery and the natural and historic objects and the wild life" and "to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."[74]

From the beginning, the NPS had the authority to allow certain commercial uses within park units. For example, the Organic Act specifically allowed national park administrators to grant grazing privileges within all national parks—except Yellowstone—as long as the grazing was not deemed "detrimental to the primary

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NAT'L PARK SERV., U.S. DEP'T OF THE INTERIOR, 9B RULEMAKING, http://www.nature.nps.gov/geology/oil_and_gas/9b_index.cfm (last visited Nov. 7, 2015); NAT'L PARK SERV., U.S. DEP'T OF THE INTERIOR, OIL AND GAS MANAGEMENT, http://www.nature.nps.gov/Geology/oil_and_gas/index.cfm (last visited Nov. 7, 2015) [hereinafter NAT'L PARK SERV., OIL AND GAS MANAGEMENT]; NAT'L PARK SERV., U.S. DEP'T OF THE INTERIOR, THE 9B REGULATIONS, http://www.nps.gov/pais/learn/management/9b-regs.htm (last visited Nov. 7, 2015).

70. U.S. Const., art. IV, § 3, cl. 2.

71. U.S. Const., art. I, § 8, cl. 3. *See* NAT'L PARK SERV., OIL AND GAS MANAGEMENT, *supra* note 69 (for a general discussion of NPS oil and gas management in national parks).

72. 54 U.S.C. § 100101, 100301-02, 100303, 100501-02, 100505 (2014) (previously codified at 16 U.S.C. §§ 1–4). *See also* Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61596, 61597 (Nov. 25, 2009) (to be codified at 36 C.F.R. 9) (stating that "the enabling statutes for several individual parks contain specific provisions authorizing the NPS to regulate such oil-and gas-related activities").

73. 54 U.S.C. § 102101 (West 2014) (previously codified at 16 U.S.C. § 3).

74. Pub. L. 91-383, August 18, 1970, 84 Stat. 824, (1970) (codified as 16 U.S.C. § 1). *See* Adam Banasiak et al., Carbon Sequestration in the U.S. National Parks: A Value Beyond Visitation 1, 2 (Harvard Kennedy Sch. Working Paper No. RWP15-007) (February 17, 2015), http://papers.ssrn.com/sol3/Papers.cfm?abstract_id=2577365 (for a discussion of the importance of preserving national parks in order to help control and combat climate change impacts) ("We find that at present average annual carbon sequestration on NPS lands amounts to 17.5 million metric tons of CO2, valued at $707 million dollars using the current federal interagency working group social cost of carbon damage price of $40.45/metric ton. In the future years through 2050, absent any changes in land management (such as invasive species removal or fire management) carbon sequestration is predicted to fall by 31 percent to an average of 12.0 million metric tons of CO2 sequestered annually, due to factors such as a warming climate, invasive species, and increased fire hazards. Given the benefits to society of avoiding this future loss in carbon sequestration, funding for management actions for the National Park Service may be economically justifiable in order to mitigate this decline, although further research is needed to better understand how specific NPS practices can maintain current carbon sequestration levels.").

purpose for which such park, monument, or reservation was created."[75] The Organic Act also allowed NPS to contract with private companies to provide services to park visitors, provided that no contract exceed 30 years.[76] When the NPS was created in 1916, there were 31 national parks, in contrast to the roughly 400 units now managed by NPS.[77]

Congress has amended the Organic Act multiple times since enactment, most notably in 1970 and 1978.[78] The 1978 amendment addressed the impacts from logging occurring just outside the Redwood National Park. The amendment stipulated that park management in Redwood National Park should be "conducted in light of the high public value and integrity of the National Park System."[79] Unless specifically directed by Congress, NPS decisions could not be "exercised in derogation of the values and purposes."[80] Hence, each amendment reaffirmed the initial mandate that NPS manage national parks in a manner that will preserve and not degrade park values.

In addition to the Organic Act, the legislation creating some national parks articulated specific provisions specifying additional regulatory authority.[81] For example, a unique provision is included in the Big Cypress National Preserve Addition Act of 1988 (the Addition Act)[82] that allows NPS to develop regulations for oil and gas development in Big Cypress than can either supplement or replace the 9B regulations.[83] The Addition Act also enabled NPS to enter into contracts with mineral owners in Big Cypress governing drilling exploration and extraction.[84]

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75. 54 U.S.C.A. § 102101(a)(1) (West 2014) ("[T]he Secretary of the Interior may, under such rules and regulations and on such terms as he may prescribe, grant the privilege to graze live stock within any national park, monument, or reservation herein referred to when in his judgment such use is not detrimental to the primary purpose for which such park, monument, or reservation was created, except that this provision shall not apply to the Yellowstone National Park.").

76. 54 U.S.C.A. § 102101(a)(1) (West 2014) ("He may also grant privileges, leases, and permits for the use of land for the accommodation of visitors in the various parks, monuments, or other reservations herein provided for, but for periods not exceeding thirty years; and no natural curiosities, wonders, or objects of interest shall be leased, rented, or granted to anyone on such terms as to interfere with free access to them by the public.").

77. Robert B. Keiter, *Revisiting the Organic Act: Can It Meet the Next Century's Conservation Challenges?*, 28.3 GEORGE WRIGHT F. 240, 240 (2012).

78. 54 U.S.C. §100502 (2014); 1978 Redwoods National Park Expansion Act, Pub. L. 95-250, Title I, §101(b), Mar. 27, 1978, 92 Stat. 166 (amending 16 U.S.C. §1a-1).

79. 1978 Redwoods National Park Expansion Act, Pub. L. 95-250, Title I, §101(b), Mar. 27, 1978, 92 Stat. 166 (amending 16 U.S.C. §1a-1).

80. *Id.*

81. Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61596, 61597 ("Not all parks with oil and gas development occurring within their boundaries have such specific direction within their enabling statutes. Whether or not specified in an individual park enabling act, the Organic Act authority alone is legally sufficient to authorize such regulations.").

82. Oil and gas exploration, development, and production in Big Cypress National Preserve and Addition, 16 U.S.C. 698m-4 (2012)

83. *Id.* at § 698m-4(a). *See also* General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. 65572, 65573 (Oct. 26, 2015) (to be codified at 36 C.F.R. pt. 1, 36 C.F.R. pt. 9).

84. § 698m-4(e). *See also* General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65573. *See* AGREEMENT AMONG THE UNITED STATES OF AMERICA, COLLIER ENTERPRISES, COLLIER DEVELOPMENT CORPORATION, AND BARRON COLLIER COMPANY Appendix 6 (May

Other legislation for specific parks in the national park system included discussions of non-federal mineral rights.[85] As an example, the Alaska National Interest Lands Conservation Act (ANILCA), creating Alaska national parks, allows oil and gas operators to file applications to drill in NPS units in a manner similar to filing a mining claim, rather than using the 9B procedures.[86]

Although NPS has broad regulatory authority to protect and conserve park resources,[87] the Organic Act is silent as to the specifics of how to manage those resources. NPS promulgated 9B regulations and developed manuals explaining the 9B permitting application process. The courts give deference to agency decisions regarding park preservation, provided NPS articulates a rational reason for NPS action.[88] There is, however, no private right of action for citizens to challenge NPS decisions concerning non-federal oil and gas rights.[89]

While the 9B regulations are designed to protect park values, they differ from other environmental and natural resource regulations. In essence, the right to regulate drilling activities in national parks stems from the role of the federal government as the surface landowner.[90] The federal government, of course, has an enhanced obligation to preserve land for future generations,[91] but aside from the stewardship obligation,[92] the right to regulate conduct on federal land in many ways

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12, 1988) (AGREEMENT GOVERNING THE EXERCISE OF RESERVED OIL AND GAS RIGHTS OF COLLIER ENTERPRISES AND BARRON COLLIER COMPANY).

85. Enabling Act for Big Cypress National Preserve, 16 U.S.C. §§ 698f–698m-4; Enabling Act for Big South Fork National River and Recreation Area, 16 U.S.C. § 460ee; Enabling Act for Big Thicket National Preserve, 16 U.S.C. §§ 698–698e; Enabling Act for Jean Lafitte National Historic Park, 16 U.S.C. §§ 230–230i; Enabling Act for New River Gorge National River, 16 U.S.C. §§ 460m-15–460m-30; Enabling Act for Obed Wild and Scenic River, 16 U.S.C1274 (15); Enabling Act for Padre Island National Seashore , 16 U.S.C. §§ 459d–459d-7; Enabling Act for Tallgrass Prairie National Preserve, 16 U.S.C. §§ 698u–698u-7.

86. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. 65572, 65573. *See also* Sturgeon v. Masica, 768 F.3d 1066, 1077–78 (9th Cir. 2014), *cert. granted*, 136 S.Ct. 27 (2015).

87. *See* Bicycle Trails Council of Marin v. Babbitt, 82 F.3d 1445, 1454 (9th Cir. 1996) (stating that "the Park Service has broad discretion in determining which avenues best achieve the Organic Act's mandate").

88. Sierra Club v. Mainella, 459 F. Supp. 2d 76, 90 (D. D.C. 2006).

89. *See, e.g*., Dunn-McCampbell Royalty Interest v. National Park Serv., 112 F.3d 1283, 1286 (5th Cir. 1997) (stating that "[a]s a preliminary matter, we note that neither the National Park Service organic statute, 16 U.S.C. § 1 et seq., nor the Padre Island National Seashore Enabling Legislation, 16 U.S.C. § 459d, provides directly for judicial review, and neither creates a private right of action."). *See also* Austral Oil Co. v. Nat'l Park Serv., 982 F. Supp. 1238, 1243 (N.D. Tex. 1997). *See generally* Jonathan Thrope, Comment, *Recent Case, Minard Run Oil v. United States Forest Service*, 36 HARV. ENVTL. L. REV. 567, 593 (2012); Derek R. McDonald, *Administrative Law*, 30 TEX. TECH L. REV. 333, 345 (1999); Linda M. Kearney, *Civil Procedure*, 29 TEX. TECH L. REV. 397, 425 (1998).

90. *See* Christopher Timmins and Ashley Vissing, Shale Gas Leases: Is bargaining efficient and what are the implications for homeowners if it is not? 1, 23–24 (Working Paper, Nov. 15, 2014), http://public.econ.duke.edu/~timmins/Timmins_Vissing_11_15.pdf (stating that "lease agreement[s] can specify other terms that restrict the operator's activities").

91. *See* Joseph L. Sax, *Helpless Giants: The National Parks and the Regulation of Private Lands*, 75 MICH. L. REV. 239, 259 (1976). *See also* Charles F. Wilkinson, *Public Trust Doctrine in Public Land Law*, 14 U.C. DAVIS L. REV. 269, 280 (1980).

92. *See* Robert B. Keiter, *Taking Account of the Ecosystem on the Public Domain: Law and Ecology in the Greater Yellowstone Region*, 60 U. COLO. L. REV. 923, 944 (1989).

differs little from that of a state or private landowner.[93] Any party granting another the right to develop property on their land has the contractual right to limit the means and conditions upon which the other party conducts the development. The ability to drill (or engage in other commercial, noncommercial or recreational activities) may be and typically is limited by contract to preserve and protect the property owner's residual assets.[94] In short, the Organic Act requires NPS to balance the use of park resources for current social wants and needs against the duty to preserve the resource for future generations.

B. Drilling in National Parks

In December 1978, the NPS promulgated the 9B regulations governing non-federal oil and gas development in National Parks. The regulations went into effect in January 1979.[95] The regulations required oversight for all activities associated with non-federal oil and gas development inside national park boundaries. The 9B regulations included oversight where access was on, across, or through federally-owned or controlled lands or waters to drilling operations. In practice, the 9B rules apply when: (1) the oil and gas drilling operation is within a national park; (2) the site is outside a national park but the oil and gas operator must cross national park boundaries to get to the site; or (3) the site is outside a national park but will drill under national park property.[96]

The 9B regulations were part of regulations that NPS, through the Secretary of the Interior, promulgated to dictate administration and management of the National Park System, including "the authority to regulate non-federal oil and gas activities within park boundaries for the purpose of protecting park resources and values."[97] Under the 9B regulations, NPS must approve a proposed plan of operations for a party who wants to drill for oil or natural gas in a national park before the party begins any oil and gas development activities within the national park.[98] Approved drilling "operators" may be held liable for damage to the national park

93. *See, e.g.*, Dan Shingler, *Landowners Dig in, Sue over Shale Leases*, CRAIN'S CLEVELAND BUSINESS, http://www.crainscleveland.com/article/20120305/SUB1/303059993/landowners-dig-in-sue-over-shale-leases (discussing how private landowners are also challenging drilling operators over land rights) ("[T]he suit alleges the landowners were not fully informed of the disruptions that would take place on their property, and so did not seek protection from them in their leases") (last visited Nov. 1, 2015).

94. *See generally* UNITED NATIONS COMM'N ON INT'L TRADE LAW, LEGISLATIVE GUIDE ON SECURED TRANSACTION, UNITED NATIONS 1, 242 (2010), *available at https://www.uncitral.org/pdf/english/texts/security-lg/e/09-82670_Ebook-Guide_09-04-10English.pdf.*

95. 36 C.F.R. § 9(b) (2015).

96. *See* NAT'L PARK SERV., OPERATORS HANDBOOK, *supra* note 67, at 3.

97. Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61596, 61597 (Nov. 25, 2009) (to be codified at 36 C.F.R. 9) ("oil and gas rights are the result of a conveyance of an interest in real property from a grantor other than the United States and may be held by individuals, companies, nonprofit organizations, or state and local governments. Such rights are a form of real property and fall under the protection of the 5th Amendment of the U.S. Constitution ('No person shall be . . . deprived of . . . property, without due process of law; nor shall private property be taken for public use, without just compensation.'). The NPS nonetheless may regulate these rights pursuant to the authority stated above.").

98. *See* Austral Oil Co. v. Nat'l Park Serv., 982 F. Supp. 1238, 1241 (N.D. Tex. 1997) ("The central feature of the Section 9B Regulations is the submission and approval of a plan of operations."). *See also* NAT'L PARK SERV., OPERATORS HANDBOOK, *supra* note 67, at 11.

that results from failure to comply with the approved plans of operation.[99] The 9B regulations also require reclamation of lands and waters affected by oil and gas operators.[100]

In essence, the purpose of promulgating the 9B regulations was to "avoid or minimize the adverse effects of non-federal oil and gas operations on natural and cultural resources,[101] visitor uses and experiences, provide for public safety, and minimize adverse effects on park infrastructure and management."[102]A description of NPS process for so doing follows.

C. The 9B Application Process

Each park administers its own application process for drilling.[103] Developers that want to drill in or near a national park must submit the permit application to the park superintendent.[104] To demonstrate entitlement to a permit, the oil or natural gas applicant must first show the NPS that the operator owns a property interest[105] and "is exercising a bona fide property right to non-federal oil and gas in the park unit."[106] To demonstrate ownership rights, the permit applicant must produce a "lease, deed, designation of operation, or assignment of rights."[107]

NPS estimates that about 30 national parks have privately owned minerals lying beneath them.[108] In most of these NPS units, the mineral rights were severed from the property when the land was conveyed to the federal government to create the park.[109] Some units were created in areas long known for oil and gas development. Others do not have a history of oil and gas usage but are under pressure today due to innovations in shale oil and gas development. At least fourteen NPS

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99. 36 C.F.R. § 9.51 (2015).

100. 36 C.F.R. § 9.39(a) (2015). *See also Austral Oil Co*., 982 F. Supp. at 1241.

101. Nonfederal Oil and Gas Development Within the Boundaries of Units of the National Park System; Intent To Prepare an Environmental Impact Statement for a Proposed Revision, 75 Fed. Reg. 82362, 82363 (Dec. 30, 2010) (to be codified at 36 C.F.R. pt. 9).

