

**THE WILDERNESS SOCIETY
COALITION TO PROTECT AMERICA'S NATIONAL PARKS * NATIONAL PARKS
CONSERVATION ASSOCIATION * ROCKY MOUNTAIN WILD * WYOMING
OUTDOOR COUNCIL**

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SUBMITTED VIA E-PLANNING

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**Re: Scoping Comments on Parcels for the Wyoming Bureau of Land Management
2025 Fourth Quarter Competitive Oil & Gas Lease Sale (DOI-BLM-WY-0000-2025-
0002-EA).**

To Whom It May Concern:

Thank you for the opportunity to submit these scoping comments on parcels under consideration for the Bureau of Land Management's (BLM's) Wyoming Bureau of Land Management 2025 Fourth Quarter Oil and Gas Lease Sale. Our organizations and members are deeply invested in sound stewardship of public lands and committed to ensuring that public land management prioritizes the health and resilience of ecosystems, benefits the public and local communities, protects biodiversity, and mitigates the impacts of climate change.

For this sale, the BLM is considering 99 parcels covering 84,045.23 acres. As the BLM prepares for this lease sale and evaluates which parcels to offer for lease, the agency must continue to abide by its obligations under the law and existing policy, including the Fluid Mineral Leases and Leasing Process Rule (Leasing Rule), which implements program reforms and provisions in the Inflation Reduction Act. In carrying out this lease sale, the BLM must comply with all applicable federal, state, and local laws and regulations.

I. The BLM has ample authority to defer lease parcels—and must evaluate deferral of lease parcels—proposed for this sale.

The BLM is not mandated to lease any particular parcel for oil and gas development and production. Under the Mineral Leasing Act (MLA), lands “known or believed to contain oil or gas deposits *may* be leased” by the Interior Department. 30 U.S.C. § 226(a) (emphasis added). If DOI chooses to lease lands, sales are held only “where *eligible* lands are *available*.” *Id.* § 226(b)(1)(A) (emphases added). For nearly a century, the U.S. Supreme Court and federal circuit courts have consistently recognized this “broad” and “considerable” discretion over the federal onshore leasing program.¹

Where conflicts with other uses exist, the BLM must analyze the deferral of lease parcels. The MLA does not contravene the Federal Land Policy and Management Act’s (FLPMA’s) resource conservation requirements. Lands merely being designated as “open” for leasing under a particular Resource Management Plan (RMP) does not mean the BLM is required to lease them. Under FLPMA, the BLM must manage public lands according to “multiple use” and “sustained yield” and “in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resources, and archeological values.” 43 U.S.C. §§ 1701(a)(7) & (8), 1712(c)(1), 1732(a). Multiple use obligates the agency to make the “most judicious use” of public lands and their resources to “best meet the present and future needs of the American people.” *Id.* § 1702(c). This requires taking “into account the long-term needs of future generations,” ensuring “harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment.” *Id.* Sustained yield mandates “achiev[ing] and maint[aining] in perpetuity . . . a high-level annual or regular periodic output of the various *renewable* resources of the public lands consistent with multiple use.” *Id.* § 1702(h) (emphasis added). The BLM must “take any action necessary to prevent unnecessary and undue degradation of the lands.” *Id.* § 1732(b). “It is past doubt that the principle of multiple use does not require BLM to prioritize development over other uses. . . . Development is a possible use, which BLM *must* weigh against other possible

¹ See *Udall v. Tallman*, 380 U.S. 1, 4 (1965) (“The Mineral Leasing Act [MLA] of 1920 . . . left the Secretary discretion to refuse to issue any lease at all on a given tract.”); *United States ex rel. McLennan v. Wilbur*, 283 U.S. 414, 419 (1931) (ruling that the Interior Secretary possesses “general powers over the public lands as guardian of the people,” which include the authority to deny oil and gas lease applications); *Mont. Wildlife Fed’n v. Haaland*, 127 F.4th 1, 44–45 (9th Cir. 2025) (“We note that there is no doubt that the government has the authority affirmatively to determine which parcels shall be offered for oil and gas leasing, as opposed to passively responding to expressions of interest.”); *W. Energy Alliance v. Salazar*, 709 F.3d 1040, 1044 (10th Cir. 2013) (“The MLA, as amended by the Reform Act of 1987, continues to vest the Secretary with considerable discretion to determine which lands will be leased.”); *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1230 (9th Cir. 1988) (“[T]he Mineral Leasing Act gives the Interior Secretary discretion to determine which lands are to be leased under the statute. . . . Thus refusing to issue the . . . leases . . . would constitute a legitimate exercise of the discretion granted to the Interior Secretary under that statute.”); *McDonald v. Clark*, 771 F.2d 460, 463 (10th Cir. 1985) (“It is clear that the Secretary has broad discretion in this area. While the statute gives the Secretary the authority to lease government lands under oil and gas leases, this power is discretionary rather than mandatory.”); *Burglin v. Morton*, 527 F.2d 486, 488 (9th Cir. 1975) (“The permissive word ‘may’ in Section 226(a) allows the Secretary to lease such lands, but does not require him to do so. Although Section 226(c) requires the Secretary to issue the lease to the first qualified applicant if the land is leased, the Secretary has discretion to refuse to issue any lease at all on a given tract.”).

uses including conservation to protect environmental values. . . .” *New Mexico ex rel. Richardson v. BLM*, 565 F.3d 683, 710 (10th Cir. 2009) (emphasis added).

The BLM is therefore not obligated to lease any specific parcel of public land for oil and gas development. The agency retains the authority to defer any or all lease sale parcels, even after bidding has concluded.² Moreover, where conflicts with other uses exist, the agency must affirmatively evaluate deferral of parcels in its alternatives analysis under the National Environmental Policy Act (NEPA), as discussed below.

II. The BLM must ensure leasing is compliant with FLPMA.

FLPMA creates a framework governing the BLM’s management of public lands. *See* 43 U.S.C. §§ 1701–1772. It provides for management of public lands under principles of multiple use and sustained yield. *See id.* § 1732(a).

Land use plans or RMPs project both the present and future use of the land. The BLM uses RMPs to identify which areas will be open to oil and gas leasing and development. *See* 43 C.F.R. § 1601.0-5(n). RMPs establish, among other things, “[l]and areas for limited, restricted or exclusive use,” “[a]llowable resource uses . . . and related levels of production or use to be maintained,” “[r]esource condition goals and objectives to be attained,” and “[p]rogram constraints and general management practices.” *Id.*; *see* 43 U.S.C. § 1712(a). FLPMA prohibits the BLM from taking actions inconsistent with the provisions of RMPs. *See* 43 U.S.C. § 1732(a); 43 C.F.R. § 1610.5-3(a) (“All future resource management authorizations and actions . . . shall conform to the approved plan.”).

RMPs may grant the BLM authority to lease in certain areas. *See* 30 U.S.C. § 226(b)(1)(A); 43 C.F.R. § 3120.1-2(a). Before issuing leases, however, the agency must confirm that the applicable RMP is up to date and that the underlying environmental analysis will support a contemporary leasing decision. If an RMP is more than five years old, the BLM must reevaluate and confirm that the analysis and any underlying assumptions remain valid. *See* 42 U.S.C. § 4336b. An RMP would no longer support a new leasing decision if important new data, policies, or changed circumstances exist that were not considered when it was approved. *See* H-1601-1 — LAND USE PLANNING HANDBOOK, SECTION VII.C, DETERMINING WHEN IT IS

² *See McDonald v. Clark*, 771 F.2d 460, 463 (10th Cir. 1985) (holding that the “fact that land has been offered for lease does not bind the Secretary to actually lease the land, nor is the Secretary bound to lease the land when a qualified applicant has been selected”); *see also Justheim Petroleum v. Dep’t of Interior*, 769 F.2d 668, 671 (10th Cir. 1985) (language in 30 U.S.C. § 226 mandating that “lands to be leased . . . shall be leased to the highest responsible qualified bidder” did not require issuing a lease, but only required awarding lease to that bidder “if [the Secretary] is going to lease at all”); *Wyoming v. U.S. Dep’t of the Interior*, No. 22-CV-247-SWS, 2024 U.S. Dist. LEXIS 235015, at *43 (D. Wyo. Dec. 31, 2024) (“When considering statutory language, the use of the word ‘may’ creates a presumption of discretion under normal rules of statutory interpretation, in contrast with the mandatory ‘shall.’” (cleaned up)); *W. Energy All. v. Salazar*, No. 10-cv-0226, 2011 U.S. Dist. LEXIS 98380, at *9–23 (D. Wyo. June 29, 2011) (holding that BLM is not required to issue leases after offering them at auction; it only needs to make a decision within 60 days on *whether* to issue the leases); 89 Fed. Reg. at 30,945 (“[T]he Secretary retains the discretion to decide, even after lands have been determined to be eligible and available, what lands will ultimately be offered for lease.”).

NECESSARY TO REVISE AN RMP; 43 C.F.R. § 1610.5-6. If an RMP is too old or stale to support a new leasing decision, the BLM must revise the RMP or undertake a new, thorough environmental analysis, such as an Environmental Impact Statement (EIS), to support new leasing.

a. The BLM cannot tier to several of the RMPs, which are outdated.

