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Western Environmental Law Center

October 20, 2017

Sent via Electronic Mail

U.S. Bureau of Land Management
Farmington Field Office
Attn: Mark Ames & Katie White Bull
6251 N. College Blvd., Suite 1A
Farmington, New Mexico 87402
Email: BLM_NM_FFO_Comments@blm.gov
Email: NMLeasesalecomments@blm.gov

Re: Draft EA Comments – Farmington Field Office, March 2018 Oil & Gas Lease Sale

Dear Mr. Ames and Ms. White Bull:

The Western Environmental Law Center, along with Amigos Bravos, Chaco Alliance, Diné Citizens Against Ruining Our Environment, Natural Resources Defense Council, San Juan Citizens Alliance, Sierra Club, and WildEarth Guardians (together "Citizen Groups"), submit the following Draft Environmental Assessment ("EA") Comments regarding the Bureau of Land Management ("BLM") Farmington Field Office ("FFO") March 2018 Oil and Gas Lease Sale. Industry submitted expressions of interest for 35 parcels, and the BLM's Environmental Assessment ("EA"), DOI-BLM-NM-0000-2017-0006-EA, evaluates the impact of leasing these 35 parcels (6,792.440 acres). But, the BLM has decided to defer 10 of these parcels. Thus, for the March 2018 lease sale, the BLM is proposing to lease 25 parcels (4,434.37 acres). Of these, 8 parcels are in the Greater Chaco area, south and west of Counselor, New Mexico, 12 parcels are directly north of Cuba, and 5 parcels are northwest of Farmington. Additionally, 10 of the parcels are located on surface administered by the Bureau of Indian Affairs ("BIA") with federal mineral estate below.

The **Western Environmental Law Center** ("WELC") uses the power of the law to defend and protect the American West's treasured landscapes, iconic wildlife and rural communities. WELC combines legal skills with sound conservation biology and environmental science to address major environmental issues in the West in the most strategic and effective manner. WELC works at the national, regional, state, and local levels; and in all three branches of government. WELC integrates national policies and regional perspective with the local knowledge of our 100+ partner groups to implement smart and appropriate place-based actions.

Amigos Bravos is a statewide river conservation organization guided by social justice principles. Amigos Bravos' mission is to protect and restore the waters of New Mexico, and ensure that those waters provide a reliable source of clean water to the communities and farmers that depend on them, as well as a safe place to swim, fish, and go boating. Amigos Bravos works locally, statewide, and nationally to ensure that the waters of New Mexico are protected by the best policy and regulations possible.

The **Chaco Alliance** is a grassroots citizens group dedicated to protecting and preserving Chaco Culture National Historical Park. We are interested in all threats to the park and its surrounding landscape, especially the threat created by energy development in the area.

Diné Citizens Against Ruining Our Environment ("Diné C.A.R.E.") is an all-Navajo organization comprised of a federation of grassroots community activists in Arizona, New Mexico and Utah who strive to educate and advocate for our traditional teachings derived from our Diné Fundamental Laws. Our goal is to protect all life in our ancestral homeland by empowering local and traditional people to organize, speak out, and determine the outlook of the environment through civic involvement and engagement in decision-making process relating to tribal development.

The **Natural Resources Defense Council** ("NRDC") works to safeguard the earth—its people, its plants and animals, and the natural systems on which all life depends. We combine the power of more than three million members and online activists with the expertise of some 500 scientists, lawyers, and policy advocates across the globe to ensure the rights of all people to the air, the water, and the wild. NRDC has more than 5,150 members in New Mexico, and has been working in the state for over four decades.

Founded in 1986, **San Juan Citizens Alliance** ("SJCA") organizes people to protect our water and air, our lands, and the character of our rural communities in the San Juan Basin. SJCA focuses on four program areas, including the *San Juan Basin Energy Reform Campaign*, which ensures proper regulation and enforcement of the oil, gas, and coal industry and transitioning to a renewable energy economy. SJCA has been active in BLM and National Forest oil and gas issues in the San Juan Basin since the early 1990s, and has commented on virtually every multi-well drilling program, lease sale, and programmatic environmental review conducted in the region by the federal land management agencies since the early 1990s. SJCA's members live, work, and recreate throughout the San Juan Basin and San Juan Mountains. SJCA's members' health, use and enjoyment of this region is directly impacted by the decisions identified in this protest.

The **Sierra Club** was founded in 1892 and is the nation's oldest grassroots environmental organization. The Sierra Club is incorporated in California, and has over 800,000 members nationwide and is dedicated to the protection and preservation of the environment. The Sierra Club's mission is to explore, enjoy and protect the wild places of the earth; to practice and promote the responsible use of the earth's ecosystems and resources; and to educate and enlist humanity to protect and restore the quality of the natural and human environments. The Sierra Club has a New Mexico chapter, known as the Rio Grande chapter, with members that live in and use this area for recreation such as hiking, climbing,

backpacking, camping, fishing and wildlife viewing, as well as for business, scientific, spiritual, aesthetic and environmental purposes.

WildEarth Guardians protects and restores wildlife, wild places, wild rivers, and the health of the American West. As part of its Climate and Energy Program, Guardians works to advance clean energy and expose the true cost of fossil fuels. Guardians works to protect and restore the Great Chaco Region in northwestern New Mexico in order to safeguard its cultural heritage, natural values, communities, and open spaces.

Citizen Groups have consistently participated in BLM decisionmaking for prior oil and gas leasing in the Greater Chaco landscape and areas in and adjacent to the Santa Fe National Forest and, therefore, incorporate by reference our prior administrative comments, protests, and exhibits[1] submitted for these prior lease sales, including: October 2014 Scoping Comments (March 24, 2014), Draft Environmental Assessment Comments (May 28, 2014), and Protest (August 14, 2014), January 2015 Draft Environmental Assessment Comments (September 23, 2014) and Protest (November 19, 2014), October 2016 Scoping Comments (March 14, 2016), January 2017 Scoping Comments (June 17, 2016), Draft Environmental Assessment Comments (September 2, 2016), and Protest (December 6, 2016). Because the parcels at issue in this sale are adjacent to and connected to these past sales and, in some cases, specific parcels have previously been offered and deferred and/or postponed by the FFO, all prior administrative engagement is properly before the agency and should be considered and included in the administrative record for this lease sale. These incorporated comments and exhibits offer detailed technical information, expert reports, and legal analysis that the agency is required to consider in its decisionmaking process for the proposed action. *See Forest Guardians v. U.S. Fish and Wildlife Service*, 611 F.3d 692, 717 (10th Cir. 2010) ("The purpose behind NEPA is to ensure that the agency will only reach a decision on a proposed action after carefully considering the environmental impacts of several alternative courses of action and *after taking public comment into account*.").

As discussed in further detail below, Citizen Groups request that the BLM refrain from offering any of the parcels up for lease until the agency completes its requirements under the Federal Land Policy and Management Act ("FLPMA"), 43 U.S.C. §§ 1701–1787 and the National Environmental Policy Act ("NEPA"), 42 U.S.C. §§ 4321–4370h.

I. The BLM Cannot Lease the March 2018 Parcels Until the BLM Completes the Mancos Shale/Gallup Formation RMP and EIS.

According to the BLM, "[l]and use planning forms the basis of, and is essential to, everything that the [BLM] does in caring for America's public lands." Resource Management Planning Final Rule, 81 Fed. Reg. 89,580, 89,580 (Dec. 12, 2016). The duty to develop land use plans stems from the Federal Land Policy and Management Act, ("FLPMA"), which requires that "[t]he Secretary [of the Interior] shall, with public involvement and consistent with the terms

[1] Exhibits for Citizen Groups' past comments and protests are submitted on a separate DVD. Exhibits for the March 2018 comments are also on this DVD.

and conditions of this Act, develop, maintain, and, when appropriate, revise land use plans which provide by tracts or areas for the use of the public lands." 43 U.S.C. § 1712(a).

