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Solar Energy Development on the Federal Public Lands: Environmental Trade-Offs on the Road to a Lower-Carbon Future

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I. INTRODUCTION

The generation of electricity produces about forty percent of carbon dioxide (“CO₂”) emissions in the United States, more than any other source.¹ This fact makes the development of renewable energy sources, in a world threatened by climate change, an attractive way to reduce the nation’s overall carbon dioxide output. As one federal district court recently explained, a renewal energy project “provides the public with a significant amount of power while reducing pollution and dependence on fossil fuels,” and “it is a goal of the federal government and the state of California to promote the development of such projects.”² By way of example, the Bureau of Land Management (“BLM”) estimates that operation of a 400-megawatt solar energy facility with a capacity factor of twenty percent could avoid up to .21 percent of CO₂ emissions from electric power facilities.³ The benefits of renewable energy development are not

1. *Human-Related Sources & Sinks of Carbon Dioxide*, EPA, http://www.epa.gov/climatechange/emissions/co2_human.html#fossil (last visited Sept. 12, 2011) (figures for 2006). In 2006, electricity generation resulted in emission of nearly 2500 teragrams of CO₂ equivalent from the combustion of coal, oil, and natural gas. *Id.* In 2009, energy-related CO₂ emissions in the United States declined by seven percent (405 million metric tons), the largest annual decline since the U.S. Energy Information Administration began collection of comprehensive annual energy data in 1949. This decline resulted from several factors, including the economic downturn and a long-term shift from an industrial to a service-based economy. *U.S. Carbon Dioxide Emissions in 2009: A Retrospective Review*, U.S. ENERGY INFO. ADMIN. (May 5, 2010), <http://www.eia.gov/oiaf/environment/emissions/carbon/>.

2. *Quechan Tribe of Fort Yuma Indian Reservation v. U.S. Dep’t of Interior*, 755 F. Supp. 2d 1104, 1121–22 (S.D. Cal. 2010).

3. U.S. DEP’T OF ENERGY & U.S. DEP’T OF INTERIOR, DES 10–59, DOE/EIS-0403, DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT FOR SOLAR ENERGY DEVELOPMENT IN SIX SOUTHWESTERN STATES 5-157 (2010) [hereinafter BLM SOLAR PEIS]; see also Uma Outka, *The Renewable Energy Footprint*, 30 STAN. ENVTL. L.J. 241, 253 (2011) (“The principal benefit of shifting to renewable resources is reducing

limited to reducing the energy industry's carbon footprint, however. Renewable energy production also has the potential to create new jobs, while enhancing the nation's energy security by reducing reliance on unstable foreign sources of energy.⁴ Additional factors contributing to the growth potential for renewable energy development include a narrowing of the price gap between conventional and renewable energy sources,⁵ in part due to the federal government's decision to subsidize renewable energy through tax incentives,⁶ and the adoption by many states of renewable portfolio standards ("RPSs") requiring that public utilities supply at least a minimum percentage of their power from renewable sources.⁷

carbon dioxide ("CO₂") emissions and avoiding the myriad environmental harms they cause.").

4. See, e.g., U.S. DEP'T OF THE INTERIOR & U.S. DEP'T OF AGRIC., *NEW ENERGY FRONTIER: BALANCING ENERGY DEVELOPMENT ON FEDERAL LANDS 1* (2011) [hereinafter *NEW ENERGY FRONTIER*] (stating that national policy prioritizing renewable energy "begins to move the Nation toward a clean energy economy, creates jobs, and reduces our dependence on foreign oil"); Sec'y of the Interior, Secretarial Order No. 3285 § 2 (Mar. 11, 2009), as amended (Feb. 22, 2010), available at http://elips.doi.gov/app_so/act_getfiles.cfm?order_number=3285A1 [hereinafter Secretarial Order No. 3285] ("Increased production of renewable energy will create jobs, provide cleaner, more sustainable alternatives to traditional energy resources, and enhance the energy security of the United States by adding to the domestic energy supply."); see also U.S. DEP'T OF THE INTERIOR, BUREAU OF LAND MGMT., *RECORD OF DECISION, IMPERIAL VALLEY SOLAR PROJECT 1-18* (2010), available at <http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/elcentro/nepa/2010/eis/ivsolar.Par.51089.File.dat/FinalRODImperialValleySolarProject.pdf> [hereinafter *IMPERIAL VALLEY SOLAR PROJECT*] (noting that solar project approved by the BLM "will produce 709 megawatts of reliable electricity that won't be subject to changes in commodity prices or overseas conflicts"); U.S. DEP'T OF THE INTERIOR, BUREAU OF LAND MGMT., *RECORD OF DECISION, GENESIS SOLAR ENERGY PROJECT 17* (2010), available at <http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/palmsprings/genesis.Par.95255.File.dat/Genesis%20ROD.pdf> [hereinafter *GENESIS SOLAR ENERGY PROJECT*] (finding that another solar project will "bring needed jobs to the area"); Robert Glennon & Andrew M. Reeves, *Solar Energy's Cloudy Future*, 1 ARIZ. J. ENVTL. L. & POL'Y 91, 93–94 (2010) (noting potential for solar power projects to create "'green-collar' jobs").

5. David J. Lazerwitz, *Renewable Energy Development on the Federal Public Lands: Catching Up with the New Land Rush*, 55 ROCKY MTN. MIN. L. INST. § 13.02[1][a] (2009); see also Sarah Pizzo, Note, *When Saving the Environment Hurts the Environment: Balancing Solar Energy Development with Land and Wildlife Conservation in a Warming Climate*, 22 COLO. J. INT'L ENVTL. L. & POL'Y 123, 132 (2011) ("[D]ynamic growth rates are spurring technological advances and driving down costs.").

6. See Lazerwitz, *supra* note 5, at § 13.02[1][b]; *infra* note 62 and accompanying text (describing tax credits available under the American Recovery and Reinvestment Act of 2009).

7. See Outka, *supra* note 3, at 247 (arguing that among the "primary drivers of renewable energy development have been state renewable portfolio standards"). According

As Part III of this article indicates, the federal government has created incentives for the development of renewable energy, including solar power. It also has sought to facilitate the location of those projects on lands owned by the federal government. The Obama Administration has formulated an energy strategy that “open[s] a new frontier for renewable energy production on public lands and water.”⁸ Several reasons support siting renewable energy projects, particularly solar facilities, on public lands. For one, solar power production depends on access to sunlight, and federal public lands in the southwestern United States experience high levels of solar insolation.⁹ According to one source, much of the six-state region which the BLM has identified as prime territory for solar energy production experiences an average of 340 days a year of sunshine.¹⁰

Another advantage offered by federal public lands is the availability of space. Renewable projects generally require more land than conventional sources for the production of an equivalent amount of power. According to government estimates, between 640 and 1280 acres of land are needed to produce 1000 megawatts of power from a coal plant, while six thousand (and in one case as many as twenty thousand) acres are needed to produce the same amount from a concentrating solar thermal plant.¹¹ Concentrating solar power facilities in particular are land-intensive.¹² The federal government owns large tracts of land in the states in which

to the U.S. Energy Information Administration, as of 2009, the only states without some form of renewable portfolio standard (“RPS”) mandate were Alabama, Alaska, Arkansas, Georgia, Idaho, Indiana, Kentucky, Louisiana, Mississippi, Nebraska, South Carolina, Tennessee, and Wyoming. In six additional states, RPS standards were voluntary. U.S. ENERGY INFO. ADMIN., TRENDS IN RENEWABLE ENERGY CONSUMPTION AND ELECTRICITY 2009, at 40 (2011). Some authorities cite a slightly lower tally. See Glennon & Reeves, *supra* note 4, at 92 (finding that at least 29 states and the District of Columbia have renewable portfolio standards (RPSs)).

8. NEW ENERGY FRONTIER, *supra* note 4, at 2; see also *id.* at 1 (“Federal lands and offshore areas managed by the U.S. Department of the Interior (“DOI”) and the U.S. Department of Agriculture (“USDA”) Forest Service (“USFS”) are key components of a comprehensive energy strategy” that, among other things, “makes renewable energy a priority.”).

9. See BLM SOLAR PEIS, *supra* note 3, at 4-2; see also NEW ENERGY FRONTIER, *supra* note 4, at 17 (“Solar radiation levels in the Southwest are some of the most ideal in the world for energy production.”). As the BLM has recognized, however, “there also are large blocks of both private and state lands in the [Southwest] with the same solar energy potential that could support utility-scale solar development.” BLM SOLAR PEIS, *supra* note 3, at 4-2.

10. Pizzo, *supra* note 5, at 133.

11. Glennon & Reeves, *supra* note 4, at 103-04; see also *id.* at 105 (“[T]he landmass footprints necessary for utility-scale solar power are staggering.”).

12. See Alexandra B. Klass, *Renewable Energy and the Public Trust Doctrine*, 45 U.C. DAVIS L. REV. (forthcoming 2012) (manuscript at 27), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1789027 (indicating that a single concentrating solar power plant may require up to ten square miles to operate).

solar power production is most likely to prove successful.¹³ The BLM alone manages approximately 120 million acres of public lands in the states that the agency has identified as best suited to solar development.¹⁴ Of those, the agency has tentatively determined that 23 million acres have particularly strong solar energy development potential.¹⁵

The time, therefore, seems right to push for significant solar development on federal lands, particularly those in the southwestern United States that are managed by the BLM. Yet, despite near universal support among environmental public interest groups for the idea of displacing conventional energy production with renewable sources that do not emit significant amounts of greenhouse gases (“GHGs”) that contribute to climate change,¹⁶ the development of solar projects on BLM lands has proven to be controversial, especially among environmental groups based in areas where such projects are planned.¹⁷ Often, it seems that “the consensus breaks down when specific sites are proposed for solar plants. The idea of solar plants seems to be more appealing than the reality.”¹⁸ This opposition stems from two related sets of concerns. First, solar projects have the potential to adversely impact the environment, albeit in different ways than fossil fuel-fired electric generation facilities that belch large amounts of GHGs do. Second, the process that the BLM has used so far to determine

13. The federal government owns 41.1% of the land in Arizona, 40.1% in California, 35.5% in Colorado, 80.9% in Nevada, 29.4% in New Mexico, and 63.12% in Utah. NATURAL RES. COUNCIL OF ME., PUBLIC LAND OWNERSHIP BY STATE, *available at* <http://www.nrcm.org/documents/publiclandownership.pdf>.

14. News Release, Office of the Secretary, U.S. Dep’t of the Interior, Salazar, Chu Announce Next Step in Nation’s March toward Renewable Energy Future, Joint Draft Environmental Study Identifies Public Lands Best Suited for Solar Development in the West (Dec. 16, 2010), *available at* http://solareis.anl.gov/documents/docs/Solar_DPEIS_BLM_PressRelease.pdf. This amounts to 16.7% of the surface acreage in Arizona, 15.2% in California, 12.5% in Colorado, 68.0% in Nevada, 17.2% in New Mexico, and 43.5% in Utah. These percentages are based on calculations from figures provided in U.S. DEP’T OF INTERIOR, BUREAU OF LAND MANAGEMENT, PUBLIC LAND STATISTICS 2009, at 7 tbls.1–3, 13 tbls.1–4 (2010), *available at* http://www.blm.gov/public_land_statistics/pls09/index.htm.

15. NEW ENERGY FRONTIER, *supra* note 4, at 17.

16. *See, e.g.*, Michael Haederle, *Solar Showdown: Are New Solar Power Projects Anti-Environmental?*, MILLER-MCCUNE (Apr. 18, 2011) <http://www.miller-mccune.com/environment/are-new-solar-power-projects-anti-environmental-29888/> (stating that some national environmental groups support the potential for solar power on federal lands to reduce reliance on fossil fuels).

17. *See* Klass, *supra* note 12 (manuscript at 28–29).

18. Glennon & Reeves, *supra* note 4, at 116.

whether to approve particular solar projects appears to have given inadequate consideration to these risks.

This article analyzes both the environmental risks created by the construction and operation of solar power projects on BLM public lands and the regulatory process the BLM has developed to review the numerous applications for project approval filed with it in recent years. Part II describes the adverse effects that the agency's approval of solar projects may have on the lands and resources administered by the BLM and on those who use those lands for purposes other than solar power production. Part III addresses the federal laws and policies aimed at facilitating solar power production, both generally and on federal lands in particular. It also describes laws that constrain the federal government's authority to approve solar projects on BLM lands. Part IV analyzes the fast-track process the BLM used to approve a series of solar projects on federal lands in 2010 and asks whether the legal framework chosen by the agency to evaluate solar project proposals is up to the task of ensuring that solar development on public lands proceeds in a manner consistent with the multiple use mandate under the BLM's organic act, the Federal Land Policy and Management Act ("FLPMA"). The article analyzes in particular whether FLPMA's right-of-way provisions are the appropriate mechanism for promoting solar power production on public lands while adequately protecting against the environmental risks associated with large-scale solar development.

Part V considers how best to evaluate future solar power project proposals involving BLM lands, and urges the agency to designate certain lands whose use as solar project sites is incompatible with resource protection obligations or other important environmental values as unavailable for solar development. On the remaining public lands suitable for solar production, the agency should use its authority under FLPMA, including its authority to engage in land exchanges, to impose conditions on project owners and operators to minimize resource impairment. All energy production activities have environmental costs.¹⁹ Congress and the federal land management agencies should create a process that allows society to reap the benefits of replacing some conventional energy sources with climate-friendly renewable sources such as solar power. At the same time, they should resist the urge to give short shrift to the environmental risks of renewable energy

19. See Tina R. Goel, Feature, *Finding the Balance: Harmonizing Renewable Energy with Wildlife Conservation*, 10 SUSTAINABLE DEV. L. & POL'Y 42, 42 (2010) ("We must not presume that a wind or solar project is environmentally sound because it emits less carbon dioxide than fossil fuels. All stakeholders—environmentalists, industry, and the government—must remember that no source of energy is truly green . . .").

development or to the laws that, if conscientiously applied, have the potential to minimize unintended adverse effects on important environmental resources and values. This article concludes that the BLM has the responsibility to minimize resource impairment resulting from solar power production on public lands and suggests that it adopt an approach that relies on a combination of zoning and conditional authorization, including the imposition of restrictions to prevent unnecessary and undue degradation of public natural resources such as wildlife and its habitat and of cultural resources important to Native Americans and others. Finally, the article briefly discusses how the agency might best define such degradation, taking into account the policy benefits of increased solar capacity and the environmental costs of haphazard oversight of the use of public lands for solar power production.

II. THE POTENTIAL COSTS OF SOLAR POWER DEVELOPMENT ON PUBLIC LANDS

The promises and pitfalls of locating renewable energy projects on federal lands was aptly summarized by the conferees on the Department of the Interior, Environment, and related Agencies Appropriations Act for 2010. While the conferees acknowledged the increasingly significant role the federal land management agencies would play in facilitating renewable energy development, they also expressed concern about the impacts solar and wind projects might have on “the pristine landscapes, limited water resources, and magnificent views of the country’s public lands and coastlines.”²⁰ This part surveys the principal adverse environmental consequences of large-scale solar power development on federal lands, the most prominent of which are adverse effects on wildlife, wildlife habitat, and water resources. It also identifies the kinds of conflicts with other public land uses that solar projects are likely to create.

20. H.R. REP. NO. 111-316, at 75 (2010) (Conf. Rep.), *available at* <http://thomas.loc.gov/cgi-bin/cpquery/T?&report=hr316&dbname=111&>.

A. *The Impacts of Solar Projects on Federal Lands and Resources*

One of the greatest concerns associated with the idea of devoting BLM lands to utility-scale solar projects, held both by project opponents and federal agencies such as the BLM and the U.S. Fish and Wildlife Service (“FWS”), relates to the impact of such projects on wildlife and wildlife habitat. As the BLM has recognized, “[a]ll utility-scale solar energy facilities that would be constructed and operated have the potential to affect wildlife.”²¹ The risks to wildlife stem from all phases of project development and operation, beginning with construction and continuing through decommissioning. Solar projects can impair, reduce, or fragment wildlife habitat.²² Fragmentation and the establishment of edge habitat due to the location of generating facilities or transmission lines has the potential to make wildlife more vulnerable to predation and parasites, modify distribution and dispersal patterns (including elimination of migration corridors essential to the maintenance of healthy big game populations), and reduce genetic interchange among populations.²³ Vegetation clearing for activities such as site preparation or access road construction could eliminate wildlife habitat or facilitate the spread of invasive species of both plants and wildlife.²⁴ Habitat loss could cause overcrowding, with resulting increases in mortality of species such as mule deer.²⁵ Project construction and operation are likely to increase stresses and alter the behavior of affected wildlife in ways detrimental to the animals.²⁶ Wildlife could be exposed to fuel spills or releases of hazardous materials.²⁷ Birds might collide with solar facilities.²⁸ The behavior of mammals such as wild horses and burros, which are present in significant numbers on BLM lands in the southwest, could be disrupted by project facilities and fencing.²⁹

Utility-scale solar power production will reduce available water supplies and adversely affect water quality, which will further harm wildlife.³⁰ All solar facilities depend on water to operate.³¹ Project operators need

21. BLM SOLAR PEIS, *supra* note 3, at 5-73.

22. *See* Outka, *supra* note 3, at 250 (“Fragmentation of habitat from scatter-shot development reduces the capacity of remaining land to support biodiversity.”).