Some of the plans governing lands subject to this lease sale are old and stale, including the Buffalo, Casper, Lander, Newcastle, Rawlins, and Worland RMPs. None of these RMPs covering the parcels under consideration for this lease sale adequately accounts for or addresses the environmental impacts on resources and land uses due to climate change:

- BLM Buffalo Field Office, Approved RMP (Sept. 2015): never discusses climate change; only mentions reducing local greenhouse gas (GHG) emissions.³
- BLM Newcastle Field Office, Approved RMP (Sept. 2000): no discussion of climate change or GHG emissions.⁴
- BLM Casper Field Office, Approved RMP (Dec. 2007): no discussion of climate change or GHG emissions.⁵
- BLM Rawlins Field Office, Approved RMP (Nov. 2019): defers consideration of and management for climate change until a later date:
 Currently BLM does not have an established mechanism to accurately predict the effect of resource management-level decisions from this planning effort on global climate change. However, potential impacts to air quality due to climate change are likely to be varied. In the future, as tools for predicting climate changes in a management area improve and/or changes in climate affect resources and necessitate changes in how resources are managed, BLM may be able to reevaluate decisions made as part of this planning process and adjust management accordingly.⁶
- BLM Lander Field Office, Approved RMP (June 2014): mentions climate change but with no substantive discussion of impacts or planning; only mentions reducing local GHG emissions.⁷

³ BLM BUFFALO FIELD OFFICE, APPROVED RESOURCE MANAGEMENT PLAN 83 table 3.1, 548 (Sept. 2015). This 2015 RMP was invalidated in court, in part on climate grounds, and BLM issued an approved RMP amendment (RMPA). *See W. Organization of Res. Councils v. BLM*, No. CV 16-21-GF-BMM, 2018 U.S. Dist. LEXIS 49635, at *6 (D. Mont. Mar. 26, 2018), *appeal dismissed*, No. 18-35836, 2019 U.S. App. LEXIS 39122, (9th Cir. Jan. 2, 2019). That RMPA was challenged and again it was invalidated. *W. Org. of Res. Councils v. United States BLM*, No. 4:20-cv-00076-GF-BMM, 2022 U.S. Dist. LEXIS 138980, at *21 (D. Mont. Aug. 3, 2022). On October 3, 2022, BLM initiated scoping to amend the RMP. 87 Fed. Reg. 59818, 591818 (Oct. 3, 2022). On November 20, 2024, the BLM issued a Coal Leasing Amendment, but that Amendment addresses coal and does not address GHG emissions or attendant climate impacts stemming from oil and gas development and production. *See* BLM BUFFALO FIELD OFFICE, RECORD OF DECISION AND APPROVED RESOURCE MANAGEMENT PLAN Amendment (Nov. 2024).

⁴ BLM NEWCASTLE FIELD OFFICE, APPROVED RESOURCE MANAGEMENT PLAN (Sept. 2000).

⁵ BLM CASPER FIELD OFFICE, APPROVED RESOURCE MANAGEMENT PLAN (Dec. 2007).

⁶ BLM RAWLINS FIELD OFFICE, APPROVED RESOURCE MANAGEMENT PLAN 1-7 (Nov. 2019).

⁷ BLM LANDER FIELD OFFICE, APPROVED RESOURCE MANAGEMENT PLAN 210, 322, 324, 349 table N.1 (June 2014).

- BLM Worland and Cody Field Offices, Approved RMP (Sept. 2015): no mention of modern anthropogenic climate change; only mentions reducing local GHG emissions.⁸

Consequently, the BLM should defer leasing in this area until the agency can consider new inventories and analyze how best to protect the resources. At the very least, the agency must undertake a thorough analysis that analyzes the potential impacts (direct, indirect, and cumulative⁹) that new leasing and development would have on sensitive resources.

Even where implicated RMPs were finalized within the last five years, the BLM must take a hard look at new resource inventories and stipulations to ensure that new leases comply with existing plans, reflect updated inventory data, and adequately protect sensitive resources. Failure to consider, analyze, and disclose these issues would violate NEPA and FLPMA.

b. Parcels proposed in the Rock Springs Field Office conflict with the most recent RMP.

The BLM is proposing to offer two parcels in the Rock Springs Field Office: WY-2025-12-0986 and WY-2025-12-0924. The agency must analyze these parcels under the recent RMP Amendment, approved by a Record of Decision (ROD) in December 2024. These two parcels appear to be in conflict with the RMP. Parcel WY-2025-12-0924 is 40 acres, **with at least three of those closed to leasing and within the Steamboat Mountain Area of Critical Environmental Concern**. The BLM should not and cannot be leasing acreage closed to leasing in an RMP.

Parcel WY-2025-12-0986 at 805.7858 acres has at least 58 acres that should have a no-surface occupancy stipulation attached to be in accordance with the RMP. Timing limitation stipulations and controlled use stipulations that are directed by the RMP may also apply and must be attached to these leases for the BLM to be in compliance.

In the Rawlins Field Office, the BLM is proposing to lease four parcels that are entirely or partly within the Muddy Creek National Restoration Landscape: WY-2025-12-2169; WY-2025-12-2160; WY-2025-12-2170; and WY-2025-12-2174. It is irresponsible of the agency to lease these parcels, conferring rights of development that would fragment or destroy habitats, when the agency has prioritized this landscape for habitat restoration and improvement.

The BLM recognizes that the Muddy Creek landscape “supports a rare community of native fish – Colorado River cutthroat, bluehead and flannelmouth suckers and roundtail chub.” BLM, BLM’S RESTORATION LANDSCAPES, <https://storymaps.arcgis.com/stories/6966af5d6f584f8b80f102d391671a3f> (last visited Apr. 29,

⁸ BLM WORLAND FIELD OFFICE, APPROVED RESOURCE MANAGEMENT PLAN 553 (Sept. 2015); BLM CODY FIELD OFFICE, APPROVED RESOURCE MANAGEMENT PLAN (2015).

⁹ Courts have consistently held that NEPA’s mandate includes considering cumulative effects. *See, e.g., Swain v. Brinegar*, 542 F.2d 364, 369–70 (7th Cir. 1976); *Henry v. Federal Power Commission*, 513 F.2d 395, 406 (D.C. Cir. 1975); *Sierra Club v. Morton*, 510 F.2d 813, 824 (5th Cir. 1975); *Hanly v. Kleindienst*, 471 F.2d 823 (2d Cir. 1972).

2025). The agency acknowledges “important winter range and migratory corridors” for big game herds and that “the landscape holds core sagebrush habitat.” *Id.* As such, the BLM is now investing \$10 million into restoration projects that will enhance wildlife habitats and ecologic function, including fuels reduction, riparian and wetland enhancement, fence conversion, and erosion control. *See id.* It is an unconscionable waste of taxpayer dollars to invest in habitat enhancement while allowing increased industrial development of the landscape by offering oil and gas leases in this location. The BLM must defer the four parcels within the Muddy Creek National Restoration Landscape.¹⁰

III. The BLM must analyze the conservation and multiple use conflicts and environmental impacts associated with the proposed lease parcels, along with evaluating the deferral of parcels based on such conflicts, including through use of the leasing preference criteria.

The BLM must evaluate the environmental impacts of this proposed lease sale under NEPA. *See, e.g.*, 42 U.S.C. §§ 4331–4347. NEPA fosters informed decision making by federal agencies and promotes informed public participation in government decisions. *See Balt. Gas & Elec. Co. v. NRDC*, 462 U.S. 87, 97 (1983). To meet those goals, NEPA requires that the BLM “consider every significant aspect of the environmental impact of a proposed action” and inform the public of those impacts. *Id.* (internal citation omitted); *accord Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc.*, 435 U.S. 519, 553 (1978).¹¹ The BLM must take a “hard look” at the environmental effects before making any leasing decisions, ensuring “that the agency, in reaching its decision, will have available, and will carefully consider, detailed information concerning significant environmental impacts.” *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349–50 (1989). Environmental “[e]ffects are reasonably foreseeable if they are sufficiently likely to occur that a person of ordinary prudence would take [them] into account in reaching a decision.” *Sierra Club v. Fed. Energy Regulatory Comm’n*, 867 F.3d 1357, 1371 (D.C. Cir. 2017) (internal quotation omitted).

In considering environmental effects, the BLM must also address whether to defer lease parcels based on conservation or other use conflicts, including by applying the leasing preference

¹⁰ In fact, in the draft Environmental Assessment for the Wyoming 2025 Third Quarter oil and gas lease sale, the BLM has proposed deleting one parcel precisely because it is within the Upper Muddy Creek Watershed/Grizzly Wildlife Habitat Management Area and thus conflicts with the Rawlins RMP. *See* BLM, ENVIRONMENTAL ASSESSMENT, DOI-BM-WY-0000-2025-0001-EA, 2025 THIRD QUARTER COMPETITIVE LEASE SALE at 15 (Apr. 14, 2025). For the present sale, the BLM should likewise delete the four parcels overlapping the Muddy Creek National Restoration Landscape.