The BLM fulfills this mandate by developing Resource Management Plans ("RMPs"). When the BLM issues a new RMP or amends a RMP, the agency must comply with the requirements of NEPA. *See* 43 C.F.R. §§ 1601.0–6. Thus, the BLM is required to issue an Environmental Impact Statement ("EIS") with each RMP. *Id*.

The applicable land use plan for the March 2018 lease sale is the 2003 Farmington Resource Management Plant ("RMP") because the Mancos Shale/Gallup Formation RMP Amendment is currently incomplete. *See* EA at 8. Thus, for the lease sale, the "[a]nalysis of projected surface disturbance impacts . . . [is] based on potential current well densities of five horizontal wells per 640 acres as listed in the Reasonable Foreseeable Development (RFD) Scenario developed for the 2003 Farmington RMP, updated 2014 and 2015." EA at 9. However, because the BLM relies on the outdated 2003 RMP and RFD, the BLM cannot demonstrate that impacts associated with the proposed leasing will not be significant, or that leasing will otherwise sufficiently protect resources in the Farmington Field Office ("FFO"). This is due to the fact that, by the BLM's own admission, the RMP and RFD do not account for the environmental impacts of horizontal drilling and multi-stage hydraulic fracturing of the Mancos Shale formation. Yet by leasing these parcels, the BLM is poised to facilitate just this kind of unforeseen development, despite any analysis as to the actual environmental impacts on both project and programmatic level.

NEPA regulations established by the Council of Environmental Quality ("CEQ") specifically prohibit an agency from taking any actions that could undermine that decision-making process, while work on a programmatic EIS "is in progress and the action is not covered by an existing program statement." *See* 40 C.F.R. § 1506.1(c). Indeed, the whole point of NEPA is to study the impact of an action on the environment *before* the action is taken. *See Conner v. Burford,* 848 F.2d 1441, 1452 (9th Cir. 1988) (NEPA requires that agencies prepare an EIS before there is "any irreversible and irretrievable commitment of resources").

Furthermore, where an "[i]nterim action prejudices the ultimate decision on the program," NEPA forbids the action. 40 C.F.R. §§ 1506.1(c)(1)-(3). An action prejudices the outcome "when it tends to determine subsequent development or limit alternatives." *Id.* Proceeding to lease 25 parcels within the FFO—or any other major Federal action impacting resources in the planning area—is impermissible due to the inherent prejudice that this action will cause to the pending Mancos Shale RMP. Indeed, as acknowledged in the FFO's EA: "After a lease has been issued, the lessee has the right to use as much of the leased land as necessary to explore (or drill) for, extract, remove, and dispose of oil and gas deposits located under the leased lands with exceptions for restrictions that may be imposed consistent with the standard lease terms and stipulations and notices attached to the lease." EA at 7. Clearly, when the oil and gas lease rights are conveyed following the sale, lessees have a right to drill, and the impact on the environment from the exercise of those rights cannot be undone, which is exactly the situation NEPA disallows—allowing new activity that limits alternatives in the future. Indeed, once this lease sale is held, the agency will no longer be able to consider an alternative in the Mancos Shale RMP that disallows oil and gas development on these parcels, which the agency's

subsequent analysis may deem as necessary.

Additionally, although the FFO consistently asserts that any impacts from the lease sale would be "linked to undetermined future levels of lease development," EA at 55, it would be entirely disingenuous for the agency to attempt to segregate this lease sale from the "shale oil play" that has motivated the Mancos Shale RMP and RFD Amendment. For one thing, by the BLM's own admission, the entire purpose of offering one parcel in the proposed lease sale is to facilitate their development in order to address drainage of the Mancos Shale that is occurring from neighboring drilling and production activities. *See* EA at 54. Further, the BLM admits that the lease parcels "are within the high potential area delineated by the RFD, where up to 1,600 potential new Mancos/Gallup wells are project to be drilled." EA at 55. Clearly, development of the proposed leases for the purpose of developing the Mancos Shale for oil is not speculative. Indeed, it is the entire purpose for undertaking proposed leasing.

The agency's failure to anticipate the new "oil boom" in the San Juan Basin is precisely why updated planning documents are needed. The agency admits:

> Oil and gas development may include constructing a well pad, access road, pipeline, and facilities, drilling a well using conventional pit system or closed-loop system, hydraulically fracturing the well, installing pipelines and/or hauling produced fluids, regularly monitoring the well, and competing work-over tasks throughout the life of the well. In the FFO typically, all of these actions are undertaken during development of an oil or gas well: it is reasonably foreseeable that they may occur on leased parcels.

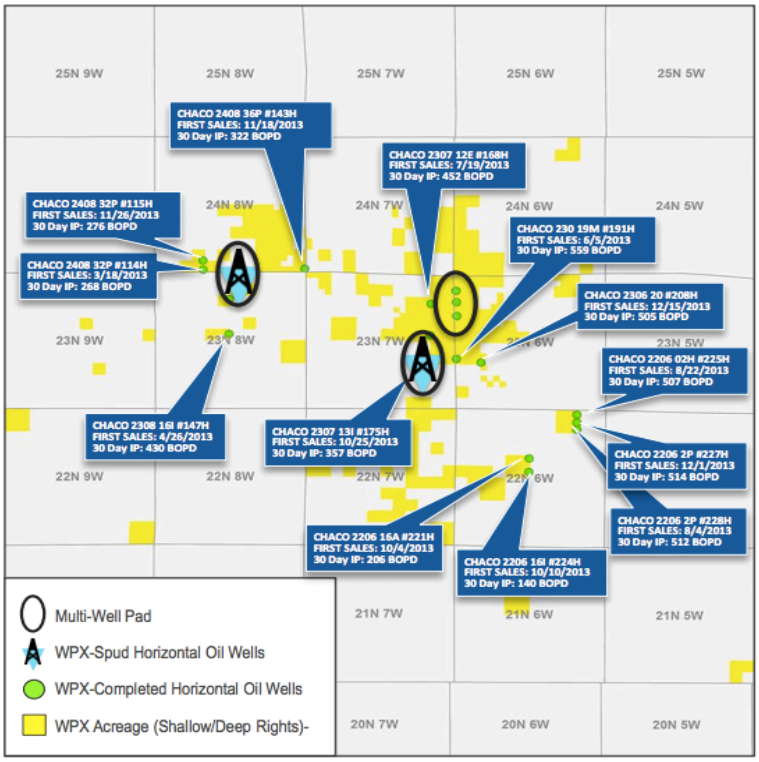
EA at 19. By the agency's own admission, it is foreseeable that the mere act of leasing these parcels will result in a significant levels of development. Moreover, all of these parcels are included in the planning area and reasonably foreseeable development analysis area for the Mancos RMPA. Therefore, proceeding with the leasing of these parcels will prejudice the pending Mancos Shale RMP and EIS process, in direct violation of NEPA.

The potential for foreseeable development is underscored by the fact that the BLM has already approved over 350 APDs, including 30 news wells since February 6, 2017,[2] in the Mancos Shale area, and is weighing approval of many additional APDs in this area. Even the companies themselves are touting past development or potential development of the Mancos shale. For example, BP announced on August 7, 2017, that it had drilled a natural gas well into the Mancos Shale that would be "a significant new source of U.S. gas supply," and that "[t]he well averaged 12.9 million cubic feet a day in its first month, the highest output achieved in the San Juan Basin in 14 years."[3] In addition, although now outdated, WPX also confirmed in a 2014 presentation that it has completed and spudded numerous Mancos shale wells using horizontal

[2] *See* Jeremy Nichols, *Trump to Navajo Nation: Screw You*, WildEarth Guardians (Apr. 29, 2017), https://climatewest.org/2017/04/29/trump-to-navajo-nation-screw-you/.

[3] Ryan Collins, *BP Unlocks a New Shale Gusher in New Mexico*, Bloomberg (Aug. 7, 2017), https://www.bloomberg.com/news/articles/2017-08-07/little-known-new-mexico-shale-play-gives-bp-big-time-results.