23. BLM SOLAR PEIS, *supra* note 3, at 5-74, 5-85.

24. *Id.* at 5-63, 5-67.

25. *Id.* at 5-75.

26. *Id.* at 5-74 to -77, 5-85.

27. *See id.* at 5-259 (describing the routine use of toxic substances such as dielectric fluids and chemical herbicides at solar projects).

28. *Id.* at 5-82.

29. *See id.* at 5-12, 5-82.

30. Project operations also are likely to generate adverse air pollution, *id.* at 5-147 to -48, and noise pollution, some of which could be detrimental to wildlife, *id.* at 5-206.

31. NEW ENERGY FRONTIER, *supra* note 4, at 20.

water during construction to control fugitive dust and wash equipment, among other uses, but the principal demand for water stems from project operation. The amount required depends on the particular solar technology used. While photovoltaic (“PV”) and dish/engine technologies require relatively little water, concentrating solar power (“CSP”) facilities that create electricity by generating steam use significantly more water.³² Unfortunately, PV systems create intermittency problems that CSP technology does not.³³ The choice of cooling option will also affect a project’s water consumption. Wet recirculating cooling uses evaporation to dissipate heat, and is water-intensive. Dry cooling systems, which cool steam in a condenser by passing air over the condenser surface, use less water, but also result in comparatively lower outputs.³⁴ The essential conundrum is that the areas in which access to sunlight is most consistent tend to be arid, which exacerbates the adverse impacts of the water use by solar projects on competing uses.³⁵ Depleted water supplies resulting from the use of solar technologies have the capacity to reduce vegetative cover and drinking water supplies important for wildlife survival, as well as increase risks of wildfire³⁶ and vulnerability of wildlife to disease, insect infestation, and predation.³⁷ Ultimately, these consequences will result in a loss of diversity and the displacement of wildlife.³⁸

32. *Id.* PV converts solar radiation directly into electric current as sunlight passes through silicon panels, while CSP systems (which include solar trough, linear Fresnel, and power tower) use a steam cycle to generate heat to boil water or another heat-transfer fluid, which creates exhaust steam capable of spinning a turbine that generates electricity. Glennon & Reeves, *supra* note 4, at 96–97; Pizzo, *supra* note 5, at 132–33.

33. PV cells do not generate power in the absence of sunlight. Glennon & Reeves, *supra* note 4, at 96–97.

34. NEW ENERGY FRONTIER, *supra* note 4, at 20.

35. Glennon & Reeves, *supra* note 4, at 96; *see* Klass, *supra* note 12 (manuscript at 28) (“[T]he most energy-efficient CSP plants require a significant amount of water to operate, placing additional pressures on desert areas in the southwest that already struggle to meet water needs for consumption, industry, and environmental protection.”).

36. According to the BLM, many areas in the Southwest that are suitable for solar projects are already susceptible to wildfires. Although the construction of solar facilities may eliminate flammable vegetation, the electrical substations at these facilities create a fire hazard. The operation of vehicles and equipment, the storage of fuel and other flammable materials, and welding during construction create similar risks. BLM SOLAR PEIS, *supra* note 3, at 5-13 to -14.

37. *Id.* at 5-75 to -76; *see also* Glennon & Reeves, *supra* note 4, at 117 (“Even modest amounts of groundwater pumping could dry up rare and critical seeps and springs, thus threatening endangered species.”).

38. *See* BLM SOLAR PEIS, *supra* note 3, at 5-75 to -76, 5-81 to -82.

The construction and operation of solar projects on BLM lands can also be expected to cause water quality problems. To begin with, the water quantity and quality problems are linked.³⁹ The depletion of surface or groundwater sources that results from solar project operations can increase the concentrations of pollutants such as sediments in surface waters. Construction and grading may cause runoff, erosion, and sediment transport, as well as alter natural drainage patterns. Fuel and chemical leaks and spills could contaminate aquifers and surface waters, as could application of chemical herbicides to clear sites before project construction. Poorly designed groundwater wells might facilitate movement of poor quality groundwater or contaminants between aquifers.⁴⁰ All of these effects could impair the ecological and hydrological functions of wildlife habitat.⁴¹

The diminution of high-quality water supplies resulting from solar projects will of course affect water use by humans as well as wildlife. But solar projects have the potential to affect people in other ways, too. These projects may cause the destruction or degradation of cultural resources. Project construction could disturb or destroy archaeological and paleontological resources through alteration of topography and hydrological patterns, removal or erosion of soils, runoff, and contamination. Increased access to these resources heightens the risk of vandalism. Project construction and operation would create particular risks for Native American cultural properties, including burial and other sacred sites.⁴²

Finally, solar projects will change the aesthetics of the BLM lands on which they are located. Larger projects will involve the construction of industrial facilities spread over as many as six square miles in areas previously characterized by flat terrain and open vistas.⁴³ According to the BLM, in the areas most suitable for solar development on lands under its jurisdiction, “solar energy development would create an industrial landscape in stark contrast to the character of the existing undeveloped

39. Justice O’Connor recognized that link in *PUD No. 1 of Jefferson Cnty. v. Wash. Dep’t of Ecology*, 511 U.S. 700 (1994). She characterized the distinction between water quality and quantity problems as

an artificial distinction. In many cases, water quantity is closely related to water quality; a sufficient lowering of the water quantity in a body of water could destroy all of its designated uses, be it for drinking water, recreation, navigation or, as here, as a fishery. In any event, there is recognition in the Clean Water Act itself that reduced stream flow, *i.e.*, diminishment of water quantity, can constitute water pollution.

Id. at 719.

40. BLM SOLAR PEIS, *supra* note 3, at 5-40 to -41.

41. *Id.* at 5-37, 5-39 to -41.

42. *Id.* at 5-214 to -215, 5-218, 5-223.

43. See John Copeland Nagle, *See the Mojave!*, 89 OR. L. REV. 1357, 1381 (2011).

landscape. These developments would be visually intrusive and would affect lands that surround them,” creating a high likelihood that “a treasured quality of many western lands, the long vistas of undeveloped land, would be substantially altered.”⁴⁴ The National Park Service has expressed concerns that tall solar towers, which in some instances would reach 800 feet high, would create “visual blight” and interfere with visitor enjoyment of neighboring national parks and monuments.⁴⁵ BLM solar facilities also could affect nearby tracts set aside for protective management by the National Forest Service or the Fish and Wildlife Service, as well as areas requiring special management by the BLM, such as areas of critical environmental concern, special recreation management areas, and areas with wilderness characteristics.⁴⁶ Ancillary development in the form of access roads, substations, and transmission lines would exacerbate the negative visual impact.⁴⁷

B. Solar Projects and Other Public Lands Use Conflicts

As discussed further below, the BLM operates under a mandate to make the lands and resources under its purview available for a wide variety of uses, including recreation, range, timber harvesting, mineral development, fish and wildlife protection, and protection of scientific

44. BLM SOLAR PEIS, *supra* note 3, at 5-4; Glennon & Reeves, *supra* note 4, at 117. The visual impact of solar facilities need not be entirely negative. The BLM noted the possibility that solar facilities will be attractive to some:

Compared with many other industrial developments (e.g., fossil fuel plants, mines, or manufacturing facilities), solar energy facilities generally exhibit strong visual unity and simplicity, attributes generally associated with positive visual quality, even though they may introduce strong visual contrasts into natural-appearing landscapes. In some cases, some viewers might find some utility-scale solar energy facilities to be attractive or interesting to view because of the facilities’ strong visual unity and simplicity or other factors, such as striking and novel light effects from reflections from ambient dust or the polished solar receiver surfaces; however, systematic research studies on this topic are not available.

BLM SOLAR PEIS, *supra* note 3, at 5-164.

45. Glennon & Reeves, *supra* note 4, at 117.

46. BLM SOLAR PEIS, *supra* note 3, at 4-3 to -4; *id.* at 5-8 (noting that areas from which solar development is excluded because of the sensitive resources they contain may “incur indirect impacts from solar energy development on BLM-administered lands adjacent to and/or within the viewshed of the excluded areas, . . . including impacts on the night sky viewing . . .”).

47. *Id.* at 5-164.

and historical values.⁴⁸ Because of the size of some of the solar projects slated for development on BLM lands and the nature of the ensuing operations, dedication of BLM lands to solar facilities will create opportunity costs in that lands devoted to solar power production will be unavailable for many of these other uses. According to the BLM, “[u]tility-scale solar energy development is not compatible with recreation uses (e.g., hiking, biking, back country driving, hunting, bird watching, [off-highway vehicle] use, and camping), and the direct impact of solar development is the exclusion of recreational use from areas developed for solar energy production.”⁴⁹ The agency thus anticipates that recreational use will be precluded in all areas developed for solar facilities.⁵⁰ In addition, solar facilities might impair the recreational use of adjacent lands (both those managed by the BLM and those managed by the other federal land management agencies) by degrading scenic vistas, removing vegetation, requiring the development of access roads, and displacing wildlife.⁵¹

Because of the incompatibility of solar facility operations and the use of BLM lands as rangeland, the agency plans to close all or most solar project sites to livestock grazing.⁵² Solar project operations also have the capacity to disrupt military and civilian aircraft operations and radar use. The military is engaged in intensive use of the airspace in the areas identified as most suitable for solar projects on BLM lands, and the glare from reflective surfaces at project sites might create hazards for overflights.⁵³

Finally, the agency has indicated that utility-scale solar development is incompatible with most mineral development activities (with the possible exceptions of mining claims and oil and gas leases using offset drilling technologies).⁵⁴ The BLM, in processing applications to proceed with renewable energy development in areas in which mining claims were located, concluded that “the location of a mining claim in an area covered by a [right-of-way] application (or identified for such an application) creates uncertainty that interferes with the orderly administration of the public lands.”⁵⁵ As a result, the BLM has temporarily segregated from the operation of the public land laws those lands included in a pending or future solar generation right-of-way application, or public lands

48. Federal Land Policy and Management Act of 1976 §§ 101(a)(7), 102(c), 43 U.S.C. §§ 1701(a)(7), 1702(c) (2006).

49. BLM Solar PEIS, *supra* note 3, at 5-16.

50. *Id.*

51. *Id.*

52. *Id.* at 5-10.

53. *Id.* at 5-17 to -18.

54. *Id.* at 5-36.

55. Segregation of Lands—Renewable Energy, 76 Fed. Reg. 23,198, 23,200 (Apr. 26, 2011) (to be codified at 43 C.F.R. pts. 2090, 2800).

identified by the BLM as suitable for potential future solar development. Once segregated, these lands will not be subject to appropriation under the Mining Law of 1872, subject to valid existing rights, for up to two years.⁵⁶

III. FEDERAL SOLAR ENERGY DEVELOPMENT POLICY

Although Congress has struggled to devise a coherent national energy strategy in recent years, it has expressed a strong interest in promoting solar energy, particularly through projects that operate on federal lands. It has taken concrete steps to both provide incentives to investors and project owners to proceed with solar development and to mandate that federal land managers be receptive to the use of their lands for solar power development. This part first addresses federal laws and policies designed to facilitate the development of solar energy projects on federal lands. It then considers the BLM's legal authority to manage its lands, as well as the ways in which FLPMA and environmental and natural resource protection statutes constrain the BLM's ability to devote lands to solar development.

A. *Federal Laws and Policies that Facilitate Solar Power Production*

If there is one constant in national energy policy since the oil supply disruptions of the late 1970s, it is the desire to reduce the nation's dependence on foreign energy supplies.⁵⁷ Congress has sought to achieve

56. 43 C.F.R. § 2091.3-1(e)(1), (3) (2011); *see also* Segregation of Lands—Renewable Energy, 76 Fed. Reg. 23,198, 23,201 (Apr. 26, 2011) (“This Interim Rule will help the BLM maintain the status quo and prevent potential resource use conflicts by allowing the BLM to temporarily segregate lands being considered for a wind or solar energy generation facility.”); Segregation of Lands—Renewable Energy, 76 Fed. Reg. 23,230 (proposed Apr. 26, 2011) (to be codified at 43 C.F.R. pts. 2090, 2800); Phil Taylor, *Public Lands: BLM Exempts 677,000 Acres from New Mining Claims to Promote Solar*, E&E NEWS PM, June 29, 2011; Notice of Segregation of Public Lands in the States of Arizona, California, Colorado, Nevada, New Mexico, and Utah, 76 Fed. Reg. 38,416 (June 30, 2011) (announcing temporary segregation from mining laws of all 677,000 acres designated by the BLM as Solar Energy Zones under the agency's draft Solar Energy Program, discussed *infra* at notes 182–90 and accompanying text).

57. *See, e.g.*, 42 U.S.C. § 15927(b)(1) (2006) (“United States oil shale, tar sands, and other unconventional fuels are strategically important domestic resources that should be developed to reduce the growing dependence of the United States on politically and economically unstable sources of foreign oil imports.”); 43 U.S.C. § 1802(1) (2006) (seeking to “establish policies and procedures for managing the oil and natural gas resources of the Outer Continental Shelf which are intended to result in expedited

this goal by various means, including the heavy subsidization of favored technologies for enhancing production of domestic supplies or achieving more efficient energy use. But the strategies used arguably have not been “the result of a national energy policy to determine the best and most efficient outcome, but instead have seemed the product of a haphazard, politicized, and inconsistent approach, with policymakers at times unwilling to interfere with industry and at other times mandating or subsidizing various technologies.”⁵⁸ Nevertheless, in recent years, Congress has rather consistently promoted solar power production on federal lands, and the land management agencies have taken steps to turn that evidenced commitment into reality.

Congress declared in the Energy Policy Act of 2005 that it was “the sense of the Congress that the Secretary of the Interior should, before the end of the 10-year period beginning on the date of enactment of this Act, seek to have approved non-hydropower renewable energy projects located on the public lands with a generation capacity of at least 10,000 megawatts of electricity.”⁵⁹ The same statute ordered the Secretary to enter into a contract with the National Academy of Sciences to study the potential of developing renewable energy resources, including solar power, on federal land available for those uses under current law, and report to Congress on the results.⁶⁰ According to one assessment, the Act triggered “a frantic land-grab” for permits to locate solar projects on public lands in the southwest.⁶¹

Four years later, in response to the economic recession that began in 2008, Congress directed the Secretary of the Treasury in the American

exploration and development of the Outer Continental Shelf in order to achieve national economic and energy policy goals, assure national security, reduce dependence on foreign sources, and maintain a favorable balance of payments in world trade”); *see also* Fred Bosselman, *Green Diesel: Finding a Place for Algae Oil*, 86 CHI.-KENT L. REV. 291, 292 (2011) (footnotes omitted) (“[I]t was the oil shocks of the 1970s that provided a new impetus to search for home-grown replacements for some of America’s oil imports, and interest ramped up again after the attacks on the World Trade Center on September 11, 2001, which highlighted our relations with the Mideast and our dependence on imported oil.”); Lawrence Zelenak, *The Loophole that Would Not Die: A Case Study of the Difficulty of Greening the Internal Revenue Code*, 15 LEWIS & CLARK L. REV. 469, 471–72 (2011) (“[R]educing the United States’ dependence on foreign oil is widely viewed as a matter of national security.”).

58. Ronald E. Minsk, Sam P. Ori & Sabrina Howell, *Plugging Cars into the Grid: Why the Government Should Make a Choice*, 30 ENERGY L.J. 317, 348 (2009). Professor Joseph Tomain prefers to describe national energy policy as “kaleidoscopic,” rather than chaotic. Joseph P. Tomain, *The Dominant Model of United States Energy Policy*, 61 U. COLO. L. REV. 355, 355 (1990). At the time, Professor Tomain identified as prominent characteristics of that policy a commitment to the free market and to “the hard energy path of large-scale, high-technology, capital intensive energy production.” *Id.* at 391.