102. *Id.*

103. *See* NAT'L PARK SERV., OPERATORS HANDBOOK, *supra* note 67, at 115, 124.

104. *Id.* at 1.

105. *See* NAT'L PARK SERV., U.S. DEP'T OF THE INTERIOR, MANAGEMENT POLICIES 117, 118 (2006), *available at* http://www2.nature.nps.gov/geology/oil_and_gas/documents/NPS%20Minerals%20Management%20Policies.pdf (Mineral exploration or development may be allowed in parks only when prospective operators demonstrate that they hold rights to valid mining claims, federal mineral leases, or nonfederally owned minerals. If this right is not clearly demonstrated, the National Park Service will inform the prospective operator that, until proof of a property right is documented, the Service will not further consider the proposed activity.) [hereinafter NAT'L PARK SERV., MANAGEMENT POLICIES].

106. Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61596, 61597 (Nov. 25, 2009) (to be codified at 36 C.F.R. 9).

107. 36 C.F.R. § 9.36(a)(2) (2015). *See also* NAT'L PARK SERV., OPERATORS HANDBOOK, *supra* note 67, at 2 ("without a demonstration of ownership rights, the NPS owes no legal obligation to an operator to grant temporary approval, review a plan of operation, or evaluate a sec. 9.32(e) application.").

108. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. 65572 (Oct. 26, 2015) (to be codified at 36 C.F.R. pt. 1, 36 C.F.R. pt. 9).

109. *Id*. at 65574. *See* Derek Cook and Jennie K. Martin, *Oil & Gas Basics: Understanding the Sticks to Avoid Stones & Broken Bones*, 76 TEX. BAR J. 319 (2013) (for a discussion of the impact of granting a mineral lease on a fee simple property interest).

units have already been the subject of active debate.[110] NPS units with private mineral estates within park borders under consideration for or actively developed are: Gulf Islands National Seashore in Alabama, Big Cypress National Preserve in Florida, Tallgrass Prairie National Preserve in Kansas, Big South Fork National River and Recreation Area in Kentucky, Jean Lafitte National Historic Park and Preserve in Louisiana, Aztec Ruins National Monument in New Mexico, Cuyahoga Valley National Park in Ohio, Obed Wild and Scenic River in Tennessee, Gauley River National Recreation Area and New River Gorge National River in West Virginia; and four Texas parks—Big Thicket, Alibates Flint Quarries National Monument, Lake Meredith National Recreation Area, and Padre Island National Seashore.[111]

Parties with a demonstrable property right in a "non-federal mineral interest"[112] may then submit a proposed plan of operation[113] to NPS outlining the desired energy project. The plan of operation must provide NPS with a blueprint of all intended drilling-related activities within the boundary of the national park.[114] The blueprint must include a description of proposed activities at all phases of oil and gas development, including a description of proposed exploration, drilling, production, transportation, and reclamation.[115] The plan must account for spill control and emergency preparedness planning.[116] Finally, the driller must submit a performance bond of up to $200,000 to ensure that funds are available to reclaim the drilling site in the event the operator defaults on its obligations under the approved plan.[117] The bonded funds, thus, may be used by NPS to clean up the drill site and restore the site to a use compatible with NPS values, even if the driller goes bankrupt or otherwise fails to meet its contractual obligation to repair environmental damage. The $200,000 cap establishes a ceiling on the total amount of funds NPS may require a driller to post to protect against damages to operations in any given NPS unit.[118] The $200,000 cap does not, however, apply to drilling operations in multiple units across the NPS

110. The Associated Press, *Sierra Club Fights Drilling Under Parks*, N.Y. TIMES, http://www.nytimes.com/2004/11/18/politics/18sierra.html?pagewanted=print&position=&_r=0 (last visited Dec. 22, 2015).

111. The Associated Press, *supra* note 108.

112. NAT'L PARK SERV., MANAGEMENT POLICIES, *supra* note 105, at 118 (" mineral interests in park units consist of oil and gas interests, rights to mineral interests other than oil and gas (such as private outstanding mineral rights, mineral rights through general land grant patents, homestead patents, or other private mineral rights that did not derive from the General Mining Act).").

113. 36 C.F.R. § 9.36. *See also* NAT'L PARK SERV., MANAGEMENT POLICIES., *supra* note 105, at 118.

114. NAT'L PARK SERV., OPERATORS HANDBOOK, *supra* note 67, at 11.

115. *See* NAT'L PARK SERV., DEP'T OF THE INTERIOR, PADRE ISLAND TEXAS NATIONAL SEASHORE: THE 9B REGULATIONS, http://www.nps.gov/pais/learn/management/9b-regs.htm (last visited Nov. 1, 2015).

116. 36 C.F.R. § 9.36(a)(10).

117. 36 C.F.R. § 9.48. *See also* Minerals Management, Non-federal Oil and Gas Development, 74 Fed. Reg. 61596, 61597 (Nov. 25, 2009) (to be codified at 36 C.F.R. 9) (NPS explained the review process as follows: "Once the NPS has completed its review and environmental compliance responsibilities and determined that a given proposal meets applicable requirements and approval standards, the NPS will approve an operator's plan of operations. The approved plan authorizes the operator to conduct its operation in a unit of the National Park System.").

118. 36 C.F.R. § 9.48(d)(3) (2015); *See also* NAT'L PARK SERV., MANAGEMENT POLICIES, *supra* note 105, at 118.

system. Drillers with operations in multiple NPS units must post a bond of up to $200,000 for each NPS unit in which the driller operates.

The drilling and operating plan must also provide NPS with specific measures the developer will take to protect national park "resources and values."[119] This resource protection provision applies to both natural and cultural resources.[120] Applicants must demonstrate that the plan will protect both the experience and physical safety of national park visitors.[121] As an example, at Padre Island Texas National Seashore the requirement to preserve "park resources and values" includes protecting "sea turtles, vegetation, shorebirds, visitor use, cultural sites, and natural soundscapes."[122] The plan of operation for Padre Island drilling includes "80 mitigation measures" developed to "minimize or eliminate the impacts to park resources and visitors."[123] Key mitigation measures at Padre Island include: (1) limiting the maximum speed limit of oil and gas vehicles to 15 miles per hour throughout the park while park visitors have a maximum speed limit of 25 miles per hour; (2) limiting the maximum number of trucks that can be in the park each day; (3) not allowing oil and gas equipment to be operated along the beach at night; (4) requiring all oil and gas equipment to convoy as a group, which is escorted by an NPS-trained turtle observer; (5) placing a net or other type of cover over any container that can hold a liquid; and (6) establishing a 500-foot buffer around permanent freshwater ponds.[124]

In addition to 9B and other federal regulations, drillers in national parks are governed by state requirements concerning oil and gas development, including those pertaining to protection of surface and groundwater where applicable.[125] Variations in state laws mean that different national parks enjoy different levels of protection.[126]

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119. NAT'L PARK SERV., OPERATORS HANDBOOK, *supra* note 67, at 1 ("The 9B regulations are a park superintendent's primary tool in protecting park resources from potential adverse impacts associated with the exercise of oil and gas rights.").

120. 36 C.F.R. § 9.47 (defining cultural resource protection).

121. *See* Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61596, 61597 ("The 9B regulations differ from most state oil and gas regulations by focusing on the protection of the park's natural and cultural resources and visitors.").

122. NAT'L PARK SERV., DEP'T OF THE INTERIOR, THE 9B REGULATIONS: PADRE ISLAND TEX. NAT'L SEASHORE, http://www.nps.gov/pais/learn/management/9b-regs.htm (last visited October 19, 2015).

123. *Id.*

124. *Id.*

125. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. 65572, 65573 (Oct. 26, 2015) (to be codified at 36 C.F.R. pt. 1, 36 C.F.R. pt. 9); Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61596, 61597–98 (Nov. 25, 2009) (to be codified at 36 C.F.R. pt. 9B) ("State regulations may contain some surface use provisions but mainly focus on conservation of the oil and gas resource, protection of the associated ownership interests, and protection of surface and groundwater."). *See, e.g.*, Nathan Richardson et al., *The State of State Shale Gas Regulation*, RESOURCES FOR THE FUTURE, 22–23 (2013), http://www.rff.org/rff/documents/RFF-Rpt-StateofStateRegs_Report.pdf; J. Schumacher et al., *The Legal Landscape of "Fracking": The Oil and Gas Industry's Game-Changing Technique Is Its Biggest Hurdle*, 17 TEX. REV. OF L. & POL. 239, 244–45 (2013); David A. Dana & Hannah J. Wiseman, *A Market Approach to Regulating the Energy Revolution: Assurance Bonds, Insurance, and the Certain and Uncertain Risks of Hydraulic Fracturing*, 99 IOWA L. REV. 1523, 1527–28 (2013).

126. *See* KERRY MOSS ET AL., POTENTIAL DEVELOPMENT OF THE NATURAL GAS RESOURCES IN THE MARCELLUS SHALE, U.S. DEP'T OF THE INTERIOR, NAT'L PARK SERV. AND GEOLOGIC RESOURCES DIV. NATURAL RES. PROGRAM CTR. (2008), http://www.nps.gov/frhi/learn/management/upload/GRD-M-Shale_12-11-2008_high_res.pdf, at 18–19 (for a table of state regulatory requirements).

For example, state oil and gas laws differ tremendously regarding water withdrawal limits, well setback requirements from homes, buildings and water sources, cementing and casing rules for drilled wells and waste disposal procedures for operational wastes.[127] While operators see the state laws and regulations as a ceiling, NPS can look at more protective state laws and regulations as baselines. NPS can learn from the experience of different states and adopt the more protective practices as a condition of granting a permit.

In evaluating the application, the NPS applies rubrics established pursuant to the National Environmental Policy Act of 1969 (NEPA),[128] the Endangered Species Act of 1973 (ESA),[129] the National Historic Preservation Act of 1966,[130] the Coastal Zone Management Act of 1972 (CZMA),[131] Executive Order 11988 (concerning floodplain management)[132] and Executive Order 11990 (pertaining to wetlands protection), [133] in addition to those specified in the 9B regulations.[134] To do so, NPS consults and coordinates with state officials as well as other federal agencies regulating public lands.[135] The NEPA requirement mandates that proposed non-federal drilling operations in NPS-regulated units be open for public notice and comment. Appropriate mitigation measures incorporated into operation plans are, hence, reviewable by the public, not pursuant to the 9B regulations, but by virtue of documents NPS publishes pursuant to its duty to comply with NEPA.[136]

Once approved, NPS park resource managers monitor activities at the drilling site to ensure compliance with the plan for the life of an oil and gas operation in the national park.[137] A limitation on the ability to address deviation from approved plan requirements lies in NPS's limited enforcement authority under the 9B rules. The NPS can enforce compliance with the approved plan only through either suspension of operations or revocation of the plan approval.[138] NPS has no authority, however, to fine operators whose violations are significant but do not rise to the level

127. *See* Richardson, *supra* note 125, at 13.

128. 42 U.S.C.A. §§ 4321(7) (West 1970). *See, e.g.*, Arnold W. Reitze, *The Role of NEPA in Fossil Fuel Resource Development and Use in the Western United State*, 39 B. C. ENVTL. AFF. L. REV. 283, 350–51 (2012) (discussing the role of NEPA in oil and gas drilling on federal lands).

129. 16 U.S.C. §§ 1531–44 (1988).

130. Pub. L. No. 89-665, 80 Stat. 915 (1966) (codified as amended in scattered sections of 54 U.S.C.100101 *et seq.*).

131. 16 U.S.C. §§ 1451–1466 (1990).

132. Exec. Order No. 11988, 42 Fed. Reg. 26951 (May 24, 1977).

133. Exec. Order No. 11990, 42 Fed. Reg. 26961 (May 24, 1977).

134. 36 C.F.R. §§ 9.30–9.52 (1978). *See also* NAT'L PARK SERV., OPERATORS HANDBOOK, *supra* note 67, at 235–306 (providing a list of all applicable federal laws, regulations, executive orders and policies).

135. NAT'L PARK SERV., OPERATORS HANDBOOK, *supra* note 67, at 305.

136. *See* NAT'L PARK SERV., *supra* note 122 ("evaluation process includes the development of an environmental document that solicits public involvement as required by the National Environmental Policy Act").

137. 36 C.F.R. §§ 9.37–9.38. *See* Joseph L. Sax and Robert B. Keiter, *The Realities of Regional Resource Management: Glacier National Park and Its Neighbors Revisited*, 2006 ECOLOGY L. Q. 233, 243 (2006).

138. 36 C.F.R. § 9.51. *See also* Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61597 ("The existing regulations also authorize the NPS to enforce the terms of the plan as may be necessary via such means as suspension of operations or revocation of the plan approval.").

of needing suspension or plan revocation.[139] For example, in the Aztec Ruins National Monument, the approved plan restricts vehicle use when roads are saturated.[140] The drilling operator, however, continued to use the NPS road in wet weather in violation of the approved plan.[141] The improper use of the dirt road in Aztec is a violation that could cause erosion and other concerns, but the violation is not significant enough to require total suspension of operations.[142] The NPS has no power to fine the operator for the minor violation.[143] NPS enforcement tools are statutorily limited to suspension or plan revocation.

Though few cases have been tried interpreting the 9B regulations,[144] the limited jurisprudence makes it clear that park administrators determining drilling permits in national parks are entitled to deference.[145] In *Sierra Club v. Mainella*,[146] environmentalists challenged ongoing directional drilling in Big Thicket National Preserve. The Sierra Club alleged that the NPS failed to consider environmental impacts from oil and gas operators' surface activities adjacent to and outside park boundaries in violation of not only the Organic Act,[147] but also in violation of the Administrative Procedure Act (APA)[148] and NEPA.[149] The Circuit Court for the District of Columbia held that granting the operators' applications to directionally drill wells beneath the Big Thicket was arbitrary and capricious under the APA because, although NPS went through the required exercise of evaluating impacts to the park, NPS failed to adequately explain and document in the administrative record the conclusion "that impacts from nearby surface drilling activities would not result in an impairment of park resources and values."[150] Rather than setting aside the NPS decision allowing drilling in Big Thicket, the court remanded the permit decisions back to NPS for further explanation documenting how the NPS determination was made. Even more significant, the court decreed that while on remand, disruption to the existing drilling activities in Big Thicket was unwarranted because NPS may be able to adequately explain the decision to allow the drilling.[151] Thus, despite the quite

139. *See* NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 10.

140. *Id.*

141. *Id.*

142. *Id.*

143. *See id.* at 11.

144. *See, e.g.*, Dunn-McCampbell Royalty Interest v. Nat'l Park Serv., 112 F.3d at 1286; *Austral Oil Co. v. National Park Serv*., 982 F. Supp. 1238 (N.D. Tex. 1997).

145. *See, e.g.*, Dunn-McCampbell Royalty Interest v. Nat'l Park Serv., 112 F.3d at 1286; Austral Oil Co. v. Nat'l Park Serv., 982 F. Supp. at 1242.

146. Sierra Club v. Mainella, 459 F. Supp. 2d at 79.

147. National Park Service Organic Act, ch. 408, 39 Stat. 535 (1915) (codified as amended in scattered sections of 54 U.S.C.).

148. Administrative Procedure Act of 1946, ch. 324, 60 Stat. 237 (codified as amended in scattered sections of 5 U.S.C.).

149. National Environmental Policy Act of 1969, 42 U.S.C. 4321 *et seq.*

150. Sierra Club v. Mainella, 459 F. Supp. 2d at 103.

151. *Id*. at 103 ("[T]he Court will remand the decisions to NPS for further explanation, rather than setting the decisions aside.") (citing MCI Telecomm. Corp. v. F.C.C., 143 F.3d 606, 609 (D.C. Cir. 1998)) (exercising discretion to remand agency action without vacating it where the flaw is inadequate explanation).

limited jurisprudence, NPS authority to grant or deny permit applications is clearly entitled to deference.