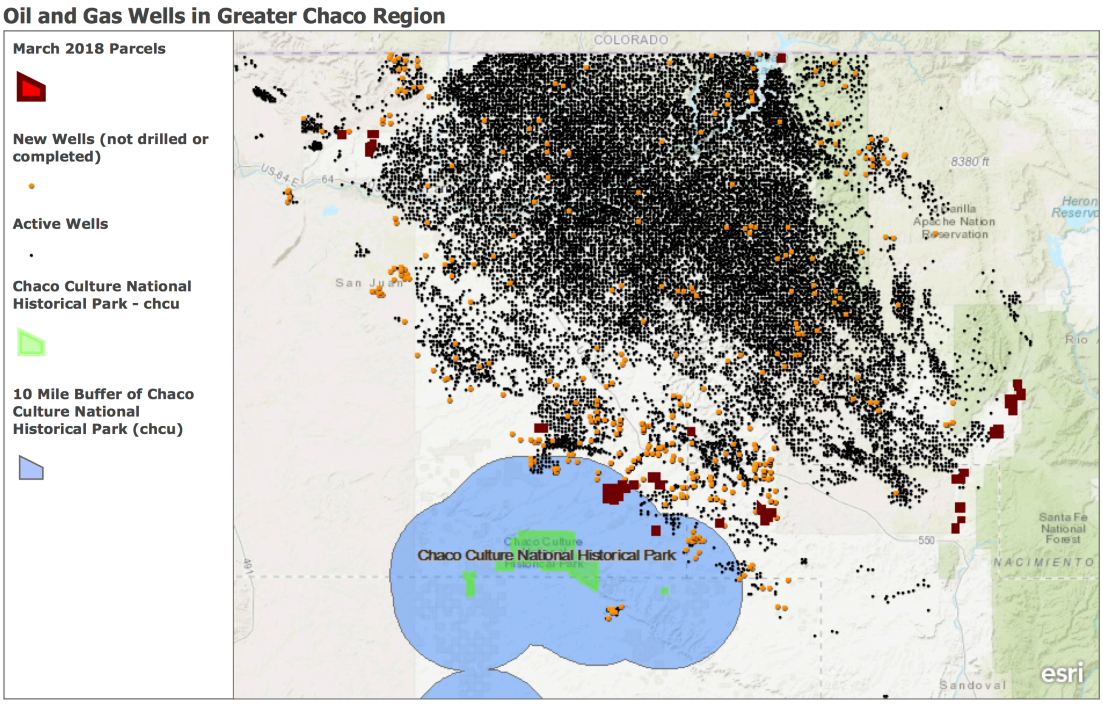
drilling in the area of the proposed leases.[4] The map below, from page 11 of WPX's presentation, illustrates the extent of Mancos shale development in the area:



WPX Energy Map of Mancos Shale Development in the Area of the Proposed Leasing.

A simple map of this area prepared by WildEarth Guardians confirms the massive scale of development, including wells that appear to clearly target the Mancos shale in the vicinity of the proposed lease parcels. The map shows the lease parcels in blue and the proximity of wells that have been recently drilled by Encana, WPX, and LOGOS. This map further underscores that development of the proposed leases is not remotely speculative, and that the BLM has the means to fully analyze and assess impacts associated with Mancos shale drilling.

[4] *See* WPX Energy, *Operational Update* (2014), available at: http://www.wpxenergy.com/media/YE2013_EarningsPresentation_Final.pdf.



Map of Proposed Lease Parcels and Mancos Shale Wells.

As provided, while CEQ regulations require a moratorium on any further leasing until the Mancos Shale RMPA and EIS are completed, such a decision is also well within the discretion of the FFO. As provided in BLM Instruction Memorandum No. 2010-117 (May 17, 2010):

> As outlined in the Land Use Planning Handbook (H-1601-1), the Resource Management Plan (RMP) underlies fluid minerals leasing decisions. Through RMP effectiveness monitoring and periodic RMP evaluations, state and field offices will examine resource management decisions to determine whether the RMPs adequately protect important resource values in light of changing circumstances, updated policies, and new information (H-1601-1, section V, A, B). The results of such reviews and evaluations may require field office resource information updates and land use plan maintenance, amendment, or revision. In some cases state and field office staff may determine that the public interest would be better served by further analysis and planning prior to making any decision whether or not to lease.

(emphasis added). There can be no better example than the present situation of where the public interest would be better served by completing the Mancos Shale RMP and EIS *before* deciding whether it is appropriate to lease additional public lands. According to BLM oil and gas statistics, there are currently 4,478,959 acres of leased land "in effect" in New Mexico, with approximately 84% (3,761,154 acres) in production. *See* BLM, Oil and Gas Statistics by Year for Fiscal Years 1988–2016, available at https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/oil-and-gas-statistics. Indeed, more than 90% of available public lands in the FFO have

already been leased. Before additional public lands are sold to oil and gas industry and committed to development, the agency must understand the additional impacts of developing the Mancos Shale/Gallup formation.

Finally, the BLM's dismissal of instituting a moratorium is especially disrespectful in light of the fact that on February 6, 2017 Navajo Nation issued a call for a moratorium on "fracking-related activities such as multi-stage hydraulic fracturing and horizontal drilling and lease sales and permit approvals in the Mancos Shale/Gallup formation in the greater Chaco area until such time as the amendment to the resource management plan is completed and an environmental impact statement is finalized."[5] The All Pueblo Council of Governors also issued a formal resolution calling for a moratorium on September 27, 2017.[6]

II. The BLM Cannot Rely on the 2003 RMP EIS to Justify the Proposed Leasing or a Finding of No Significant Impact.

While the FFO is to be commended for acknowledging the inability of the 2003 RMP/EIS and RFD to continue serving their necessary planning function and beginning the RMP amendment process, at the same time, the BLM cannot simultaneously rely on the 2003 RMP/EIS and RFD to justify the March 2018 lease sale. *See* EA at 21 ("The BLM determined that the RMP resource protections provide adequate consideration of resource values and potential for adverse impacts during evaluation at the leasing stage."); *see also* EA at 55 ("The anticipated indirect impacts of horizontal drilling and multi-stage fracking are consistent with the impacts considered in the 2003 RMP."). Furthermore, BLM's EA explicitly tiers to the analysis contained in the 2003 RMP/EIS, EA at 9, which, as explained in the agency's Federal Register Notice for the Mancos Shale RMP, is no longer capable of guiding such decision-making:

> As full-field development occurs, especially in the shale oil play, additional impacts may occur that previously were not anticipated in the RFD or analyzed in the current 2003 RMP/EIS, which will require an EIS-level plan amendment and revision of the RFD for complete analysis of the Mancos Shale/Gallup Formation.

79 Fed. Reg. 10,548 (Feb. 25, 2014). The inability of the current RMP/EIS and RFD to support the proposed leasing, or to provide any reasonable analysis from which to tier, is further underscored by the details of its shortcomings.

For one thing, the 2003 Farmington RMP never contemplated commercially viable development of the Mancos shale, whether for oil or gas, utilizing horizontal drilling techniques. This is significant because all indications are that the proposed leases are meant to facilitate

[5] Exhibit 1, Letter from the Navajo Nation, *Concerns Regarding Chaco Canyon Cultural Historic Park*, available at http://www.sanjuancitizens.org/wp-content/uploads/2017/03/NN-Moratorium-request-2017-02-23-.pdf.