¹¹ *See Kleppe v. Sierra Club*, 427 U.S. 390, 410, 413 (1976); *City of Rochester v. U.S. Postal Serv.*, 541 F.2d 967, 973–74 (2d Cir. 1976); *Concerned About Trident v. Rumsfeld*, 555 F.2d 817, 825 (D.C. Cir. 1976); *City of Davis v. Coleman*, 521 F.2d 661, 666–677 (9th Cir. 1975); *Brooks v. Coleman*, 518 F.2d 17, 18 (9th Cir. 1975); *Natural Resources Defense Council v. Callaway*, 524 F.2d 79, 89 (2d Cir. 1975); *Env’tl. Def. Fund, Inc. v. Corps of Eng’rs of U.S. Army*, 492 F.2d 1123, 1135 (5th Cir. 1974); *Swain v. Brinegar*, 517 F.2d 766 (7th Cir. 1975); *Minnesota Public Interest Research Group v. Butz*, 498 F.2d 1314, 1322 (8th Cir. 1974); *Natural Resources Defense Council v. Morton*, 458 F.2d 827, 834–36 (D.C. Cir. 1972); *Hanly v. Kleindienst*, 471 F.2d 823, 830–31 (2d Cir. 1972); *Calvert Cliffs’ Coordinating Comm., Inc. v. U.S. Atomic Energy Comm’n*, 449 F.2d 1109, 1114 (D.C. Cir. 1971).

criteria to scoping parcels. *See* 43 C.F.R. § 3120.32. Doing so clearly and consistently is important. A helpful example of clear application of the criteria is in the Environmental Assessment for the Wyoming Quarter Four 2023 Lease Sale. *See* BUREAU OF LAND MGMT., ENVIRONMENTAL ASSESSMENT, DOI-BLM-WY-0000-2023-0004-EA, 2023 FOURTH QUARTER COMPETITIVE LEASE SALE, at 18–21 & Table 2.3 (Nov. 2023). There, the BLM included an explanation of each criterion being used, followed by a table designating the preference (low or high). *See id.* Each parcel that received a “low” designation was deferred, with a brief parenthetical explanation in the chart as to why it was being deferred. *See id.* We urge the BLM to follow a similar, consistent approach for this lease sale.

The BLM should defer lease parcels with a low preference value. If the BLM does move forward any parcels that receive a low preference designation, the agency must explain the specific reasons for doing so.

While the regulations preference leasing parcels with “[p]roximity to existing oil and gas development,” 43 C.F.R. § 3120(a), some of these areas risk further concentrating and expanding development, exacerbating ongoing and historical degradation to the affected area and the public health of nearby communities. We urge the BLM to not assign a “high” preference value to proposed lease parcels that are in proximity to existing oil and gas development or that are on lands with high development potential if the proposed parcels are on lands where other sensitive resources are present. In addition, we urge the BLM to document and prioritize community health and environmental justice impacts. The agency has documented proximity to residences and communities in other lease sales. *See, e.g.,* BUREAU OF LAND MGMT., PECOS DISTRICT OFFICE OIL AND GAS LEASE SALE, ENVIRONMENTAL ASSESSMENT, QUARTER 2 2024, DOI-BLM-NM-P000-2023-0002-EA, at 68 (Mar. 2024). The BLM should do so for this sale as well.

Determining leasing preference also requires the BLM to evaluate the obligation “to take any action required to prevent unnecessary or undue degradation of the lands.” 43 U.S.C. § 1732(b). The BLM has defined “unnecessary or undue degradation” as:

harm to resources or values that is not necessary to accomplish a use’s stated goals or is excessive or disproportionate to the proposed action or an existing disturbance. Unnecessary or undue degradation includes two distinct elements: “Unnecessary degradation” means harm to land resources or values that is not needed to accomplish a use’s stated goals. For example, approving a proposed access road causing damage to critical habitat for a plant listed as endangered under the Endangered Species Act that could be located without any such impacts and still provide the needed access may result in unnecessary degradation. “Undue degradation” means harm to land resources or values that is excessive or disproportionate to the proposed action or an existing disturbance. For example, approving a proposed access road causing damage to the only remaining critical habitat for a plant listed as endangered under the Endangered Species Act, even if there is not another location for the road, may result in undue degradation. The statutory obligation to prevent “unnecessary or undue degradation” applies when

either unnecessary degradation or undue degradation, and not necessarily both, is implicated.

43 C.F.R. § 6101.2(aa). The BLM must explain how it is meeting this obligation with the parcels it moves forward in a lease sale and how application of the preference criteria do or do not fulfill this obligation to prevent unnecessary or undue degradation.

The following subsections discuss environmental analysis for the BLM to include in its NEPA review and associated parcel deferral recommendations.

a. The BLM must analyze the impacts of leasing parcels in greater sage-grouse habitat and designate as low preference for leasing and defer parcels in Priority Habitat Management Areas and General Habitat Management Areas.

The agency will preference “lands that would not impair the proper functioning of [fish and wildlife] habitats or corridors.” 43 C.F.R. § 3120.32(b). The following 89 proposed parcels overlap with General Habitat Management Areas (GHMA) for the greater sage-grouse:

WY-2025-12-0862	WY-2025-12-1754	WY-2025-12-7020
WY-2025-12-0869	WY-2025-12-2126	WY-2025-12-7023
WY-2025-12-0924	WY-2025-12-2127	WY-2025-12-7024
WY-2025-12-0932	WY-2025-12-2128	WY-2025-12-7028
WY-2025-12-0934	WY-2025-12-2156	WY-2025-12-7029
WY-2025-12-0939	WY-2025-12-2157	WY-2025-12-7034
WY-2025-12-0940	WY-2025-12-2159	WY-2025-12-7051
WY-2025-12-0946	WY-2025-12-2160	WY-2025-12-7052
WY-2025-12-0948	WY-2025-12-2161	WY-2025-12-7070
WY-2025-12-0955	WY-2025-12-2162	WY-2025-12-7073
WY-2025-12-0961	WY-2025-12-2164	WY-2025-12-7075
WY-2025-12-0971	WY-2025-12-2165	WY-2025-12-7077
WY-2025-12-0978	WY-2025-12-2166	WY-2025-12-7078
WY-2025-12-0979	WY-2025-12-2167	WY-2025-12-7079
WY-2025-12-0983	WY-2025-12-2169	WY-2025-12-7081
WY-2025-12-0986	WY-2025-12-2170	WY-2025-12-7111
WY-2025-12-1076	WY-2025-12-2171	WY-2025-12-7127
WY-2025-12-1077	WY-2025-12-2173	WY-2025-12-7149
WY-2025-12-1081	WY-2025-12-2174	WY-2025-12-7150
WY-2025-12-1086	WY-2025-12-2176	WY-2025-12-7151
WY-2025-12-1114	WY-2025-12-2179	WY-2025-12-7169
WY-2025-12-1130	WY-2025-12-6985	WY-2025-12-7171
WY-2025-12-1213	WY-2025-12-7015	WY-2025-12-7185
WY-2025-12-1274	WY-2025-12-7016	WY-2025-12-7189
WY-2025-12-1276	WY-2025-12-7018	WY-2025-12-7350
WY-2025-12-1555	WY-2025-12-7019	WY-2025-12-7415

WY-2025-12-7417	WY-2025-12-7430	WY-2025-12-7439
WY-2025-12-7418	WY-2025-12-7432	WY-2025-12-7440
WY-2025-12-7427	WY-2025-12-7437	WY-2025-12-7441
WY-2025-12-7428	WY-2025-12-7438	

The following two proposed parcels significantly overlap Primary Habitat Management Areas (PHMA):

WY-2025-12-2131
WY-2025-12-0932

The BLM should designate all parcels as having a low preference for leasing and should avoid leasing all parcels in GHMA and PHMA under the 2015 Greater Sage-Grouse Resource Management Plan Amendments (the 2015 Plans).

As explained in the Leasing Rule’s preamble: “The preference criteria . . . were proposed consistent with the MLA to direct the BLM’s administrative resources to leasing tracts most likely to be developed, to reduce conflicts between oil and gas development and other public land uses that were not resolved in the resource management plans, and to ‘take[] into account the long-term needs of future generations for renewable and nonrenewable resources.’” 89 Fed. Reg. 30,916, 30,919 (Apr. 23, 2024) (quoting 43 U.S.C. §1702). Moreover, the agency explained that it “will apply the criteria . . . consistent with the BLM’s existing policy and implementation of IM 2023–007, *Evaluating Competitive Oil and Gas Lease Sale Parcels for Future Lease Sales*.” Although that IM and associated attachment have been rescinded, the Leasing Rule’s requirement that BLM will apply the preference criteria consistent with the principles in the IM remains. Those principles direct deferral of parcels with identified conflicts with the criteria, such as parcels in sage-grouse habitat.

The BLM must provide an analysis of the reasonably foreseeable impacts to sage-grouse from development on the proposed lease parcels. The agency has “specifically identified ‘oil and gas development’ as a ‘major threat’ to sage-grouse habitat.” *Mont. Wildlife Fed’n*, 127 4th at 43. Previous lease sale analysis of sage-grouse impacts has been found to violate NEPA. *See Wilderness Soc’y v. U.S. Dep’t of the Interior*, No. 22-cv-1871 (CRC), 2024 U.S. Dist. LEXIS 51011, at *62 (D.D.C. Mar. 22, 2024). In *Wilderness Soc’y*, the district court recognized that BLM’s practice of simply claiming that impacts from leases will be “similar” to those discussed in the NEPA documents for the 2015 Plans falls short of what the law requires. *See id.* at *54–62. Instead, the NEPA analysis must address the *specific* lands being offered and develop a “prediction of how this lease sale will likely impact sage grouse populations in light of all available evidence, including the more recent science that has motivated [the BLM] to redraft the existing [2015 Plans].” *Id.* at *17; *see Western Watersheds Project v. Bernhardt*, 543 F. Supp. 3d 958, 991–93 (D. Idaho 2021). NEPA requires the BLM to analyze the impacts of the decision it will consider for this lease sale.