D. Approved Plans

NPS estimates that, since implementing the 9B rules, an average of 550 oil and gas wells operate each year throughout the national park system.[152] The number of wells in operation has remained relatively constant as the "plugging and reclamation of old wells has essentially offset drilling and production of new wells."[153] In 2009, NPS reported there were 693 non-federal oil and gas drilling operations permitted in a total of 13 units of the National Park System.[154] Not all permitted wells are operational and not all parks with permitted wells have had oil and gas drilling commence. As of January 2014, only 12 NPS units had active wells.[155] According to government estimates, about 90 percent of oil and gas wells now drilled on federal and Indian lands use hydraulic fracturing.[156] NPS expects that the number of wells drilled could dramatically increase when energy prices rise.[157]

In addition to long-term production activities, oil and gas activities in national parks include short-term exploration and development activities such as geophysical seismic exploration and drilling.[158] Since 1998, twenty seismic studies were conducted in six national parks, averaging 1.4 seismic surveys per year. Most studies were three-dimensional seismic surveys covering large geographic areas. Although interest in drilling has increased, NPS expects the number of seismic surveys to decrease as fewer and fewer acres of land are left unstudied.[159]

Although the numbers of active wells in the NPS systems has historically remained constant, the dramatic increase in interest in shale gas exploration through alternative technologies, including horizontal drilling and HVHF,[160] means that the numbers of permit applications and, hence, active sites, may increase—especially on the East Coast in the Marcellus Shale where there has historically been little

152. PATRICK O'DELL, GEOLOGICAL RES. DIV., NAT'L PARK SERV., COST-BENEFIT AND REGULATORY FLEXIBILITY ANALYSIS: U.S. DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE FOR PROPOSED REVISIONS TO 36 C.F.R. PART 9, SUBPART B 2–3 (2014), http://www.nature.nps.gov/geology/oil_and_gas/documents/2014-12-8%209B%20Reg%20Rev%20Final%20Draft%20Economic%20Analysis%20and%20RFA.pdf [hereinafter O'DELL, COST-BENEFIT AND REGULATORY FLEXIBILITY ANALYSIS].

153. *Id.* at 2–3.

154. Advanced Notice of Proposed Rulemaking, 74 Fed. Reg. 61596, 61597. *See also* NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 1–2.

155. NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 1–2.

156. *See* Press Release, BUREAU OF LAND MGMT., U.S. DEP'T OF THE INTERIOR, BLM EXTENDS PUBLIC COMMENT PERIOD ON PROPOSED HYDRAULIC FRACTURING RULE (June 7, 2013), http://www.blm.gov/wo/st/en/info/newsroom/2013/june/nr_06_07_2013.html.

157. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. 65572, 65574 (Oct. 26, 2015) (to be codified at 36 C.F.R. pt. 1, 36 C.F.R. pt. 9).

158. O'DELL, COST-BENEFIT AND REGULATORY FLEXIBILITY ANALYSIS, *supra* note 152, at 2.

159. O'DELL, COST-BENEFIT AND REGULATORY FLEXIBILITY ANALYSIS, *supra* note 152, at 2.

160. *See supra* notes 35–38 and accompanying text.

drilling.[161] Many of the current and proposed operations are outside the scope of the 9B regulations. A discussion of these exempt operations follows.

E. Exempt Operations

The NPS estimates that about 60 percent of the total oil and gas wells currently operating in national parks lawfully operate without NPS approval because they are exempt from the 9B regulations.[162] Oil and gas development operations in national parks can be exempt for several reasons,[163] including a grandfather clause for existing operations[164] and an "access exemption."[165] Currently, there are five national parks in which all of the 186 oil and gas operations drilling within the park boundaries are exempt from the NPS 9B regulations: Big Thicket Nature Preserve in Texas (152 exempt operations); Cumberland Gap National Historic Park (two exempt); Gauly River National Recreation Area (28 exempt) and New River Gorge (one exempt) in West Virginia; and Obed Wild & Scenic River in Tennessee (five exempt).[166] As such, all 186 sites operate lawfully in the national parks without NPS oversight or regulation. In these five parks with all oil and gas operations outside the 9B regulations, 78 wells operate under the access exemption,[167] with the remainder consisting of grandfathered operations. Each are discussed below.

1. Grandfathered Sites

A grandfather clause was put into effect when NPS first promulgated the 9B rules, such that oil and gas drilling operators that held a state or federal permit at the time of 9B promulgation did not need to comply with 9B rules.[168] Although the regulations were put in place in 1978, as of 2014, there are still 241 grandfathered oil and gas operations in national parks.[169] These grandfathered operations constitute 45 percent of wells in the NPS system.[170] Many of the grandfathered wells are found in the East Coast, as illustrated in the table below:[171]

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161. General Provisions and Non-federal Oil and Gas Rights, 80 Fed. Reg. at 65574; Moss, *supra* note 126, at 2–3.

162. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65572; NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 1 (The 60 percent number increased from the 53 percent estimate set out in Nonfederal Oil and Gas Development Within the Boundaries of Units of the National Park System; Intent To Prepare an Environmental Impact Statement for a Proposed Revision, 75 Fed. Reg. 82362 (Dec. 30, 2010) (to be codified at 36 C.F.R. pt. 9B).

163. Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61596, 61598 (Nov. 25, 2009) (to be codified at 36 C.F.R. pt. 9B).).

164. Oil and Gas Operations: Existing Operations, 36 C.F.R. § 9.33; *see also* NAT'L PARK SERV., OPERATORS HANDBOOK, *supra* note 67 at 6–8, 129–141.

165. Non-federal Oil and Gas Operations: Access, 36 C.F.R. § 9.32.

166. NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 2.

167. NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 5.

168. 36 C.F.R. § 9.33. *See also* NAT'L PARK SERV., MANAGEMENT POLICIES, *supra* note 105, at 2.

169. O'DELL, COST-BENEFIT AND REGULATORY FLEXIBILITY ANALYSIS, *supra* note 152, at 3–4. *See also* NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 3–4.

170. NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 2–3.

171. *Id.* at 2; Moss, *supra* note 126, at 15.

NATIONAL PARK	STATE	NUMBER GRANDFATHERED	SHALE
Aztec Ruins NM	NM	1	
Big South Fork National River & Recreation Area	TN, KY	98	Devonian black Shale; Northwest Ohio Shale
Cuyahoga Valley National Park	OH	66	Near the Marcellus and within black shale
Cumberland Gap National Historic Park	TN, KY, VA	2	About 30 miles west of Marcellus and within black shale
Gauley River NRA	WV	28	Marcellus and within black shale
Lake Meredith National Recreation Area	TX	41	
New River Gorge National River	WV	1	Marcellus and within black shale
Obed Wild & Scenic River	TN	4	Devonian black Shale; Northwest Ohio Shale
8 PARKS	**7 STATES**	**241 GRANDFATHERED WELLS**	

Many of these East Coast parks lay above portions of black shale formations, including the Marcellus Shale.[172]

Under federal law, grandfathered operations can continue in national parks as long the operations do not pose "an imminent threat or significant injury."[173] This lower standard required of grandfathered operations allows a large percentage of operators to avoid the best management practices now set in place to protect "park resources and values, and visitor health and safety."[174]

Today, the NPS estimates that there are over fifty grandfathered wells in national parks that are inactive, but not closed. Some grandfathered wells have not been used for production in over ten years.[175] Many inactive wells are both eyesores and safety hazards for park visitors and employees. Old, decaying extraction equipment sits idle without any monitoring or oversight to ensure the wells remain properly capped, and no environmental or safety impacts flow to either the national park or visitors to the park from the seemingly abandoned equipment.[176]

NPS 9B enforcement authority allows only the ability to suspend drilling operations for noncompliance;[177] but the ability to suspend operations is irrelevant and has no impact on wells that are not being used and are not generating revenue.[178] As such, in practice, operators of grandfathered wells can cease operations without adhering to the 9B requirements to safely cap the well, and the NPS has limited ability to take action until the site either becomes an imminent hazard or qualifies for a lawsuit for damages to park resources[179] pursuant to the Park System Resource Protection Act.[180] Despite mounting scientific studies that demonstrate old wells may

172. *See generally* John H. Williams, *The Marcellus Shale Gas Play*, U.S. GEOLOGICAL SURVEY, http://ny.water.usgs.gov/projectsummaries/CP30/Marcellus_Presentation_Williams.pdf; PA. DEP'T OF CONSERVATION & NAT. RES., MARCELLUS AND UTICA SHALE RESEARCH IN PENNSYLVANIA, http://www.dcnr.state.pa.us/topogeo/econresource/oilandgas/marcellus/index.htm (last visited Nov. 1st, 2015).

173. O'DELL, COST-BENEFIT AND REGULATORY FLEXIBILITY ANALYSIS, *supra* note 152, at 4.

174. *Id. See* A NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50 (for examples).

175. *Id.* at 4. *See also* O'DELL, COST-BENEFIT AND REGULATORY FLEXIBILITY ANALYSIS, *supra* note 140, at 4.

176. *See* NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 4.

177. *See* 36 C.F.R. § 9.51(c).

178. 36 C.F.R. § 9.33; NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 4.

179. *Cf.* NAT'L PARK SERV., OPERATORS HANDBOOK, *supra* note 67, at 215–17 (operators are only liable for damages for 9B violations that injures or causes a loss to a park system resource.).

180. 54 U.S.C.A. §§ 100721-100725 (West 2015).

become a source of methane leakage in both air[181] and water,[182] the NPS is left essentially powerless to demand that grandfathered operations undertake immediate action to ensure appropriate maintenance or closure of unused wells.[183] NPS has limited enforcement mechanisms,[184] which in turn provide disincentives to operators of abandoned or poorly-closed wells to meet their obligations that would otherwise be required under 9B regulations and NPS approved plans.[185]

2. Access Exemption

If an oil and gas operator locates drilling operations outside a national park and proposes to drill from that private surface under the park, the operator can apply for a section 9B exemption to the permit process.[186] The process of drilling from private land outside a park under the surface of a national park is called directional drilling and the 9B regulations expressly cover it.[187] Directional drilling was defined by the district court in *Sierra Club v. Mainella* as "the practice of drilling at a slant

181. Ratner, *supra* note 2, at 15. *See, e.g.*, David T. Allen et al., *Measurements of Methane Emissions at Natural Gas Production Sites in the United States*, 110.44 PROC. OF THE NAT'L ACAD. OF SCI. 17768, 17768 (2013); Ramón A. Alvarez et al., *Greater Focus Needed on Methane Leakage from Natural Gas Infrastructure*, 109 PROC. OF THE NAT'L ACAD. OF SCI. 6435, 6435 (2012); Robert Hariss et al., *Using Multi-Scale Measurements to Improve Methane Emission Estimates from Oil and Gas Operations in the Barnett Shale Region, Texas*, 49 ENV'T. SCI. & TECH. 7524, 7525 (2015); Robert W. Howarth et al., *Methane and the Greenhouse-gas Footprint of Natural Gas from Shale Formations*, 106 CLIMATIC CHANGE 679, 680 (2011); Christopher L. Weber & Christopher Clavin, *Life Cycle Carbon Footprint of Shale Gas: Review of Evidence and Implications*, 46 ENV'T SCI. & TECH. 5688, 5688 (2012). *But see* Lawrence M. Cathles III et al., *A Commentary on "The Greenhouse-gas Footprint of Natural Gas in Shale Formations by R.W. Howarth, R. Santoro, and Anthony Ingraffea*, 113 CLIMATIC CHANGE 525, 541 (2012).

182. Shyama K. Alawattegama et al., *Well Water Contamination in a Rural Community in Southwestern Pennsylvania Near Unconventional Shale Gas Extraction*, 50 J. OF ENV'T SCI. & HEALTH 516, 516 (2015); Robert B. Jackson et al., *Increased Stray Gas Abundance in a Subset of Drinking Water Wells near Marcellus Shale Gas Extraction*, 110 PROC. OF THE NAT'L ACAD. OF SCI. 11250, 1150 (2013); Stephen G. Osborn et al., *Methane Contamination of Drinking Water Accompanying Gas-well Drilling and Hydraulic Fracturing*, 108 PROC. OF THE NAT'L ACAD. OF SCI. 8172, 8172 (2011); Avner Vengosh et al., *A Critical Review of the Risks to Water Resources from Unconventional Shale Gas Development and Hydraulic Fracturing in the United States*, 48 ENV'T SCI. & TECH. 8334, 8334 (2014); R. D. Vidic et al., *Impact of Shale Gas Development on Regional Water Quality*, 340 SCI. 1235009, 1235009 (2013). *See generally* John L. Adgate et al., *Potential Public Health Hazards, Exposures and Health Effects from Unconventional Natural Gas Development*, 48 ENV'T SCI. & TECH. 8307, 8307 (2014); Anthony R. Ingraffea et al., *Assessment and Risk Analysis of Casing and Cement Impairment in Oil and Gas Wells in Pennsylvania, 2000–2012*, 111 PROC. OF THE NAT'L ACAD. OF SCI. 10955, 10955 (2014); Seth B.C. Shonkoff et al., *Environmental Public Health Dimensions of Shale and Tight Gas Development*, 122 ENV'T HEALTH PERSP. 787, 787 (2014).

183. *See* 36 C.F.R. § 9.51(c).

184. 36 C.F.R. §§ 9.33(c), 9.51(c).

185. *See* NAT'L PARK SERV., U.S. DEP'T OF THE INTERIOR, REVISION OF 9B REGULATIONS GOVERNING OIL & GAS ACTIVITIES ENVIRONMENTAL IMPACT STATEMENT PUBLIC SCOPING COMMENT ANALYSIS 12, 14–17 (2011), *available at* http://www.nature.nps.gov/geology/oil_and_gas/documents/98_Regs_Draft_Comment_Analysis_Report_NOI.pdf [hereinafter NAT'L PARK SERV., COMMENT ANALYSIS].

186. Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61596, 61598 (Nov. 25, 2009) (to be codified at 36 C.F.R. pt. 9B).

187. 36 C.F.R. § 9.32(e). *See also Sierra Club v. Mainella*, 459 F. Supp. 2d at 79.

adjacent to and outside of park boundaries to extract privately owned oil and gas from beneath the park unit surface."[188] The exemption is not absolute. 9B requirements for directional drilling may be exempt only if the regional director determines that the operations within a park unit "pose no significant threat of damage to park resources."[189]

NPS estimates that about 15 percent of wells extracting from NPS units fall under the so-called "access exemption," which applies to oil and gas operators that can access NPS land without crossing federal owned lands or waters. [190] About 78 wells currently operate in national parks under the access exemption.[191] Many of these exempt wells are not required to install modern, state-of-the-art spill control equipment or adhere to spill control procedures. Operating near the park boundary and accessing parkland through drilling technology, while not adhering to state-of-the-art spill measures, may impact lands and waters within national parks.[192] Through site inspections of exempt operations, NPS found at least 10 instances of oil and gas sites subject to the access exemption with oil spills or leaks resulting in contamination of soils and water inside an NPS unit.[193]

Only four parks in four states currently have wells subject to the access exemption, but those parks have numerous exempt wells, as depicted in the table below:[194]

188. *Mainella*, 459 F. Supp. 2d at 79 (citing 36 C.F.R. § 9.32(e)).

189. *See id.* (citing 36 C.F.R. § 9.32(e)).

190. 36 C.F.R. § 9.32.

191. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. 65572, 65575 (Oct. 26, 2015) (to be codified at 36 C.F.R. pt. 1, 36 C.F.R. pt. 9); NAT'L PARK SERV., REGULATORY STATUS OF NONFEDERAL OIL AND GAS WELLS IN UNITS OF THE NATIONAL PARK SYSTEM (Sept. 2013), *available at* http://www.nature.nps.gov/geology/oil_and_gas/documents/2014-01-29%20Nonfederal%20Oil%20and%20Gas%20Wells%20in%20NPS%20Units.pdf; *see also* Elizabeth Geltman, *Better Regulation in National Parks*, HUFFINGTON POST (Dec.18, 2015), *available at* http://www.huffingtonpost.com/elizabeth-glass-geltman/post_10532_b_8808724.html.

192. *See* NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 5.

193. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. 65572, 65575 (Oct. 26, 2015) (to be codified at 36 C.F.R. pt. 1, 36 C.F.R. pt. 9).

194. GEOLOGICAL RES. DIV., NAT'L PARK SERV., U.S. DEP'T OF THE INTERIOR, REGULATORY STATUS OF OIL AND GAS WELL IN UNITS OF THE NATIONAL PARK SYSTEM 2 (2013), *available at* http://www.nature.nps.gov/geology/oil_and_gas/documents/2014-01-29%20%20Oil%20and%20Gas%20Wells%20in%20NPS%20Units.pdf.

NATIONAL PARK	STATE	NO FEDERAL ACCESS
Big Thicket	TX	2
Big South Fork National River & Recreation Area	TN, KY	54
Cuyahoga Valley National Park	OH	21
Obed Wild & Scenic River	TN	1
8 PARKS	**4 STATES**	**78 EXEMPT WELLS**

Big Thicket National Preserve[195] is an important illustration of pressure due to the shale gas boom to balance energy usage against long-term preservation goals.[196] There is a long history of oil and gas development in the area now designated as the Big Thicket Nature Preserve. Drilling in Big Thicket dates back to the beginning of the twentieth century.[197] When the Big Thicket National Preserve was established in 1974, Congress did not authorize the federal acquisition of subsurface mineral rights.[198] Hence, many subsurface rights in Big Thicket remain privately-held. Applications to extract the estimated 1.21 million barrels of oil, 70.11 billion cubic feet of natural gas and 1.02 million barrels of natural gas liquids date back to 1999.[199] Big Thicket now has nine non-federal oil and gas operations within the preserve, over 35 horizontally directional wells drilled from outside the preserve, and 105 pipeline segments.[200]

195. *See* NAT'L PARK SERV., U.S. DEP'T OF THE INTERIOR, BIG THICKET: HISTORY & CULTURE, http://www.nps.gov/bith/learn/historyculture/index.htm (last visited Oct. 18, 2015) (for a history of Big Thicket).

196. NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 5.

197. NAT'L PARK SERV., U.S. DEP'T OF THE INTERIOR, OIL AND GAS EXPLORATION AND PRODUCTION, http://www.nps.gov/bith/learn/nature/oil-and-gas-exploration-and-production.htm (last visited Dec. 22, 2015) (wherein NPS said, "Oil and gas production in the Big Thicket region dates back to the beginning of the 20th century, when oil was discovered at Spindletop, Sour Lake, Saratoga, and Batson. Early oil exploration initially concentrated at the southern edge of the Big Thicket region, pushed north and east in the 1930s, and by the 1950s much of the future national preserve was home to some level of oil and gas activity. Over 200 abandoned wells have been located within the boundary of the Preserve.").

198. *Id.* ("When the preserve was established, subsurface mineral rights were privately-held and Congress did not authorize the federal acquisition of these rights.")

199. Christine S. Diamond, *Judge delaying oil, gas drilling in Big Thicket*, LUFKIN DAILY NEWS, (Oct. 27, 2006), *available at* http://lufkindailynews.com/news/article_b9edc131-73e9-5437-b5d4-112801c58035.html.

200. NAT'L PARK SERV., U.S. DEP'T OF THE INTERIOR, OIL AND GAS EXPLORATION AND PRODUCTION, http://www.nps.gov/bith/learn/nature/oil-and-gas-exploration-and-production.htm (last

The administrators of Big Thicket receive numerous requests for drilling down to and accessing the oil and gas resources beneath the preserve using directional drilling.[201] Rather than allowing for drilling on preserve land, Big Thicket park administrators encourage horizontal directional drilling from lands outside the preserve for both well development and pipeline placement as a tool to minimize the impacts within the preserve.[202] Big Thicket administrators also encourage the use of helicopters rather than roads when evaluating drill sites to avoid damaging vegetation while accessing test hole sites.[203] Yet NPS has concerns about the ability to balance oil and gas drilling with preservation in Big Thicket. As an example of such concern, NPS said: "a poorly operated oil tank battery within the boundary of Big Thicket National Preserve that is currently exempt because it does not require access across federally owned land has contaminated storm water runoff that runs into adjacent federally owned land near Village Creek."[204]

Big Thicket is not the only park where examples of the inadequacy to regulate wells subject to the access exemption. A large compressor found in Big South Fork National River and Recreation Center provides another example of practical concern presented by the access exemption.[205] According to NPS, the compressor located outside the park "causes unabated noise for which the NPS is unable to require mitigation due to the current scope of the regulations."[206]

3. Directional Drilling Incentives

With the invention and expansion of the use of HVHF, the new form of access exemption developed and proliferated in the form of directional drilling. Oil and gas operators can now locate operations outside the park and drill under park property to extract oil or natural gas from shale. The allowance of an exemption for directional drilling[207] "provides an incentive to operators to locate their surface

visited Oct. 31, 2015). *See also* Plan of Operations, Environmental Assessment, Big Thicket National Preserve, Texas, 77 Fed. Reg. 24,979 (Apr. 18, 2012); U.S. Gov't Publishing Office, *77 FR 24979-Plan of Operations, Environmental Assessment, Big Thicket National Preserve, Texas*, http://www.gpo.gov/fdsys/granule/FR-2012-04-26/2012-10137 (last visited Oct. 31, 2015).

201. NAT'L PARK SERV., U.S. DEP'T OF THE INTERIOR, OIL AND GAS EXPLORATION AND PRODUCTION, http://www.nps.gov/bith/learn/nature/oil-and-gas-exploration-and-production.htm (last visited Dec. 22, 2015) ("With nearly all of the oil and gas resources under the preserve being 'owned' by mineral rights, Big Thicket continues to get requests for drilling down to and accessing those oil and gas resources.").

202. *Id.* ("The use of best management practices like horizontal directional drilling from lands outside the preserve for both well development and pipeline placement is one tool used to minimize the impacts to the preserve.").

203. NAT'L PARK SERV., U.S. DEP'T OF THE INTERIOR, OIL AND GAS EXPLORATION AND PRODUCTION, http://www.nps.gov/bith/learn/nature/oil-and-gas-exploration-and-production.htm (last visited Nov. 2, 2015). *See* NAT'L PARK SERV., OPERATORS HANDBOOK, *supra* note 67, at Table 5.1, 118–119 (for a list of other suggested mitigation measures).

204. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. 65572, 65575 (Oct. 26, 2015) (to be codified at 36 C.F.R. pt. 1, 36 C.F.R. pt. 9).

205. *Id.*

206. *Id.*

207. 36 C.F.R. § 9.32 (2015). *See* NAT'L PARK SERV., COMMENT ANALYSIS, *supra* note 185 (for public comments on directions drilling); Jessica Goad & Christy Goldfuss, *Drilling Could Threaten Our National Parks*, CENTER FOR AMERICAN PROGRESS (Sept. 12, 2012), https://

facilities outside the park and thereby reduce impacts to park resources."[208] When qualifying for the directional drilling exemption, operators do not need to submit a proposed plan of operations[209] or post a bond[210] to cover accidents[211] and post closure cleanup.[212] Rather, after demonstrating a mineral right in the NPS unit, the operator prepares a more limited Section 9.32(e) application rather than a full plan of operations.[213] Thus, for operators, qualifying for the exemption reduces costs and makes the process of commencing drilling operations much quicker.[214]

The incentives for the directional drilling exemption are not, however, limited to operators.[215] Rather, the exemption also provides certain advantages for park superintendents because locating the drilling pads outside the national park can "significantly reduce direct impacts to park resources and values."[216] When the drill pad is established outside the park, then little to no land need be cleared inside the park boundaries. By locating drilling operations outside the park, both the park and the operator "ha[ve] deployed a major park protection mitigation measure."[217]

Nonetheless, adverse impacts are not limited to downhole drilling activities.[218] Both NPS and the courts describe impacts from "connected actions," defined as development actions "occurring outside of the park related to the directional drilling operation inside the park includ[ing] the construction of the well and production pad(s), gas sales/transportation line, and access road; drilling and completion; hydrocarbon production and transportation; and well plugging and surface reclamation."[219]

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www.americanprogress.org/issues/green/news/2012/09/12/37152/drilling-could-threaten-our-national-parks/.

208. Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61598 (Nov. 25, 2009) (to be codified at 36 C.F.R. pt. 9B). Directional drilling also creates challenges to private property owners. *See* Garrett Wilkerson, *Rigging Rights of Passage: Analyzing Subsurface Easements in Horizontal Drilling*, 84 MISS. L.J. 135 (2015) (for a discussion of easements). *See also* H. Philip Whitworth & D. Davin McGinnis, *Square Pegs, Round Holes: The Application and Evolution of Traditional Legal and Regulatory Concepts for Horizontal Wells*, 7 TEX. J. OIL GAS & ENERGY L. 177 (2011–2012); Benjamin Holliday, *New Oil and Old Laws: Problems in Allocation of Production to Owners of Non-Participating Royalty Interests in the Era of Horizontal Drilling*, 44 ST. MARY'S L.J. 771 (2013).

209. *See* NAT'L PARK SERV., OPERATORS HANDBOOK, *supra* note 67, at 55–112 (for details of what is required in the plan of operation).

210. 36 C.F.R. § 9.48.

211. 36 C.F.R. § 9.46.

212. 36 C.F.R. § 9.48; *see also* NAT'L PARK SERV., OPERATORS HANDBOOK, *supra* note 67, at 17.

213. *See* NAT'L PARK SERV., OPERATORS HANDBOOK, *supra* note 67, at 4 and 113–126.

214. *See id.* at 116.

215. *See* John M. Golden & Hannah J. Wiseman, *Fracking Revolution: Shale Gas as a Case Study in Innovation Policy*, 64 EMORY L.J. 955 (2014) (for a discussion of innovations in shale oil and gas technology and their benefits).

216. Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61598 (Nov. 25, 2009) (to be codified at 36 C.F.R. 9).

217. Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61598 (Nov. 25, 2009) (to be codified at 36 C.F.R. 9).

218. *See Mainella*, 459 F. Supp. 2d at 89.

219. *Id.* at 83.

In Big Thicket National Park, NPS conducted different environmental assessments for "impacts from in-park operations" and "impacts from connected operations."[220] Although the record showed no adverse impacts "as a result of the downhole activities that would occur within the Preserve" because "the wellbore would cross into the Preserve at depths too far below the surface to give rise to environmental impacts," the record specifically noted the potential for damage due to connected activities.[221] The range of impacts on the park due to activities taking place outside the preserve included air,[222] water,[223] light[224] and noise pollution.[225]

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220. *Id.*

221. *Id.* at 84.

222. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. 65572, 65574, 65575 (Oct. 26, 2015) (to be codified at 36 C.F.R. pt. 1, 36 C.F.R. pt. 9). *Cf.* Aviva Litovitz et al., *Estimation of Regional Air-quality Damages from Marcellus Shale Natural Gas Extraction in Pennsylvania*, 2013 ENVTL. RES. LETTERS 1, 1 (Jan. 1, 2013) ("Most emissions are related to ongoing activities, i.e., gas production and compression, which can be expected to persist beyond initial development and which are largely unrelated to the unconventional nature of the resource. Regulatory agencies and the shale gas industry, in developing regulations and best practices, should consider air emissions from these long-term activities, especially if development occurs in more populated areas of the state where per-ton emissions damages are significantly higher.").

223. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65574. *See* R. D. Vidic et al., *supra* note 182, at 826 ("Horizontal drilling and hydraulic fracturing make the extraction of tightly bound natural gas from shale formations economically feasible. These technologies are not free from environmental risks, however, especially those related to regional water quality, such as gas migration, contaminant transport through induced and natural fractures, wastewater discharge, and accidental spills.").

224. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65574. *See generally* Steve Albers & Dan Duriscoe, *Modeling Light Pollution from Population Data and Implications for National Park Service Land*, 18.4 GEORGE WRIGHT FORUM 56 (2001) (describing a model to "evaluate the effects of light pollution on areas administered by the National Park Service for the purpose of protecting night sky visibility.").

225. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65574. *See also* NAT'L PARK SERV., U.S. DEP'T OF THE INTERIOR, OIL AND GAS EXPLORATION AND PRODUCTION, http://www.nps.gov/bith/learn/nature/oil-and-gas-exploration-and-production.htm (last visited Dec. 22, 2015) ("Continued oil and gas exploration and production within the [Big Thicket] preserve are of concern for multiple reasons. Spills can contaminate waters and soils; air quality can be affected by accidental releases of volatile chemicals; vehicle traffic and new roads can compact soils and change natural drainage patterns; wildlife movements and feeding and nesting activities can be disrupted; and vegetation must be cut or cleared along seismic survey lines and pipelines and where drilling pads are placed. Visitor experience and natural quiet can also be negatively affected by oil and gas activities within the Preserve."). *See generally* Britton L. Mace, Paul A. Bell, & Ross J. Loomis, *Visibility and Natural Quiet in National Parks and Wilderness Areas: Psychological Considerations*, 36 ENV'T AND BEHAV. 5 (2004) ("For over a century, authorities have recognized cultural and psychological benefits of preserving national parks and wilderness areas. Yet, with increases in visitation and mechanized travel, air and noise pollution are intruding more and more into preserved natural areas. Psychological research shows that humans can detect very low levels of these pollutants in natural and laboratory settings, that air and noise pollution detract from the enjoyment of the visitor experience, and that people place a high value on naturally quiet, pollution-free settings."). *See also* Jesse R. Barber, Kevin R. Crooks & Kurt M. Fristrup, *The Costs of Chronic Noise Exposure for Terrestrial Organisms*, 25 TRENDS IN ECOLOGY & EVOLUTION 180, 180 (2010) ("Growth in transportation networks, resource extraction, motorized recreation and urban development is responsible for chronic noise exposure in most terrestrial areas, including remote wilderness sites. Increased noise levels reduce the distance and area over which acoustic signals can be perceived by animals . . . effective management of protected areas must include noise assessment.").

Air pollution is already a concern in many NPS units that are in nonattainment areas[226] for criteria pollutants.[227] Drilling in NPS units, including offsite directional drilling into NPS units, may exacerbate the problem.[228] Air pollution from directional drilling results from oil and gas construction activities, use of vehicles and large gasoline, and diesel engines required to power drilling equipment.[229] Air pollution is greatest during the drilling phase but continues "at an unspecified reduced level after drilling."[230] Air pollution in Big Thicket due to directional drilling was described in the NPS environmental assessment as "low intensity levels, with localized, short-to long-term, negligible to minor, adverse impacts."[231]

Water pollution is a concern in all oil and gas drilling operations, [232] but is an especially important factor in modern operations that use HVHF.[233] Water pollution from both ground and surface waters from HVHF activities has particularly caught the attention of the public and is the subject of numerous active studies. Even where the drill site is located outside the park, water pollution is possible, depending on the location of the well pads.[234] Most documented water pollution results from spills;[235] if the well pad is located at a higher elevation or upstream from the park, then any spills occurring outside of the park may travel downhill or downstream into the park. Concerns are greatest, of course, where well pads are located in areas that would drain in the direction of park water resources such as floodplains, wetlands, and "other waters of the United States."[236] Contaminants such as brine water, hazardous substances and leaked oil and gas could spill and drain from the wellhead

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226. *See* ENVTL. PROT. AGENCY, CHAPTER 5: NONATTAINMENT AREAS, AIRTRENDS 1995 REPORT 59, 59 (1995), *available at* http://www3.epa.gov/airtrends/aqtrnd95/report/files/chapt5.pdf (last visited Nov. 2, 2015) (offering a definition of nonattainment).