[6] Exhibit 2, Rebecca Moss, *Tribes Ask Feds to Halt Drilling Leases in Chaco Region*, Santa Fe New Mexican, http://www.santafenewmexican.com/news/local_news/tribes-ask-feds-to-halt-drilling-leases-in-chaco-region/article_414de61a-814b-59f7-8537-d91c5dbadf6c.html.

horizontal drilling of the Mancos shale. The RFD (which was actually prepared in 2001, two years prior to the adoption of the RMP) stated:

> Horizontal drilling is possible but not currently applied in the San Juan Basin due to poor cost to benefit ratio. If horizontal drilling should prove economically and technically feasible in the future, the next advancement in horizontal well technology could be drilling multi-laterals or hydraulic fracturing horizontal wells. Multilaterals could be one, two or branched laterals in a single formation or single laterals in different formations. Hydraulic fracturing could be a single fracture axial with the horizontal well or multiple fractures perpendicular to the horizontal well. These techniques are currently complex and costly, and therefore typically inappropriate for most onshore U.S. reservoirs. Comprehensive engineering and geologic research will be required in the near future in order for these techniques to become viable within the 20-year time frame anticipated by this RFD.[7]

In other words, at the time the 2001 RFD was prepared and the RMP finalized, horizontal drilling and fracking was not viable.

Although the 2001 RFD makes clear that viable shale gas and oil development using horizontal drilling would not occur within 20 years, the RFD nevertheless contemplated 300 Mancos shale gas and oil wells, including development and exploration wells. *See* RFD at 5.27. However, the RFD contemplated "behind pipe" access to Mancos shale reserves through vertically drilled wells into the Dakota formation. RFD at 5.27. In other words, the RFD considered access to the Mancos shale only as an afterthought to drilling vertical Dakota wells, and certainly did not contemplate horizontally drilled wells into the Mancos shale. To the extent that the RFD contemplated development only of the Mancos shale, it was only in a region called the "fractured Mancos oil play" in the southeastern portion of the Basin, which was described only as "probable" development. RFD at 5.27. Again, the RFD did not contemplate horizontal drilling, whether for development or exploration.

WPX (formerly Williams Production), a major oil and gas producer in the San Juan Basin, has confirmed that the RFD never contemplated the impacts of horizontal drilling of the Mancos shale, whether for exploration or development. The company recently stated in its Middle Mesa development proposal that, "When the [RMP] FEIS was prepared, horizontal drilling had been attempted as an experimental technique in the San Juan Basin, but faced technical problems and not yet been proven economically viable[.]"[8] The BLM has concurred, noting that only the recent advancement in horizontal drilling technology that "has made Mancos stand-alone wells economically viable," explaining:

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[7] BLM, *Oil and Gas Resource Development for the San Juan Basin, New Mexico, a 20-year, Reasonably Foreseeable Development (RFD) Scenario Supporting the Resource Management Plan for the Farmington Field Office, Bureau of Land Management* (July 2, 2001) at 8.3.

[8] Williams Production Co., *Proposal for Rosa Middle Mesa Development* at 3 (previously included as Exhibit 1 in Citizen Groups' comments from Oct. 27, 2014 on FFO approval of APDs in the Mancos Shale).

> [A]t the time of the RFD[S] report, horizontal drilling and multi-stage hydraulic fracturing was in its infancy, since then, the technology has evolved to be more efficient and less costly as in the past. Horizontal drilling and multi-stage fracturing is a common practice throughout the U.S. even though the RFD[S] only hinted at its future success and usage.[9]

Here, "hinting" at environmental impacts does not suffice to demonstrate that such impacts were fully analyzed and assessed as required under NEPA or that the RFD sufficiently considered the impacts of this practice or demonstrated that there would be no significant impacts. The RFD simply does not suffice to demonstrate that the BLM has adequately considered the cumulative impacts of Mancos shale oil or gas development, and in particular horizontal drilling and fracking to develop Mancos shale, in the FFO. In light of the shortcomings of the RFD, as well as significant new information demonstrating that the Mancos shale is being targeted for horizontal drilling for gas and oil, it is clear that both the RMP and EIS are now inadequate under NEPA.

Taken together with BLM's concession that the current RMP/EIS does not address the latest surge in Mancos shale development, it is clear that unless and until the RMP Amendment and EIS are completed, there exist no sufficient environmental considerations of horizontal drilling and fracking of the Mancos shale.[10] To this end, the BLM cannot rely on the 2003 RMP/EIS to support approval of the proposed leases or any determination that impacts will not be significant.

III. The BLM is Required to Prepare an EIS, and Fails to Provide a Convincing Statement of Reasons Why the Lease Sale Will Impact the Environment No More than Insignificantly.

As Citizen Groups have consistently maintained, an environmental impact statement ("EIS") should be prepared before subject parcels can be offered at the March 2018 oil and gas lease sale. An EIS is required when a major federal action "significantly affects the quality of the human environment." 42 U.S.C. § 4332(2)(C); 40 C.F.R. § 1502.4. A federal action "affects" the environment when it "will or *may* have an effect" on the environment. 40 C.F.R. § 1508.3 (emphasis added); *Airport Neighbors Alliance v. U.S.,* 90 F.3d 426, 429 (10th Cir. 1996) ("If the

[9] BLM, *Unconventional Gas Reservoirs, Hydraulic Fracturing, and the Mancos Shale* (Nov. 30, 2011) at 6 (previously included as Exhibit 2 in Citizen Groups' comments from Oct. 27, 2014 on FFO approval of APDs in the Mancos Shale).

[10] In light of this, we would submit that BLM must presume that the lands proposed for leasing are not "available" due to the failure of the current RMP/EIS to account for the significant impacts of horizontal drilling and fracking of Mancos shale. In this case, the BLM clearly made lands available for leasing based on its understanding of environmental considerations at the time the RMP/EIS was adopted. Given that horizontal drilling and fracking techniques were not accounted for, it would be absurd to believe that the RMP decision made lands available for leasing for the purpose of horizontal drilling of the Mancos shale. Indeed, BLM's Handbook on the issuance of oil and gas leases explicitly states that eligible lands are available for leasing only when all statutory requirements and reviews, "including compliance with the National Environmental Policy act (NEPA) of 1970," have been met. BLM Handbook, H-3101-1, Section I.A.1.

agency determines that its proposed action *may* 'significantly affect' the environment, the agency must prepare a detailed statement on the environmental impact of the proposed action in the form of an EIS.") (emphasis added). Similarly, according to the Ninth Circuit:

> We have held that an EIS *must* be prepared if 'substantial questions are raised as to whether a project ... *may* cause significant degradation to some human environmental factor.' To trigger this requirement a 'plaintiff need not show that significant effects *will in fact occur*,' [but instead] raising 'substantial questions whether a project may have a significant effect' is sufficient.

Idaho Sporting Cong. v. Thomas, 137 F.3d 1146, 1149-50 (9th Cir. 1998) (citations omitted) (emphasis original). Given the magnitude of the proposed action and possible direct, indirect and cumulative impacts to both the natural environment and human communities, BLM's FONSI is completely unsupportable.

Critically, the FFO has also failed to "put forth a convincing statement of reasons' that explains why the March 2018 lease sale will impact the environment no more than insignificantly. This account proves crucial to evaluating whether the [agency] took the requisite 'hard look.'" *Ocean Advoc. v. U.S. Army Corps of Engrs*., 402 F.3d 846, 864 (9th Cir. 2005). Nowhere in BLM's EA and unsigned FONSI does there exist a convincing statement explaining the insignificance of impacts from this sale. To the contrary, BLM suggests that any real analysis of impacts can be pushed off until the APD stage—which, as described above, is wholly deficient. If BLM proceeds in its refusal to perform an EIS, it must provide a detailed accounting of each NEPA significance factor, as provided in 40 C.F.R. § 1508.27, explaining why the project will impact the environment no more than insignificantly. The cursory and evasive manner in which BLM has addressed these significance factors in the EA unsigned FONSI is insufficient to meet the agency's NEPA mandate.

IV. The BLM Impermissibly Relies on Mitigation Measures to Avoid a Finding of Significance.

Although it is possible that "some or all of the environmental consequences of oil and gas development may be mitigated through lease stipulations, it is equally true that the purpose of NEPA is to examine the foreseeable environmental consequences of a range of alternatives *prior* to taking an action that cannot be undone." *Montana Wilderness Ass'n v. Fry*, 310 F.Supp.2d 1127, 1145 (D. Mont., 2004) (citation omitted) (emphasis added); 40 C.F.R. § 1501.2. "[M]itigation measures, while necessary, are not alone sufficient to meet the [Agency's] NEPA obligations to determine the projected extent of the environmental harm to enumerated resources *before* a project is approved." *Northern Plains Resource Council v. Surface Transportation Board,* 668 F.3d 1067, 1085 (9th Cir. 2011) (emphasis in original). Consequently, if BLM discovers significant impacts at the APD stage, it may no longer be able to prevent them.