Deferral of parcels in habitat management areas is required. A key component of the 2015 Plans requires the BLM to prioritize new oil and gas leasing outside of PHMA and GHMA

to protect that habitat from future disturbance. The Ninth Circuit recently affirmed that “the government must take an affirmative role in encouraging oil and gas leasing in non-sage-grouse habitat.” *Mont. Wildlife Fed’n*, 127 F.4th at 45. The BLM’s national policy addressing prioritization, IM 2018-026, has been struck down. *See Mont. Wildlife Fed’n v. Bernhardt*, No. 18-cv-69-GF-BMM, 2020 WL 2615631 (D. Mont. May 22, 2020), *aff’d*, 127 F.4th 1 (9th Cir. 2025). The agency has not adopted new national guidance on the prioritization requirement and has represented to the U.S. Montana District Court that the agency’s previous prioritization guidance (adopted in 2016) also is not in effect. As a result, there is currently no national guidance providing direction on how prioritization is to be applied.

What is clear is that the BLM cannot merely “respond to industry expressions of interest . . . in leasing specific land parcels,” but rather it must undertake “independent agency determinations of which parcels to offer for oil and gas leases.” *Wilderness Soc’y*, No. 22-cv-1871 (CRC), U.S. App. LEXIS 1106, at 69. The approach the BLM has taken in Wyoming since the 2020 ruling fails to comply with the 2015 Plans. The agency must prioritize leasing away from PHMA and also guide leasing away from GHMA lands. Stipulations are insufficient—the “Prioritization Objective imposes an affirmative requirement on the Bureau to ‘guide’ and ‘encourage’ development away from sage-grouse habitat.” *Mont. Wildlife Fed’n*, 127 F.4th 1 at 43.

In March 2021, U.S. Geological Survey (USGS) researchers released a report that provides one of the most comprehensive population trend modeling efforts ever undertaken for sage-grouse. *See* PETER S. COATES ET AL., RANGE-WIDE GREATER SAGE-GROUSE HIERARCHICAL MONITORING FRAMEWORK: IMPLICATIONS FOR DEFINING POPULATION BOUNDARIES, TREND ESTIMATION, AND A TARGETED ANNUAL WARNING SYSTEM (March 2021) [Exs. 1a & 1b], <https://doi.org/10.3133/ofr20201154>. The report reveals that since 1965, sage-grouse populations have declined 80% range-wide, including in areas where the decline has not been as severe. *See id.* at 36. Since 2002, range-wide populations have declined 37%. *See id.* at 3. Also, 78% of leks have a greater than 50% probability of extirpation in the next 56 years. *See id.* at 52, 90. In September 2022, the USGS and other federal agencies released a report that found 1.3 million acres of habitat are transitioning each year from largely intact sagebrush sites to less functioning sagebrush habitat. *See* KEVIN DOHERTY ET AL., A SAGEBRUSH CONSERVATION DESIGN TO PROACTIVELY RESTORE AMERICA’S SAGEBRUSH BIOME: U.S. GEOLOGICAL SURVEY OPEN-FILE REPORT 2022–1081, 28 (Sept. 22, 2022) [Ex. 2], <https://pubs.usgs.gov/of/2022/1081/ofr20221081.pdf>.

The science makes clear that the BLM’s focus must be to “stop the bleeding” on sage-grouse population losses. *See Wilderness Soc’y*, No. 22-cv-1871 (CRC), 2024 U.S. Dist. LEXIS 51011, at *59. The BLM must conduct a proper analysis of effects to the sage-grouse for this lease sale. The failure to properly analyze and consider deferral of parcels in sage-grouse habitat would mean that the BLM had neglected to consider a reasonable modified leasing alternative that would advance the purpose and need of the sale.

- b. The BLM must analyze the impacts of leasing parcels in big game habitat and designate as low preference for leasing and defer parcels in such areas.**

The agency will preference “lands that would not impair the proper functioning of [fish and wildlife] habitats or corridors.” 43 C.F.R. § 3120.32(b). The following nine proposed parcels overlap with crucial big game habitat:

WY-2025-12-0924 (elk crucial winter range)
 WY-2025-12-0978 (pronghorn crucial winter range)
 WY-2025-12-0979 (pronghorn crucial winter range)
 WY-2025-12-2128 (mule deer and pronghorn crucial winter range)
 WY-2025-12-2160 (mule deer and pronghorn crucial winter range)
 WY-2025-12-7051 (pronghorn crucial winter range)
 WY-2025-12-7185 (pronghorn crucial winter range)
 WY-2025-12-7189 (mule deer and pronghorn crucial winter range)
 WY-2025-12-7413 (mule deer crucial winter range)

The BLM should designate all parcels as having a low preference for leasing and evaluate deferring all parcels. The BLM must thoroughly analyze the impacts to big game of leasing in these areas.

FLPMA requires the BLM to manage public lands “in a manner that will provide food and habitat” for all wildlife. 43 U.S.C. § 1701(a)(8). Research makes clear that big game suffer considerable losses from leasing and development on their crucial winter range. *See, e.g.,* Adele K. Reinking et al., *Across Scales, Pronghorn Select Sagebrush, Avoid fences, and Show Negative Responses to Anthropogenic Features in Winter*, 10(5) ECOSPHERE 1, 1–14 (May 2019) [Ex. 3], <https://esajournals.onlinelibrary.wiley.com/doi/epdf/10.1002/ecs2.2722>; BLM, ENVIRONMENTAL ASSESSMENT FOR WYOMING FIRST QUARTER 2024 COMPETITIVE LEASE SALE at 82–90, https://eplanning.blm.gov/public_projects/2025221/200555584/20105111/251005111/2024-03.20240304.0804.WSO.921.2024-03%20EA.pdf. Peer-reviewed research has demonstrated that mule deer respond unfavorably to oil and gas development in migratory habitats, often missing out on high-quality forage during the spring migration. *See* Ellen O. Aikens et al., *Industrial energy development decouples ungulate migration from the green wave*, 6 NATURE ECOLOGY. & EVOLUTION 1733, 1733–1741 (Oct. 2022) [Ex. 4], <https://doi.org/10.1038/s41559-022-01887-9>. Extensive leasing in crucial winter range or migration corridors have significant adverse impacts on Wyoming’s big game herds.

The BLM must provide a full analysis of the reasonably foreseeable impacts to big game populations from development on these particular lease parcels. The BLM’s prior approach to analyzing big game has been found to violate NEPA because it relied on analysis prepared for the agency’s RMPs and lacked “anything resembling an estimate of how the lease sale [at issue] will impact these species.” *Wilderness Soc’y*, No. 22-cv-1871 (CRC), 2024 U.S. Dist. LEXIS 51011, at *67. This approach is especially inadequate here because many of the BLM’s Wyoming RMPs are decades old, and new research has shown that big game are suffering substantial population losses in areas of intensive oil and gas development. *See id.* at *63. The BLM “must use available evidence to reasonably forecast how these lease sales will affect . . . big game” on the specific lands being proposed for leasing. *Id.* at *68.

The BLM must also consider how drilling on the proposed parcels will add to habitat impairment from past, present, and reasonably foreseeable future drilling elsewhere in Wyoming big game habitat. In doing so, the agency must provide a baseline of impacts from existing development, including how much critical winter range acreage is directly disturbed or impaired in connection with ongoing and future development. The BLM has an obligation to determine whether the direct, indirect, and cumulative effects of this lease sale will have a significant impact on big game, and thus whether an environmental impact statement is required.

The parcels noted above that overlap critical big game habitat should be designated as low preference and deferred.

- c. The BLM must analyze the impacts of leasing parcels in areas with low oil and gas development potential and not near existing development and designate as low preference for leasing and defer parcels in areas with low oil and gas development potential.**

The BLM will preference lands with “high potential” for oil and gas development. 43 C.F.R. § 3120.32(e). Of the parcels being considered, 74 parcels are in areas identified as having low potential for development in BLM Reasonably Foreseeable Development Potential documents. Four of the parcels in low development potential areas are more than four miles from producing wells:

WY-2025-12-7059
WY-2025-12-7070
WY-2025-12-7073
WY-2025-12-7413

All these parcels on low development potential lands should be designated as having a low preference for leasing and be deferred.

The MLA directs the BLM to hold periodic oil and gas lease sales for “lands . . . which are known or believed to contain oil or gas deposits.” 30 U.S.C. § 226(a); *see Vessels Coal Gas, Inc.*, 175 IBLA 8, 25 (2008) (“It is well-settled under the MLA that competitive leasing is to be based upon reasonable assurance of an existing mineral deposit.”). Leasing lands with no or low potential for oil and gas development violates FLPMA’s multiple use mandate. Offering parcels in low potential lands precludes management for other uses. The BLM itself has reiterated this point, explaining that the preference criteria are meant to “ensure that oil and gas leasing on public lands focuses development where there is the most potential for recovery and allows the agency to manage public lands for other uses.” 89 Fed. Reg. at 30,956. Accordingly, the BLM should analyze for deferral—and defer—parcels on land with low development potential.

- d. The BLM should analyze and defer parcels that overlap with inventoried Lands with Wilderness Characteristics (LWC), Wilderness Study Areas (WSA), and Areas of Critical Environmental Concern (ACEC) until**

management decisions are made for those lands in order to comply with NEPA and FLMPA.

FLPMA obligates the BLM to take its resource inventory into account when preparing management plans and authorizing uses, observing the principles of multiple use and sustained yield. *See* 43 U.S.C. §§ 1711(a), 1712(c); *see Ore. Natural Desert Ass’n v. Bureau of Land Mgmt.*, 625 F.3d 1092, 1122 (9th Cir. 2008). The BLM is also required to “prevent unnecessary or undue degradation of the lands.” 43 U.S.C. § 1732(b).