59. Energy Policy Act of 2005, Pub. L. No. 109-58, § 211, 199 Stat. 594, 660.

60. *Id.* § 1833(a)–(b).

61. Glennon & Reeves, *supra* note 4, at 111–12.

Recovery and Reinvestment Act (“ARRA”) to provide a grant to any person who placed in service a “specified energy facility,” which included solar projects, to reimburse him or her for a portion of project expenses. Grants were conditioned on the project being commenced or placed in service by the end of 2010.⁶²

Both the President and the agencies took actions to further Congress’s push for enhanced solar energy resources. Even before the adoption of the Energy Policy Act of 2005, President Bush issued an Executive Order directing federal agencies to expedite projects that increase the production, transmission, or conservation of energy.⁶³ In 2009, based on authority provided by the Energy Policy Act, the Secretary of the Interior issued Secretarial Order 3285 (“The Order”), which established the development of renewable energy as a priority for the Department.⁶⁴ The Order identified the key roles that use of the public lands, especially those managed by the Interior Department, could play in the development of renewable resources. It declared that the federal public lands possess substantial renewable resources capable of helping meet the nation’s future energy needs, benefitting both the environment and the economy, and enhancing energy security by adding to the domestic energy supply.⁶⁵ It also stated that, “[a]s the steward of more than one-fifth of our Nation’s lands, and neighbor to other land managers, the Department of the Interior has a significant role in coordinating and ensuring environmentally responsible renewable energy production and development of associated infrastructure needed to deliver renewable energy to the consumer.”⁶⁶ The Order characterized the encouragement of the production,

62. American Recovery and Reinvestment Act, Pub. L. No. 111-5, § 1603(a), (d)(3), 123 Stat 115 (2009); see Outka, *supra* note 3, at 248 (explaining that the 2009 legislation “poured billions of ‘stimulus’ dollars into grants, tax credits, research, and other programs for energy efficiency and renewable energy.”). One solar project approved by the BLM in California’s Imperial Valley was slated to get \$273 million in federal stimulus grants. See Onell R. Soto, *Feds Approve Big Solar Project in the Imperial Valley*, SIGNON SAN DIEGO (Oct. 5, 2010), <http://www.signonsandiego.com/news/2010/oct/05/feds-approve-big-solar-project-in-the-imperial-valley>; see also Felicity Barringer, *Solar Power Plants to Rise on U.S. Land*, N.Y. TIMES, Oct. 6, 2010, at A21 (stating that the Imperial Valley project could receive hundreds of millions of dollars in federal stimulus grants and loan guarantees).

63. Exec. Order No. 13212, §§ 1, 2, 66 Fed. Reg. 28,357 (May 22, 2001).

64. Secretarial Order No. 3285, *supra* note 4. The Order also established a Departmental Task Force on Energy and Climate Change. *Id.* § 1. The Order cited § 211 of the Energy Policy Act of 2005 as one source of authority. *Id.* § 3.

65. *Id.* § 2.

66. *Id.*

development, and delivery of renewable energy as “one of the Department’s highest priorities,” and committed agencies and bureaus within the Department to working collaboratively with each other, other federal agencies, other levels of government, and private landowners, to encourage the expeditious and responsible development of renewable energy and associated transmission facilities.⁶⁷ The Secretary charged the Task Force on Energy and Climate Change created by the Order with developing a strategy to increase renewable energy development on appropriate public lands, best management practices to ensure that such development was environmentally responsible, and “clear policy direction for authorizing the development of solar energy on public lands.”⁶⁸

The Interior Secretary and the BLM responded to these legislative and executive branch directives by establishing a specific framework for the consideration of solar projects. The BLM, during the Bush Administration in 2007, had responded to the Energy Policy Act of 2005 by issuing a Solar Energy Development Policy in the form of an Instruction Memorandum (“IM”).⁶⁹ The IM established an agency policy for reviewing proposed solar projects as applications for rights-of-way on public lands administered by the BLM under FLPMA. The BLM declared a general policy of facilitating environmentally responsible commercial development of solar energy projects on public lands in the form of either CSP or PV generating facilities. Commercial solar projects would have to comply with the BLM’s planning, environmental, and right-of-way application requirements, just as other similar commercial uses do. The IM indicated that right-of-way applications for solar energy development projects would be identified as high priority, consistent with President Bush’s 2001 Executive Order and the Energy Policy Act of 2005. The IM also indicated that “adequate resources should be provided to review and process applications.”⁷⁰

A right-of-way grant would authorize the construction of all facilities related to any given commercial solar energy development project, including the solar collectors, tower, turbine generator, fossil fired generator for hybrid systems, thermal storage, access roads, electrical and transmission facilities, and other testing and support facilities. The IM provided that right-of-way authorizations would contain appropriate

67. *Id.* § 4.

68. *Id.* § 5(a)–(c).

69. BUREAU OF LAND MGMT, U.S. DEP’T OF THE INTERIOR, INSTRUCTION MEMORANDUM NO. 2007-097, EMS TRANSMISSION 04/11/2007, SOLAR ENERGY DEVELOPMENT POLICY (2007), *available at* http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2007/im_2007-097_.html [hereinafter 2007 SOLAR ENERGY DEVELOPMENT POLICY].

70. *Id.*

stipulations relating to road construction and maintenance, vegetation removal, biological resource mitigation and monitoring, and site reclamation. The BLM would conduct environmental reviews under the National Environmental Policy Act (“NEPA”) of all aspects of a solar project, taking into account direct, indirect, and cumulative effects. The agency also would analyze the impact of issuance of a right-of-way for commercial solar development on endangered species, migratory birds, and historic and cultural resources, both at the project site itself and at areas potentially affected by the project.⁷¹

Construction and operation could not begin without a BLM-approved Plan of Development (“POD”), which would be processed at the same time as the right-of-way authorization, if possible. In addition, the BLM would require a bond to ensure compliance with conditions attached to the right-of-way and with regulatory requirements such as reclamation. The term of right-of-way grants would take into account the costs of the facility but would not exceed the design life of solar facilities (typically thirty years). Grants would include a due diligence requirement for installation of facilities consistent with an approved POD. Failure to comply would afford the BLM the option of terminating the right-of-way authorization.⁷²

The BLM decided to process right-of-way applications for solar projects on a first-come, first-served basis. It would initiate a competitive bidding process if a land use planning decision had specifically identified an area for competitive leasing and other public interest and technical factors favored offering lands for competitive leasing.⁷³ The IM noted that the BLM had the right to authorize other compatible uses, but indicated that such authorizations would be unlikely because of the intensive use that PV or CSP facility equipment requires.⁷⁴

The BLM updated the IM in 2010 to conform to the policies reflected in Secretarial Order 3285.⁷⁵ The amended IM elaborated on the terms of the performance and reclamation bond that the BLM would require for

71. *Id.*

72. *Id.*

73. *Id.*; see also 43 C.F.R. § 2804.23(c) (2010).

74. 2007 SOLAR ENERGY DEVELOPMENT POLICY, *supra* note 69.

75. BUREAU OF LAND MGMT, U.S. DEP’T OF THE INTERIOR, INSTRUCTION MEMORANDUM NO. 2011-003, EMS TRANSMISSION 10/13/2010, SOLAR ENERGY DEVELOPMENT POLICY (2010), available at http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2011/IM_2011-003.html [hereinafter 2010 AMENDED IM].

solar projects. Each bond would consist of three components. The first would address environmental liabilities, including those arising from the use of hazardous materials, herbicides, petroleum-based fluids, and dust control or soil stabilization materials. The second would address the decommissioning, removal, and disposal of improvements and facilities, while the third would address reclamation, revegetation, restoration, and soil stabilization. The third component would also consider the potential for flood events and downstream sedimentation from the site that could result in offsite impacts such as Clean Water Act violations. The amended IM also stated that the BLM was preparing a Solar Energy Development Programmatic Environmental Impact Statement (“PEIS”) to identify the impacts of solar energy development and potential best management practices (“BMPs”) that could mitigate or reduce its adverse impacts on the public lands. In the interim, the BLM had developed a preliminary set of potential BMPs for consideration by BLM field offices when analyzing individual projects.⁷⁶ In doing so, the BLM identified a preliminary list of project-specific plans that would be required for each solar energy project, and which would include mitigation measures. These plans would cover activities such as decommissioning and site reclamation, erosion and sedimentation control, vegetation management, habitat restoration and management, hazardous materials management, cultural resources management and mitigation, and visual restoration. Each right-of-way grant would require that the POD include these plans and that the holder comply with them. Additional plans could be required on a site-by-site basis.⁷⁷

B. Legal Authority for and Constraints on Solar Development on Public Lands

The source of the BLM’s authority to issue rights-of-way authorizing solar projects on the public lands is FLPMA, which also requires that the agency take steps to ensure that FLPMA rights-of-way for activities such as solar project operations adequately protect the environment, including fish and wildlife resources, and are consistent with the public interest. Other environmental protection statutes impose additional constraints on the issuance and use of rights-of-way for projects that generate solar energy.

^{76.} *Id.*

^{77.} *Id.*

1. *The BLM's General Management Authority Under FLPMA*

The BLM's authority to manage the public lands derives from its organic act, FLPMA. The BLM is one of the two "multiple use" federal land management agencies, along with the Forest Service. Unlike the National Park Service ("NPS") and the Fish and Wildlife Service ("FWS"), which must prioritize certain dominant uses (resource preservation and recreation in the case of the NPS,⁷⁸ and wildlife protection and compatible hunting and fishing activities in the case of the FWS's management of the national wildlife refuges),⁷⁹ the BLM must accommodate a host of potentially conflicting uses, no one of which should predominate over the others.⁸⁰

FLPMA generally directs the BLM to manage the public lands under principles of multiple use and sustained yield.⁸¹ The principle of multiple use dictates the management of federal lands in the combination that best meets the needs of the American people (but not necessarily the combination that maximizes dollar return or unit output), taking into account changing needs and conditions as well as the long-term needs of future generations for renewable and non-renewable resources.⁸² FLPMA specifically recognizes that BLM lands need not always be managed for all available uses.⁸³ Sustained yield is the achievement and maintenance in perpetuity of a high-level output of renewable resources consistent with multiple use.⁸⁴ FLPMA requires the BLM to develop land use plans (called resource management plans) for the lands under its jurisdiction.⁸⁵ These plans must observe the principles of multiple use and sustained yield, use a science-based interdisciplinary approach to land management, give priority to protecting areas of critical environmental concern, consider

78. 16 U.S.C. § 1 (2006); see 1 GEORGE CAMERON COGGINS & ROBERT L. GLICKSMAN, PUBLIC NATURAL RESOURCES LAW § 6:14 (2d ed. 2007).

79. 16 U.S.C. §§ 668dd(d)(1)(A), 668ee(1) (2006); see 1 COGGINS & GLICKSMAN, *supra* note 78, § 6:15. For additional information on the mandate to preserve wildlife, and a discussion of case law on the subject of what constitutes a "compatible" activity in this context, see generally 3 COGGINS & GLICKSMAN, *supra* note 78, §§ 24:1 to 24:3.

80. For a discussion of the connected multiple use and sustained yield mandates applicable to the BLM and the Forest Service, see generally 3 COGGINS & GLICKSMAN, *supra* note 78, §§ 30:1 to 30:8.

81. Federal Land Policy and Management Act of 1976 § 102(a)(7), 43 U.S.C. § 1701(a)(7) (2006).

82. *Id.* § 1702(c).

83. *Id.*

84. *Id.* § 1702(h).

85. *Id.* § 1712(a).

present and potential uses of the public lands, consider the relative scarcity of the values involved and the availability of alternative means and sites for realization of those values, weigh long- and short-term public benefits, and require compliance with federal and state pollution control laws.⁸⁶ Management decisions must conform to the land use plans.⁸⁷

2. *The BLM's Authority to Issue Rights-of-Way*

FLPMA authorizes the BLM to grant rights-of-way over or upon the public lands for a variety of uses, including systems for the generation, transmission, and distribution of electric energy and for other systems or facilities in the public interest.⁸⁸ FLPMA defines a right-of-way to include not only interests in the land of another typically thought of as rights-of-way, such as easements or the right to traverse the public lands, but also a “lease, permit, or license to occupy [or] use” public lands for purposes covered by the Act’s right-of-way provisions.⁸⁹ The BLM may issue a right-of-way only if it finds that the applicant has the technical and financial capacity to construct the project for which the right-of-way is requested in accordance with statutory and regulatory requirements.⁹⁰

The statute also constrains the BLM’s ability to issue rights-of-way. Some of these constraints derive from FLPMA’s general land and resource management provisions. All project-level decisions must conform to BLM resource management plans.⁹¹ In addition, FLPMA directs the BLM, in managing the public lands, to “take any action necessary to prevent unnecessary or undue degradation of the lands.”⁹² The BLM has stated as one of its regulatory objectives that right-of-way grants will not result in degradation of public lands.⁹³ Neither FLPMA nor the BLM’s regulations define unnecessary or undue degradation, however.

FLPMA’s right-of-way provisions impose additional constraints on the BLM’s authorization of those uses. In determining right-of-way corridors and whether rights-of-way should be confined to them, the BLM must take into account federal and state land use policies, environmental quality,

86. *Id.* § 1712(c).

87. Federal Land Policy and Management Act of 1976 § 302(a), 43 U.S.C. § 1732(a) (2006).

88. *Id.* § 1761(a)(4), (7).

89. *Id.* § 1702(f).

90. *Id.* § 1764(j).

91. *Id.* § 1732(a); *see also* BLM SOLAR PEIS, *supra* note 3, at 1-9 (“[S]olar energy development must be in conformance with the existing, approved land use plan.”).

92. Federal Land Policy and Management Act of 1976 § 302(b), 43 U.S.C. § 1732(b) (2006).

93. 43 C.F.R. § 2801.2(b) (2010); *see also id.* § 2805.11(a)(5).

economic efficiency, and national security, among other factors.⁹⁴ Each right-of-way must be limited to an area that does not unnecessarily damage the environment,⁹⁵ and be subject to regulations or stipulations consistent with FLPMA and other applicable laws.⁹⁶ If a project for which a right-of-way is sought might have a significant impact on the environment, the BLM must require the applicant to submit a plan of construction, operation, and rehabilitation that complies with relevant agency regulations.⁹⁷ The statute requires that a right-of-way contain terms and conditions that result in the realization of specified statutory and regulatory purposes, minimize damage to scenic and esthetic values, as well as to fish and wildlife, require compliance with applicable federal health, safety, and environmental standards, and otherwise protect the environment.⁹⁸ The BLM may impose additional terms and conditions it deems necessary to protect federal property and economic interests, manage lands subject to the right-of-way efficiently, protect lives and property, safeguard the interests of individuals who rely on subsistence use of the fish and wildlife in the area, minimize environmental damage in locating the right-of-way, and “otherwise protect the public interest” in the lands covered by or adjacent to the right-of-way.⁹⁹ The BLM has the discretion to require holders of rights-of-way to furnish a bond or other security covering all obligations imposed by right-of-way terms or conditions.¹⁰⁰ The BLM may suspend or terminate a right-of-way if its

94. Federal Land Policy and Management Act of 1976 § 503, 43 U.S.C. § 1763 (2006).

95. *Id.* § 1764(a).

96. *Id.* § 1764(c). The BLM may impose on a right-of-way holder terms and conditions concerning extent, duration, location, construction, maintenance, and termination. *Id.*

97. *Id.* § 1764(d). BLM regulations concerning rights-of-way are authorized under *id.* § 1764(e). The regulations promulgated under that authority may be found at 43 C.F.R. pt. 2800 (2010). FLPMA also directs the BLM to issue regulations specifying the extent to which holders of rights-of-way shall be liable for damage or injury to the United States caused by the use or occupancy of rights-of-way. 43 U.S.C. § 1764(h)(1).

98. 43 U.S.C. § 1765(a). BLM regulations provide that, in granting rights-of-way, the BLM seeks to protect “the natural resources associated with public lands and adjacent lands, whether private or administered by a government entity.” 43 C.F.R. § 2801.2(a).

99. 43 U.S.C. § 1765(b). BLM regulations provide that right-of-way approvals may include “terms, conditions, and stipulations that BLM determines to be in the public interest,” including requirements that applicants modify their proposed uses, or change the route or location of the facilities. 43 C.F.R. § 2805.10(a)(1).