Here, BLM relies on future, unspecified and general mitigation to avoid a finding of significance, in violation of the agency's NEPA mandate. The EA generically offers: "Site-specific mitigation measures and BMPs would be brought forth from the NEPA document and attached as COAs [Conditions of Approval] for each proposed exploration and development

activity authorized on a lease." EA at 14, 19, and 63. Unfortunately, very little additional specificity is provided elsewhere in the EA. And while the agency does provide a list of lease stipulations by parcel, these are "[s]tandard terms and conditions and lease stipulations from the BLM FFO 2003 RMP … and Lease Notices developed through the parcel review and analysis [which] would apply (as required by 43 CFR 3101.3) to address site specific concerns or new information not identified in the land use planning process." EA at 14. In other words, these stipulations are not specifically aimed at mitigating any direct, indirect, or cumulative impact from the proposed action, nor are they linked to site-specific concerns. In fact, the type of detailed mitigation that NEPA calls for would be impossible without first analyzing the site-specific impacts of leasing and development, which the FFO expressly acknowledges has not been done.

The mitigation measures proposed by the agency must be reasonably developed, which, here, is not the case. "A 'perfunctory description,' or 'mere listing of mitigation measures, without supporting analytical data,' is insufficient to support a finding of no significant impact." *National Parks & Conservation Ass'n v. Babbitt*, 241 F.3d 722, 735 (9th Cir. 2001). The court, when determining the sufficiency of the mitigation measures, considers "whether they constitute an adequate buffer against the negative impacts that may result from the authorized activity. Specifically, [the court] examine[s] whether the mitigation measures will render such impacts so minor as to not warrant an EIS." *Id.; see also, Hill v. Boy,* 144 F.3d 1446, 1451 (11th Cir.1998) (explaining that where an agency relies on an assumption to reach a FONSI, the assumption must be supported by substantial evidence). Moreover, the proposed mitigation underlying the FONSI "must be more than a possibility" in that it is "imposed by statute or regulation or have been so integrated into the initial proposal that it is impossible to define the proposal without mitigation." *Wyoming Outdoor Council v. U.S. Army Corps of Eng'rs,* 351 F.Supp.2d 1232, 1250 (D.Wyo. 2005). Here, the agency offers nothing more than the statement that site-specific mitigation measures and BMPs would be attached as COAs—and fail to even offer a list what these potential measures might be.

Similarly, with regard to cumulative impacts, the agency must provide *some* explanation of how or why compensatory mitigation will reduce the cumulative adverse impacts on the resources in question to insignificance. Bare assertions of mitigation are insufficient. *O'Reilly v. U.S. Army Corps of Eng'rs,* 477 F.3d 225, 235 (5th Cir.2007) ("[A] bare assertion is simply insufficient to explain *why* the mitigation requirements render the cumulative effects of this project less-than-significant, when considered with the past, present, and foreseeable future development in the project area." (emphasis in the original)). Here, in describing the fluctuating cumulative impacts of oil and gas development, the agency offers generally: "Conserving as much land as possible and applying appropriate mitigation measures will alleviate the cumulative impacts." EA at 74. The FFO offers *nothing* else to address cumulative impacts. This type of vague and conclusory statement is entirely insufficient and fails to meet the FFO's obligations under NEPA.

V. The BLM Fails to Take a "Hard Look" by Predetermining its NEPA Analysis.

As detailed below, NEPA "requires ... that an agency give a 'hard look' to the environmental impact of any project or action it authorizes." *Morris v. U.S. Nuclear Regulatory Commission,* 598 F.3d 677, 681 (10th Cir. 2010). This examination "must be taken objectively and in good faith, not as an exercise in form over substance, and not as a subterfuge designed to rationalize a decision already made." *Forest Guardians v. U.S. Fish & Wildlife Serv.,* 611 F.3d 692, 712 (10th Cir. 2010) (quoting *Metcalf v. Daley,* 214 F.3d 1135, 1142 (9th Cir. 2000)); *see also* 40 C.F.R. § 1502.2(g) ("Environmental impact statements shall serve as the means of assessing the environmental impact of proposed agency actions, rather than justifying decisions already made."); *id.* § 1502.5 ("The statement shall be prepared early enough so that it can serve practically as an important contribution to the decision-making process and will not be used to rationalize or justify decisions already made.").

By failing to perform the necessary analysis, the agency, in effect, is presupposing that any site-specific impacts from oil and gas development can be mitigated without significant, unacceptable impacts at the APD stage before even knowing what those site-specific impacts are. The agency is also presupposing that oil and gas resources, if developed, outweigh non-oil and gas resources, like wildlife habitat, air quality, water quality protection, and human communities in the planning area.

As soon as BLM issues an oil and gas lease—particularly, as here, when the lease is sold without a no surface occupancy ("NSO") stipulation covering the entire parcel[11]—that sale confers a guaranteed right to the leaseholder, which includes the right of occupancy. *See* EA at 7 ("After a lease has been issued, the lessee has the right to use as much of the leased land as is necessary to explore (or drill) for, extract, remove, and dispose of oil and gas deposits located under the leased lands with exceptions for restrictions that may be imposed consistent with the standard lease terms and the stipulations and notices attached to the lease."). Without analyzing impacts from the lease sale itself, any subsequent analysis intrinsically shifts from *preventing* impacts (and managing lands for other resource values) to merely *mitigating* impacts (and allowing oil and gas lessees to exercise their surface use rights to the lease at the expense of other resource values). This approach is fundamentally incongruous with NEPA's mandate. In *Northern Plains* the Ninth Circuit warned: "In a way, reliance on mitigation measures presupposes approval. It assumes that—regardless of what effects construction may have on resources—there are mitigation measures that might counteract the effect without first understanding the extent of the problem. This is inconsistent with what NEPA requires." 668 F.3d at 1084–85. In the present case, this presupposition is precisely what BLM has done in determining that actual NEPA analysis can wait until some future date while relying on generic lease stipulations and future mitigation to avoid a finding of significance.

BLM, in making this predetermined conclusion, creates an un-level playing field that benefits oil and gas leasing and drilling at the expense of other multiple use resources. There is a long line of cases that warn agencies against making a predetermined decision with respect to

[11] Lease stipulation F-44-NSO applies to 6 of the oil and gas lease parcels. EA at 17–18. But, this stipulation does not mandate No Surface Occupancy ("NSO") for the entire lease parcel. It specifies only that NSO is allowed within 660 feet of any occupied residence. EA at 65.

NEPA analysis. The Tenth Circuit has cautioned: "[I]f an agency predetermines the NEPA analysis by committing itself to an outcome, the agency likely has failed to take a hard look at the environmental consequences of its actions due to its bias in favor of that outcome and, therefore, has acted arbitrarily and capriciously." *Forest Guardians,* 611 F.3d at 713 (citing *Davis v. Mineta,* 302 F.3d 1104 (10th Cir. 2002). The Tenth Circuit further stated that "[w]e [have] held that ... predetermination [under NEPA] resulted in an environmental analysis that was tainted with bias" and was therefore not in compliance with the statute. *Id.* (citing *Davis,* 302 F.3d at 1112–13, 1118–26)).