In making decisions about leasing areas for oil and gas development, the BLM can and should protect wildlife, scenic values, recreation opportunities, and wilderness character on public lands. This is necessary and consistent with the definition of multiple use, which identifies the importance of various aspects of wilderness characteristics (such as recreation, wildlife, and natural scenic values) and requires the BLM’s consideration of the relative values of these resources but “not necessarily to the combination of uses that will give the greatest economic return.” *See id.* § 1702(c).

The BLM has exercised its discretion to defer parcels occurring on LWCs, WSAs, and ACECs where management direction has not been made or where lands are being managed under such designations. For example, the Grand Junction Field Office deferred lease parcels from its December 2017 lease sale in areas that the BLM inventoried and found to have wilderness characteristics. The BLM stated: “Portions of the following parcels were deferred due to having lands with wilderness characteristics that require further evaluation.” DOI-BLM-CO-N050-2017-0051-DNA, at 1 (Dec. 6, 2017). The Grand Junction Field Office completed its RMP revision in 2015 but still determined that it was inappropriate to lease areas that had been inventoried and found to possess wilderness characteristics because the RMP was completed in order to allow the agency to consider management options for those wilderness resources. The BLM should similarly defer leasing in inventoried LWC, WSA, and ACEC for which management decisions have not been made or which are actively being managed based on these designations. This approach is consistent with agency policy and authority and is critical to preserving the BLM’s ability to make management decisions for those wilderness resources through a public planning process.

As discussed above, **WY-2025-12-0924 contains at least three acres closed to leasing and within the Steamboat Mountain Area of Critical Environmental Concern. This parcel or at least that portion of it should be removed from this sale.**

- e. The BLM must analyze GHG emissions and climate effects and factor GHG emissions and climate effects into its leasing decisions.**

The BLM must not only properly analyze and quantify the direct, indirect, and cumulative GHG emissions and climate impacts that may result from leasing, but it must also factor GHG emissions into its leasing decisions. *See Wilderness Soc’y*, No. 22-cv-1871 (CRC), 2024 U.S. Dist. LEXIS 51011, at *91. The agency must consider GHG analysis when making its decision on a lease sale. As one court recently explained: “Any claim that the analysis of GHG

emissions was informational only and did not inform BLM’s decision-making is hard to square with [NEPA’s] purpose.” *Id.* at *87. The agency must also consider unquantified effects, recognize the worldwide and long-range character of climate change impacts, and incorporate this analysis of ecological information into its environmental analysis. *See* 42 U.S.C. §§ 4332(2)(A), (B), (D), (I) & (K). The BLM has the tools to undertake this analysis. Failing to do so for this lease sale would be arbitrary and capricious.

The MLA requires the Secretary of the Interior to lease lands for oil and gas development only in the public interest. *See* 30 U.S.C. § 192. In its NEPA analysis, the BLM can and must consider adverse effects to health and the environment—part of the public interest—when determining whether to lease. *See* 43 U.S.C. § 1732(b) (requiring the BLM to prevent unnecessary and undue degradation); *cf. Sierra Club v. Fed. Energy Regulatory Comm’n*, 867 F.3d at 1373–74 (explaining that whether an agency must analyze certain environmental effects under NEPA turns on the question, “What factors can [the agency] consider when regulating in its proper sphere,” and holding that the agency consider direct and indirect environmental effects because the statute at issue indeed vested the agency with authority to deny the project based on harm to the environment (internal quotation marks omitted)). Such adverse environmental effects include those caused by GHG emissions and impacts on the climate.

Court decisions clearly establish that NEPA mandates consideration and analysis of the indirect and cumulative climate impacts of BLM fossil fuel production decisions, including at the leasing stage.¹² The BLM must ensure it fully considers not only the GHG emissions from prospective wells drilled on the leases sold at this lease sale—and the climate change impacts of those GHG emissions—but also the impacts of other federal lease sales in the state, region, and nation, as well as impacts from GHG emissions from non-Federal sources. The BLM must consider GHG emissions in the aggregate along with other foreseeable emissions. Such analysis is necessary to meet the cumulative impacts demands of NEPA.

The indirect and cumulative impacts must be given meaningful context, including within carbon budgets, rather than simply dismissed as insignificant compared to national or global total GHG emissions. *See, e.g., WildEarth Guardians*, 368 F. Supp. 3d at 77. “Without establishing the baseline conditions . . . there is simply no way to determine what effect the proposed [action] will have on the environment and, consequently, no way to comply with NEPA.” *Half Moon Bay Fisherman’s Marketing Ass’n v. Carlucci*, 857 F.2d 505, 510 (9th Cir. 1988). Excluding climate

¹² *See, e.g., 350 Mont. v. Haaland*, 50 F.4th 1254, 1266–70 (9th Cir. 2022); *Vecinos para el Bienestar de la Comunidad Costera v. FERC*, 6 F.4th 1321, 1329–30 (D.C. Cir. 2021); *Sierra Club v. Fed. Energy Regulatory Comm’n*, 867 F.3d at 1371–75 (requiring quantification of indirect greenhouse gas emissions); *Ctr. for Biological Diversity v. Nat’l Highway Transp. Safety Admin.*, 538 F.3d 1172, 1215–16 (9th Cir. 2008) (requiring assessment of the cumulative impacts of climate change); *WildEarth Guardians v. U.S. Bureau of Land Mgmt.*, 870 F.3d 1222, 1236–38 (10th Cir. 2017); *Mid States Coal. for Progress v. Surface Transp. Bd.*, 345 F.3d 520, 550 (8th Cir. 2003); *Wilderness Soc’y*, No. 22-cv-1871 (CRC), 2024 U.S. Dist. LEXIS 51011, at *83–92 (explaining that the BLM cannot “overlook[] what is widely regarded as the most pressing environmental threat facing the world today”); *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41, 63, 67–77 (D.D.C. 2019) (invalidating nine BLM NEPA analyses in support of oil and gas lease sales because “BLM did not take a hard look at drilling-related and downstream [greenhouse gas] emissions from the leased parcels and, it failed to sufficiently compare those emissions to regional and national emissions”).

change effects from the environmental baseline ignores the reality that the impacts of proposed actions must be evaluated based on the already deteriorating, climate-impacted state of the resources, ecosystems, human communities, and structures that will be affected. The BLM's climate effects analysis "must give a realistic evaluation of the total impacts and cannot isolate a proposed project, viewing it in a vacuum." *Grand Canyon Trust v. Fed. Aviation Admin.*, 290 F.3d 339, 342 (D.C. Cir. 2002).¹³

In analyzing these impacts, the BLM must consider the full lifecycle of development activities and GHG emissions that are reasonably foreseeable under a BLM oil and gas lease. The social cost of greenhouse gases (SC-GHG) is a useful tool to aid in this analysis. While NEPA does not require a cost-benefit analysis, it is "nonetheless arbitrary and capricious to quantify the *benefits* of the lease modifications and then explain that a similar analysis of the *costs* was impossible when such an analysis was in fact possible and was included in an earlier draft EIS." *High Country Conservation Advocates v. United States Forest Serv.*, 52 F. Supp. 3d 1174, 1191 (D. Colo. 2014) (emphases in original). Courts have rejected agency refusals to properly quantify the impact of GHG emissions.¹⁴

The Interior Department had "adopt[ed] . . . [the EPA's] new estimates of the social cost as the best available science." 90 Fed. Reg. 4779, 4779 (Jan. 16, 2025); see U.S. Dep't of the Interior, Informational Memorandum on DOI comparison of available estimates of social cost of greenhouse gases (SC-GHG), at 1, 8 (Oct. 16, 2024) [Ex. 5], https://eplanning.blm.gov/public_projects/2036015/200638053/20126874/251026854/20241016.DOI%20SC_GHG%20Info%20Memo.pdf (directing the BLM to "adopt the EPA's 2023 estimates of the Social Cost of Greenhouse Gases (SC-GHG) as the best available science (as of September 30, 2024)"). In a final Environmental Assessment (EA) for the Quarter 1 2025 New

¹³ See also *Great Basin Mine Watch v. Hankins*, 456 F.3d 955, 973–74 (9th Cir. 2006) (holding agency's cumulative impacts analysis insufficient based on failure to discuss other mining projects in the region); *Kern v. BLM*, 284 F.3d 1062, 1078 (9th Cir. 2002) (holding that BLM arbitrarily failed to include cumulative impacts analysis of reasonably foreseeable future timber sales in the same district as the current sale); *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1214–16 (9th Cir. 1998) (overturning Forest Service EA that analyzed impacts of only one of five concurrent logging projects in the same region); *San Juan Citizens All. v. United States BLM*, 326 F. Supp. 3d 1227, 1248 (D.N.M. 2018) (holding that BLM failed to take a hard look at the cumulative impact of GHG emissions (citing *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008) (concluding that an agency "must provide the necessary contextual information about the cumulative and incremental environmental impacts" because even though the impact might be "individually minor," its impact together with the impacts of other actions would be "collectively significant"))).