100. 43 U.S.C. § 1764(i).

holder violates FLPMA, agency regulations, or right-of-way terms and conditions.¹⁰¹

3. Other Laws Applicable to BLM Rights-of-Way

A host of federal environmental and natural resource protection laws apply to the BLM's issuance of rights-of-way for solar projects and the subsequent operation of those projects on public lands. Indeed, FLPMA requires that the BLM include stipulations in right-of-way grants to ensure compliance with these laws.¹⁰² NEPA requires that the BLM consider and disclose the potential environmental impacts of right-of-way issuance and operation.¹⁰³ The National Historic Preservation Act ("NHPA") mandates that the BLM consider the potential impacts of rights-of-way on properties listed or eligible for listing on the National Register of Historic Places.¹⁰⁴ The Endangered Species Act ("ESA") requires that the BLM, in issuing a right-of-way, avoid jeopardizing listed endangered or threatened species or adversely affecting their critical habitats.¹⁰⁵ The Clean Water Act ("CWA") imposes limits on discharges of pollutants and dredge and fill material by right-of-way facilities (including transmission lines) that qualify as point sources or that traverse wetlands or other covered waters.¹⁰⁶ Projects operated on federal rights-of-way

101. *Id.* § 1766; *see also id.* § 1732(c).

102. *Id.* § 1765(a).

103. National Environmental Policy Act of 1969 § 102(2)(C), 42 U.S.C. § 4332(2)(C) (2006); *see, e.g.*, *Sierra Club v. Hodel*, 848 F.2d 1068, 1090–91 (10th Cir. 1988) (holding that the BLM's duty under FLPMA § 1763(c) and implementing regulations to prevent unnecessary degradation of wilderness study areas from changes in a right-of-way provides sufficient federal control to qualify as major federal action subject to NEPA analysis), *overruled in part by* *Village of Los Ranchos de Albuquerque v. Marsh*, 956 F.2d 970 (10th Cir. 1992); *Quechan Tribe of Fort Yuma Indian Reservation*, 755 F. Supp. 2d at 1120 (S.D. Cal. 2010). BLM right-of-way regulations provide that before approving a right-of-way application, the agency will complete a NEPA analysis for the application or approve a NEPA analysis previously completed for the application. 43 C.F.R. § 2804.25(d)(1). *Cf.* *Montana Wilderness Ass'n v. Fry*, 310 F. Supp. 2d 1127, 1147–48 (D. Mont. 2004) (finding violation of NEPA in connection with issuance of right-of-way for gas pipeline).

104. National Historic Preservation Act of 1966 § 106, 16 U.S.C. § 470f (2006); *see, e.g.*, *Quechan Tribe of Fort Yuma Indian Reservation*, 755 F. Supp. 2d at 1119–20 (S.D. Cal. 2010) (preliminarily enjoining solar project on basis of potential NHPA violations).

105. Endangered Species Act of 1973 § 7(a)(2), 16 U.S.C. § 1536(a)(2) (2006); *see, e.g.*, *Montana Wilderness Ass'n*, 310 F. Supp. 2d at 1149–50 (finding violation of ESA in connection with issuance of right-of-way for gas pipeline); *cf.* Karin Sheldon, *Mother Nature's Challenge: Managing Energy as if Wildlife Really Matters*, 55 ROCKY MTN. MIN. L. INST. § 15.06 (2009) ("Renewable energy generation also has the potential to cause significant habitat fragmentation and wildlife disturbance on public lands.").

106. 33 U.S.C. §§ 1311(a), 1342(a)(1)–(2), 1344(a), (c) (2006); *see, e.g.*, *Sierra Club v. Clinton*, 746 F. Supp. 2d 1025, 1029 (D. Minn. 2010).

may impact specific wildlife species, such as migratory birds or eagles, necessitating compliance with statutes such as the Migratory Bird Treaty Act (“MBTA”)¹⁰⁷ or the Bald and Golden Eagle Protection Act.¹⁰⁸

IV. THE FAST-TRACK APPROVAL PROCESS AND THE BLM’S SOLAR ENERGY PROGRAM

In response to congressional and secretarial policies encouraging the development of solar power on federal lands, the BLM has used its authority to grant rights-of-way under FLPMA as a vehicle for approving a series of solar projects in the southwest. The agency processed the right-of-way applications for these projects under a fast-track program to ensure that approved projects would qualify for federal financial assistance made available under the ARRA. The agency conditioned approval of these projects in ways designed to minimize adverse environmental impacts and to require compliance with all relevant statutes. Although the BLM has insisted that it fully complied with FLPMA and other applicable environmental laws in approving the fast-track projects, some are concerned that the fast-track process gave short shrift to environmental values and requirements, and at least one court has enjoined a fast-track right-of-way approval because of probable noncompliance with the NHPA. The BLM has begun developing a long-term solar program that has the potential to afford concerned parties greater certainty that solar projects operating on public lands will not have the kinds of adverse consequences described in Part II above. The agency has issued a massive draft programmatic environmental impact statement in which it has described the options it is considering for that program.¹⁰⁹

This Part describes the results of the fast-track process, including the conditions the BLM has imposed in granting rights-of-way under

107. 16 U.S.C. §§ 703–711 (2006); *see, e.g.*, 2007 SOLAR ENERGY DEVELOPMENT POLICY, *supra* note 69 (referencing the need for compliance with the MBTA in considering solar energy development right-of-way application); U.S. DEP’T OF THE INTERIOR, BUREAU OF LAND MGMT., RECORD OF DECISION, BLYTHE SOLAR POWER PROJECT 23 (2010), *available at* http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/palmsprings/blythe_feis0.Par.18342.File.dat/Blythe_ROD_FINAL.pdf [hereinafter BLYTHE SOLAR POWER PROJECT] (describing steps right-of-way applicant for solar project would be required to take to ensure eagle impacts are mitigated to the extent possible, including surveys, monitoring, and facility design).

108. 16 U.S.C. §§ 668–668(d).

109. *See infra* Part IV.B.

FLPMA for solar projects. It also assesses the sufficiency of the right-of-way approvals the BLM has provided for the fast-track projects in complying with the agency's environmental protection responsibilities. Finally, it addresses the long-term program the agency may develop to replace the more ad hoc approach used by the agency in approving the fast-track projects thus far.

A. *The Fast-Track Process*

The BLM currently evaluates on a project-specific basis proposals for solar power projects on public lands under its authority to issue rights-of-way under FLPMA.¹¹⁰ The process includes assessment of a proposed project under FLPMA's right-of-way provisions, NEPA, the ESA, the NHPA, and other applicable statutes and regulations. The agency also considers whether proposals are consistent with resource management plans or would require land use plan amendments.¹¹¹

In 2009, the BLM established a list of priority energy projects for expedited application review and processing. According to the agency, the fast-track process was used only for those projects that had demonstrated sufficient progress in environmental review and public participation processes under FLPMA, NEPA, and other federal environmental statutes to potentially be cleared for approval by December 2010, making them eligible for economic stimulus funding under the ARRA. The BLM approved one geothermal priority project in 2009, and one wind project,

110. See, e.g., U.S. DEP'T OF THE INTERIOR, BUREAU OF LAND MGMT., RECORD OF DECISION, SILVER STATE SOLAR ENERGY PROJECT 4 (2010), available at http://www.blm.gov/pgdata/etc/medialib/blm/nv/field_offices/las_vegas_field_office/energy/nextlight_-_other/nextlight_rod.Par.44736.File.dat/Silver_State_ROD_signed.pdf [hereinafter SILVER STATE SOLAR ENERGY PROJECT] ("The ROW [right-of-way] authorization [under FLPMA] provides the legal authority to enforce compliance with all mitigation measures required for implementation [of solar projects] . . . including the associated terms and conditions of the Biological Opinion issued by the U.S. Fish and Wildlife Service [under the ESA].").

111. BLM SOLAR PEIS, *supra* note 3, at ES-1 to ES-2. The agency, elaborating on this concept, has written:

Solar energy development projects, as with other implementation actions, must be in conformance with the applicable land use plan. In cases where a proposed solar energy facility is not in conformance with the applicable land use plan, the BLM can reject the application for a [right-of-way (ROW)] or amend the land use plan to allow for the ROW. The BLM must determine whether to initiate a plan amendment process when a proposal changes the scope of resource uses or the terms, conditions, and/or decisions of an approved plan (43 CFR 1610.5-5). Land use plan amendments are subject to environmental review under NEPA and must be completed in accordance with BLM planning regulations (43 CFR 1610 et seq.).

Id. at 1-12.

one geothermal priority project, and nine solar projects in 2010.¹¹² Of the approved solar projects, all to be located in California and Nevada, three will use parabolic trough technology, two involve PV technology, two more will be power tower projects, and the final two will be solar dish projects.¹¹³ The projects involve use of just over 400¹¹⁴ to more than 7000 acres of BLM land,¹¹⁵ and have a combined capacity of 3682 megawatts of electricity.¹¹⁶ As of the end of 2010, 104 additional solar right-of-way applications covering a million acres of public lands in Arizona, California, Nevada, and New Mexico, with an aggregate generating capacity of 60,000 megawatts of electricity, were pending before the BLM.¹¹⁷ The BLM indicated that it would follow the same steps for processing priority projects in 2011, including one solar project in Nevada and eight in California.¹¹⁸ It approved two more utility-scale solar projects on public lands in California in July 2011.¹¹⁹

The BLM has justified the approvals for the fast-track projects by pointing to their capacity to displace conventional energy production facilities that produce greenhouse gases.¹²⁰ It is also cognizant, however, of the potential adverse impacts of solar project construction and operation on the environment, requiring a “careful balancing of many competing public interests in managing public lands.”¹²¹ As a result, “to protect

112. NEW ENERGY FRONTIER, *supra* note 4, at 43–44.

113. *Id.* at 19.

114. U.S. DEP’T OF THE INTERIOR, BUREAU OF LAND MGMT., RECORD OF DECISION, CHEVRON ENERGY SOLUTIONS LUCERNE VALLEY SOLAR PROJECT 4 (2010), *available at* <http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/Barstow.Par.35258.File.dat/FinalRODLucerneValleySolarProject.pdf> [hereinafter CHEVRON ENERGY SOLUTIONS LUCERNE VALLEY SOLAR PROJECT].

115. BLYTHE SOLAR POWER PROJECT, *supra* note 107, at 1. According to one source, this facility would be nearly half the size of Manhattan. Haederle, *supra* note 16.

116. NEW ENERGY FRONTIER, *supra* note 4, at 17.

117. *Id.*; News Release, Office of the Sec’y of the Interior, *supra* note 14.

118. NEW ENERGY FRONTIER, *supra* note 4, at 43–44.

119. News Release, Office of the Sec’y of the Interior, Bureau of Land Mgmt., Salazar Approves Major Renewable Energy Projects, Identifies Next Step in Solar Energy Development (July 14, 2011), *available at* http://www.blm.gov/wo/st/en/info/newsroom/2011/july/NR_07_14_2011A.html.

120. BLYTHE SOLAR POWER PROJECT, *supra* note 107, at 25; *see also id.* at 1 (“Granting the ROW contributes to the public interest in developing renewable power to meet state and federal renewable energy goals.”); CHEVRON ENERGY SOLUTIONS LUCERNE VALLEY SOLAR PROJECT, *supra* note 114, at 13 (“The project takes a step toward meeting state and federal climate change goals. It will provide enough clean electricity to power up to 13,500 homes.”).

121. BLYTHE SOLAR POWER PROJECT, *supra* note 107, at 1.

natural resources on the public lands and adjacent lands and to prevent unnecessary or undue degradation to the public lands, the BLM has established sound environmental policies, procedures, and siting and mitigation strategies for solar energy development on the public lands.”¹²² In approving particular fast-track projects, the BLM has asserted that it took all practicable steps to reduce environmental harm and prevent projects from causing any unnecessary or undue degradation. In some instances, these statements seem conclusory.¹²³ In others, the agency listed the conditions it imposed to ensure compliance with FLPMA’s nondegradation mandate in some detail.¹²⁴ Similarly, the decisions approving specific projects have asserted that they are in the public interest because, among other things, they require compliance with NEPA or ESA documents and the provisions of statutes that include the NHPA and the CWA.¹²⁵

The Records of Decision on the fast-track solar project approvals reflect several recurring methods the BLM has adopted to minimize environmental damage from the approved facilities. In some cases, the BLM reduced the size of the projects it approved, or required or encouraged project applicants to relocate facilities away from sensitive resources, such as the critical habitats of species listed under the ESA or wilderness study areas.¹²⁶ The agency further accommodated concerns relating to the ESA by approving only the portions of projects least likely to affect listed species,¹²⁷ restricting activities likely to harm listed

122. BLM SOLAR PEIS, *supra* note 3, at 1-9.

123. *See, e.g.*, SILVER STATE SOLAR ENERGY PROJECT, *supra* note 110, at 5.

124. *See, e.g.*, BLYTHE SOLAR POWER PROJECT, *supra* note 107, at 25 (including siting the facility in a location “not specifically designated for the protection of any resources”; modifying project boundaries to minimize impacts to various natural resources; considering project location alternatives with a view towards minimizing any detrimental impacts; and developing mitigation measures, “including compensation requirements for the displacement of desert tortoise habitat, to further avoid or minimize impacts”).

125. *See, e.g.*, IMPERIAL VALLEY SOLAR PROJECT, *supra* note 4, at 3-5 to 3-6.

126. *See, e.g.*, BLYTHE SOLAR POWER PROJECT, *supra* note 107, at 15 (“The BLM discouraged the Applicant from including in its application alternate BLM locations with significant environmental concerns, such as critical habitat, Areas of Critical Environmental Concern, Desert Wildlife Management Areas (“DWMAs”), designated OHV areas, wilderness study areas, and designated wilderness areas or other sensitive resources. The BLM encouraged the Applicant to design a project with the fewest potential conflicts.”); GENESIS SOLAR ENERGY PROJECT, *supra* note 4, at 15; U.S. DEP’T OF THE INTERIOR, BUREAU OF LAND MGMT., RECORD OF DECISION, CALICO SOLAR PROJECT 3-21, 4-2 (2010), *available at* http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/Barstow/calico_feis.Par.60395.File.dat/Calico%20ROD.pdf [hereinafter CALICO SOLAR PROJECT] (reduction in size and relocation of project boundaries to avoid habitat for desert tortoise and bighorn sheep).

127. *See, e.g.*, SILVER STATE SOLAR ENERGY PROJECT, *supra* note 110, at 8 (“In consideration of reducing the effects on individual desert tortoises and their translocation

species or their habitats (such as by requiring a project applicant to construct fencing to limit recreational vehicle use),¹²⁸ incorporating as project conditions mitigation measures specified in biological opinions prepared by the FWS under the ESA,¹²⁹ requiring applicants to relocate populations of listed species such as desert tortoises¹³⁰ or take measures to enhance existing habitat,¹³¹ mandating the creation of predator control programs,¹³² and requiring project applicants to provide funds for the purchase of alternative habitats for species such as desert tortoises, bighorn sheep, horned lizards and burrowing owls.¹³³ Several of the project approvals require project applicants to develop avian protection

from the project area, limiting the authorization to this phase of the project disturbs fewer acres of desert tortoise habitat and limits translocation to about one dozen individual animals.”).

128. BLYTHE SOLAR POWER PROJECT, *supra* note 107, at 17–18.

129. *See, e.g., id.* at 23; CHEVRON ENERGY SOLUTIONS LUCERNE VALLEY SOLAR PROJECT, *supra* note 114, at 17; IMPERIAL VALLEY SOLAR PROJECT, *supra* note 4, at 3-7; U.S. DEP’T OF THE INTERIOR, BUREAU OF LAND MGMT., RECORD OF DECISION, IVANPAH SOLAR ELECTRIC GENERATING SYSTEM PROJECT 24 (2010), *available at* http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/needles/lands_solar.Par.68027.File.dat/FinalRODIvanpahSolarProject.pdf [hereinafter IVANPAH SOLAR ELECTRIC GENERATING SYSTEM PROJECT].

130. *E.g.,* SILVER STATE SOLAR ENERGY PROJECT, *supra* note 110, at 8; IVANPAH SOLAR ELECTRIC GENERATING SYSTEM PROJECT, *supra* note 129, at 24, 32; CALICO SOLAR PROJECT, *supra* note 126, at 13. Scientific researchers have urged recognition of the Sonoran population of desert tortoises as a separate species from the Mojave population. *See* Robert W. Murphy et al., *The Dazed and Confused Identity of Agassiz’s Land Tortoise, Gopherus agassizii (Testudines, Testudinidae) with the Description of a New Species, and Its Consequences for Conservation*, 113 ZOOKEYS 39 (2011), *available at* <http://www.pensoft.net/journals/zookeys/article/1353/abstract/>. “The most important implication of [doing so] is that Arizona and Mexico can no longer be considered to harbor a genetic reservoir for the Mojavian population of the desert tortoise.” *Id.* at 61. Regarding the Mojave and Sonoran populations as separate species might heighten the risk that solar development in the Arizona and California deserts will adversely affect the tortoise or its critical habitat. *See* Scott Streater, *New Tortoise Classification Could Snag Energy Development in Southwest*, LAND LETTER, June 30, 2011.