While the threshold for finding agency predetermination is high—"occur[ing] only when an agency *irreversibly and irretrievably* commits itself to a plan of action that is dependent upon the NEPA environmental analysis producing a certain outcome, *before* the agency has completed that environmental analysis," *Forest Guardians*, 611 F.3d at 714 (emphasis in original)—here, BLM's misguided process has met that threshold. BLM made the express determination that an analysis of impacts is not necessary at the lease sale stage, which guarantees that a FONSI will be issued. That FONSI is based not on any actual analysis of impacts, but rather on the predetermined decision to perform the necessary NEPA analysis at a later stage. Indeed, by not performing any genuine analysis, it is impossible to reach any conclusion other than a FONSI. By playing this shell-game, BLM, at a minimum, creates an improper "inertial presumption" in favor of committing resources to oil and gas development before knowing the site-specific impacts. *Natl. Wildlife Fed. v. Morton*, 393 F.Supp. 1286, 1292 (D.D.C. 1975).

By reaching, in effect, a predetermined decision—or at least creating a presumption in favor of oil and gas leasing and development—BLM not only violates NEPA, but also, by elevating development of oil and gas over other multiple use resources, violates the Federal Land Policy and Management Act ("FLPMA"). As the Tenth Circuit has explained:

> 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 uses – including conservation to protect environmental values, which are best assessed through the NEPA process.

New Mexico ex rel. Richardson, 565 F.3d 683, 710 (10th Cir. 2009). BLM's presupposition of outcome is a direct affront to both NEPA and FLPMA, and cannot be sustained.

VI. BLM Must Consider Existing, New, and Revised National Policy on Climate Change in Its RMP Decisionmaking.

The National Environmental Policy Act ("NEPA") is our "basic national charter for the protection of the environment," achieving its purpose through "action forcing procedures. . . requir[ing] that agencies take a *hard look* at environmental consequences." 40 C.F.R. § 1500.1; *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989) (citations omitted) (emphasis added). This includes the consideration of best available information and data, as well as disclosure of any inconsistencies with federal policies and plans.

In 2014, President Obama described climate change as an "urgent and growing threat . . . that will define the contours of this century more dramatically than any other."[12] In that same year, the U.S. pledged to reduce its greenhouse gas ("GHG") emissions 26-28 percent below 2005 levels by 2020.[13] Since then, the President has also announced a new goal to cut methane emissions from the oil and gas sector by 40-45 percent below 2012 levels by 2025,[14] and set standards to reduce carbon dioxide emissions from the electricity sector by 32 percent from 2005 levels by 2030.[15] In 2015, President Obama recognized, "ultimately, if we're going to prevent large parts of this Earth from becoming not only inhospitable but uninhabitable in our lifetimes, we're going to have to keep some fossil fuels in the ground rather than burn them and release more dangerous pollution into the sky."[16] In his final State of the Union address, President Obama again noted the federal government's commitment to fighting climate change, vowing "to accelerate the transition away from old, dirtier energy sources," and making a powerful promise "to change the way we manage our oil and coal resources so that they better reflect the costs they impose on taxpayers and our planet."[17] These statements culminated in December, 2015 when the President joined with 194 other nations in recognizing "that climate change represents an urgent and potentially irreversible threat to human societies and the planet" and setting the goal of "holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C."[18] The President ratified the Paris Agreement, along with China, on September 3, 2016.[19] The President has also recognized that "the Paris Agreement alone will not solve the climate crisis. Even if we meet every target embodied in the agreement, we'll only get to part of where we need to go."[20]

Although the Trump administration, in public comments and rhetoric, has suggested a different set of priorities with respect to action on climate change, this does not alter the

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[12] The White House, Remarks by the President at U.N. Climate Change Summit (Sept. 23, 2014), available at: https://www.whitehouse.gov/the-press-office/2014/09/23/remarks-president-un-climate-change-summit.

[13] U.S.-China Joint Announcement on Climate Change (Nov. 11, 2014), available at: https://www.whitehouse.gov/the-press-office/2014/11/11/us-china-joint-announcement-climate-change (attached as Exhibit 46).

[14] The White House, Climate Action Plan: Strategy to Reduce Methane Emissions (March 2014), available at: https://www.whitehouse.gov/blog/2014/03/28/strategy-cut-methane-emissions (Carbon Budget Exhibit 1).

[15] Environmental Protection Agency, Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64662 (Oct. 23, 2015).

[16] The White House, Statement by the President on the Keystone XL Pipeline (Nov. 6, 2015), available at: https://www.whitehouse.gov/the-press-office/2015/11/06/statement-president-keystone-xl-pipeline.

[17] President Barack Obama, State of the Union (Jan. 12, 2016), available at: https://www.whitehouse.gov/sotu.

[18] United Nations Framework Convention on Climate Change, Conference of the Parties (Nov 30-Dec. 11, 2015), Adoption of the Paris Agreement, Art. 2, U.N. Doc. FCCC/CP/2015/L.9 (Dec. 12, 2015), available at: http://unfccc.int/resource/docs/2015/cop21/eng/l09.pdf ("Paris Agreement") (Carbon Budget Exhibit 2).

[19] The White House, President Obama: The United States Formally Enters the Paris Agreement (Sept. 3, 2016), available at: https://www.whitehouse.gov/blog/2016/09/03/president-obama-united-states-formally-enters-paris-agreement.

[20] The White House, Office of the Press Secretary, Remarks by the President on the Paris Agreement (Oct. 5, 2016), attached as Exhibit 3, and available at https://www.whitehouse.gov/the-press-office/2016/10/05/remarks-president-paris-agreement (last viewed Oct. 26, 2016).

fundamental math and science of the challenges we face. Indeed, even if the Trump administration were to back out of the United States' many commitments to reduce greenhouse gas emissions and to create a pathway that limits warming—which, to date, has not occurred—that does not absolve the agency from considering the best available information and taking a hard look at impacts, as well as to have its decisionmaking be reflective of this analysis.

It should further be recognized that while national policy and statements addressing climate change accelerated during the Obama presidency—as they should be given the narrowing window of time to take meaningful action—the federal government's recognition of climate change is not new. The Secretary of the United States Department of the Interior stated, in Secretarial Order 3226, *Evaluating Climate Change Impacts in Management Planning* (January 19, 2001), that "[t]here is a consensus in the international community that global climate change is occurring and that it should be addressed in governmental decision making." Order 3226 established the responsibility of agencies to "consider and analyze potential climate change impacts when undertaking long-range planning exercises, when setting priorities for scientific research and investigations, when developing multi-year management plans, and/or when making major decisions regarding potential utilization of resources under the Department's purview."

In a 2007 report entitled *Climate Change: Agencies Should Develop Guidance for Addressing the Effects on Federal Land and Water Resources,* the GAO concluded that the Department of the Interior had not provided specific guidance to implement Secretarial Order 3226, that officials were not even aware of Secretarial Order 3226, and that Secretarial Order 3226 had effectively been ignored. This report led to Secretarial Order 3289, *Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources* (September 14, 2009), which reinstated the provisions of Order 3226, and recognized that "the realities of climate change require us to change how we manage land, water, fish and wildlife, and cultural heritage and tribal lands and resources we oversee," and acknowledged that the Department of the Interior is "responsible for helping protect the nation from the impacts of climate change." A month later, in Executive Order No. 13514, *Federal Leadership in Environmental, Energy, and Economic Performance* (Oct. 5, 2009), the President called on all federal agencies to "measure, report, and reduce their greenhouse gas emissions from direct and indirect activities." 74 Fed. Reg. 52,117 (Oct. 8, 2009). This directive was followed by Executive Order No. 13693, *Planning for Federal Sustainability in the Next Decade* (March 25, 2015), which reaffirmed the federal government's commitment to reducing GHG emissions. 80 Fed. Reg. 15,871 (March 25, 2015).

In 2009, the Environmental Protection Agency ("EPA") issued a finding that the changes in our climate caused by elevated concentrations of greenhouse gases in the atmosphere are reasonably anticipated to endanger the public health and welfare of current and future generations. 74 Fed. Reg. 66496 (Dec. 15, 2009). In 2015, EPA acknowledged more recent scientific assessments that "highlight the urgency of addressing the rising concentrations of CO_2 in the atmosphere." 80 Fed. Reg. 64661 (Oct. 23, 2015).