227. *See, e.g.*, Eduardo P. Olaguer, *The Potential Near-Source Ozone Impacts of Upstream Oil and Gas Industry Emissions*, 62 J. OF THE AIR & WASTE MGMT. ASS'N. 966, 966 (2012); Susan, Kemball-Cook et al., *Ozone Impacts of Natural Gas Development in the Haynesville Shale*, 44 ENVTL. SCI. & TECH. 9357, 9357 (2010); Amnon Bar-Ilan et al., *Development of Baseline 2006 Emissions from Oil and Gas Activity in the Denver-Julesburg Basin*, ENVIRON INT'L CORP., 1 (2008), http://www.colorado.gov/airquality/documents/deno308/2008-04_2706_Baseline_Emissions_DJ_Basin_Technical_Memo_(04-30).pdf.

228. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65574.

229. *Id. See also* Moss, *supra* note 126, at 1, 8.

230. Sierra Club v. Mainella, 459 F. Supp. 2d 76 at 85.

231. *Id.*

232. Burden et al., ENVTL. PROT. AGENCY, REVIEW OF STATE AND INDUSTRY SPILL DATA: CHARACTERIZATION OF HYDRAULIC FRACTURING-RELATED SPILLS 1 (2015), *available at* http://www2.epa.gov/sites/production/files/2015-05/documents/hf_spills_report_final_5-12-15_508_km_sb.pdf ("Spills related to hydraulic fracturing were most often characterized by numerous, low volume events (up to 1,000 gallons) and relatively few high volume events (greater than 20,000 gallons). The most common material spilled was flowback and produced water, and the most common source of spills was storage units. More spills were caused by human error than any other cause. Over half of the spills associated with hydraulic fracturing reached an environmental receptor, with 33 instances of spilled fluids reaching surface or ground water resources.").

233. *See supra* p. 6–7 and accompanying text.

234. *See* Moss, *supra* note 126, at 1, 4, 15.

235. *See infra* notes 240–246 and accompanying text.

236. *See* Clean Water Rule: Definition of "Waters of the United States," 80 Fed. Reg. 37,054 (June 29, 2015) (to be codified at 33 C.F.R. pt. 328).

outside the park into the land and waters in the park.[237] In the worst-case scenario, spills could lead to aquifer contamination.[238]

For mitigation measures to protect surface waters from proposed drilling in the Marcellus, NPS looks for use of closed-loop mud systems, off-site disposal of waste, use of berms and liners in storage, stormwater and erosion control measures, and control of the locations and source of water used for the hydraulic fracturing itself.[239] To protect groundwater in the Marcellus, NPS seeks good casing and cementing practices when drilling and plugging oil and gas wells.[240] NPS also mandates well monitoring during production.[241] For example, to prevent spills, operators in Big Thicket agreed to employ surface casing and cementing as well as erosion controls in the site design that would mitigate risks to park waters.[242] NPS efforts to incorporate regulations developed by its sister agency, BLM, provide an important framework for construction and operation standards within NPS units.[243] Needed revisions include updating well casing and cementing standards to incorporate modern safety standards, establishing an environmental baseline as a precondition to granting drilling permits and mapping where piping related to oil and gas operations is installed. The 2015 proposed regulations do a good job of updating well casing and cementing standards and otherwise incorporating modern safety standards,[244] but the proposed changes do not address the need to establish an environmental baseline or to map subsurface activities.

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237. Sierra Club v. Mainella, 459 F. Supp. 2d at 85.

238. Moss, *supra*, note 126, at 7.

239. Moss, *supra*, note 126, at 16.

240. *Id. See* BOYD ET AL., ENVTL. PROT. AGENCY, REVIEW OF WELL OPERATOR FILES FOR HYDRAULICALLY FRACTURED OIL AND GAS PRODUCTION WELLS: WELL DESIGN AND CONSTRUCTION, 6 (2015), http://www2.epa.gov/sites/production/files/2015-05/documents/wfr_1_final_5-8-15_508_km_5-13-15_sb.pdf (for an EPA report on the importance of well casing in protecting water) ("The importance of oil and gas production well design and construction in isolating and protecting ground water resources is well-known [Ground Water Protection Council (GWPC), 2014; GWPC and ALL Consulting, 2009; King and King, 2013]. Several studies, however, suggest that the construction of oil and gas production wells may introduce pathways along which fluids may move, potentially leading to impacts to drinking water resources (Harrison, 1983, 1985; Jackson et al., 2013a; Jackson et al., 2013b; Ohio Department of Natural Resources, 2008; Osborn et al., 2011; Van Stempvoort et al., 2005; Watson and Bachu, 2009). For example, the Ohio Department of Natural Resources (2008) determined that inadequately cemented casing contributed to natural gas migration to a ground water resource by creating a pathway that connected a high pressure gas zone to the ground water resource. As demonstrated by this case, subsurface fluid movement depends on many factors, including the existence of a pathway, the presence of a fluid, and a driving force (e.g., pressure differential).").

241. Moss, *supra* note 126, at 7. *See* Itzchak E Kornfeld, *Geology, the Marcellus Shale, Experts, and Dispute Resolution*, 116 W.V. L. REV. 866, 866–67 (2014) (for a discussion of the legal importance of good casing) ("Indeed, as in any discussion of the environment or oil and gas exploration and production, knowledge of the geology of the subsurface terrain is essential. For example, if a well's casing is not cemented correctly, or if a cement bond survey is faulty, a series of experts, including a cementing engineer or cement scientist, and a geologist, will need to demonstrate to the trier of fact what the proper cementing methodology or standard is, and whether it was followed . . . experts in geology, hydrogeology and hydrological modeling are needed in actions claiming fracking-related water contamination.").

242. 459 F. Supp. 2d at 86.

243. *Cf.* 43 C.F.R. § 3160 (2015).

244. *See* General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. 65572, 65573 (Oct. 26, 2015) (to be codified at 36 C.F.R. pt. 1, 36 C.F.R. pt. 9).

Sound pollution from directionally drilled sites can be quite pronounced,[245] as sound can travel great distances. Increased sound is likely to occur during the building phase of the oil and gas operations and continues, to a lesser extent, throughout the life of the well as long as the well remains in operation.[246] Increased sound can displace wildlife and interfere with park visitor use and enjoyment in national parks. Concerns about noise pollution in national parks is by no means limited to oil and gas operations—timbering operations can also yield sound pollution. To reduce sound, as with other commercial ventures in park units, NPS may place seasonal restrictions on certain activities, require engineering that either takes advantage of natural barriers or erect man-made sound barriers, or simply demand the mufflers be installed on machinery.[247]

In addition to changes in sound levels, directional drilling could potentially impair park visitors' day-to-day enjoyment by way of other direct impacts, including impaired sight, light pollution due to artificial light and foul odors.[248] Oil and gas well pads are visible footprints of industry that create physical eyesores that may be considered inconsistent with the tranquility associated with park recreation.[249] Drilling operations often have huge lights that alter the nightscape. [250] Even without accidental spills, holding ponds sometimes used by drillers to hold produced waters can smell unpleasant and inconsistent with the natural odors park visitors expect when hiking, climbing, or camping in a national park.

The indirect impacts of increased sound, altered vistas, increased artificial light, and foul odors can alter park experience.[251] Simple, often inexpensive techniques such as limiting drill sites to areas that are not being used for recreation and requiring oil and gas drilling to occur only in daylight can reduce some impacts on park users. Current NPS policy demands that park administrators balance the needs to honor mineral rights owners with those of park visitors and future generations.[252] As such, the current NPS practice is to encourage locating well pads outside national park borders as a key mitigation strategy because such locating eliminates park land clearings and other direct impacts,[253] and reduces certain indirect impacts (relative to surface operations within a park).[254]

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245. *Id*. at 65574. *See* Emma Lynch et al., *An assessment of noise audibility and sound levels in U.S. National Parks,* 26 LANDSCAPE ECOLOGY 1297 (2011) (for discussions of noise); Nicholas P. Miller, *U.S. National Parks and management of park soundscapes: A review*, 69.2 APPLIED ACOUSTICS 77 (2008).

246. *See* Sierra Club v. Mainella, 459 F. Supp. 2d at 85–86.

247. Moss, *supra* note 126, at 17.

248. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65574.

249. *Id.*

250. *Id.*

251. *Id.*

252. *Id.* at 65573.

253. NAT'L PARK SERV., OPERATORS HANDBOOK, *supra* note 67, at 4, 115.

254. Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61598 (Nov. 25, 2009) (to be codified at 36 C.F.R. 9).

III. PROPOSED REVISIONS TO THE 9B RULES

Compared to the 95,000 wells operated on BLM lands[255] and the 5,000 oil and gas wells in 107 National Wildlife Refuges,[256] the NPS program of about 550 active oil and gas wells is remarkably small. Nonetheless, based on the pressure to increase drilling on federal lands, 30 years after the first promulgation of the 9B rules, in November 2009, the NPS sought input from the public on ways the NPS could improve the 9B regulations prior to undertaking a proposed rulemaking.[257]

A little over one year later, in late December 2010, the NPS published its formal proposal on how to revise the 9B regulations.[258] In 2010, NPS listed concrete objectives in revising the 9B regulations. 9B regulations should: (1) regulate all operations within the boundary of NPS units; (2) update operating standards to incorporate new scientific findings, technologies, and methods least-damaging to park resources and values; (3) protect the public and park staff from health and safety hazards associated with non-federal oil and gas operations; (4) ensure financial assurance is adequate to protect park resources and values; (5) provide a practical means for dealing with minor acts of noncompliance or with illegal and unauthorized operations; (6) obtain fair compensation for operators' use of federal land outside of the leasehold; (7) promulgate regulations in clear language that is better understood by the operating community, public, and park staff; and (8) regulate directional drilling operations to retain incentives for operators to site operations outside of parks while still protecting park resources and values.[259]

As of December 2010, when the NPS proposed revising the 9B regulations,[260] 693 non-federal oil and gas operations were permitted in a total of twelve units of the National Park System in compliance with the 9B regulations.[261]

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255. Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands, 80 Fed. Reg. 16129 (March 25, 2015) (to be codified at 43 C.F.R. 3160).

256. Management of Oil and Gas Rights; Proposed Rule, 80 Fed. Reg. 77200, 77201 (Dec. 11, 2015) (to be codified at 50 C.F.R. pt. 28, 50 C.F.R. pt. 29).

257. Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61596 (Nov. 25, 2009) (to be codified at 36 C.F.R. 9) (further explaining that the NPS is evaluating alternatives for revising 36 C.F.R. Part 9, Subpart B (the "9B regulations") that governs oil and gas development within the boundaries of units of the National Park System. The current regulations have been in effect for over thirty years and have not been substantively updated during that period. NPS is preparing an environment impact statement (EIS) to assess potential environmental impacts associated with a range of reasonable alternatives for regulating oil and gas development impacts on park resources such as threatened and endangered species, soils, vegetation, wetlands, wildlife, and cultural resources. Effects on oil and gas operators, visitor experience and public safety, adjacent lands and park operations will also be analyzed.); NAT'L PARK SERV., U.S. DEP'T OF INTERIOR, REVISIONS OF 9B REGULATIONS GOVERNING OIL AND GAS ACTIVITIES, http://parkplanning.nps.gov/projectHome.cfm?projectID=28329 (last visited Nov. 2, 2015).

258. *See* Non-federal Oil and Gas Development Within the Boundaries of Units of the National Park System; Intent To Prepare an Environmental Impact Statement for a Proposed Revision, 75 Fed. Reg. 82362, 82363 (Dec. 30, 2010) (to be codified at 36 C.F.R. pt. 9).

259. *Id. See also* O'DELL, COST-BENEFIT AND REGULATORY FLEXIBILITY ANALYSIS, *supra* note 152, at 2.

260. *See* Nonfederal Oil and Gas Development Within the Boundaries of Units of the National Park System; Intent To Prepare an Environmental Impact Statement for a Proposed Revision, 75 Fed. Reg. 82362, 82363 (Dec. 30, 2010) (to be codified at 36 C.F.R. pt. 9).

261. *Id.* at 82363.

The increased interest in drilling in the Marcellus[262] and other newly exploited shale deposits on the East Coast creates a substantial need to reevaluate the 9B rules.

Unlike the over 177,000 comments filed concerning BLM's proposed revisions to oil and gas drilling regulations,[263] only 19 public comments were filed in the public docket that NPS opened to solicit responses to the proposed revision of the 9B regulations.[264] Although few made comments in 2009 when the 9B revisions were first proposed, environmental conservation groups, including the National Parks Conservation Association,[265] Food and Water Watch,[266] and the Center for American Progress,[267] (not surprisingly) shared NPS concerns about unregulated or under-regulated oil and gas operations in national parks.

The Obama administration again issued a proposal to amend the regulations regarding oil and gas development in national park units on October 26, 2015.[268] The

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262. General Provisions and Non-federal Oil and Gas Rights, 80 Fed. Reg. 65572, 65574 (Oct. 26, 2015) (to be codified at 36 C.F.R. pt. 1, 36 C.F.R. pt. 9). Moss, *supra* note 126, at 1.

263. *See* BUREAU OF LAND MGMT., U.S. DEP'T OF THE INTERIOR, BLM EXTENDS PUBLIC COMMENT PERIOD ON PROPOSED HYDRAULIC FRACTURING RULE, http://www.blm.gov/wo/st/en/info/newsroom/2013/june/nr_06_07_2013.html (last visited Nov. 2, 2015) ("[T]he BLM received more than 177,000 public comments and feedback that helped to inform the updated draft proposal, which was published May 25, 2013.").

264. Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61596, 61599 (Nov. 25, 2009) (to be codified at 36 C.F.R. 9). *See also* NAT'L PARK SERV., U.S. DEP'T OF THE INTERIOR, REVISION OF 9B REGULATIONS GOVERNING NONFEDERAL OIL AND GAS ACTIVITIES 1, 1–67 (2011), *available at* https://www.nature.nps.gov/geology/oil_and_gas/documents/98_Regs_Draft_Comment_Analysis_Report_NOI.pdf.

265. *See* Energy and Mining, NAT'L PARKS CONSERVATION ASS'N, http://www.npca.org/protecting-our-parks/air-land-water/mining-and-fracking/ (last visited Nov. 3, 2015). *See also* Ben Jervey, *Fracking out National Parks: America's Best Idea Threatened by Oil and Gas Addiction*, DESMOG BLOG, (Apr. 27, 2013, 8:00 PM), http://www.desmogblog.com/2013/04/27/fracking-our-national-parks-america-s-best-idea-threatened-american-oil-and-gas-addiction.

266. *Map: Public Lands Threatened by Fracking*, FOOD AND WATER WATCH, https://secure3.convio.net/fww/site/SPageServer?pagename=national_parks_public_lands_fracking_2014 (last visited Oct. 15, 2015).

267. *Drilling Could Threaten our National Parks*, CENTER FOR AMERICAN PROGRESS (Sept. 12, 2012), https://www.americanprogress.org/issues/green/news/2012/09/12/37152/drilling-could-threaten-our-national-parks/.

268. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. 65572 (Oct. 26, 2015) (to be codified at 36 C.F.R. pt. 1, 36 C.F.R. pt. 9). According to NPS, the 2015 updates would include:

- Elimination of two regulatory provisions that exempt approximately 60% of the oil and gas operations located within the national park system;
- Elimination of the cap on financial assurance (bonding);
- Application of the penalty provisions of 36 CFR 1.3;
- Incorporation of fees for new access beyond that held as part of the operator's mineral right;
- Addition of a new well-plugging provision;
- Clarification that access to oil and gas properties in Alaska is controlled by 43 CFR part 36, which implements provisions of the Alaska National Interest Lands Conservation Act;
- Clarification of well stimulation information requirements and operating standards;
- Incorporation of a new format that makes it easier to identify the information requirements for particular types of operations;
- Incorporation of a new format for operating standards so that both the NPS and the operator can readily identify what standards apply to particular operations;
- Elimination of redundant definitions and provisions;

most recent proposal includes standards promulgated by BLM[269] and is consistent with proposed regulations for National Wildlife Refuges.[270] The 2015 NPS proposal is based on documented damage non-federal oil and gas activities caused in national parks, including: 26 instances of surface water quality degradation in national parks from spills, storm water runoff, erosion, and sedimentation; 47 instances of soil and ground water contamination in national parks from existing drilling mud pits, poorly constructed wells, and spills, and leaks attributable to wellhead leaks, pump jack leaks, tank battery leaks, and operations and maintenance spills; 14 instances of air quality degradation and notable odors in national parks (emanating from wellheads) due to dust, natural gas flaring, hydrogen sulfide gas, and emissions from production operations and vehicles; 6 instances of increased noise in NPS units from well pad equipment (such as seismic operations, blasting, construction, oil and gas drilling and production operations); 15 NPS sites with adverse effects on sensitive and endangered species; 6 NPS sites with disturbance due to archeological and cultural resources from blasting associated with seismic exploration and road/site preparation, maintenance activities or by spills; and 62 instances in national parks that presented as visitor safety hazards from equipment, pressurized vessels and lines, presence of hydrogen sulfide gas, and leaking oil and gas that could create explosion and fire hazards.

NPS also documented but did not quantify concerns about "noise and human presence effects on wildlife behavior, breeding, and habitat utilization; disruption of wildlife migration routes; viewshed intrusion by roads, traffic, drilling equipment, production equipment, pipelines; and night sky intrusion from artificial

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- Consolidation of existing regulatory provisions; and
- Codification of some existing agency policies and practices.

NAT'L PARK SERV., U.S. DEP'T OF THE INTERIOR, General Provisions and Non-Federal Oil and Gas Rights, *available at* http://www.regulations.gov/#!documentDetail;D=NPS-2015-0006-0001. The administration also proposed a set of regulations updating oil and gas operations in the National Wildlife Refuge System on Dec. 11, 2015. Management of Oil and Gas Rights; Proposed Rule, 80 Fed. Reg. 77200 (Dec. 11, 2015) (to be codified at 50 C.F.R. pt. 28, 50 C.F.R. pt. 29). Like national park units, there are numerous units in the National Wildlife Refuge System where the mineral rights were severed prior to transferring title to the federal government. *Id.* Discussion of oil and gas regulations in the National Wildlife Refuge System is beyond the scope of this article.

269. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65572 (Key updates to the proposed regulations also included the (1) elimination of two regulatory provisions that exempt approximately 60 percent of the oil and gas operations located within the national park system; (2) elimination of the cap on financial assurance (bonding); (3) application of the penalty provisions of 36 C.F.R. § 1.3 (2015); (4) incorporation of fees for new access beyond that held as part of the operator's mineral right; (5) addition of a new well-plugging provision; (6) clarification that access to oil and gas properties in Alaska is controlled by 43 C.F.R. pt. 36 (2015), which implements provisions of the Alaska National Interest Lands Conservation Act; (7) clarification of well stimulation information requirements and operating standards; (8) incorporation of a new format that makes it easier to identify the information requirements for particular types of operations; (9) incorporation of a new format for operating standards so that both the NPS and the operator can readily identify what standards apply to particular operations; (10) elimination of redundant definitions and provisions; (11) consolidation of existing regulatory provisions; and (12) codification of some existing agency policies and practices.).

270. Management of Oil and Gas Rights; Proposed Rule, 80 Fed. Reg. 77200 (Dec. 11, 2015) (to be codified at 50 C.F.R. pt. 28, 50 C.F.R. pt. 29).

lighting and gas flares.[271] Following is a discussion of key revisions proposed by NPS, beginning with the need for updating financial assurances.

A. Updating Financial Assurances

A key target for 9B revision is the change to the financial assurance provisions.[272] NPS proposes renaming what was previously called the "performance bond" requirement as a dictate of "financial assurances."[273] The revised regulations would require oil and gas drillers to post financial assurance "equal to the amount of reclamation,"[274] rather than limiting bonds to $200,000 per operator as was stipulated in the 1978 rules. In addition, the revised rules allow NPS to amend financial assurances provided by oil and gas drillers and operators if and when circumstances change.[275]

Concerns over bond inadequacy are not academic and are not limited to future oil and gas operations. NPS estimates that there are about 150 oil and gas drilling operations with projected reclamation requirements that exceed the current $200,000 bonding cap.[276] Total costs to close current NPS facilities for the 150 sites that are under-bonded are estimated at $10 million to $12 million, which will fall to federal taxpayers[277] and deplete scarce park resources[278] unless the 9B rules are amended.

Changes to the NPS 9B bond requirements and other financial assurances are badly needed to protect national parks. Bond requirements protect national park resources in several circumstances. First, requiring drillers to post a bond serves as a financial assurance that the oil and gas operators will properly close the drill site according to the approved plan and applicable state law. State law is especially important in instances where the oil and gas operations are exempt from 9B regulations since for exempt operations, only state laws and regulations would apply. Second, the bond provides needed funds in the event of a drilling or operational accident. Finally, the bond is expected to provide sufficient funds to protect the park if the drilling operator goes out of business or otherwise fails to fulfill obligations under state law or the approved plan of operations.[279]

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271. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65574.

272. General Provisions and Oil and Non-Federal Gas Rights, 80 Fed. Reg. at 65582, 65600. Nonfederal Oil and Gas Development Within the Boundaries of Units of the National Park System; Intent to Prepare an Environmental Impact Statement for a Proposed Revision, 75 Fed. Reg. 82362, 82363 (Dec. 30, 2010) (to be codified at 36 C.F.R. 9).

273. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65582.

274. *Id.*

275. *Id.*

276. NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 8.

277. *Id.*

278. *See* NAT'L PARK SERV., U.S. DEP'T OF THE INTERIOR, FISCAL YEAR 2016 BUDGET JUSTIFICATIONS 1, 2–5 (2016), *available at* http://www.nps.gov/aboutus/upload/FY-2016-Greenbook.pdf.

279. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65582. *See* Nonfederal Oil and Gas Development Within the Boundaries of Units of the National Park System; Intent To Prepare an Environmental Impact Statement for a Proposed Revision, 75 Fed. Reg. 82362, 82363 (Dec. 30, 2010) (to be codified at 36 C.F.R. pt. 9B).

The outdated 9B financial regulations do not account for inflation and "are not consistent with practices of other Federal agencies and private landowners by requiring compensation for privileged access across federally owned lands for operators accessing their leaseholds."[280] The bonding limits set by NPS in 1978 remain at $200,000 per operator, per park unit.[281] In today's monetary values, the equivalent to the regulatory bond limit would be about $756,238.32. NPS is wise to replace the $200,000 bond limit with the actual cost of reclamation[282] and the costs for processing and monitoring non-federal oil and gas operations in national parks.[283] In addition, by matching financial assurances to actual cost, the proposed revision also allows financial assurances required as a condition of permit to rise to reflect inflation. Non-federal operations in national parks are expensive because operators require oversight to ensure preservation of park resources. Currently, the NPS—and thereby the federal taxpayers—bear the cost of oversight, rather than the private oil and gas drillers that benefit financially from the operations. Since the $200,000 bond limit no longer covers the actual costs of projected site reclamation and, in practice, often leaves the burden on federal taxpayers to pay for park reclamation of abandoned sites and sites subject to accidents, the NPS proposed amends are quite reasonable. Changing the financial assurance provision will shift the burden back so the taxpayers do not bear the burden of depletion of park resources. Shifting the burden away from taxpayers is especially important since the taxpayers gain no direct benefit from drilling in park units—direct benefits accrue to the oil and gas drillers, operators and investors.

An example of inadequate current bond limits is oil and gas operations at the Padre Island National Seashore in Texas.[284] The cost to close and reclaim a single pad, multi-well drilling operation in the Padre Island National Seashore is estimated at $350,000 per site.[285] To date, the $150,000 per site deficit was usually absorbed by federal taxpayers, rather than by the oil and gas operator who profited from the mineral extraction. NPS bond limits remain far below those financial assurances that other federal agencies require for oversight of drilling on federal lands. In their respective regulations, BLM and FWS each set bonds based on estimated costs of well closure, site reclamation, and closure.[286] Neither BLM nor FWS are subject to any bonding cap—let alone a cap as low as $200,000 per park unit.[287] Instead, when

280. *Id.* at 82363.

281. Performance Bond, 36 C.F.R. § 9.48; NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 8.

282. Nonfederal Oil and Gas Development Within the Boundaries of Units of the National Park System; Intent To Prepare an Environmental Impact Statement for a Proposed Revision, 75 Fed. Reg. 82362, 82363 (Dec. 30, 2010) (to be codified at 36 C.F.R. pt. 9B); Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61596, 61599 (Nov. 25, 2009) (to be codified at 36 C.F.R. 9). *See also* NAT'L PARK SERV., COMMENT ANALYSIS, *supra* note 185, at 1.

283. *Id. See also* NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 1.

284. *See* NAT'L PARK SERVICE, COMMENT ANALYSIS, *supra* note 185, at 8.

285. *Id. See* Richard W. Dixon, Susan L. Peters & Christi G. Townsend, *Burrowing preferences of Atlantic ghost crab, Ocypode quadrata, in relation to sand compaction in Padre Island National Seashore, Texas*, 36 PHYSICAL GEOGRAPHY 188 (2015) (for a discussion of ecological impacts of increased oil and gas truck traffic at Padre Island National Seashore).

286. NAT'L PARK SERV., COMMENT ANALYSIS, *supra* note 185, at 10.

287. NAT'L PARK SERV., COMMENT ANALYSIS, *supra* note 185, at 10.

granting rights to drill on federal lands, BLM sets financial assurances based on the project. BLM also has the right to increase bond requirements on operators at any time based on changing needs.[288]

Revisions to 9B bonding requirements are critical and would provide parity across federal lands.[289] The revisions are correct in requiring that facilities operating in national parks post bonds equal to the reasonable cost of reclamation for each unit operating within the national park borders.[290] Posting bonds that reflect closure costs is a reasonable cost of doing business.[291] NPS should not allow oil and gas operators that are unwilling or cannot afford to post spill protection and closure bonds to conduct business on park property. Operators who want to drill in national parks should expect to raise sufficient financial backing to cover the costs of accidents and closure as another cost of doing business. Such bond assurance revisions would act as a mechanism to allow timely reclamation completion in instances where the operator defaults or otherwise fails to undertake the needed closure.[292] The revisions would preserve scarce NPS resources and ensure that those doing the drilling bear the cost of cleaning up after oil and gas operations.

B. Removing Exemptions

A second target of NPS concern are exempt operations.[293] Removal of both the grandfather and access exemption could play an important role in safe siting and operation of new wells.[294]

1. Grandfather Exemption

Fifty-three percent of non-federal oil and gas operations are exempt[295] from the current regulations because they were pre-existing drilling operations that were

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288. *See* NAT'L PARK SERVICE, COMMENT ANALYSIS, *supra* note 185, at 8.

289. *Cf.* Nonfederal Oil and Gas Development Within Boundaries of Units of the National Park System, 75 Fed. Reg. 82362, 82363 (Dec. 30, 2010) (to be codified at 36 C.F.R. 9); Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61596, 61599 (Nov. 25, 2009) (to be codified at 36 C.F.R. 9).

290. *See* NAT'L PARK SERV., COMMENT ANALYSIS, *supra* note 185 (for public comments on financial assurances and bonding requirements).

291. *See* David A. Dana & Hannah J. Wiseman, *A Market Approach to Regulating the Energy Revolution: Assurance Bonds, Insurance, and the Certain and Uncertain Risks of Hydraulic Fracturing, Insurance, and the Certain and Uncertain Risks of Hydraulic Fracturing*, 99 IOWA L. REV. 1523, 1561 (2015). *See also* Byung-Cheol Kim & Matthew E. Oliver, *Optimal Assurance Bonding: An Application to Shale Gas Extraction* 1, 4 (2015).

292. NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 1.

293. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. 65572 (Oct. 26, 2015) (to be codified at 36 C.F.R. pt. 1, 36 C.F.R. pt. 9).

294. Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61596, 61598 (Nov. 25, 2009) (to be codified at 36 C.F.R. pt. 9B); Nonfederal Oil and Gas Development Within the Boundaries of Units of the National Park System; Intent To Prepare an Environmental Impact Statement for a Proposed Revision, 75 Fed. Reg. 82362, 82363 (Dec. 30, 2010) (to be codified at 36 C.F.R. 9). *See also* NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 5.

295. *See* Nonfederal Oil and Gas Development Within the Boundaries of Units of the National Park System; Intent To Prepare an Environmental Impact Statement for a Proposed Revision, 75 Fed. Reg. at 82362, 82363.

grandfathered when the original regulations were promulgated.[296] When the NPS put the grandfather exception into place, it anticipated that the then-present operators would continue their drilling practices uninterrupted in the manner permitted by the state, the drill site would be closed in accordance with state law, and all operations thereafter taking place in the park would be subject to federal regulation.[297] No one expected that grandfathered drilling operations would continue, and in some cases expand, 37 years later.[298] The rate of grandfathered oil and gas permit expiration was "much slower than anticipated" by NPS.[299] Forty-five percent of operations remain exempt, "causing unnecessary and readily avoidable impacts to NPS-administered resources and values."[300] As examples, NPS documents "20 instances of hydrocarbon spills and leaks, 3 instances of gas venting, 2 instances of notable noise issues, and 3 instances of notable hydrocarbon odors emanating from the well site."[301]

Under the revised rules, operations previously exempt under the grandfather provision will need to obtain an Operations Permit[302] within 90 days of promulgation.[303] To continue operating in the national park, the previously grandfathered operation will need to demonstrate to NPS that the operations "are being conducted in compliance with NPS operating standards."[304] NPS would have a moratorium on enforcement actions against grandfathered oil and gas operators for 90 days after the rule is approved.[305]

New oil and gas drillers would not be able to take advantage of the grandfather provision even if the mineral rights predated the creation of the park; rather, all new drillers would need to submit an application that demonstrated to NPS that the operator would use "the least damaging locations for its access, drilling site, production facilities, and gathering-line routes."[306]

2. Access Exemption

Currently, about 15 percent of oil and gas operations in national parks are exempt pursuant to the access exemption;[307] this number is expected to grow significantly. To date, 78 operations subject to the access exemption drill in national parks but are not required to have a plan of operation approved by NPS, do not need to post financial assurance and are not obligated to comply with NPS rules designed "to protect park resources and values."[308] NPS documented at least 10 instances

296. *See* NAT'L PARK SERVICE, OPERATORS HANDBOOK, *supra* note 67, at 6–7 (for definition and explanation of grandfathered operations).

297. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65577.

298. *Id.*

299. *Id.*

300. *Id.*

301. *Id.*

302. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65577.

303. *Id.*

304. *Id.*

305. *Id.*

306. *Id.*

307. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65575, 65576.

308. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65575.

where operations exempted under the access exemption resulted in oil spills or leaks caused oil and water contamination in a national park,[309] including damage to Big Thicket National Preserve and Big South Fork National River and Recreation Area.[310]

NPS explained that it made a policy choice in 1978 when it created the access exemption. NPS' policy choice was not, however, mandated by legislation. Accordingly, "NPS now believes that it is appropriate to revisit and modify the application of its regulations."[311] The NPS analysis is correct.

Under the October 2015 proposal, the oil and gas permitting process will apply to all oil and gas operations drilling in a national park, including operations that directionally drill into a NPS unit (operations that had been subject to the access exemption). The permitting process for directionally drilled wells will include an evaluation of whether and to what extent the oil and gas operations would have an adverse effect on federally owned or administered lands, waters or resources. The permit requirements will also require consideration of park visitor use and enjoyment as well as the safety of both park visitors and park employees.[312] In addition, the proposed 9B rules clarify that park access includes access via aircraft or drones.

Surface activities outside a national park continue to not be subject to 9B regulation.[313] NPS regulatory authority begins "at the subsurface point where the proposed operation (borehole) crosses the park boundary and enters federally owned or controlled lands or water, and applies to all infrastructure and activities within the NPS unit."[314] According to NPS, the revised regulations continue to encourage drillers to locate well pads outside of park units and drill into the park, rather than locate the well pad inside a national park. NPS will continue to review application using a standard of "no significant threat of damage."[315]

Removing the access exemption, as NPS proposed, may be especially important in parks not previously subject to drilling operations, such as the parks in the East Coast lying above or near the Marcellus and Utica shales.[316] Many East Coast parks have dormant mineral estates which private landowners own.[317] For years, these mineral rights posed no threat to the NPS units because the minerals were difficult, if not impossible, to access or extract. The ability to extract oil and gas from shale changed the game and awakened interest in mineral rights long thought to be of little or no value. When the NPS promulgated the 9B regulations in 1978, it only contemplated conventional drilling operations, and the ability to extract oil and gas from shale was theoretical, but not yet technologically possible. The 9B provisions did not anticipate the dramatic advances in oil and gas drilling technologies—including horizontal drilling and HVHF—that have exponentially

309. *Id.*

310. *Id.*

311. *Id.*

312. *Id.*

313. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65578.

314. *Id.*

315. *Id.*

316. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65574. Moss, *supra* note 233, at 1.

317. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65574.

increased drilling capacities to miles under a national park from outside the park property. An example of a NPS unit that could face significant impact from exemption removal is the Upper Delaware Scenic and Recreational River, where 99 percent of private surface estate is outside the scope of NPS jurisdiction, because hundreds of wells are projected to be developed within the boundary of Upper Delaware Scenic and Recreational River Park.[318] Removing the access exemption so that operations that drill into the park from outside unit boundaries are within the 9B permitting process to the extent they drill into an NPS unit would better protect both NPS units that historically included oil and gas operations, as well as those parks (like the many above the Marcellus and Devonian Shales) that are new targets for energy developers.

C. Access Fees

In addition to changing bond and financial assurance requirements, NPS's proposal would modify the fee structure for the drillers' and operators' pay for use of NPS lands.[319] The current 9B regulations charge a usage fee for commercial vehicles on roads the NPS oversees.[320] The BLM and FWS currently charge fees for access when oil and gas operators have no pre-existing rights to cross federal property,[321] as do private landowners.[322] NPS proposes an additional privileged use

318. NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 5. *See also* Peter Becker, *Super warns of risks to area*, THE NEWS EAGLE (Jan. 2, 2015), http://www.neagle.com/article/20150102/News/150109968 ("Superintendent Kristina Heister, National Park Service, Upper Delaware Scenic & Recreational River, offered her opinion that allowing gas drilling in the heavily forested Upper Delaware region would risk spoiling the high quality river."); Matt Elliott and Valerie Naylor, *Fracking encroaches on national parks: Pennsylvania's incoming governor should do more to protect our natural treasures*, PITTSBURGH POST-GAZETTE (Nov. 30, 2014), http://www.post-gazette.com/opinion/Op-Ed/2014/11/30/Fracking-encroaches-on-national-parks/stories/201411300033 ("There are looming threats to our parks, and oil and gas development is one of them. This threat has come quickly to the commonwealth and is knocking at the door of the Delaware River Basin, home to three national parks including the Upper Delaware Scenic and Recreational River, Middle Delaware National Scenic River and the Delaware Water Gap National Recreation Area."); Kurt Repanshek, *Lawsuit Seeks Full Environmental Review Of "Fracking" Near Delaware Water Gap NRA*, *Upper Delaware National Scenic and Recreational River*, NATIONAL PARKS TRAVELER (Aug. 5, 2011), *available at* http://www.nationalparkstraveler.com/2011/08/lawsuit-seeks-full-environmental-review-fracking-near-delaware-water-gap-nra-upper-delaware-national8563 ("Concerns over how "fracking" for natural gas might impact Delaware Water Gap National Recreation Area and the Upper Delaware National Scenic and Recreational River have led to a lawsuit seeking a full environmental review of the operations. The lawsuit maintains that the Army Corps of Engineers and the Delaware River Basin Commission failed to follow the National Environmental Policy Act in proposing gas drilling regulations.").

319. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65572. NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 1. *See* NAT'L PARK SERV., COMMENT ANALYSIS, *supra* note 185, at 24–26 (for public comments and opinions on access fees); Jessica Goad, *Drilling Could Threaten our National Parks*, CENTER FOR AMERICAN PROGRESS, https://www.americanprogress.org/issues/green/news/2012/09/12/37152/drilling-could-threaten-our-national-parks/.

320. 36 C.F.R.§ 9.50(a)(1).

321. Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61599 (Nov. 25, 2009) (to be codified at 36 C.F.R. 9).

322. *Id.* 61599. *See* Valence Operating, *Sample Mineral Royalty Interest Deed*, http://valenceoperating.com/SampleMineralRoyaltyInterestDeed.pdf (for an example of a lease offered by a oil and gas company to a private landowner). *See Texas Sample Oil and Gas Lease and Surface Use Agreement*,

fee for operators that require new roads or gathering in park units.[323] The proposed 9B fee revision would include fees to cover the cost of completion upon the termination of the oil and gas operations.[324] When drilling occurs on private and BLM land, fees covering the cost of site closure and reclamation "are generally recognized today by the oil and gas industry as a cost of doing business."[325] In the alternative, NPS could accept in-kind reclamation in lieu of fees.[326] Under either mechanism, the fees would reflect actual "wear and tear" on park roads and resources.

The building of an 11-mile road stretching over 45 acres in Big Cypress National Preserve[327] in Florida to reach one private oil and gas lease is an example of the need to revise fees.[328] The NPS acquired the Big Cypress National Preserve from the Collier family in 1974.[329] In so granting, the Collier family retained mineral

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EARTHWORKS, *available* at http://www.earthworksaction.org/files/publications/Texas-Sample-Model-Gas-Lease_201106.pdf (for an example of how landowners can use a lease and surface use agreement to protect landowner needs). Mineral leases are governed by state law. *See, e.g*., MICH. DEP'T OF NAT. RES, OIL & GAS LEASE, https://www.michigan.gov/documents/dnr/OilAndGasLeasePR4305_183829_7.pdf (for further discussions of how landowners should evaluated mineral leases pursuant to various state laws); Sample Mineral Lease, NORTH DAKOTA STATE UNIVERSITY, *available at* https://www.ag.ndsu.edu/NDOilandGasLaw/mineralowners/NDsampleminerallease (last visited Dec. 15, 2015). *See also* John B. McFarland, *Checklist for Negotiating an Oil & Gas Lease* 1, 1–24 (Graves, Dougherty, Hearon & Moody, P.C.), http://www.gdhm.com/images/pdf/jbm-ogleasechecklist.pdf; Judon Fambrough*, Hints on Negotiating an Oil & Gas Lease*, REAL ESTATE CENTER, TEXAS A&M UNIVERSITY 1, 1–30 (2015), available at http://recenter.tamu.edu/pdf/229.pdf; Southeastern Wyoming Mineral Develop. Coalition, *Landowner Guidelines for Negotiating a Mineral Lease or Surface Use Agreement*, http://region8water.colostate.edu/PDFs/Oilgaslandownerguidelines.pdf; *Mineral Interest on Your Land: A Guide for Landowners in Indiana and Illinois*, CONSERVATION LAW CENTER, http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1117450.pdf (last visited Dec. 15, 2015); Stan T. Ingram, *The Oil & Gas Lease*, Miss. State Bar Association 2013 Summer School for Lawyers (presented on July 8th–10th, 2013), *available at* http://msbar.org/media/600287/Mineral%20Leasing.pdf. *But see* Curtis Talley Jr., Michigan State University Extension, *Compulsory Pooling and the Landowner that Has Not Signed an Oil and Gas Lease*, http://firm.msue.msu.edu/uploads/files/Leasing_and_Rental_Arrangements/Compulsory_Pooling_Fact_Sheet_3-15-2013.pdf.

323. NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 8.

324. *Id.* at 1.

325. Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61596, 61599 (Nov. 25, 2009) (to be codified at 36 C.F.R. 9).

326. NAT'L PARK SERV., PICTORIAL OVERVIEW, *supra* note 50, at 1.

327. *See* David Fleshler, *Plan seeks more oil drilling in Big Cypress*, THE SUN SENTINEL (June 17, 2015), http://www.sun-sentinel.com/local/broward/fl-big-cypress-oil-20150617-story.html (for discussion regarding the controversy over drilling in Big Cypress); William E. Gibson, *Controversy spreads over Everglades oil drilling*, THE SUN SENTINEL (July 5, 2014), http://articles.sun-sentinel.com/2014-07-05/news/fl-everglades-drilling-toxic-wastewater-20140703_1_oil-drilling-collier-resources-co-energy-companies; Kurt Repanshek, *To Drill Or Not To Drill For Oil Beneath Big Cypress National Preserve, That Is The Question*, NATIONAL PARKS TRAVELER (Nov. 4, 2009), http://www.nationalparkstraveler.com/2009/11/drill-or-not-drill-oil-beneath-big-cypress-national-preserve-question4868.

328. *See* NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 8. *See* Jorge A. Villa and William J. Mitsch, *Carbon sequestration in different wetland plant communities in the Big Cypress Swamp region of southwest Florida*, 11.1 INT'L J. OF BIODIVERSITY SCI., ECOSYSTEM SERVICES & MGMT. 17 (2015) (for a discussion of the ecological importance of Big Cypress National Preserve).

329. The Collier family has attempted to sell or trade the mineral rights on multiple occasions. *See* David Fleshler and Neil Santaniello, *U.S. Aims to Prevent Big Cypress Drilling*, THE SUN SENTINEL (January 17, 2002), http://articles.sun-sentinel.com/2002-01-17/news/0201170272_1_mineral-rights-oil-

rights to the 500,000 acres of land in the Everglades deeded to the federal government and then leased their mineral rights to Burnett Oil Co. for the purpose of drilling for oil. In Big Cypress, the road built to access the oil and gas operations is unsightly and has had a large impact on the national preserve.[330] NPS asserts the drilling operator is not paying market rates for use and enjoyment of the federal land.[331] The situation is controversial because, in addition to the existing roads and structures, on multiple occasions the drilling operators sought to expand oil and gas exploration and operations in the preserve.[332]

Changing the NPS usage fees to reflect wear and tear on National Parks from building of new roads and gathering lines[333] is consistent with expectations of other landowners. Machinery used in oil and gas exploration and extraction is quite heavy and takes a toll on roads used for operation ingress and egress.[334] Many of the existing roads in national parks were not built for commercial use or to withstand use by heavy trucks and machinery;[335] the roads were built for the visiting public to enjoy

drilling-collier; John Nohlgren, *Rip-Off in Big Cypress: How the Department of the Interior attempted to orchestrate one of the worst land deals in history*, TAXPAYERS FOR COMMON SENSE (June 20, 2005), http://www.taxpayer.net/library/article/rip-off-in-big-cypress.

330. *See generally* Letter from the Center for Biological Diversity, Conservancy of Southwest Florida, Earthworks National Parks Conservation Association, Natural Resources Defense Council, Sierra Club, and South Florida Wildlands Association, to Pedro Ramos, Superintendent of the Big Cypress National Preserve (May 16th, 2014), *available at* https://www.earthworksaction.org/files/publications/Conservation_Groups_Letter_to_NPS_re_Oil_and_Gas_5-16-2014.pdf ("Every stage of oil and gas development, including exploration, construction, drilling, stimulation, processing, waste management, transportation of materials, ongoing production, plugging and abandonment, and site reclamation can have significant impacts on land, water, air, habitat, and other natural values. These impacts present significant threats to the many sensitive values in BICY, including: (a) wildlife mating, feeding, nesting, spawning, and migration routes, including those for threatened and endangered species; (b) watercourses, streams, wetlands, floodplains, water wells, springs, and other water sources; (c) archeological, historical and cultural resources; (d) opportunities for human recreation; (e) local economies dependent on fishing, recreation, tourism, and other social and economic values; (f) clean air and the airshed; (g) natural beauty, solitude, and visual resources; (h) soils, vegetation, and landscape; (i) the preservation of the natural soundscape of the Preserve; and (j) lands with wilderness characteristics.").

331. NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 8.

332. *See* NAT'L PARK SERV., U.S. DEP'T OF THE INTERIOR, NOBLES GRADE 3-D SEISMIC SURVEY BIG CYPRESS NATIONAL PRESERVE AND BIG CYPRESS NATIONAL PRESERVE ADDITION PLAN OF OPERATIONS (revised Dec. 2014), *available at* http://parkplanning.nps.gov/document.cfm?parkID=352&projectID=53498&documentID=66527; NAT'L PARK SERV., U.S. DEP'T OF THE INTERIOR, ENVIRONMENTAL ASSESSMENT FOR A PROPOSED OIL AND GAS PLAN OF OPERATIONS: NOBLES GRADE 3-D SEISMIC SURVEY WITHIN BIG CYPRESS NATIONAL PRESERVE PROPOSED BY BURNETT OIL CO., INC. (Nov. 2015), *available at* http://parkplanning.nps.gov/document.cfm?parkID=352&projectID=53498&documentID=69396; *see also* David Fleshler, *Plan seeks more oil drilling in Big Cypress* (June 17, 2015), THE SUN SENTINEL, http://www.sun-sentinel.com/local/broward/fl-big-cypress-oil-20150617-story.html.

333. NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 1.

334. Ambarish Banerjee, Jolanda Prozzi, & Jorge Prozzi, *Evaluating the effect of natural gas developments on highways: Texas case study*, 2282 TRANSP. RES. REC. 49, 49 (2012) ("Damage caused by the natural gas truck traffic translated into reduced service life for pavements in the region. Results indicated a reduced service life of approximately 5.6 percent, 29 percent, and 16 percent associated with rig, construction, and saltwater traffic, respectively, in terms of rutting.").