¹⁴ See, e.g., *Montana Env't Info. Ctr. v. U.S. Office of Surface Mining*, 274 F. Supp. 3d 1074, 1094–99 (D. Mont. 2017) (rejecting agency's failure to incorporate the federal SCC estimates into its cost-benefit analysis of a proposed mine expansion); see also *Zero Zone, Inc. v. U.S. Dep't of Energy*, 832 F.3d 654, 679 (7th Cir. 2016) (holding estimates of the social cost of carbon (SCC) used to date by agencies were reasonable); *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174, 1190–93 (D. Colo. 2014) (holding the SCC was an available tool to quantify the significance of GHG impacts, and it was "arbitrary and capricious to quantify the *benefits* of the lease modifications and then explain that a similar analysis of the *costs* was impossible") (emphasis in original). An agency may not assert that the social cost of fossil fuel development is zero: "by deciding not to quantify the costs at all, the agencies effectively zeroed out the costs in its quantitative analysis." *High Country Conservation Advocates*, 52 F. Supp. 3d at 1192; see *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1200 (9th Cir. 2008) (holding that while there is a range potential social cost figures, "the value of carbon emissions reduction is certainly not zero").

Mexico Oil and Gas Lease Sale, the BLM chose to omit its quantification of climate impacts (which had been included in the draft EA), did not replace this omission with any other adequate quantitative analysis, and purported to rescind its memorandum. *See* BLM, CARLSBAD FIELD OFFICE OIL AND GAS LEASE SALE ENVIRONMENTAL ASSESSMENT at 88, QUARTER 1 (2025). But the BLM failed to provide proper justification for changing its position. *Cf. FCC v. Fox TV Stations, Inc.*, 556 U.S. 502, 515 (2009) (holding that an agency must provide “good reasons” for a change in position and must provide “a more detailed justification” when a “new policy rests upon factual findings that contradict those which underlay [an agency’s] prior policy; or when its prior policy has engendered serious reliance interests that must be taken into account”). The BLM’s only apparent substantive justification for not including such quantification is that “costs attributed to GHGs are often so variable and uncertain that they are unhelpful for the BLM’s analysis.” *Id.* That bald contention, with no reference or explanation to support it, is insufficient to justify a change in position. For years and over multiple projects, the BLM has quantified climate impacts, primarily relying on the well-supported SC-GHG estimates. *See, e.g.*, BLM, ENVIRONMENTAL ASSESSMENT: WYOMING 2023 SECOND QUARTER COMPETITIVE LEASE SALE at 54–55 (2023). Failing to properly quantify climate impacts in this process would thus be arbitrary and capricious. The BLM must also make a significance determination based on GHG emissions that accounts for climate impacts.

NEPA requires agencies to “identify and develop methods and procedures . . . which will ensure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations.” 42 U.S.C. § 4332(2)(B). A livable climate is a “presently unquantified environmental amenit[y].” By neglecting to use SC-GHG, the BLM would be failing to “identify and develop methods and procedures” to ensure that this “presently unquantified environmental . . . value” is “given appropriate consideration in decisionmaking.”

For this lease sale, the BLM must not only analyze GHG emissions. It must also address how GHG emissions inform its leasing decisions. “[T]he complexity of the task does not give the [BLM] a free pass to avoid making these tough decisions by asserting that GHG emissions did not factor into its decision-making.” *Wilderness Soc’y*, No. 22-cv-1871 (CRC), 2024 U.S. Dist. LEXIS 51011, at *91. The BLM “must . . . explain how its GHG analysis inform[s] the decision to select” its preferred alternative. *Id.* at *91–92. If the BLM does “not consider GHG emissions when rendering its decision . . . it would . . . overlook[] what is widely regarded as the most pressing environmental threat facing the world today.” *Id.*, No. 22-cv-1871 (CRC), 2024 U.S. Dist. LEXIS 51011, at *87–88.

f. The BLM must take a hard look at impacts to groundwater from well construction practices and hydraulic fracturing.

NEPA requires the BLM to assess all the potential environmental impacts from oil and gas leases before it offers those leases to operators. That responsibility includes taking a “hard look” at how development on those leases could impact groundwater. *See WildEarth Guardians v. U.S. Bureau of Land Mgmt.*, 457 F. Supp. 3d 880, 886–89 (D. Mont. 2020).

Groundwater is a critical resource that supplies many communities, particularly rural ones, with drinking water. Protecting these resources is imperative to protect human health and the environment, especially because groundwater will become more important as increased aridity and higher temperatures due to climate change alter water use, quality, and availability. The U.S. Environmental Protection Agency (EPA) has noted that existing drinking water resources “may not be sufficient in some locations to meet future demand” and that future sources of fresh drinking “will likely be affected by changes in climate and water use.” U.S. Environmental Protection Agency, *Hydraulic Fracturing for Oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States*, EPA/600/R-16/236F, at 2-1 to 2-18 (Dec. 2016) [hereinafter EPA 2016 Report] [Ex. 6], <https://cfpub.epa.gov/ncea/hfstudy/recordisplay.cfm?deid=332990>. As a result, the BLM must protect aquifers currently used for drinking water and deeper and higher-salinity aquifers that may be needed in coming decades.

Oil and gas drilling involves boring wells to depths thousands of feet below the surface, often through or just above groundwater aquifers. Without proper well construction and vertical separation between aquifers and producing formations, oil and gas development can contaminate underground sources of water. *See, e.g.,* Gayathri Vaidyanathan, *Fracking Can Contaminate Drinking Water*, SCI. AM. (Apr. 4, 2016) [Ex. 7], <https://www.scientificamerican.com/article/fracking-can-contaminate-drinking-water/>; Dominic C. DiGiulio & Robert A. Jackson, *Impact to Underground Sources of Drinking Water and Domestic Wells from Production Well Stimulation and Completion Practices in the Pavillion, Wyoming Field*, 50 ENVTL. SCI. & TECH. 4524, 4524–4536 (Mar. 29, 2016) [Ex. 8] [hereinafter DiGiulio 2016]. However, federal rules and regulations do not provide specific directions for the BLM and operators on how to protect all usable water. As a result, agency regulations, like the 43 C.F.R. § 3172.7 (formerly Onshore Order No. 2) requirement to “protect and/or isolate all usable water zones,” are inconsistently applied and often disregarded in practice. *See* BLM, *Regulatory Impact Analysis for the Final Rule to Rescind the 2015 Hydraulic Fracturing Rule*, at 44–45 (Dec. 2017), <https://beta.regulations.gov/document/BLM-2017-0001-0464>.

Industry has admitted that it often does not protect usable water in practice. Western Energy Alliance (WEA) and the Independent Petroleum Association of America have told the BLM that the “existing practice for locating and protecting usable water” does not measure the numerical quality of water underlying drilling locations and therefore does not consider whether all usable water would be protected during drilling. WEA and the Independent Petroleum Association of America, Sept. 25, 2017, comments Re: RIN 1004-AE52, Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands; Rescission of a 2015 Rule (82 Fed. Reg. 34,464) (2017 WEA comments), at 59, <https://www.regulations.gov/document?D=BLM-2017-0001-0412>. Multiple reports studying samples of existing federal oil and gas wells in Wyoming and Montana confirm industry admissions that well casing and cementing practices do not always protect underground sources of drinking water. *See, e.g.,* REBECCA TISHERMAN, ET AL., *EXAMINATION OF GROUNDWATER RESOURCES IN AREAS OF WYOMING PROPOSED FOR THE JUNE 2022 BLM LEASE SALE* (May 12, 2022) [hereinafter TISHERMAN REPORT] [Ex. 9], https://eplanning.blm.gov/public_projects/2015538/200495187/20062621/250068803/Exhibit%20119-%20PSE%20WY%20Report%20May%202022%20Final.pdf; DOMINIC DIGIULIO,

DOMINIC DIGIULIO, EXAMINATION OF GROUNDWATER RESOURCES IN AREAS OF MONTANA PROPOSED FOR THE MARCH 2018 BLM LEASE SALE (Dec. 22, 2017) [hereinafter DIGIULIO REPORT] [Ex. 10], https://eplanning.blm.gov/public_projects/nepa/87551/136880/167234/Earthjustice_Protest_1-12-2018.pdf (Exhibit D to David Katz and Jack and Bonnie Martinell's protest of the March 13, 2018, BLM Montana-Dakotas oil and gas lease sales). A study of hydraulic fracturing in Pavillion, Wyoming, indicated that oil and gas drilling had contaminated underground sources of drinking water in that area due to lack of vertical separation between the aquifer and target formation. *See* DiGiulio 2016, at 4532. Indeed, multiple courts have invalidated BLM lease sales in recent years due to the agency's failure to grapple with this evidence. *See Wilderness Soc'y*, No. 22-cv-1871 (CRC), 2024 U.S. Dist. LEXIS 51011, at *14–50; *WildEarth Guardians*, 457 F. Supp. 3d at 886–89.

Given these risks to a critical resource, the BLM must evaluate potential groundwater impairment from any lease parcels it proposes to offer.

First, as a threshold matter, the BLM must provide a detailed accounting of all groundwater resources that could be impacted in the areas considered for leasing, including usable aquifers that may not currently be used as a drinking water supply. The accounting must include, at minimum, all aquifers with up to 10,000 parts per million total dissolved solids (the standard for usable water and underground sources of drinking water). This data is readily available from the USGS and other resources, *see* TISHERMAN REPORT & DIGIULIO REPORT, and the BLM cannot substitute existing drinking water wells or other inadequate proxies for a full description of all potentially usable groundwater resources in the area. The BLM must provide an explanation of the impacts to usable water zones where fracking is already occurring (even if those zones are not currently being used as a drinking water source), and how that fracking may degrade the quality of groundwater.

Second, the BLM must use that accounting to assess how new oil and gas wells might impact these resources. That evaluation must assess the sufficiency of protective measures that will be employed, including the depth of surface casing, the extent to which deeper areas of the wellbore are both cased and cemented (especially across zones containing groundwater with less than 10,000 ppm TDS), and vertical separation between aquifers and the oil and gas formations likely to be hydraulically fractured. In assessing these protections, the BLM cannot presume that state and federal regulations will protect groundwater, because of the shortcomings and industry noncompliance described above.