Recently, the White House Council on Environmental Quality ("CEQ")—the federal agency tasked with managing the federal government's implementation of NEPA—recognized

the unique nature of climate change and the challenges it imposed on NEPA compliance. On August 1, 2016, CEQ released *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews* (hereafter, "Climate Guidance") (attached as Exhibit 4). The guidance applies to all proposed federal agency actions, "including land and resource management actions." *Id*. at 9. Notably, CEQ's guidance is intended to "facilitate compliance with existing NEPA requirements." *Id.* at 1. In other words, the Climate Guidance is meant to underscore BLM's existing legal obligations to disclose and consider the foreseeable effects that, for example, oil and gas leasing and development has on climate change. On January 12, 2017, BLM issued a Permanent Instruction Memorandum to all Washington Office and Field Officials requiring that "[a]ll relevant NEPA documents must be consistent with the CEQ guidance." IM No. 2017-003 (attached as Exhibit 26). BLM is accordingly required to incorporate Climate Guidance into its RMPA. In its Climate Guidance, the CEQ recognized that:

> Climate change results from the incremental addition of GHG emissions from millions of individual sources, which collectively have a large impact on a global scale. CEQ recognizes that the totality of climate change impacts is not attributable to any single action, but are exacerbated by a series of actions including actions taken pursuant to decisions of the Federal Government. Therefore, a statement that emissions from a proposed Federal action represent only a small fraction of global emissions is essentially a statement about the nature of the climate change challenge, and is not an appropriate basis for deciding whether or to what extent to consider climate change impacts under NEPA. Moreover, these comparisons are also not an appropriate method for characterizing the potential impacts associated with a proposed action and its alternatives and mitigations because this approach does not reveal anything beyond the nature of the climate change challenge itself: the fact that diverse individual sources of emissions each make a relatively small addition to global atmospheric GHG concentrations that collectively have a large impact.

Id. at 10-11. CEQ's Climate Guidance also explains the application of NEPA principles and practices to the analysis of GHG emissions and climate change, including: (1) that agencies quantify a proposed action's projected direct and indirect GHG emissions, taking into account available data and GHG quantification tools; (2) that agencies use projected GHG emissions as a proxy for assessing potential climate change effects when preparing a NEPA analysis; (3) where GHG emission tools, methodologies, or data inputs are not reasonably available, that agencies include a qualitative analysis in the NEPA document and explain the basis for determining that quantification is not reasonably available; (4) that agencies analyze foreseeable direct, indirect, and cumulative GHG emissions and climate effects; (5) that agencies consider reasonable alternatives and the short- and long-term effect and benefits in the alternatives and mitigation analysis; (6) that agencies consider alternatives that would make the actions and affected communities more resilient to the effects of a changing climate; and (7) that agencies assess the broad-scale effects of GHG emissions and climate change, either to inform programmatic decisions, or at both the programmatic and project-level. *See id.* at 4-6.

A. BLM Must Consider National Policy on Climate Change in Agency Decisionmaking on the RMPA, as well as Consider Recent Climate Science and Carbon Budgeting.

NEPA requires BLM to consider national policy in its decisionmaking process.[21] The FFO has historically adopted a position in its decisionmaking that reflects a fundamental disconnect with regard to how our public lands are managed for energy production and national policies to limit GHG emissions. The agency has not only failed to take informed action to address climate change, as required by Order 3226 and Order 3289, but has signaled a deep misunderstanding of basic climate science as well as the "tools and methodologies for quantifying GHG emissions and comparing GHG quantities across alternative scenarios." *See* Climate Guidance at 11.[22] As stated in Order 3289, BLM must "appl[y] scientific tools to increase understanding of climate change and to coordinate an effective response to its impacts," and "management decisions made in response to climate change impacts must be informed by [this] science."

Through statements that have been offered to avoid any actual analysis, BLM has historically failed to take a hard look at the climate impacts of fossil fuel leasing and development on public lands in the planning area, as required by NEPA and underscored by the CEQ. These mistakes must not be repeated here. The FFO must also consider alternatives that would meaningfully address greenhouse gas emissions and climate change impacts in the planning area—including a no-leasing alternative—and that are reflective of current science and national policy. The FFO planning area is already over 90% leased for oil and gas. Over 40,000 oil and gas wells have historically been drilled, with at least 21,725 wells currently in production. This legacy of exploitation has resulted in vast impacts to the regions land, air, and water—including a methane hotspot that drapes over the basin—which people and our communities have been forced to endure. To correct past failures, BLM must, at a minimum, ensure it uses the best and most up-to-date climate science available, much of which is summarized below.

Since the dawn of the industrial revolution a century ago, the average global temperature has risen some 1.6 degrees Fahrenheit. Most climatologists agree that, while the warming to date is already causing environmental problems, another 0.4 degree Fahrenheit rise in temperature, representing a global average atmospheric concentration of carbon dioxide ("CO_2") of 450 parts per million ("ppm"), could set in motion unprecedented changes in global climate and a significant increase in the severity of natural disasters—and could represent the point of no

[21] NEPA regulations direct federal agencies, "to discuss any inconsistency of a proposed action with any approved State or local plan and laws (whether or not federally sanctioned)," 40 C.F.R. § 1506.2(d), and require agencies to address "possible conflicts between the proposed action and the objectives of Federal, regional, State, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned." 40 C.F.R. § 1502.16(c). CEQ's NEPA Climate Guidance interprets these regulations to encompass the requirement to address "approved federal, regional, state, tribal, or local plans, policies, or laws for GHG emission reductions or climate adaptation to make clear whether a proposed project's GHG emissions are consistent with such plans or laws." Climate Guidance at 28-29.

[22] *See also*, Climate Guidance at 12 n.28 (linking to quantification tools that "are widely available, and are already in broad use in the Federal and private sectors").

return.[23] In August 2016, the atmospheric concentration of CO_2 was approximately 402.25 ppm, up from 398.93 ppm the same month a year earlier.[24]

Climate change has been intensively studied and acknowledged at the global, national, and regional scales. Climate change is being fueled by the human-caused release of greenhouse gas emissions, in particular carbon dioxide and methane. The Intergovernmental Panel on Climate Change ("IPCC") is a Nobel Prize-winning scientific body within the United Nations that reviews and assesses the most recent scientific, technical, and socio-economic information relevant to our understanding of climate change. In its most recent report to policymakers in 2014, the IPCC provided a summary of our understanding of human-caused climate change. Among other things, the IPCC summarized:[25]

- Human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history. Recent climate changes have had widespread impacts on human and natural systems.

- Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, and sea level has risen.

- Anthropogenic greenhouse gas emissions have increased since the pre-industrial era, driven largely by economic and population growth, and are now higher than ever. This has led to atmospheric concentrations of carbon dioxide, methane, and nitrous oxide that are unprecedented in at least the last 800,000 years. Their effects, together with those of other anthropogenic drivers, have been detected throughout the climate system and are extremely likely to have been the dominant cause of the observed warming since the mid-20th century.

- In recent decades, changes in climate have caused impacts on natural and human systems on all continents and across the oceans. Impacts are due to observed climate change, irrespective of its cause, indicating the sensitivity of natural and human systems to changing climate.

- Continued emission of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive, and irreversible impacts for people and ecosystems. Limiting

[23] *See* David Johnston, *Have We Passed the Point of No Return on Climate Change?*, Scientific American (April 2015), available at: http://www.scientificamerican.com/article/have-we-passed-the-point-of-no-return-on-climate-change/.

[24] NOAA, Earth System Research Laboratory, *Trends in Atmospheric Carbon Dioxide*, available at: http://www.esrl.noaa.gov/gmd/ccgg/trends/.