131. *E.g.,* IMPERIAL VALLEY SOLAR PROJECT, *supra* note 4, at 1-13 (habitat for bighorn sheep); IVANPAH SOLAR ELECTRIC GENERATING SYSTEM PROJECT, *supra* note 129, at 40 (placement of water source in bighorn sheep habitat).

132. *E.g.,* CALICO SOLAR PROJECT, *supra* note 126, at 3-15 (requiring development of plan for the lethal control of ravens, which prey on desert tortoises).

133. *See, e.g.,* Ari Natter, *Sixth Solar Project on Public Land to Gain Interior Approval Is Largest at 7,000 Acres*, 41 ENV’T REP. (BNA) 2408 (Oct. 29, 2010); Ari Natter, *Interior Approves Solar Thermal Project in Mohave Desert, Requires Mitigating Actions*, 194 DAILY ENV’T REP. (BNA) A-6, Oct. 8, 2010 (responding to concerns about the impact of the Ivanpah project on the Gila monster); IMPERIAL VALLEY SOLAR PROJECT, *supra* note 4, at 1-12, 3-16.

plans to mitigate impacts to eagles through surveys, monitoring, facility design changes, and other measures.¹³⁴

The fast-track approvals also have included conditions designed to minimize project impacts on vegetation that provides important wildlife habitat or serves other ecosystem benefits. These conditions include requirements to eliminate sensitive habitat from project boundaries¹³⁵ or avoid project activities in those areas,¹³⁶ salvage cactus and yucca,¹³⁷ collect succulents and seeds to assist in reclamation efforts,¹³⁸ refrain from eliminating introduced species,¹³⁹ and limit harvesting by mechanical means.¹⁴⁰

The BLM has sought to address both the water quantity and quality issues associated with the operation of solar projects in the desert southwest. To minimize adverse impacts on water supplies, the BLM has altered project technological components (such as the number of heliostats that require washing) to save water,¹⁴¹ encouraged or required the use of dry cooling or photovoltaic alternatives,¹⁴² and required project applicants to purchase groundwater to offset amounts used by the project¹⁴³ or to purchase specified amounts of existing water rights.¹⁴⁴ To minimize adverse impacts of project operations on water quality, the BLM has required the construction of drainage structures to mitigate stormwater runoff without significantly altering water flow, and the use of best management practices to minimize soil erosion and offsite sediment

134. *E.g.*, BLYTHE SOLAR POWER PROJECT, *supra* note 107, at 23; CHEVRON ENERGY SOLUTIONS LUCERNE VALLEY SOLAR PROJECT, *supra* note 114, at 17.

135. *E.g.*, IVANPAH SOLAR ELECTRIC GENERATING SYSTEM PROJECT, *supra* note 129, at 28.

136. *E.g.*, CALICO SOLAR PROJECT, *supra* note 126, at 4-2 (discussing creation of “avoidance areas” to protect sensitive plants).

137. *E.g.*, BLYTHE SOLAR POWER PROJECT, *supra* note 107, at 10; GENESIS SOLAR ENERGY PROJECT, *supra* note 4, at 13.

138. *E.g.*, BLYTHE SOLAR POWER PROJECT, *supra* note 107, at 34; IMPERIAL VALLEY SOLAR PROJECT, *supra* note 4, at 3-15.

139. *See, e.g.*, BLYTHE SOLAR POWER PROJECT, *supra* note 107, at 35.

140. *Id.* at 34.

141. *E.g.*, IVANPAH SOLAR ELECTRIC GENERATING SYSTEM PROJECT, *supra* note 129, at 18.

142. *E.g.*, BLYTHE SOLAR POWER PROJECT, *supra* note 107, at 17; U.S. DEP’T OF THE INTERIOR, BUREAU OF LAND MGMT., RECORD OF DECISION, AMARGOSA FARM RD. SOLAR ENERGY PROJECT 8 (2010), *available at* http://www.blm.gov/pgdata/etc/medialib/blm/nv/field_offices/las_vegas_field_office/energy/solar_millennium_-/Amargosa_Farm_Road_ROD.Par.31331.File.dat/Amargosa%20Farm%20Road%20ROD%20signed.pdf [hereinafter AMARGOSA FARM RD. SOLAR ENERGY PROJECT]; CHEVRON ENERGY SOLUTIONS LUCERNE VALLEY SOLAR PROJECT, *supra* note 114, at 13.

143. *See, e.g.*, AMARGOSA FARM RD. SOLAR ENERGY PROJECT, *supra* note 142, at 8-9.

144. *E.g.*, AMARGOSA FARM RD. SOLAR ENERGY PROJECT, *supra* note 142, at 4.

transport.¹⁴⁵ It also has denied permission to redirect surface water¹⁴⁶ and required low impact development practices with limited grading.¹⁴⁷

The fast-track approval decisions also addressed concerns about the impact of solar facilities on cultural and historic resources, especially resources important to Native Americans. The BLM has insisted that it engaged in consultation with tribal representatives to avoid or mitigate adverse impacts on these resources, although at least one court has tentatively disagreed with that assertion and some tribes have vigorously contested it.¹⁴⁸ As a result of these consultations, some projects were moved, or their dimensions reduced, in order to avoid affecting areas with cultural or historic resources.¹⁴⁹ The BLM represented that the Imperial Valley project, for example, was approved through a process carried out in full compliance with the NHPA.¹⁵⁰

Finally, the BLM addressed the manner in which the construction and operation of solar projects would affect other uses that would otherwise be appropriate at solar sites. In some instances, the agency simply eliminated potentially conflicting uses such as off-road vehicle use.¹⁵¹ In others, it imposed mitigation requirements to avoid conflicts with other recreational uses, such as trail hiking.¹⁵² In at least one instance, the BLM required the movement of facilities to avoid conflicts with military operations and testing missions.¹⁵³ In another case, however, the BLM approved only part of a project, noting that it needed to further consider

145. *E.g.*, BLYTHE SOLAR POWER PROJECT, *supra* note 107, at 33.

146. *See, e.g.*, CHEVRON ENERGY SOLUTIONS LUCERNE VALLEY SOLAR PROJECT, *supra* note 114, at 1–13.

147. *See, e.g.*, IMPERIAL VALLEY SOLAR PROJECT, *supra* note 4, at 3-13; IVANPAH SOLAR ELECTRIC GENERATING SYSTEM PROJECT, *supra* note 129, at 37.

148. *See, e.g.*, BLYTHE SOLAR POWER PROJECT, *supra* note 107, at 17, 33; IMPERIAL VALLEY SOLAR PROJECT, *supra* note 4, at 3-14. For discussion of the case referenced in the text and of other tribal assertions of inadequate consultation, see *infra* notes 169–81 and accompanying text.

149. *See, e.g.*, BLYTHE SOLAR POWER PROJECT, *supra* note 107, at 27; IMPERIAL VALLEY SOLAR PROJECT, *supra* note 4, at 1-16 to 1-17, 3-6 to 3-7; CALICO SOLAR PROJECT, *supra* note 126, at 3-6; GENESIS SOLAR ENERGY PROJECT, *supra* note 4, at 28.

150. IMPERIAL VALLEY SOLAR PROJECT, *supra* note 4, at 3-3.

151. *See, e.g.*, BLYTHE SOLAR POWER PROJECT, *supra* note 107, at 3; IMPERIAL VALLEY SOLAR PROJECT, *supra* note 4, at 1-15.

152. *See* IMPERIAL VALLEY SOLAR PROJECT, *supra* note 4, at 3-9 to 3-10.

153. *See* U.S. DEP'T OF THE INTERIOR, BUREAU OF LAND MGMT., RECORD OF DECISION, CRESCENT DUNES SOLAR ENERGY PROJECT 6-7 (2010), *available at* http://www.blm.gov/pgdata/etc/medialib/blm/wo/MINERALS_REALTY_AND_RESOURCE_PROTECTION_/energy/solar_and_wind/fast_track_maps.Par.38222.File.dat/Crescent%20Dunes%20ROD.pdf [hereinafter CRESCENT DUNES SOLAR ENERGY PROJECT].

how to resolve conflicts between a solar facility, different recreational uses, and the removal of locatable minerals.¹⁵⁴

The BLM's assurances notwithstanding, it is not clear that the fast-track approvals succeeded in meeting the congressional goal of devoting public lands to solar power production while complying with the environmental protection requirements of FLPMA and other federal environmental laws. In some instances, environmental public interest groups expressed satisfaction that projects had been moved out of environmentally sensitive areas or reduced in size. Other environmental groups objected to the same projects, however, based on their detrimental impact on the habitats of species listed under the ESA.¹⁵⁵ The BLM analyzed and ruled on these right-of-way applications quickly, creating the possibility that it gave insufficient consideration to the potential adverse impacts of the projects on the environment. The ARRA, which provided the impetus for fast-track review of proposed solar projects on BLM lands, seemed to allow for speedy BLM rulings to trump thorough environmental evaluation. That statute sought to ensure that "applicable environmental reviews under the National Environmental Policy Act are completed on an expeditious basis and that the shortest existing applicable process under the National Environmental Policy Act shall be utilized."¹⁵⁶

Past agency efforts to pursue shortcuts through the NEPA and ESA processes have not fared well. Congress included provisions in appropriations bills in the late 1980s and early 1990s, for example, to accelerate timber harvesting in the habitat of northern spotted owls in the Pacific Northwest in response to judicial decisions halting such sales to protect the owls.¹⁵⁷ When restrictions on judicial review of compliance with environmental statutes in connection with those sales expired, the courts found that the Forest Service and the BLM had flagrantly violated NEPA and the ESA.¹⁵⁸ Similarly, in a 1995 supplemental appropriations bill, Congress authorized the Secretaries of Agriculture and the Interior

154. SILVER STATE SOLAR ENERGY PROJECT, *supra* note 110, at 8.

155. *See, e.g.,* Soto, *supra* note 62.

156. American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, § 1609(b), 123 Stat. 115, 304; *see generally* Dialogue, *Expedited NEPA Review for Alternative Energy Projects*, 39 ENVTL. L. REP. 10581 (2009) (presenting various perspectives on how expedited reviews under NEPA function, and discussing briefly provisions of the ARRA in conjunction with this topic).

157. The provisions of the Department of the Interior and Related Agencies Appropriations Act for Fiscal Year 1990, Pub. L. No. 101-121, § 318, 103 Stat. 701, 745-50 (1989), are explained by the courts in *Seattle Audubon Soc'y v. Robertson*, 914 F.2d 1311 (9th Cir. 1990) (striking down a particular clause as unconstitutional), *rev'd on other grounds*, 503 U.S. 429 (1992), and *Seattle Audubon Soc'y v. Robertson*, 20 Env'tl. L. Rep. 21167 (W.D. Wash. 1990).

158. *Portland Audubon Soc'y v. Babbitt*, 998 F.2d 705, 708-10 (9th Cir. 1993); *Seattle Audubon Soc'y v. Espy*, 998 F.2d 699, 704-05 (9th Cir. 1993).

to award salvage timber sales for a limited period of time, notwithstanding the provisions of a host of resource protection statutes, regulations, and court orders.¹⁵⁹ The resulting rush to cut caused environmental damage that may have been avoided had the normal decision-making process been allowed to proceed.¹⁶⁰ The Interior Department's former Minerals Management Service ("MMS") accelerated the environmental review process for offshore oil and gas leases in the Gulf of Mexico by simply creating categorical exclusions from NEPA's environmental impact statement process.¹⁶¹ The agency also routinely prepared environmental assessments and impact statements that referred to analysis found in previously prepared environmental assessments and impact statements concerning broad programmatic actions (a process called tiering), even where those documents lacked the level of detail needed to properly

159. Emergency Supplemental Appropriations for Additional Disaster Assistance, for Anti-Terrorism Initiatives, for Assistance in the Recovery from the Tragedy that Occurred at Oklahoma City, and Rescissions Act, Pub. L. No. 104-19, § 2001, 109 Stat. 194 (1995) (codified at 16 U.S.C. § 1611 (2006)).

160. See, e.g., Sandra Beth Zellmer, *Sacrificing Legislative Integrity at the Altar of Appropriations Riders: A Constitutional Crisis*, 21 HARV. ENVTL. L. REV. 457, 480 (1997) (noting that salvage timber sales authorized by the appropriations riders failed to protect fragile soils, old growth, watersheds, and wildlife); DeAnne E. Parker, *Backdoor Tactics to Forest Management: The Emergency Salvage Timber Rider of H.R. 1944*, 16 J. ENERGY NAT. RESOURCES & ENVTL. L. 216, 228 (1996) (stating that "Congress's real intent behind the salvage program is to provide short-term economic assistance to the timber industry and timber communities by releasing timber sales previously blocked by environmental litigation," but that the program "circumvents [the] policy of a systematic and analytical scientific approach to forest management" and "may impair the health of our Nation's forests").

161. If an agency decides that a proposed action is categorically excluded from NEPA analysis, it need not prepare either an environmental assessment ("EA") or an environmental impact statement ("EIS") before proceeding with the proposal. See 40 C.F.R. § 1508.4 (2010) (stating that actions categorically excluded because they lack a significant effect on the environment require preparation of neither an EA nor an EIS). Agencies sometimes regard categorical exclusions "as a way of escaping NEPA entirely." ROBERT L. GLICKSMAN ET AL., ENVIRONMENTAL PROTECTION: LAW AND POLICY 239 (6th ed. 2011). The Council on Environmental Quality ("CEQ"), which is responsible for overseeing the implementation of NEPA, National Environmental Policy Act of 1969 §§ 202, 204, 42 U.S.C. §§ 4342, 4344 (2006), recently recognized the potential for agency reliance on categorical exclusions to circumvent NEPA obligations and took steps to curb such abuses. Council on Environmental Quality, Final Guidance for Federal Departments and Agencies on Establishing, Applying, and Revising Categorical Exclusions Under the National Environmental Policy Act, 75 Fed. Reg. 75,628 (Dec. 6, 2010) (to be codified at 40 C.F.R. pts. 1500–1508). See generally Kevin H. Moriarty, Note, *Circumventing the National Environmental Policy Act: Agency Abuse of the Categorical Exclusion*, 79 N.Y.U. L. REV. 2312 (2004).

evaluate subsequent site-specific projects such as lease sales.¹⁶² These practices contributed to the explosion of the Deepwater Horizon's Macondo well in April 2010 and the resulting oil spill that ravaged the Gulf of Mexico and surrounding areas.¹⁶³

162. The CEQ's NEPA regulations define tiering as the coverage in broader environmental impact statements (such as national program or policy statements) with subsequent narrower statements or environmental analyses (such as regional or basinwide program statements or ultimately site-specific statements) incorporating by reference the general discussions and concentrating solely on the issues specific to the statement subsequently prepared.

40 C.F.R. § 1508.28. For an example of a case finding improper tiering in the context of oil and gas leasing, see *Pennaco Energy, Inc. v. U.S. Dep't of Interior*, 377 F.3d 1147 (10th Cir. 2004). According to one source, courts are not likely to approve tiering if the previous EIS to which a subsequent NEPA document refers "lacks site-specific information about the anticipated impact of the current proposal" or "if circumstances have changed significantly since preparation of the first EIS." 2 COGGINS & GLICKSMAN, *supra* note 78, § 17:26 (citing *League of Wilderness Defenders v. Marquis-Brong*, 259 F. Supp. 2d 1115, 1121–23 (D. Or. 2003); *Oregon Natural Desert Ass'n v. Green*, 953 F. Supp. 2d 1133, 1147 (D. Or. 1997)).