Third, the BLM may not defer its analysis until the APD stage because information is readily available at the lease sale stage to evaluate groundwater risks. *See WildEarth Guardians*, 457 F. Supp. 3d at 888. As noted above, data is available to identify the depth and quality of aquifers in the area of proposed leasing. The BLM can look to nearby existing oil and gas wells for a forecast of the likely depth of new wells and whether those wells present concerns over adequate casing and cementing. A failure to conduct such an analysis would violate NEPA. *See id.*

g. The BLM must properly analyze methane emissions that would result from this lease sale.

The BLM must take the requisite hard look at the impacts of methane emissions that will result from development of and production on these lease parcels, including the economic, public health, and public welfare impacts of venting and flaring. *See, e.g.*, ENVIRONMENTAL DEFENSE FUND, FLARING AERIAL SURVEY RESULTS (2021) [Ex. 11], <https://www.permianmap.org/flaring-emissions/>. In 2019 alone, venting or flaring accounted for roughly 150 billion cubic feet of methane, resulting in the loss of over \$50 million in federal royalty revenue. This waste also means lost royalty revenues for taxpayers and Tribes. An analysis conducted by Synapse Energy Economics determined the value of lost gas in the form of: (1) lost royalties; (2) lost state revenue from taxes; and (3) lost revenue from wasted natural gas that could be used for other purposes. The study found that \$63.3 million in royalties, \$18.8 million in state revenue from taxes (from the top six states), and \$509 million in gas value was lost due to venting, flaring, and leaks on federal and Tribal lands. OLIVIA GRIOT ET AL., ONSHORE NATURAL GAS OPERATIONS ON FEDERAL AND TRIBAL LANDS IN THE UNITED STATES: ANALYSIS OF EMISSIONS AND LOST REVENUE, SYNAPSE ENERGY ECONOMICS INC. at 3 (Jan. 20, 2023) [hereinafter GRIOT ET AL.] [Ex. 12], https://blogs.edf.org/energyexchange/files/2023/01/EMBARGOED_EDF-TCS_Public_Lands_Analysis.pdf. The report found that, in 2019, leaks accounted for 46% and flaring for 54% of lost gas. *See id.* at 23.

Venting and flaring on Tribal and federal public lands has significant health impacts on frontline and fence line communities. *See e.g.*, Jeremy Proville et al., *The demographic characteristics of populations living near oil and gas wells in the USA*, 44 POPULATION AND ENV'T 1 (2022) [Ex. 13], <https://doi.org/10.1007/s11111-022-00403-2>. Proximity to oil and gas infrastructure creates disproportionate adverse health risks and impacts on Indigenous communities in particular. *See, e.g., id.* at 2–5. According to an Environmental Defense Fund (EDF) analysis, roughly 1,100 adults with asthma, 800 adults with chronic obstructive pulmonary disease, 700 adults with coronary heart disease, and 400 adults who have experienced a stroke live within a half mile of a flaring well. *See* GRIOT ET AL. Another study links flaring to shorter gestation and reduced fetal growth. *See* Lara J. Cushing et al., *Flaring from Unconventional Oil and Gas Development and Birth Outcomes in the Eagle Ford Shale in South Texas*, 128 ENVTL. HEALTH PERSPECTIVES 077003-1, 077003-1 to 077003-8 (2020) [Ex. 14]. Reducing waste from flaring on federal and Tribal lands would lessen these harms. Therefore, the BLM should not issue additional oil and gas leases until the agency addresses waste on Tribal and federal public lands.

h. The BLM must analyze the impacts of oil and gas leasing on public health.

Protecting public health is fundamental to the underlying purpose of NEPA, which includes “stimulat[ing] the health and welfare of man” and mandates that agencies consider the degree to which their proposed actions affect public health or safety. 42 U.S.C § 4321. NEPA requires federal agencies “to use all practicable means, consistent with other essential considerations of national policy” to “assure for all Americans safe, healthful, productive and aesthetically and culturally pleasing surroundings.” *Id.* § 4331(b). To protect public health and

promote informed agency decision-making, transparency, and public participation, NEPA imposes “action-forcing procedures ... requir[ing] that agencies take a hard look at environmental consequences,” *Robertson*, 490 U.S. at 350, which includes public health.

Oil and gas development poses myriad public health impacts. An extensive and ever-growing body of peer-reviewed research has shown what people living near oil and gas operations already know firsthand: proximity to drilling operations, including hydraulic fracturing, and other oil and gas facilities is linked to adverse health risks and impacts. These risks and impacts include but are not limited to:

- Reproductive harms, including birth defects, low birth weight, preterm births, and miscarriages;
- Respiratory health effects, including asthma, lung disease, breathing difficulty, and, most recently, increased vulnerability to COVID-19;
- Eye, skin, and throat irritation and rashes;
- Cardiovascular effects, including higher blood pressure and other indicators of, or precursors to, heart disease;
- Possible disruption of the endocrine system (a system of glands producing hormones that regulate a variety of functions in the body, including metabolism, growth and development, reproduction, sleep, and mood);
- Cancer (lung cancer and other types of cancer);
- Motor vehicle injuries and fatalities, and other health and safety risks associated with increased vehicle traffic (and the air pollutants it emits) from oil and gas development;
- Injuries and fatalities from explosions, fires, spills, and leaks; and
- Trauma and psychological stress.

See, e.g., ZOTERO, PHYSICIANS, SCIENTISTS, AND ENGINEERS FOR HEALTHY ENERGY, REPOSITORY FOR OIL AND GAS ENERGY RESEARCH (ROGER) DATABASE, HEALTH, https://www.zotero.org/groups/248773/repository_for_oil_and_gas_energy_research_roger_-_pse_healthy_energy/collections/SASKSKDG (last visited Apr. 21, 2025).

The ROGER database contains the best available scientific information, which shows the voluminous public health risks and impacts associated with oil and gas activities that result from the BLM’s leasing decisions.¹⁵ Multiple peer-reviewed papers have identified adverse health effects and risks arising from exposure to unconventional oil and gas drilling operations, even within a large radius of residences, potentially up to 10 miles. See Janet Currie et al., *Hydraulic Fracturing and Infant Health: New Evidence from Pennsylvania*, 3 SCIENCE ADVANCES 1, 5 (Dec. 13, 2017) [Ex. 19] (finding evidence of negative health effects of in utero exposure to

¹⁵ See, e.g., Longxiang Li et al., *Exposure to unconventional oil and gas development and all-cause mortality in Medicare beneficiaries*, 7 NATURE ENERGY 177 (2022) [Ex. 15]; Zoya Banan & Jeremy M. Gernand, *Emissions of particulate matter due to Marcellus Shale gas development in Pennsylvania: Mapping the implications*, 148 ENERGY POLICY 1 (2021) [Ex. 16]; Katie Jo Black et al., *Economic, Environmental, and Health Impacts of the Fracking Boom*, 13 ANNUAL REVIEW OF RESOURCE ECONOMICS 311 (2021) [Ex. 17]; R.Z. Witter et al., *Occupational exposures in the oil and gas extraction industry: state of the science and research recommendations*, AMERICAN JOURNAL OF INDUSTRIAL MEDICINE (2014) [Ex. 18].

fracking sites within 3 km, or about 1.86 miles, of a mother's residence, with the largest health impacts seen within 1 km, or about 0.62 miles). For example, one study found that babies whose mothers lived in close proximity to multiple oil and gas wells were 30% more likely to be born with heart defects than babies born to mothers who did not live close to oil and gas wells. *See* Lisa M. McKenzie et al., *Birth Outcomes and Maternal Resident Proximity to Natural Gas Development in Rural Colorado*, 122 ENVIRONMENTAL HEALTH PERSPECTIVES 412, 414 (April 2014) [Ex. 20]. Other adverse health impacts documented among residents living near drilling and fracking operations include increased reproductive harms, asthma attacks, higher rates of hospitalization, ambulance runs, emergency room visits, self-reported respiratory problems and rashes, motor vehicle fatalities, trauma, and drug abuse. *See* CONCERNED HEALTH PROFESSIONALS OF NY, PHYSICIANS FOR SOCIAL RESPONSIBILITY, COMPENDIUM OF SCIENTIFIC, MEDICAL, AND MEDIA FINDINGS DEMONSTRATING RISKS AND HARMS OF FRACKING (UNCONVENTIONAL GAS AND OIL EXTRACTION) at 27 (6th ed. 2019) [Ex. 21]. Another recent study found that fracking and drilling near people's homes "drives stress experiences that go beyond the mere presence of industrial land uses in neighborhoods" and identified two key institutional barriers driving negative mental health impacts for people living near unconventional oil and gas (UOG) production—namely: (1) uncertainty, due to inaccessible, transparent information about environmental and public health risks; and (2) powerlessness to meaningfully impact regulatory or zoning processes. *See* Stephanie A. Malin, *Depressed democracy, environmental injustice: Exploring the negative mental health implications of unconventional oil and gas production in the United States*, 70 ENERGY RESEARCH & SOCIAL SCIENCE 1, 2 (2020) [Ex. 22]. In turn, "these institutional barriers make UOG production a chronic stressor – which can be more insidious, negative, and, significantly, can generate longer-term mental health impacts such as self-reported depression." *Id.* (citation omitted). The BLM must take a hard look at the adverse health risks and effects associated with proximity to oil and gas activity and facilities and disclose them to the public. The agency should disclose, at the least, how many residences are within approximately 1, 5, and 10 miles of the proposed leases.