335. *See* Kakan Chandra Dey et al., *Infrastructure Damage-Cost-Recovery Fee for Overweight Trucks: Tradeoff Analysis Framework*, 141 J. TRANSP. ENG. 7 (2015) (for research on the costs of trucks on roads); Kakan Dey et al., *Estimation of pavement and bridge damage costs caused by overweight trucks*, 2411 TRANSP. RES. REC.: J. TRANSP. RES. BOARD 62 (2014).

the park as a recreational resource and to provide limited access to the wildlife refuge or scenic river.[336] It is reasonable to require the oil and gas developers causing damage and stress to park roads to incorporate those costs of road development and maintenance as costs of operations. It is unreasonable for oil and gas developers to expect taxpayers to pick up the added cost of road usage—especially because taxpayers do not share in profits from the oil and gas operations.[337] NPS has a statutory duty to mitigate damage to park units.[338] Rather than deny access to national parks for drilling operations, imposing a fee structure that would cover costs of maintaining existing roads that were not designed for heavy truck traffic associated with drilling and other oil and gas operations strikes a balance between land preservation and the pressure for further oil and gas development.[339]

D. Assessments for Non-Compliance

Perhaps most critically, the NPS seeks enhanced enforcement tools to address minor acts of noncompliance that could potentially have an important impact on human health and the environmental tranquility of national parks.[340] Under existing 9B rules, the NPS enforcement tools are limited to: (1) suspension of operations[341] or (2) revocation of an approved plan.[342] NPS seeks to expand enforcement authority to include penalty provisions against oil and gas, and other industries operating within national parks.[343] Currently, there is no method for NPS to cite violations of 9B rules without shutting down operations or going to court to seek damages. This gap in enforcement authority raises an issue where NPS encounters violations that should be promptly corrected, but that would not merit closing down the site. With the proposed regulations, NPS seeks the ability to access fines for violations consistent with other NPS regulations.[344]

The inability of NPS to adequately address so-called minor violations is well documented. There are numerous instances where oil and gas drillers engaged

336. *See* Jove Graham et al., *Increased traffic accident rates associated with shale gas drilling in Pennsylvania*, 74 ACCIDENT ANALYSIS & PREVENTION 203, 203–4 (2015) (for a discussion of increased traffic accidents).

337. The federal government does not charge a severance tax for oil and gas drilled in NPS units. In many states, taxpayers do not even enjoy the benefit of severance taxes. *See* Ryan Pulver, *Sustainable Finance-A Blueprint for Severance Taxes in the Marcellus Shale*, 7 KY. J. EQUINE AGRIC. & NAT. RES. L. 297 (2014).

338. 36 C.F.R. § 9.36(a)(16).

339. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65572.

340. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg at 65572. *See* NAT'L PARK SERV., U.S. DEP'T OF THE INTERIOR, REVISION OF 9B REGULATIONS GOVERNING OIL & GAS ACTIVITIES ENVIRONMENTAL IMPACT STATEMENT PUBLIC COMMENT ANALYSIS 1, 27 (2011), *available at* http://www.nature.nps.gov/geology/oil_and_gas/documents/98_Regs_Draft_Comment_Analysis_Report_NOI.pdf (for public comments on non-compliance).

341. 36 C.F.R. § 9.51(c)(2).

342. 36 C.F.R. § 9.51(c)(3).

343. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65572. Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61596, 61599 (Nov. 25, 2009) (to be codified at 36 C.F.R. 9).

344. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65572 (NPS seeks the ability to apply the penalty provisions of 36 C.F.R. § 1.3.).

in minor violations considered substandard or unapproved drilling practices. Examples of minor infractions that raise concern are the accumulation of oil field debris onsite, slow cleanup response to relatively small, contained spills, and lack of road maintenance on access sites.[345] Certain drilling operations in the Big Thicket National Preserve are instructive.[346] In Big Thicket, the operator altered the approved oil loading design so that the "make or break" point was relocated from a secondary containment box inside a bermed area to an open point on top of the berm. The plan changes caused spillage outside the containment area. Although a minor act of non-compliance, the repetition of the practice by the operator in Big Thicket had a cumulative effect on the operations, so that a large oil spill occurred in uncontained space that could potentially leach into the environment.[347] NPS knew of the problem but was unable to stop the practice.

Another example of problematic minor violations that the NPS enforcement provisions cannot address are those instances where operators fail to follow approved plans for road maintenance in operations.[348] For example, in Aztec National Monument, an operator was granted the right to a short access on a dirt road, with use limited to dry conditions.[349] The operator was not allowed to use the dirt road when the road saturated in order to avoid damaging road conditions, to prevent erosion, and to promote control of sediment.[350] Despite this, the operator violated the agreement and continued to use the road even when it should not have done so due to saturated conditions.[351] NPS recognized that the violation should not warrant closing the drilling operations; but the violation, although minor, could lead to significant erosion or sedimentation—exactly what the limited use provision was designed to avoid. Moreover, the damage could require the NPS to engage in expensive, noisy, and unattractive repair work near the primary visitor use area in the Aztec National Monument.[352] The 9B regulations should be modified so NPS can address such situations by imposing fines.

A final illustration of the need for enhanced enforcement provisions for minor violations is the habit of certain oil and gas operators to leave a collection of unsightly, unused equipment and debris piled in parks rather than removing unneeded materials. NPS expressed frustration over the collection of abandoned pipes and equipment in the Padre Island National Seashore.[353] Current regulations provide no authority for NPS to demand removal of unneeded equipment associated with drilling operations that accumulate and litter national parks,[354] even when there

345. *Id.*

346. *See* NAT'L PARK SERV., U.S. DEP'T OF THE INTERIOR, BIG THICKET NATIONAL PRESERVE TEXAS, OIL AND GAS EXPLORATION AND PRODUCTION, http://www.nps.gov/bith/learn/nature/oil-and-gas-exploration-and-production.htm (last visited Nov. 2, 2015).

347. NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 10.

348. *Id.*

349. *See id.* at 11.

350. *Id.*

351. *Id.*

352. *See generally* NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 11.

353. *See* NAT'L PARK SERV., A PICTORIAL OVERVIEW, *supra* note 50, at 11.

354. *See, e.g.*, Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61596, 61599 (Nov. 25, 2009) (to be codified at 36 C.F.R. 9).

is well documented evidence of contamination from oil and gas operations at the site.[355]

The NPS is correct that revisions to the 9B regulations allowing for administrative penalties are badly needed and it is reasonable to apply NPS' penalty provisions set out in 36 C.F.R. § 9. NPS should have the express authority to use administrative assessments when it observes and documents a "minor violation" that the operator fails to correct after notification from NPS.[356] Revised rules would not alter the NPS duty to notify the operator of the problem and request the operator correct the issue of concern in a timely manner.[357] Rather, the revisions should give NPS the authority to address instances when an operator is noncompliant, or is unable or unwilling to comply in a timely fashion.[358] 9B rules should be amended to allow NPS the express authority to issue noncompliant operators administrative assessments. "The assessment would be a monetary amount that an operator must pay to the park, based on an estimation of the cost of damages to park resources due to the operator's violation of a term or condition of an approved permit."[359] Simply said, to protect park resources, it is important that NPS park administrators' have the ability to issue administrative assessments in the event the notified oil and gas operator does not bring the minor violation into compliance.[360]

E. Beyond NPS Recommendations

In 2009, NPS sought public input on what, if any, industry-developed advances and code of operations NPS should adopt to ensure the best operational practices for drilling in national parks.[361] In 2015, BLM became the first unit of the Department of Interior to require specific standards for operators to establish that well casing and cementing is safe and done in a manner to preserve federal land.[362] Later in 2015, NPS proposed to adopt the BLM standards for the NPS units.[363] With

355. E. G. Carls et al., *Soil contamination by oil and gas drilling and production operations in Padre Island National Seashore, Texas, USA*, 45.3 J. ENVTL. MGMT. 273, 273 (1995).

356. Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61596, 61599 (Nov. 25, 2009) (to be codified at 36 C.F.R. 9).

357. *Id.*

358. *See id.*

359. Minerals Management, Nonfederal Oil and Gas Development, 74 Fed. Reg. 61596, 61599 (Nov. 25, 2009) (to be codified at 36 C.F.R. 9) (an example of such an approach can be found under BLM regulations at 43 C.F.R. 3163.1, which gives BLM the authority to assess a penalty of $500 per day for major violations, and $250 for minor violations.).

360. *See generally id.*; General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65572.

361. *Id. See* Thomas W. Merrill and David Schizer, The Shale Oil and Gas Revolution, Hydraulic Fracturing, and Water Contamination: A Regulatory Strategy, 1, 222 (Columbia Law and Econ. Working Paper No. 440, November 6, 2013) (for a discussion of the importance of best practices).

362. Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands, 80 Fed. Reg. 16218, 16219 (proposed Thursday, March 26, 2015) (to be codified at 43 C.F.R. pt. 3160).

363. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65573 ("[T]he NPS proposed rule uses most of the language from BLM's hydraulic fracturing information requirements at 43 CFR 3162.3–3(d)(1) through (7) which BLM recently promulgated under authority of the Mineral Leasing Act, 30 U.S.C. 189, the Federal Land Policy and Management Act, 43 U.S.C. 1701 et seq., and other BLM authorities." (citing Requirements for Operating Rights Owners and Operators, 43 C.F.R 3162 (2015); Mineral Leasing Act, 30 U.S.C. § 189 (2012); Federal Land Policy and Management Act, 43 U.S.C. § 1701 (2012).

these proposals, NPS correctly sought to update the 9B regulations to include specific guidelines for both operators and park administrators to ensure that drilling in park units not only meet the safety standards at the time of drilling, but that the wells are built so that they do not damage park resources or the environment after the well is closed and the operations cease.[364] The NPS has documented numerous instances where ceased oil and gas operations mar national park landscape.[365] That trend must stop. Moreover, as more and more wells are drilled, completed, and abandoned, the risk to NPS resources increases.

While the BLM guidelines are an important update, there are other provisions that should also be included. The revised operating standards should be clarified to mandate a baseline assessment of environmental conditions before construction and operations commence,[366] in addition to mapping exactly where the boreholes and piping are located.[367] Establishing a baseline would ensure the state of the property, including any prior chemical or methane contamination—whether natural or manmade. In the event of a spill or allegation of water contamination, evidence will exist to establish whether or not the driller caused the harm.

Inclusion of a publicly available recorded map will help preclude new operators from causing environmental harm by hitting current or closed operations. The proposed rules require grandfathered operations be mapped "to scale showing all proposed surface uses (well site, access route, flowlines, productions facilities) that occur outside the NPS unit"[368] and new operations be mapped to show proposed area of operations (including new surface disturbances, access routes and support facilities such at sanitation, staging areas, loading docks, fuel dumps, refueling areas, water supplies and disposal facilities).[369] It is, however, imperative that the maps required are made readily available for pubic review without necessitating a Freedom of Information Act request and that the maps include piping and subsurface activities. As more wells are drilled—with longer and longer piping—the chance of one driller hitting another pipe increases. Mapping of subsurface activities, as well as those on the surface, will not only reduce future drilling accidents, but will help NPS plan and supervise oil and gas drilling to ensure the continued safety of casing and other protective measures.

IV. CONCLUSION

National parks are one of the great resources enjoyed by the American people. When Congress created the national park system, the NPS was mandated to balance park usages (including commercial usages) with preserving open, pristine lands for future generations. There are currently 13 national parks where there are active oil and gas drilling operations and that number is expected to dramatically

364. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65573.

365. *See* discussion *infra* part II.

366. *See* JOHN GLASSON ET AL., INTRODUCTION TO ENVIRONMENTAL IMPACT ASSESSMENT 1, 168 (Routledge 3rd ed.) (2013).

367. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65593.

368. *Id.*

369. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65595.

increase.[370] In 30 national parks,[371] the private mineral estates were severed from the title transferred to the federal government. With the ability to extract oil and gas from shale using horizontal drilling and HVHF, there is keen interest in taking further advantage of these retained private mineral estates and expanding oil and gas drilling operations into NPS units that were not previously feasible.

The use of directional drilling can mitigate some of the effects within parks and other resources. If oil and gas operators drill wells outside an NPS unit and extract energy through wells drilled far below the park surface, then there will indeed be reduced need for land clearance within the park. Directional drilling does not eliminate all potential impacts on park resources, since spills can drain into the park,[372] light and noise can travel to the park,[373] and the long-term effects of closed wells on national park well-being are unclear and still in great need of study.

Certain principles are clear. The best way to eliminate all drilling in NPS units would be for Congress to authorize purchase of the underlying mineral estates. Since outright purchase is neither politically nor economically likely, revision to the 9B rules is needed. The 9B rules were created in 1978 before the practice of HVHF and horizontal drilling were combined. When the 9B rules were created, few considered the possibility of drilling for miles into a park from land outside the park. Even fewer considered the economic viability of extracting oil and gas from shale in national parks located close to large population centers that depend on the parks for both recreation and to maintain the health of air and water quality.

The NPS proposes overhauling the 9B regulations so they are consistent with the recent BLM revision and with proposals the Fish and Wildlife Service is making concerning oil and gas drilling in National Wildlife Refuges.[374] Having one consistent set of permit requirements across all federally owned and operated lands makes sense. To this extent, four basic revisions reflective of NPS concerns are critical. At a minimum, NPS needs to: (1) raise bond and financial assurance requirements; (2) create protocols that bring exempt operations within the 9B regulations; (3) create access and user fees that reflect fair use; and (4) allow administrative fines to be assessed for minor violations.

It is critical to the maintenance of park resources that the 9B rules are revised to include financial assurances and bonding requirements that reflect the current economy and the actual drilling practices taking place in the parks. The present value of the current bond limit is about $800,000, considering inflation; but NPS is correct that the better practice is to set bonds based on projected costs to remedy spills and complete operational closure.

Access and user fees are needed to ensure that those engaged in oil and gas drilling in the parks pay for use of the roads and cover the costs for wear and tear on park roads and resources. Where park roads need to be expanded to handle heavy trucks and machinery to gain access to oil and gas wells, the fees should cover not just cost of road improvement but the cost of road maintenance as well.

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370. General Provisions and Non-Federal Oil and Gas Rights, 80 Fed. Reg. at 65574.

371. *Id.*

372. *Id.*

373. *Id.*

374. Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands, 80 Fed. Reg. 16218, 16219 (proposed Thursday, March 26, 2015) (to be codified at 43 C.F.R. pt. 3160).

Changing the 9B rules to allow NPS to issue administrative penalties for noncompliance with permits or state laws and regulations is critical to ensure preservation of national park resources. NPS should not need to prove an imminent hazard before taking action. When drillers are allowed in national parks, the NPS (as surface property owner, preservationist, and guarantor of the public good) must be able to take action well before any noncompliance has a significant or lasting impact.

Exempt operations should be brought within the 9B process. The grandfather provisions were never intended to last in perpetuity. The purpose of the grandfather clause was to prevent undue surprise on entities not previously covered by the then-new 9B regulations. Since the 9B rules have been in place for thirty-seven years, that rationale no longer applies. Moreover, when the access exemption was put into place, NPS did not expect directional drilling. While locating well pads outside a park and allowing directional drilling will mitigate certain impacts, it is important that NPS evaluate all impacts (including the so-called "connected actions") when determining if allowing any given oil and gas operation can be done consistent with conserving park resources.

Finally, the 9B regulations should be amended to include specific guidelines for both operators and park administrators to ensure that drilling in park units both meet modern safety standards and are built in a manner such that the wells or associated piping and equipment do not damage park resources or the environment after the well is closed and the operations cease.

Beyond the NPS proposal, revised well permitting standards should also include a baseline assessment of environmental conditions before construction and operations commence. Establishing a baseline is consistent with NEPA protocol, and would help determine when and if detrimental environmental events arise. The rules should also require that a map of both surface and subsurface operations be recorded in land records of exactly where the boreholes and piping are located to preclude later operators from causing environmental harm by hitting current or closed wells. While the NPS proposal contemplates mapping of surface operations, inclusion of subsurface mapping, as well, will not only reduce future drilling accidents, but will help NPS plan and supervise operations by mineral rights owners to ensure the continued safety of casing and other protective measures.

While these limited changes may not be sufficient in and of themselves to protect national parks, altering the 9B rules in combination with enhanced state laws and regulations governing modern oil and gas drilling will better preserve the land treasures known as our national parks.