163. The President's Commission on the Deepwater Horizon explosion found that: The Department of the Interior and MMS . . . took a series of steps that . . . limited the potential for NEPA to ensure government decisions were based on full consideration of their environmental consequences. Erosion of NEPA's application to offshore oil and gas activities began . . . when Congress exempted a category of leasing activities in the Gulf of Mexico from NEPA review. The Interior Department, however, subsequently took that legislative exemption and unilaterally expanded its scope beyond those original legislative terms. NAT'L COMM'N ON THE BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING, DEEP WATER 81 (2011). The Commission's report added that "the rule in practice in the Gulf of Mexico was the categorical exclusion—rather than the exception to that exclusion. MMS staff have reported that leasing coordinators and managers discouraged them from reaching conclusions about potential environmental impacts that would increase the burden on lessees." *Id.* at 82. With respect to the Macondo well in particular, the report found the following:

MMS performed no meaningful NEPA review of the potentially significant adverse environmental consequences associated with its permitting for drilling of BP's exploratory Macondo well. MMS categorically excluded from environmental impact review BP's initial and revised exploration plans—even though the exploration plan could have qualified for an "extraordinary circumstances" exception to such exclusion, in light of the abundant deep-sea life in that geographic area and the biological and geological complexity of that same area. MMS similarly categorically excluded from any NEPA review the multiple applications for drilling permits and modification of drilling permits associated with the Macondo well. The justification for these exclusions was that MMS had already conducted NEPA reviews for both the Five-Year Program and the Lease Sale that applied to the Macondo well. The flaw in that agency logic is that both those prior NEPA reviews were conducted on a broad programmatic basis, covering huge expanses of leased areas of which the Macondo well was a relatively incidental part. . . . As a result, none of those prior programmatic reviews carefully considered site-specific factors relevant to the risks presented by the drilling of the Macondo well

Id. at 82–83; see also Sandra Zellmer, Joel A. Mintz & Robert Glicksman, *Throwing Precaution to the Wind: NEPA and the Deepwater Horizon Blowout*, 2 GEO. WASH. J.

The pattern reflected in these examples is unmistakable—congressional mandates and agency discretionary accelerations of decisionmaking on projects with potentially significant adverse environmental effects result, if not inexorably, then with some degree of frequency, in a process that neglects to give full consideration to those environmental risks. It would come as no surprise, therefore, to find that the BLM’s fast-track approval process for solar projects on federal lands caused potential adverse environmental effects of project construction or operation to be overlooked or downplayed.

One indication that this is exactly what did occur is the finding by the BLM that the ESA analysis of the Ivanpah solar project, upon which the BLM relied in approving the project, underestimated the adverse impact of the project on desert tortoises and their habitats in the California desert. The Obama Administration announced in 2011 that it had temporarily halted construction on the project due to its concerns over the project’s impact on tortoises, pending the FWS’s preparation of a revised biological assessment under the ESA. Whereas the original biological assessment concluded that dozens of animals were at risk, the BLM’s subsequent findings revealed that the project might cause the loss of about 3300 acres of tortoise habitat and the deaths of more than 600 tortoises.¹⁶⁴ As a result, the BLM reinitiated consultation with the FWS,¹⁶⁵ although it subsequently issued to the project’s operator a “notice to proceed” with the project based on the operator’s initiation of a “head start” program that protects just-hatched and juvenile tortoises from natural predators until they adapt to the wild.¹⁶⁶

ENERGY & ENVTL. L. 62, 69 (Summer 2011) (finding it “reasonable” to conclude that the damage resulting from the Deepwater Horizon explosion in April 2010 and the resulting oil spill could have been avoided or caused less environmental damage if “MMS had done a better job at the NEPA analyses, and if it had actually analyzed the drilling plan instead of categorically excluding it from analysis”).

164. See SUNDANCE BIOLOGY & KIVA BIOLOGICAL CONSULTING, REVISED BIOLOGICAL ASSESSMENT FOR THE IVANPAH SOLAR ELECTRIC GENERATING SYSTEM (IVANPAH SEGS) PROJECT 4-1 (revised Apr. 19, 2011) (describing possible loss of over 600 tortoises and removal of about 3300 acres of critical habitat) [hereinafter REVISED BA]; see also Colin Sullivan, *U.S. Halts Mojave Desert Project Over Species Concerns*, GREENWIRE, Apr. 28, 2011.

165. REVISED BA, *supra* note 164, at 1-1, 2-1.

166. Ed Fuentes, *Feds Allow Solar Farm Construction to Continue, Despite Objections Over Threatened Desert Tortoise*, KCET (June 16, 2011), http://www.kcet.org/updaily/socal_focus/environment/mojaves-desert-tortoise-not-endangered-by-solar-project-says-feds-34533.html. Environmental groups criticized the decision. *Id.*; see also BrightSource’s “Head Start” for Desert Tortoises, GREENTECHSOLAR (June 13,

The apparent inaccuracy of the initial ESA analysis of the Ivanpah project may or may not be symptomatic of more widespread underestimation of the adverse impacts of the fast-track projects on wildlife and its habitat, but some environmental groups did proceed on the basis of that assumption. Those groups filed lawsuits to halt other fast-track projects based on alleged violations of the ESA in failing to acknowledge the scope of project impacts on desert tortoises.¹⁶⁷ Environmental groups also challenged fast-track projects on the basis of allegedly unlawful depletion of groundwater.¹⁶⁸

The other major charge leveled against the BLM was its alleged failure to afford adequate consideration to the impact of fast-track projects on cultural resources important to Native Americans. This contention gained traction, at least temporarily, when a federal district court in California issued a preliminary injunction at the end of 2010 halting the Imperial Valley solar project.¹⁶⁹ The court noted that the area in which the project would be located was extensively used by Native American groups, including the Quechan Tribe, whose reservation is located in Arizona and Imperial County, California.¹⁷⁰ More than 450 cultural resources were identified within the project area, including more than 300 locations of prehistoric settlement, ancient trails, and areas apparently containing archaeological artifacts and human remains.¹⁷¹ The BLM's draft EIS acknowledged that the project "may wholly or partially destroy all archaeological sites on the surface of the project area."¹⁷² The Quechan Tribe alleged the project would destroy hundreds of cultural sites, and endanger the habitat of the flat-tailed horned lizard, a species culturally important to the Tribe which was, additionally, being considered for listing under the ESA. The Tribe alleged violations of NEPA, FLPMA, and the NHPA.¹⁷³

2011), <http://www.greentechmedia.com/articles/read/brightsource-energys-head-start-program-for-desert-tortoises/>.

167. See, e.g., Haederle, *supra* note 16 (reporting the Western Watersheds Project brought suit to halt the Ivanpah project because of its purported failure to comply with conservation laws affecting desert tortoises); Todd Woody, *Solar Energy Faces Tests of Greenness*, N.Y. TIMES, Feb. 24, 2011, at B1 (reporting that "Calico is the subject of three lawsuits"); Klass, *supra* note 12, at 29 (stating that the Sierra Club sued to halt the Calico project based on its location amidst tortoise habitat).

168. See Haederle, *supra* note 16 (noting suit by California Unions for Reliable Energy to stop the Genesis project).

169. *Quechan Tribe of Fort Yuma Indian Reservation*, 755 F. Supp. 2d at 1106 (S.D. Cal. 2010).

170. *Id.* at 1106–07.

171. *Id.* at 1107.

172. *Id.*

173. *Id.*

With respect to the NHPA, the Tribe asserted that the BLM failed to adequately consult with it as required by § 106 of the Act, and the court found that claim to afford the strongest basis for injunctive relief.¹⁷⁴ The BLM had refused to meet privately with the Tribe on the reservation, even though the statute and implementing regulations require “government-to-government” consultation.¹⁷⁵ Public informational meetings, consultations with individual tribal members, meetings with government staff or contracted investigators, and written updates did not provide an adequate substitute, in the court’s view, especially because the Tribe’s requests for information and meetings were denied or ignored.¹⁷⁶ Moreover, the BLM admitted that the evaluation of sites eligible for inclusion in the National Register of Historic Places had not been completed. Because of the lack of information, the court determined that the Tribe was not afforded a meaningful opportunity to consult with the BLM.¹⁷⁷ The court therefore concluded that the Tribe was likely to prevail on its claim that it was not adequately consulted as required by the NHPA, and, as a result, preliminarily enjoined further work on the project.¹⁷⁸ The court also concluded, without elaboration, that the Tribe’s FLPMA and NEPA claims presented serious questions.¹⁷⁹

The *Quechan Tribe* case raises doubts about the adequacy of the BLM’s evaluation of the impact of solar development on cultural resources important to that tribe. The fast-track process may have resulted in similar deficiencies in connection with other approved solar projects.¹⁸⁰ Another tribe, the La Cuna de Aztlan Sacred Sites Protection Circle, sued the BLM to halt several other fast-track projects, alleging inadequate

174. *Id.* at 1108.

175. *Id.* at 1108–10, 1118–19 (citing 36 C.F.R. § 800.2(c)(2)(ii)(C)).

176. *Id.* at 1119.

177. *Id.* at 1118–19.

178. *Id.* at 1119–22.

179. *Id.* at 1120.

180. See Haederle, *supra* note 16 (“Practically speaking, some observers say, [the BLM fast-track process] became an improvised process with too few staffers to handle the flood of applications and a regulatory framework ill-suited to the new technology.”); SOLAR DONE RIGHT, U.S. PUBLIC LANDS SOLAR POLICY: WRONG FROM THE START 4, 8 (2011), available at <http://solaradoneright.org/images/uploads/WrongFromTheStart.pdf> (“The fast-track process puts enormous pressure on responsible agencies and staff to rush through evaluations of largely unknown technologies on an unprecedented scale. . . . Six of the nine fast-tracked projects are currently under litigation in response to inadequate, expedited reviews and potentially unwarranted approvals.”).

consultation under the NHPA.¹⁸¹ At the very least, this litigation indicates that solar development in the southwestern deserts creates the potential for significant adverse impacts on cultural resources important to Native Americans.

B. The Draft Solar Programmatic Environmental Impact Statement

The BLM currently has an opportunity to refashion its approach to analysis of applications to construct and operate solar projects on the public lands. In 2010, the agency issued a Draft Programmatic Environmental Impact Statement (“PEIS”) in response to Executive Order 13212, the Energy Policy Act of 2005, and the Secretary of the Interior’s 2010 Order on solar policy.¹⁸² As stated in that draft, the agency’s objective is to create a new Solar Energy Program (the “Program”) that responds “in a more efficient and effective manner to the high interest in siting utility-scale solar energy development on public lands and to ensure consistent application of measures to mitigate the adverse impacts of such development.”¹⁸³ The proposed Program includes four main elements: (1) identification of lands to be excluded from utility-scale solar energy development in the six states the BLM deems most suitable for solar development (Arizona, California, Colorado, Nevada, New Mexico, and Utah);¹⁸⁴ (2) identification of priority areas within lands open to solar development; (3) establishment of mitigation requirements to ensure “the most environmentally responsible development and delivery of solar energy”; and (4) amendment of resource management plans in the six-state area to accommodate utility-scale solar development.¹⁸⁵

181. See Haederle, *supra* note 16; Woody, *supra* note 167 (reporting that the La Cuna de Aztlan Sacred Sites Protection Circle sought to block the Tessera, Ivanpah, Blythe, and Genesis projects).

182. BLM SOLAR PEIS, *supra* note 3, at ES-2 to ES-3, 1-7.

183. *Id.* at 1-7. According to the BLM, the objectives of its Solar Energy Program include “[f]acilitating near-term utility-scale solar energy development on public lands; [m]inimizing potential negative environmental, social, and economic impacts; [p]roviding flexibility to consider a variety of solar energy projects (location, facility size, [and] technology...); [o]ptimizing existing transmission infrastructure and corridors; and [s]tandardizing and streamlining the authorization process for utility-scale solar energy development on BLM-administered lands.” *Id.* at ES-3.

184. The agency regards these states as the optimal locations for solar development on public lands because they have excellent solar energy resources, low slopes of less than five percent (making construction of solar facilities more practicable), and the acreage necessary to enable the concentrated development needed for utility-scale solar projects. NEW ENERGY FRONTIER, *supra* note 4, at 18.

185. BLM SOLAR PEIS, *supra* note 3, at ES-3, 1-8.

The draft PEIS indicates that the BLM plans to identify and prioritize the most suitable locations for solar projects on the public lands.¹⁸⁶ In 2009, the BLM and the Department of Energy identified 24 Solar Energy Study Areas on public lands in the six states for possible solar development.¹⁸⁷ Among other things, lands had to be free of threatened and endangered species habitats in order to qualify.¹⁸⁸ The two agencies solicited comments on the potential for significant resource impacts of solar energy development and on the economic viability of solar energy development within these areas.¹⁸⁹ Based on the input received and the resource conflicts identified, the BLM in the draft PEIS proposed the creation of solar energy zones (“SEZs”) on the public lands for future solar development.¹⁹⁰

The draft PEIS evaluated three alternatives for solar development on the public lands. The first option, the solar energy development program alternative, would implement the new Solar Energy Program in lieu of the current case-by-case consideration of solar projects as right-of-way authorizations. The BLM would exclude lands known or believed to be unsuitable for utility-scale solar development, including lands prohibited by law, regulation, Presidential proclamation, or Executive Order. In addition, this alternative would preclude solar development on lands that have slopes greater than or equal to five percent, low solar insolation levels, or known resources, resource uses, or special designations identified in local land use plans that are incompatible with solar energy development.¹⁹¹ Based on these exclusions, approximately 22 million acres of BLM-administered lands would be available for solar development based on applications for rights-of-way under FLPMA. Within these lands, the BLM would designate SEZs (comprising about 677,000 acres in the draft PEIS) in which the agency would prioritize solar energy production and associated infrastructure development based on the

186. *Id.* at 1-7.

187. Notice of Availability of Maps and Additional Public Scoping for Programmatic Environmental Impact Statement to Develop and Implement Agency-Specific Programs for Solar Energy Development; Bureau of Land Management Approach for Processing Existing and Future Solar Applications, 74 Fed. Reg. 31,307, 31,307–08 (June 30, 2009).

188. NEW ENERGY FRONTIER, *supra* note 4, at 17–18.

189. 74 Fed. Reg. at 31,308.

190. BLM SOLAR PEIS, *supra* note 3, at 1-7.

191. *Id.* at ES-6 to ES-7. For a list of the areas that would be excluded from solar development under this alternative, see *id.* at ES-8 to ES-9 tbl.2.2-2.

absence of impediments to those activities.¹⁹² The BLM would continue to process individual right-of-way applications for solar projects on a case-by-case basis, but would tier environmental evaluations to the analysis in the final PEIS. The agency would supplement that analysis with project-specific evaluation on matters not addressed in the PEIS, including location-specific impacts that vary from site to site such as impacts on groundwater availability, wildlife habitat, vegetation, viewshed, the presence of species listed under the ESA, and the presence of cultural resources.¹⁹³ Mitigation measures in addition to those that would be required for all utility-scale solar projects on BLM lands¹⁹⁴ would be incorporated into individual project development plans and stipulations attached to right-of-way authorizations.¹⁹⁵

The second alternative presented in the draft PEIS was the Solar Energy Zone Program Alternative.¹⁹⁶ This option would entail the same standard program administration, authorization policies, and design features, but would confine utility-scale solar project approvals to the 677,000 acres comprising the SEZs. Lands outside of these zones would be unavailable for solar development through right-of-way approval, although the agency would reserve the right to change the boundaries of the SEZs “based on lessons learned from individual projects and/or new information (e.g., ecoregional assessments).”¹⁹⁷ Changes in SEZ boundaries would require amendments to affected land use plans, a process that would trigger environmental analysis.¹⁹⁸

The final alternative presented was the “no action alternative,” the consideration of which was required by the Council on Environmental Quality regulations.¹⁹⁹ Under that option, solar energy development would continue on BLM-administered lands under the agency’s 2007 Solar Energy Policy, as amended in 2010. The agency would not implement a comprehensive Solar Energy Program for the six-state area or implement

192. *Id.* at ES-7, ES-10.

193. *Id.* at ES-5, ES-9.

194. The draft PEIS provides for Programmatic Design Features, which are mitigation measures that would apply to all utility-scale solar energy projects at “each phase of development (i.e., site evaluation, construction, operation, and decommissioning) to protect natural and cultural resources” and other resource uses. Additional design features would be crafted to address resource conflicts within specific SEZs. *Id.* at ES-11.

195. BLM SOLAR PEIS, *supra* note 3, at ES-9.

196. *Id.* at ES-11.

197. *Id.* at ES-11 to ES-12.

198. *Id.* at ES-12.