The BLM must take a hard look not only at direct health impacts and proximity-related health impacts of oil and gas development, but also at cumulative health risks and impacts. Cumulative health risks and impacts can arise not only from multiple pollutant exposures, and cumulative pollution exposures over time, but also from compounding structural, social, and economic factors, many of which are rooted in systemic inequities and injustices. To adequately analyze human health impacts, the BLM should incorporate findings from regionally relevant health impact assessments (HIAs). An HIA is a preventative health tool that anticipates the human health impacts of new or existing development projects, programs, or policies. The overall goal of this type of assessment is to identify and minimize negative health effects of a particular action, such as oil and gas development and production.

i. The BLM should thoroughly analyze the impacts of oil and gas leasing on environmental justice.

The BLM must analyze the lease sale's impact on environmental justice, and not only in relation to health. Courts have repeatedly held that agencies must take a hard look at

environmental justice pursuant to NEPA.¹⁶ The agency's failure to undertake such analysis would be arbitrary and capricious.

IV. The BLM must consider a range of reasonable alternatives.

The BLM must evaluate a range of reasonable alternatives in the NEPA document prepared for this lease sale. The range of alternatives is the heart of a NEPA document because “[w]ithout substantive, comparative environmental impact information regarding other possible courses of action, the ability of [a NEPA analysis] to inform agency deliberation and facilitate public involvement would be greatly degraded.” *New Mexico ex rel. Richardson*, 565 F.3d at 683, 708. NEPA analysis must cover a reasonable range of alternatives so that an agency can make an informed choice from the spectrum of reasonable options. An environmental review offering a choice between leasing every parcel nominated and leasing nothing at all under the no-action alternative fails to present a reasonable range of alternatives. A middle-ground alternative must consider deferring at least some parcels.

Such an alternative is particularly important when considering impacts to specific resources, such as sage-grouse habitat. For this lease sale, the BLM must evaluate an alternative that would defer leasing parcels in PHMA and GHMA, along with deferrals based on other use conflicts. Deferring parcels with such conservation conflicts—and certainly parcels that the BLM itself designates as having low preference for leasing—is precisely what the Leasing Rule contemplates.

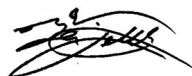
V. The BLM must properly evaluate mitigation measures.

NEPA requires BLM to include a discussion of possible mitigation measures in an environmental assessment. *See WildEarth Guardians v. U.S. Fish & Wildlife Serv.*, 784 F.3d 677, 698 (10th Cir. 2015) (ruling that an EA must “explore mitigation measures where it acknowledges the possibility that the agency action will cause environmental harm”). The BLM must, in order, seek to avoid impacts, minimize impacts, and, only if those approaches are insufficient to fully mitigate the impacts, appropriately and sufficiently offset any remaining impacts.

VI. Conclusion.

We appreciate your consideration of these comments. Should you have any questions, please do not hesitate to contact us.

Respectfully submitted,



¹⁶ *See, e.g., Friends of Buckingham v. State Air Pollution Control Bd.*, 947 F.3d 68, 87 (4th Cir. 2020); *Latin Ams. for Social & Econ. Dev. v. Fed. Highway Admin.*, 756 F.3d 447, 465 (6th Cir. 2014); *Coliseum Square Ass’n, Inc. v. Jackson*, 465 F.3d 215, 232 (5th Cir. 2006); *Cmtys. Against Runway Expansion, Inc. v. FAA*, 355 F.3d 678, 689 (D.C. Cir. 2004).

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Exhibit Index to TWS et al. Comments on Parcels for the Wyoming Bureau of Land Management 2025 Fourth Quarter Competitive Oil & Gas Lease Sale (DOI-BLM-WY-0000-2025-0002-EA)

<u>Appendix</u>	<u>Exhibit No.</u>	<u>Title/Description</u>
A	1a	PETER S. COATES ET AL., RANGE-WIDE GREATER SAGE-GROUSE HIERARCHICAL MONITORING FRAMEWORK: IMPLICATIONS FOR DEFINING POPULATION BOUNDARIES, TREND ESTIMATION, AND A TARGETED ANNUAL WARNING SYSTEM (March 2021) (Part 1)
B	1b	PETER S. COATES ET AL., RANGE-WIDE GREATER SAGE-GROUSE HIERARCHICAL MONITORING FRAMEWORK: IMPLICATIONS FOR DEFINING POPULATION BOUNDARIES, TREND ESTIMATION, AND A TARGETED ANNUAL WARNING SYSTEM (March 2021) (Part 2)
C	2	KEVIN DOHERTY ET AL., A SAGEBRUSH CONSERVATION DESIGN TO PROACTIVELY RESTORE AMERICA’S SAGEBRUSH BIOME: U.S. GEOLOGICAL SURVEY OPEN-FILE REPORT 2022–1081 (Sept. 22, 2022)
C	3	Adele K. Reinking et al., <i>Across Scales, Pronghorn Select Sagebrush, Avoid fences, and Show Negative Responses to Anthropogenic Features in Winter</i> , 10(5) ECOSPHERE 1 (May 2019)
C	4	Ellen O. Aikens et al., <i>Industrial energy development decouples ungulate migration from the green wave</i> , 6 NATURE ECOLOGY. & EVOLUTION 1733 (Oct. 2022)
C	5	U.S. Dep’t of the Interior, Informational Memorandum on DOI comparison of available estimates of social cost of greenhouse gases (SC-GHG) (Oct. 16, 2024)
D	6	U.S. Environmental Protection Agency, Hydraulic Fracturing for Oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States, EPA/600/R-16/236fa (Dec. 2016) (Part 1)
E	7	Gayathri Vaidyanathan, <i>Fracking Can Contaminate Drinking Water</i> , SCI. AM. (Apr. 4, 2016)
E	8	Dominic C. DiGiulio & Robert A. Jackson, <i>Impact to Underground Sources of Drinking Water and Domestic Wells from Production Well Stimulation and Completion Practices in the Pavillion, Wyoming Field</i> , 50 ENVTL. SCI. & TECH. 4524 (Mar. 29, 2016)
E	9	REBECCA TISHERMAN, ET AL., EXAMINATION OF GROUNDWATER RESOURCES IN AREAS OF WYOMING PROPOSED FOR THE JUNE 2022 BLM LEASE SALE (May 12, 2022)
E	10	DOMINIC DIGIULIO, EXAMINATION OF GROUNDWATER RESOURCES IN AREAS OF MONTANA PROPOSED FOR THE MARCH 2018 BLM LEASE SALE (Dec. 22, 2017)
E	11	ENVIRONMENTAL DEFENSE FUND, FLARING AERIAL SURVEY RESULTS (2021)

E	12	OLIVIA GRIOT ET AL., ONSHORE NATURAL GAS OPERATIONS ON FEDERAL AND TRIBAL LANDS IN THE UNITED STATES: ANALYSIS OF EMISSIONS AND LOST REVENUE, SYNAPSE ENERGY ECONOMICS INC. (Jan. 20, 2023)
E	13	Jeremy Proville et al., <i>The demographic characteristics of populations living near oil and gas wells in the USA</i> , 44 POPULATION AND ENV'T 1 (2022)
E	14	Lara J. Cushing et al., <i>Flaring from Unconventional Oil and Gas Development and Birth Outcomes in the Eagle Ford Shale in South Texas</i> , 128 ENVTL. HEALTH PERSPECTIVES 077003-1 (2020)
E	15	Longxiang Li et al., <i>Exposure to unconventional oil and gas development and all-cause mortality in Medicare beneficiaries</i> , 7 NATURE ENERGY 177 (2022)
E	16	Zoya Banan & Jeremy M. Gernand, <i>Emissions of particulate matter due to Marcellus Shale gas development in Pennsylvania: Mapping the implications</i> , 148 ENERGY POLICY 1 (2021)
E	17	Katie Jo Black et al., <i>Economic, Environmental, and Health Impacts of the Fracking Boom</i> , 13 ANNUAL REVIEW OF RESOURCE ECONOMICS 311 (2021)
E	18	R.Z. Witter et al., <i>Occupational exposures in the oil and gas extraction industry: state of the science and research recommendations</i> , AMERICAN JOURNAL OF INDUSTRIAL MEDICINE (2014)
E	19	Janet Currie et al., <i>Hydraulic Fracturing and Infant Health: New Evidence from Pennsylvania</i> , 3 SCIENCE ADVANCES 1 (Dec. 13, 2017)
E	20	Lisa M. McKenzie et al., <i>Birth Outcomes and Maternal Resident Proximity to Natural Gas Development in Rural Colorado</i> , 122 ENVIRONMENTAL HEALTH PERSPECTIVES 412 (April 2014)
E	21	CONCERNED HEALTH PROFESSIONALS OF NY, PHYSICIANS FOR SOCIAL RESPONSIBILITY, COMPENDIUM OF SCIENTIFIC, MEDICAL, AND MEDIA FINDINGS DEMONSTRATING RISKS AND HARMS OF FRACKING (UNCONVENTIONAL GAS AND OIL EXTRACTION) (6th ed. 2019)
E	22	Stephanie A. Malin, <i>Depressed democracy, environmental injustice: Exploring the negative mental health implications of unconventional oil and gas production in the United States</i> , 70 ENERGY RESEARCH & SOCIAL SCIENCE 1 (2020)