199. 40 C.F.R. § 1502.14(d) (2010); *see* Natural Res. Def. Council, Inc. v. Hughes, 437 F. Supp. 981, 990–991 (D.D.C. 1977), *modified*, 454 F. Supp. 148 (D.D.C. 1978) (remanding programmatic EIS on Interior Department to resume coal leasing due to failure to consider no action alternative); *see also* Pit River Tribe v. U.S. Forest Serv., 469 F.3d 768, 786–87 (9th Cir. 2006).

the authorization policies, design features, or land use plan amendments specified for the two action alternatives. As a result, “[f]uture solar energy projects and land use plan amendments would continue to be evaluated solely on an individual, case-by-case basis.”²⁰⁰

The BLM designated the solar development program alternative, the first of the three alternatives described above, as the preferred alternative. According to the draft PEIS, this option would best meet the BLM’s objectives:

It would likely result in the highest pace of development at the lowest cost to the government, developers, and stakeholders. Simultaneously, it would provide a comprehensive approach for ensuring that potential adverse impacts would be minimized to the greatest extent possible. If the pace of development is greatest under this alternative, it would accelerate the rate at which the economic and environmental benefits would be realized at the local, state, and regional levels. This alternative would make an adequate amount of lands available to support [solar development] and would provide a great deal of flexibility in siting both solar energy facilities and associated transmission infrastructure. In addition, the solar energy development program alternative would be very effective at facilitating development on BLM-administered lands in accordance with the mandates of the Energy Policy Act of 2005 and Secretarial Order 3285A1 (Secretary of the Interior 2010).²⁰¹

The BLM estimates that implementation of the preferred alternative would result in the generation of about 24,000 megawatts of solar energy over a twenty-year period on about 214,000 dedicated acres of BLM public lands.²⁰²

200. BLM SOLAR PEIS, *supra* note 3, at ES-12.

201. *Id.* at ES-29.

202. *Id.* at ES-12. In July 2011, the BLM announced that it would prepare a “targeted supplement” to the draft PEIS to address key issues identified through public comments and provide a number of enhancements, including developing well defined criteria for identifying solar energy zones; incentives for encouraging developers to site their projects in the zones and a variance process for those who wish to develop facilities outside such zones; additional surveys of biological and cultural resources in the zones; and a more detailed analysis of transmission. News Release, Office of the Sec’y of the Interior, *supra* note 119. In October 2011, the BLM issued the supplement to the draft PEIS. See Interior Releases Updated Roadmap for Solar Energy Development, U.S. Department of Interior News Release (Oct. 27, 2011), available at http://solareis.anl.gov/documents/docs/Supplement_to_Draft_PEIS_PressRelease.pdf. In response to public comments, the BLM “modified its preferred alternative to include 17 solar energy zones, totaling about 285,000 acres potentially available for development within the zones. The BLM refined or removed zones that had development constraints or serious resource conflicts.” *Id.* at 2. The supplement reduced the number of solar energy zones from 24 to 17 and the acreage they covered from 667,000 to 285,000 (or 445 square miles). According to Interior Secretary Kenneth Salazar, these 445 square miles represent the “sweet spots . . . where development will be driven.” Juliet Eilperin, *Interior Picks Solar*

C. Fast-Tracking, Streamlining, and Analytical Short-Cutting

The agency's plan to identify the optimal locations for solar development, to prohibit development in areas in which significant resource impairment would be likely, and to create a mechanism for minimizing adverse environmental impacts, incorporating both programmatic and location-specific design features and mitigation measures, is laudable.²⁰³ Its commitment to "streamlining the authorization process for utility-scale solar development" on the public lands²⁰⁴ should raise red flags, however, given the tendency to paper over environmental concerns that has characterized past congressional and land management agency efforts to streamline project review processes,²⁰⁵ and that may have plagued the BLM's own fast-track process for solar projects.²⁰⁶ It is not clear what a "streamlining" of the process for evaluating right-of-way applications would entail, and in particular, whether the agency envisions a process as compressed as the one the BLM used to approve fast-track projects in 2010.²⁰⁷

Elimination of unnecessary delays is obviously desirable. But expedited review of proposed solar projects seems to invite hasty judgments on project suitability and the nature of necessary project-specific mitigation measures.²⁰⁸ The preparation of the final programmatic EIS should afford

Zones for Solar Projects, WASH. POST, Oct. 28, 2011. In addition, the modified preferred alternative would create a variance process "that [will] allow development of well-sited projects outside of solar energy zones on an additional 20 million acres of public land." The BLM indicated that it would consider establishing additional solar energy zones based on state planning efforts and input by interested stakeholders. Interior Releases Updated Roadmap for Solar Energy Development, *supra*, at 2. One of these additional areas might be the West Chocolate Mountains near the Salton Sea in Southern California. See Scott Streater, *Calif.'s West Chocolate Mountains Eyed for Large-Scale Solar, Geothermal Expansions*, LAND LETTER (July 21, 2011); SUPPLEMENT TO THE DRAFT PROGRAMMATIC IMPACT STATEMENT FOR SOLAR ENERGY DEVELOPMENT IN SIX SOUTHWESTERN STATES 2-30 (Oct. 2011), available at http://solareis.anl.gov/documents/supp/Supplement_to_the_Draft_Solar_PEIS.pdf.

203. Similarly commendable is the fact that the draft PEIS also indicates that either of the first two alternatives would include implementation of an adaptive management plan "to ensure that new data and lessons learned about the impacts of solar energy projects would be reviewed and, as appropriate, incorporated into the program through revised policies and design features." BLM SOLAR PEIS, *supra* note 3, at ES-11.

204. *Id.* at 1-8.

205. See discussion *supra* notes 157-63 and accompanying text.

206. See *supra* note 164 and accompanying text (discussing possibility that initial failure to accurately assess impacts of the proposed Ivanpah project on tortoises was due to accelerated review process).

207. The BLM has indicated that it intends to follow the same process for priority projects in 2011 as it used in approving the nine fast-track projects in 2010. NEW ENERGY FRONTIER, *supra* note 4, at 43.

208. Cf. Nagle, *supra* note 43, at 1386 ("This push for increased solar power strains the ability of governmental regulators to implement the law's environmental constraints.").

the BLM ample time to craft effective program-wide mitigation measures, but “streamlined” consideration of individual right-of-way applications would seem to put at risk the agency’s commitment to supplementing program-wide mitigation measures with appropriate project-specific constraints. Indeed, the BLM has characterized the new solar energy program it is crafting as an effort to “[m]ov[e] away from the application-based approach [to allow] better control in prioritizing sites for expedited development of large-scale renewable energy projects. The most effective way to meet this objective is to complete the required environmental analyses upfront, in advance of offering sites for project application.”²⁰⁹ Nevertheless, the agency’s acknowledgment that the programmatic aspects of its revised approach to solar development cannot and will not result in evaluation of the localized impacts of project construction and operation make it imperative that adequate time be allotted to conduct and evaluate environmental studies of those impacts and to formulate effective protective measures. The desire to facilitate the commencement of proposed solar projects should similarly not be allowed to prematurely foreclose opportunities for public participation, as the *Quechan Tribe* litigation²¹⁰ made plain the risks of short-circuiting opportunities for public participation in order to speed projects through the decision-making pipeline.

The agency’s commitment to processing solar projects through amendments to BLM resource management plans should provide some protection against the adverse environmental effects of solar development. FLPMA requires, for example, that plans provide for compliance with applicable pollution control laws.²¹¹ FLPMA’s land use planning requirements afford the BLM a great deal of discretion, however, as the statute lacks the detailed substantive planning requirements found in the organic statute for the other multiple use land management agency, the

209. NEW ENERGY FRONTIER, *supra* note 4, at 60–61; *see also id.* at 61 (“The BLM will move decisively away from the previous application-by-application, rights-of-way-oriented funding, and processing procedures toward a coordinated regional focus in developing renewable energy potential. By focusing resources on areas with the greatest potential for renewable production with reduced environmental conflicts, and by coordinating with transmission planning, the BLM expects to transmit renewable energy to the end user more quickly.”).

210. *See supra* notes 169–79 and accompanying text.

211. Federal Land Policy and Management Act of 1976 § 202(c)(8), 43 U.S.C. § 1712(c)(8) (2006).

National Forest Management Act.²¹² Indeed, one court described FLPMA's resource management plans as but "a course [sic] filter to broadly assess the entire BLM resource area" in order to determine appropriate locations for different kinds of uses and whether constraints should be imposed on categories of available multiple uses.²¹³ In addition, the agency's planning regulations have been characterized as "vague to the point of opaqueness."²¹⁴

The speed with which the agency rules on solar project proposals is not the only issue that needs to be examined with regard to its approval of utility-scale solar projects. Whether FLPMA's right-of-way provisions are the appropriate vehicle through which to facilitate solar development on public lands is similarly an issue worthy of serious consideration. The traditional conception of the term right-of-way as a means of passage across someone else's land might appear fundamentally ill-suited to application in connection with the long-term nature of solar project facilities.²¹⁵ Some have argued that FLPMA's right-of-way provisions were designed to provide linear access across public lands and are therefore "not well-suited to address the large-scale solar and wind projects and their associated long-term resource needs and environmental impacts in a multiple use setting."²¹⁶ FLPMA apparently envisions a broader range of uses, however, given its explicit reference to construction and operation of rights-of-way,²¹⁷ not to mention electric generation systems.²¹⁸ The BLM has defined the term right-of-way in its FLPMA regulations to mean "the public lands BLM authorizes a holder to *use or occupy* under

212. See 2 COGGINS & GLICKSMAN, *supra* note 78, § 16:19.

213. Chihuahuan Grasslands Alliance v. Norton, 507 F. Supp. 2d 1216, 1221 (D.N.M. 2007), *vacated as moot and remanded*, 545 F.3d 884 (10th Cir. 2008).

214. 2 COGGINS & GLICKSMAN, *supra* note 78, § 16:21; *cf. id.* § 16:22 (arguing that the FLPMA provision governing the adoption of land use plans "resounds with abstractly attractive language that is very difficult to pin down").

215. See, e.g., Wilderness Soc'y v. Morton, 479 F.2d 842, 853 (D.C. Cir. 1973) ("A right-of-way is most typically defined as the right of *passage* over another person's land." (emphasis added) (citing 77 C.J.S. *Right* § 393 (1952))).

216. Lazerwitz, *supra* note 5, § 13.04[3]; see also *id.* at § 13.02[2] (arguing that solar projects on BLM lands "present new challenges to FLPMA's existing . . . process . . . [for] providing . . . 'rights-of-way' . . . for roads, pipelines, and transmission lines").

217. Federal Land Policy and Management Act of 1976 § 504(d), 43 U.S.C. § 1764(d) (2006).

218. *Id.* § 1761(a)(4). It is true that six of the seven categories of use authorized for FLPMA rights-of-way involve the movement of people, water (which also may be impounded or stored under a FLPMA right-of-way), goods, or services across public lands, rather than the production of a commodity which is then transported elsewhere. See *id.* § 1761(a)(1)–(3), (5)–(7) (authorizing rights-of-way for storage and transportation of water, pipelines for liquids and gases, storage and movement of solid materials, communications transmissions, and transportation facilities). Electric energy generation is the sole exception.

a grant.”²¹⁹ Ultimately, the name the statute applies to an authorization allowing a private entity to use public lands for commercial purposes such as utility-scale solar power production is less important than the conditions the government imposes on such a right.

The more important question, therefore, is whether FLPMA creates an adequate framework for conditioning solar power development on public lands in ways that are consistent with the statute’s multiple use and non-impairment mandates and with other resource protection laws such as NEPA, the ESA, and the NHPA. Perhaps it would have been better for Congress to have created a separate statutory mechanism to deal with long-term facilities operations, as opposed to the use of roads or similar means of access for the movement of people and goods across public lands. As it is, the statute lumps them all together under the rubric of rights-of-way. As indicated above,²²⁰ however, FLPMA vests in the BLM ample authority and responsibility to manage the lands and resources under its charge, including those devoted to energy production, through environmentally protective conditions and constraints.

Sections 302(b) and 505 of FLPMA in particular mandate such protections. The first provision directs the BLM, in managing the public lands, “by regulation or otherwise, [to] take any action necessary to prevent unnecessary or undue degradation of the lands.”²²¹ The second requires more specifically that rights-of-way include conditions to minimize damage to scenic and esthetic values, fish, and wildlife, to “otherwise protect the environment,” and to ensure compliance with federal and state environmental protection laws.²²² The records of decision for the fast-track projects approved in 2009 purport to implement these responsibilities.²²³ Pending litigation, however, has raised the possibility that the fast-track process proved inadequate to the task.²²⁴ Whatever shape the BLM’s solar program ultimately takes, it is critical that the agency, in carrying out its multiple use mandate and promoting congressional and agency policies to promote energy development, take care to ensure that other environmental values are not sacrificed in the

219. 43 C.F.R. § 2801.5 (2010) (emphasis added).

220. See *supra* notes 81–101 and accompanying text.

221. 43 U.S.C. § 1732(b) (2006).

222. *Id.* § 1765(a).

223. See, e.g., BLYTHE SOLAR POWER PROJECT, *supra* note 107, at 125 (discussing steps taken to ensure protection of nearby resources and habitat).

224. See *supra* notes 167–68, 180–81, and accompanying text (discussing suits filed in response to possible ESA and NHPA violations).

course of pursuing such development. There is no reason the agency cannot use its FLPMA management authority to facilitate the development of renewable energy sources that avoid exacerbating climate change and that enhance national security through the development of secure domestic energy sources, without permitting those activities to damage significantly the nation's human and natural resource capital.

V. THE FUTURE OF SOLAR POWER ON THE PUBLIC LANDS

The potential adverse effects of utility-scale solar power development raise questions about the future role of the federal lands in fostering that form of renewable energy in the United States. This Part addresses the potential roles that federal lands may play in increasing the nation's solar energy production capacity without disrupting ecosystem integrity or sacrificing important environmental values. It concludes that excluding solar projects from certain public lands altogether, and dedicating appropriate lands to solar power projects subject to environmentally protective conditions, is likely to represent the optimal approach.

A. Exclusion

To some, the adverse effects of solar development are likely to be sufficiently great as to suggest the best policy would be to avoid devoting any federal lands to utility-scale solar power projects.²²⁵ The critics of allowing large solar projects on federal lands contend that large solar power production facilities would be better situated on private land, and especially on land already degraded by previous uses.²²⁶ Abandoned mining sites, oil and gas fields, decommissioned fossil fuel plants, and brownfields properties are among the possibilities.²²⁷ The BLM, in

225. See, e.g., Glennon & Reeves, *supra* note 4, at 123 (“Given the problems faced by CSP in terms of water use, transmission lines, and land footprint, it seems painfully obvious to many people, like those at [the Center for Biological Diversity], that the nation’s best solution for renewable solar is a massive system of photovoltaic cells located on rooftops in urban areas.”).

226. See SOLAR DONE RIGHT, *supra* note 180, at iv–v, ix (urging the use of degraded agricultural lands, parking lots, airports, and abandoned mine lands, brownfields, and federal and non-federal Superfund sites instead of federal lands for solar development); *id.* at 12 (“When considering the big picture of renewable energy development, technology and market trends, we believe that the discretionary targeting of intact public lands for industrial solar development is a grave mistake in need of reversal.”); see also Glennon & Reeves, *supra* note 4, at 127.

227. See Pizzo, *supra* note 5, at 154. The author adds:

Such sites are often close to existing infrastructure, which will minimize construction of new roads and transmission lines. Researchers are also developing ways to generate solar power along existing roadways. Many interstate highways are already leveled and cleared of most sunlight-blocking

contrast, offered a countervailing consideration in its record of decision in one of the 2009 fast-track approvals, noting that “no single parcel of private land capable of accommodating the proposed project had been identified. Therefore, if available, use of multiple private parcels would have presented too much uncertainty in the company’s ability to obtain all the necessary leases, permits and approvals.”²²⁸

Lands owned by Native Americans may not only be suitable for solar power development, but also available in large enough tracts to support utility-scale projects. Significant chunks of sun-drenched states such as Arizona are tribal lands.²²⁹ In addition, the Energy Policy Act authorized federal agencies to afford preferential treatment to businesses whose majority owners are tribes.²³⁰ Despite the opposition by tribes to many of the fast-track projects based on their impact on archaeological and cultural resources, solar projects may ultimately prove attractive to tribe members, especially if they control project location and have input into the manner in which completed projects are operated.²³¹ Tribal leaders may regard solar projects as economic development opportunities,²³² as they have some other land uses regarded by others as undesirable.²³³

objects, so PV panels or small CSP facilities could be constructed along the edges of these roads. This solution also eliminates the cost of transmission because many existing transmission lines parallel roadways.

Id. (footnotes omitted). See also Nagle, *supra* note 43, at 1383 (suggesting that solar facilities be moved out of the Mojave desert to the San Joaquin Valley, “where decades of intensive farming have eliminated many of the scenic and biological resources that environmentalists value in the Mojave. Or solar projects could be located at abandoned mining sites, contaminated properties, or on Native American lands.”) (footnotes omitted); Outka, *supra* note 3, at 281–82 (writing favorably about locating solar projects on brownfields sites on both public and private lands).

228. CHEVRON ENERGY SOLUTIONS LUCERNE VALLEY SOLAR PROJECT, *supra* note 114, at 30.

229. See Glennon & Reeves, *supra* note 4, at 130 (noting that nearly 35 percent of Arizona consists of tribal lands).

230. *Id.*

231. See *id.* at 131 (“[A] number of tribes have already expressed interest in developing solar projects.”).

232. See Ryan D. Dreveskracht, *Native Nation Economic Development via the Implementation of Solar Projects: How to Make It Work*, 68 WASH. & LEE L. REV. 27, 112 (2011) (“Solar energy will have a ripple effect across Indian country. It will likely be profitable for tribes and government agencies to ride that wave.”); see also Ryan D. Dreveskracht, *Economic Development, Native Nations, and Solar Projects*, 34 J. ENERGY & DEV. 141 (2011) (describing how solar projects may present a solution to many of the issues currently blocking development on tribal lands).

233. See, e.g., Rebecca Tsosie, *Indigenous People and Environmental Justice: The Impact of Climate Change*, 78 U. COLO. L. REV. 1625, 1631 (2007) (“The power plants

B. Zoning

Even if alternative sites were available for large-scale solar projects, however, there is little chance that solar power production would be completely foreclosed on federal lands, given the even more intrusive forms of other energy development that have long been situated there.²³⁴ Assuming that solar projects will be approved on some federal lands, the next question is which federal lands are suitable for those projects. The BLM's draft PEIS reflects an effort to zone the public lands into areas that are suitable and unsuitable for solar facilities. Under the preferred solar development program alternative, discussed above,²³⁵ the BLM would exclude lands known or believed to be unsuitable for utility-scale solar development, including lands prohibited by law, regulation, Presidential proclamation, or Executive Order and lands with high slopes or low solar insolation. That option would additionally bar solar development on lands that are sites for uses incompatible with solar energy development. Based on these exclusions, approximately 22 million acres of BLM-administered lands would be available for solar development but the BLM would prioritize the approval of solar projects on the 677,000 acres designated as SEZs. The draft PEIS's second alternative would allow solar projects to be located only in the SEZs.²³⁶

The two options explored in the draft PEIS provide three distinct but overlapping rationales for excluding solar projects from particular public lands. The first rationale is pragmatic and functional: lands that have low solar potential should not become solar sites. The second rationale is derivative of the agency's mandate to manage the public lands for

on the Navajo reservation, for example, provide significant sources of employment for tribal members as well as millions of dollars in tax revenue for the Navajo Nation. The Campo Band of Mission Indians in California, which decided to locate a solid waste disposal on its reservation, asserted its own need to have a source of revenue for tribal members . . .").

234. See, e.g., Klass, *supra* note 12 (discussing the adverse environmental impacts that some more traditional energy development have caused to wildlife, on federal lands and elsewhere). The Departments of Agriculture and Interior, in which the two multiple use federal land management agencies operate, have addressed the need to devote certain federal lands to the production of renewable energy, while protecting environmental values:

With the growing importance of energy development from the Federal lands, with advancing technology, and with the emerging role of renewable energy in the Nation's energy policy, the laws, regulations, and policies that conserve the resources and values of the public lands continue to evolve. Uncertainty requires continued diligence to monitoring and research to ensure the sustainability of ecosystems on Federal lands while also ensuring our Nation's energy future.

NEW ENERGY FRONTIER, *supra* note 4, at 45.

235. See *supra* notes 191–92 and accompanying text.

236. BLM SOLAR PEIS, *supra* note 3, at ES-11.

multiple use and is designed to avoid incompatible uses: solar production activities should not be allowed in places in which those operations would preclude important alternative authorized uses in ways that frustrate FLPMA's multiple use mandate. Such an approach is consistent with judicial interpretations of FLPMA's multiple use mandate, which have recognized that such a mandate does not contemplate that every acre be managed for every multiple use, and that "some land will be used for less than all of the resources."²³⁷ The third rationale is implicit in FLPMA's mandate to manage for sustained yield as well as for multiple uses.²³⁸ It is also supported by FLPMA's general undue degradation directive²³⁹ and its provisions requiring that rights-of-way be approved subject to environmentally protective conditions.²⁴⁰

The BLM has indicated that it will make efforts to avoid locating solar facilities near national parks and wildlife refuges if solar operations would adversely affect these lands,²⁴¹ and will coordinate its environmental assessments for proposed solar projects with the NPS and the FWS.²⁴² Still, environmental groups have objected to the inclusion of particular areas in the BLM's SEZs, and disputes over whether individual tracts should be excluded under any of the three rationales will surely continue to arise.²⁴³ The BLM may be able to use its authority to enter land exchanges or acquire non-federal lands²⁴⁴ to resolve some of these

237. *Wind River Multiple-Use Advocates v. Espy*, 835 F. Supp. 1362, 1372 (D. Wyo. 1993) (quoting 16 U.S.C. § 531(a) (2006)), *aff'd*, 85 F.3d 641 (10th Cir. 1996) (unpublished table decision); *see also* *New Mexico ex rel. Richardson v. Bureau of Land Mgmt.*, 565 F.3d 683, 710 (9th Cir. 2009) (stating that FLPMA "does not mandate that every use be accommodated on every piece of land; rather, delicate balancing is required") (citing *Norton v. S. Utah Wilderness Alliance*, 542 U.S. 55, 58 (2004)).

238. *See* 3 COGGINS & GLICKSMAN, *supra* note 78, § 30:4 (arguing that sustained yield mandate is consistent with a commitment to ecosystem management).

239. Federal Land Policy and Management Act of 1976 § 302(b), 43 U.S.C. § 1732(b) (2006).

240. *Id.* § 1765(a).

241. *See* NEW ENERGY FRONTIER, *supra* note 4, at 57.

242. *Id.* at 44.

243. *See, e.g.*, Phil Taylor, *BLM Hears Differing Views on Solar Permitting Plan*, LAND LETTER, Feb. 3, 2011 (reporting that environmental groups have challenged inclusion of some lands in the SEZs, such as the Iron Mountain and Pisgah zones in Southern California). As indicated above, the BLM issued a supplement to the draft PEIS in which it responded to comments by interested persons, among other things, on the propriety of the SEZs the agency initially proposed. *See supra* note 203.

244. 43 U.S.C. § 1715 (2006).

conflicts.²⁴⁵ It could, for example, dispose of lands on which utility-scale solar projects could be operated without creating significant environmental threats in exchange for more environmentally valuable land. It also could acquire lands to serve as buffers between solar operations and public lands that contain habitats for endangered or threatened species or other significant environmental or cultural resources, or to serve as wildlife migration corridors for species whose freedom of movement has been impaired by the construction of solar facilities and transmission lines.

In addition, to offset some of the inevitable adverse environmental side effects of solar operations on federal lands, the land management agencies should consider reducing environmentally destructive production of more traditional energy supplies, such as oil and gas, on multiple use lands. Such an approach would be consistent with shifting energy production away from fossil fuels whose use contributes to climate change.

C. Conditional Authorization

Once the BLM has determined that a particular locale is suitable for utility-scale solar production, it should attach appropriate environmentally protective conditions to any right-of-way authorization for those projects. The BLM has broad discretion to impose conditions on rights-of-way, and review by both the Interior Board of Land Appeals and the federal courts tend to be deferential.²⁴⁶ Yet, courts have overturned agency failures to impose right-of-way conditions that are sufficient to meet FLPMA's mandate to minimize damage to fish and wildlife habitats.²⁴⁷

As the discussion above indicates, the BLM imposed conditions to minimize adverse impacts on wildlife and other resources in its fast-track approvals.²⁴⁸ However, both the discovery that the likely impacts of at least one project on desert tortoises were significantly greater than

245. The BLM stated in the draft PEIS that it “may also decide to dispose of some parcels of land through land sales or exchanges to support the development of solar energy on a case-by-case basis.” BLM SOLAR PEIS, *supra* note 3, at 1-10.

246. *See, e.g.*, Mary Byrne, 174 I.B.L.A. 223, 232 (2008) (“BLM may also impose conditions on an ROW if it provides a rational basis for that decision.”) (citing Wiley F. & L’Marie Beaux, 171 I.B.L.A. 58, 66 (2007); Mark Patrick Heath, 163 I.B.L.A. 381, 388 (2004)). *Cf.* Michael & Edith Lederhause, 174 I.B.L.A. 188, 194–95 (2008) (upholding denial of right-of-way application for irrigation pipeline and related structures because grant would cause unnecessary or undue degradation); King’s Meadow Ranch, 126 I.B.L.A. 339, 341–43 (1993) (upholding BLM’s denial of request to amend right-of-way to permit construction of a water conveyance pipeline from a spring because of potential damage to riparian vegetation).

247. *E.g.*, Trout Unlimited v. U.S. Dep’t of Agric., 320 F. Supp. 2d 1090, 1106–10 (D. Colo. 2004), *appeal dismissed*, 41 F.3d 1214 (10th Cir. 2006) (discussing failure to require bypass flows from reservoir).

248. For representative examples of such conditions, see *supra* notes 127–40, and accompanying text.

initially anticipated, and the litigation over alleged NHPA noncompliance,²⁴⁹ raise questions about the sufficiency of those efforts. The agency's new solar energy program, as contemplated in the draft PEIS, also entails the imposition of mitigation measures both on a programmatic and site-specific basis. The issue is whether restrictions on solar activities that the BLM has not yet imposed or proposed to impose might ultimately generate better outcomes.

Some have suggested that the BLM reduce the adverse impact of solar projects through a prohibition or strong limitations on the use of particular kinds of solar production technologies, such as those requiring the use of large amounts of water.²⁵⁰ An alternative would be to build on the precedents provided by the fast-track approvals in requiring project applicants to acquire water rights to mitigate the consequences of a project's water consumption. Similarly, the BLM has already required and should continue to require solar facility operators to purchase mitigation habitat that can be dedicated to wildlife protection or similarly environmentally beneficial purposes. FLPMA authorizes the BLM to require the periodic payment by right-of-way holders of the fair market value of their interests.²⁵¹ It also requires the BLM to specify the extent to which right-of-way holders will be held liable to the government "for damage or injury by the United States caused by the use and occupancy of the rights-of-way."²⁵² Because there appear to be no reported cases involving this FLPMA provision, the manner in which it might be applied to solar project operators to compensate for or mitigate damage to natural resources is unclear. It nevertheless seems to have promise as a protective device for the environmental harms that may be caused by solar projects on public lands. The imposition of reclamation requirements, accompanied by bonds to provide security for the performance of these

249. See Colin Sullivan, *U.S. Halts Mojave Desert Project Over Species Concerns*, GREENWIRE, Apr. 28, 2011.

250. See, e.g., Glennon & Reeves, *supra* note 4, at 123 (urging adoption of a "heavy presumption against wet-cooling technologies on public lands").

251. Federal Land Policy and Management Act of 1976 § 504(g), 43 U.S.C. § 1764(g) (2006); cf. Klass, *supra* note 12, at 34 (noting suggestion by Professor John Leshy that one way to reconcile competing uses on public lands in the area of renewable energy and climate change is "requiring renewable energy projects to pay the government for use of federal lands based on the value of the energy produced and using that money for conservation programs on other public lands"). *But cf.* Charles Ryden, 119 I.B.L.A. 277, 279 (1991) (holding that the BLM could not require an applicant for a right-of-way assignment to grant an easement for general public access).

252. 43 U.S.C. § 1764(h)(1) (2006).

obligations, is another way to protect public natural resources from solar project operations.²⁵³

The input of technical experts will be critical in fashioning conditions that are sufficiently protective to comply with the BLM's prevention of undue degradation and resource protection obligations. Conservation biologists have developed a checklist for managing energy development projects in ways that protect landscape and wildlife.²⁵⁴ If this or a similar list were used to guide the approval process for solar projects, BLM officials considering right-of-way applications might be directed to manage the entire mosaic, not just the pieces; consider both the amount and configuration of habitat and particular land cover types; identify (and protect) disproportionately important species, processes, and landscape elements; integrate aquatic and terrestrial environments; maintain the capability of landscapes to recover from disturbances; manage for change through an experimental framework; and manage at multiple scales.²⁵⁵ Similar guidance might be useful in devising both the programmatic and site-specific design features and mitigation conditions needed to address the threats solar operations pose to other resources, natural and cultural.

Finally, the BLM should consider providing further guidance, for agency officials reviewing right-of-way applications, solar operators, and other interested persons on what amounts to "unnecessary or undue degradation" of the public lands in violation of § 302(b) of FLPMA.²⁵⁶ The meaning of that term is unsettled, both generally and in the context of right-of-way authorizations.²⁵⁷ The BLM's right-of-way regulations do not define the term. The BLM has addressed the meaning of unnecessary and undue degradation, however, in its regulations governing surface management of mining claims. At one point, the agency defined the term to mean conditions, activities, or practices that, among other things, failed to comply with regulatory performance standards, approved mining plan of operations conditions, or other federal or state environmental and cultural resource protection laws; failed to attain levels of protection or reclamation required by laws governing areas such as wild and scenic rivers, portions of the national wilderness system, or national monuments;

253. See Pizzo, *supra* note 5, at 156. FLPMA specifically authorizes bonding or related security requirements. 43 U.S.C. § 1764(i) (2006).

254. David Lindenmayer et al., *A Checklist for Ecological Management of Landscapes for Conservation*, 11 *ECOLOGY LETTERS* 78, 85 (2008).

255. *Id.* at 85–88.

256. Federal Land Policy and Management Act of 1976 § 302(b), 43 U.S.C. § 1732(b) (2006).

257. See, e.g., *Theodore Roosevelt Conservation P'ship v. Salazar*, 744 F. Supp. 2d 151, 157 (D.D.C. 2010) (describing dispute among parties as to the meaning of the term), *aff'd* 661 F.3d 66 (D.C. Cir. 2011).

or resulted in “substantial irreparable harm to significant scientific, cultural, or environmental resource values of the public lands that cannot be effectively mitigated.”²⁵⁸ This definition sought to preclude mining operations from causing substantial irreparable harm to significant resources that could not effectively be mitigated.²⁵⁹ Although the regulatory definition was subsequently watered down,²⁶⁰ the version described here seems transferable to the solar project right-of-way context, and capable of providing an appropriate accommodation of the benefits of solar power production and the desire to avoid the adverse impacts that may accompany that activity.

VI. CONCLUSION

The BLM, consistent with congressional and presidential policy pronouncements, has embarked upon an effort to promote the development of utility-scale solar power projects on the public lands. A significant increase in solar power production, along with the development of other renewable sources of energy, can help reduce the greenhouse gas emissions that accompany the use of the fossil fuels that currently serve the vast bulk of the nation’s energy needs. Renewable energy sources also can assist in achieving a long-standing national goal of increasing energy security. Unfortunately, all sources of energy that humans have harnessed so far have detrimental environmental consequences, and solar power is no exception. The adverse impacts of solar power production, even on a large scale, seem miniscule in relation to the immensely disruptive impact that climate change is already having and will continue to have on ecosystems, weather systems, and human and natural communities.

A shift from fossil fuel-based energy sources to solar power therefore seems like a desirable move, notwithstanding the adverse effects of solar

258. 4 COGGINS & GLICKSMAN, *supra* note 78, § 42:33 (quoting 43 C.F.R. § 3809.5 (2001)).

259. *Id.* (citing Mining Claims Under the General Mining Laws; Surface Management, 65 Fed. Reg. 69,998, 70,001 (Nov. 21 2000)).

260. The regulation was amended in 2001 to remove the reference to irreparable harm to resources that cannot be effectively mitigated. *See id.*; Mining Claims Under the General Mining Laws; Surface Management, 66 Fed. Reg. 54,834, 54,845 (Oct. 30, 2001). For a discussion of the 2000 regulations and the 2001 changes, see Roger Flynn & Jeffrey P. Parsons, *The Right to Say No: Federal Authority over Hardrock Mining on Public Lands*, 16 J. ENVTL. L. & LITIG. 249 (2001).

power production described in this article. The environmental benefits of increasing solar power production capacity, however, do not justify ignoring the adverse impacts those activities may have on public lands. The BLM has the opportunity to avoid some of the unnecessary environmental damage that its authorization of fossil fuel and hydropower production on public lands has helped cause without sacrificing the benefits of increased reliance on renewable energy sources. Conscientious supervision of solar power production so as to minimize environmental spillover effects will undoubtedly increase the cost of the energy produced by solar facilities on public lands. That, too, seems to represent a trade-off that is well worth making.