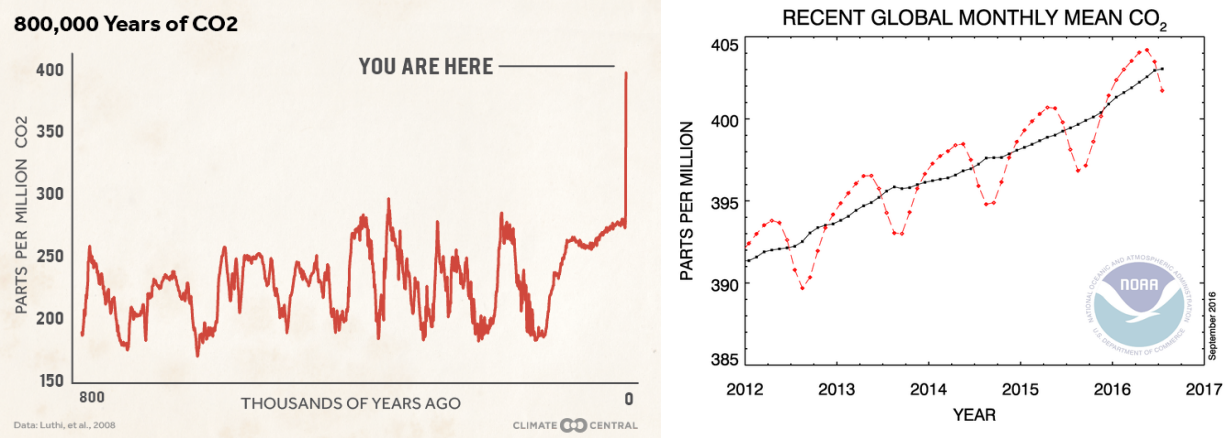
[25] IPCC AR5*, Summary for Policymakers* (March 2014) available at: http://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf (Carbon Budget Exhibit 5).

climate change would require substantial and sustained reductions in greenhouse gas emissions which, together with adaptation, can limit climate change risks.

- Surface temperature is projected to rise over the 21st century under all assessed emission scenarios. It is very likely that heat waves will occur more often and last longer, and that extreme precipitation events will become more intense and frequent in many regions. The ocean will continue to warm and acidify, and global mean sea level to rise.

Carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are recognized as the key greenhouse gases contributing to climate change. In 2009, the EPA found that these "six greenhouse gases taken in combination endanger both the public health and the public welfare of current and future generations."[26] The D.C. Circuit has upheld this decision as supported by the vast body of scientific evidence on the subject. *See Coal. for Responsible Regulation, Inc. v. EPA.*, 684 F.3d 102, 120-22 (D.C. Cir. 2012).

According to the National Oceanic and Atmospheric Administration ("NOAA"), "[t]he combined average temperature over global land and ocean surfaces for August 2016 was the highest for August in the 137-year period of record, marking the 16th consecutive month of record warmth for the globe." [27] The global climate crisis is happening and it may well be accelerating quickly.



The graphs show globally averaged historic and monthly mean carbon dioxide.

The IPCC in 2013 affirmed: "Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased" causing "widespread impacts on human and natural systems."[28] This is consistent with the findings of the United States' 2014 Third National Climate Assessment, stating: "That the planet has warmed is 'unequivocal,' and

[26] Environmental Protection Agency, *Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act* 74 Fed. Reg. 66,496 (Dec. 15, 2009).

[27] NOAA, Global Analysis – August 2016, available at: https://www.ncdc.noaa.gov/sotc/global/201608.

[28] IPCC AR5 Synthesis Report at 2 (Carbon Budget Exhibit 5).

is corroborated through multiple lines of evidence, as is the conclusion that the causes are very likely human in origin."[29] With particular regard to the Southwest Region—which includes Colorado, New Mexico, Utah, Arizona, Nevada, and California—the National Climate Assessment included in the following overview:[30]

- Snowpack and streamflow amounts are projected to decline in parts of the Southwest, decreasing surface water supply reliability for cities, agriculture, and ecosystems.
- The Southwest produces more than half of the nation's high-value specialty crops, which are irrigation-dependent and particularly vulnerable to extremes of moisture, cold, and heat. Reduced yields from increasing temperatures and increasing competition for scarce water supplies will displace jobs in some rural communities.
- Increased warming, drought, and insect outbreaks, all caused by or linked to climate change, have increased wildfires and impacts to people and ecosystems in the Southwest. Fire models project more wildfire and increased risks to communities across extensive areas.
- Flooding and erosion in coastal areas are already occurring even at existing sea levels and damaging some California coastal areas during storms and extreme high tides. Sea level rise is projected to increase as Earth continues to warm, resulting in major damage as wind-driven waves ride upon higher seas and reach farther inland.
- Projected regional temperature increases, combined with the way cities amplify heat, will pose increased threats and costs to public health in southwestern cities, which are home to more than 90% of the region's population. Disruptions to urban electricity and water supplies will exacerbate these health problems.

Immediate and substantial greenhouse gas reductions are required to avoid catastrophic impacts to people and communities. "Following the warmest year on record in 2014 according to most estimates, 2015 reached record warmth yet again, surpassing the previous record by more than 0.1°C."[31] This record warming was again surpassed in 2016. "Globally-averaged temperatures in 2016 were 1.78 degrees Fahrenheit (0.99 degrees Celsius) warmer than the mid-20th century mean. This makes 2016 the third year in a row to set a new record for global average surface temperatures."[32]

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[29] Jerry M. Melillo, *et al.*, Climate Change Impacts in the United States: The Third National Climate Assessment (2014) at 61, available at: http://nca2014.globalchange.gov (attached as Exhibit 6).

[30] *See id.* at 463-86.

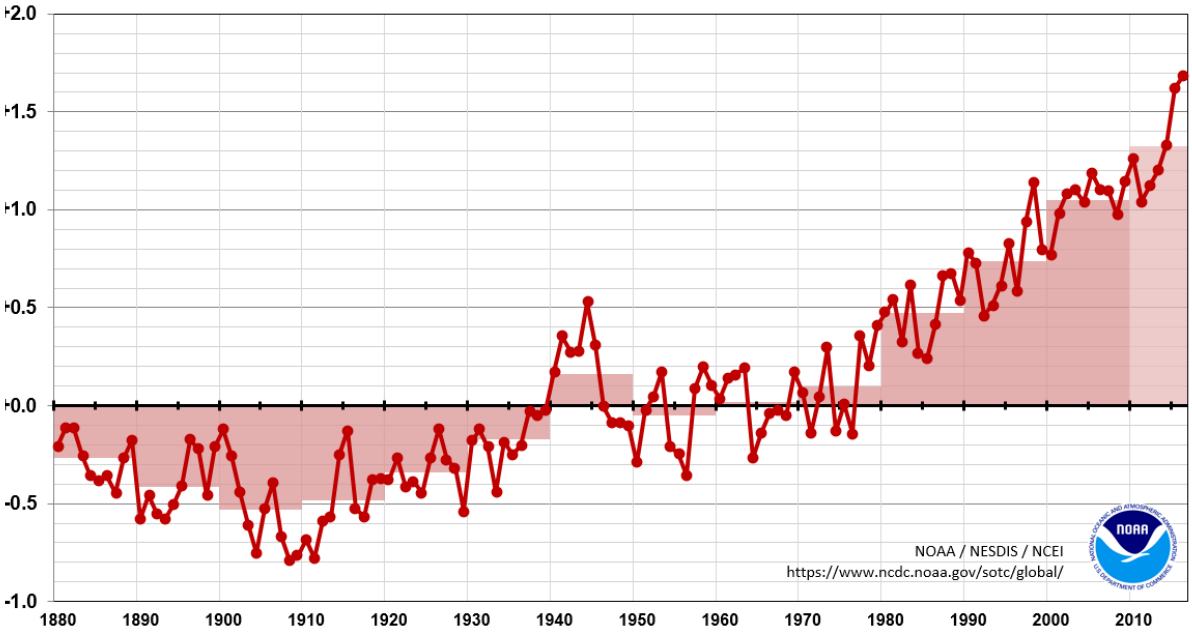
[31] American Meteorological Society, *State of the Climate in 2015*, Vol.97, No.8 (Aug. 2016), at S7 (Carbon Budget Exhibit 7).

[32] NASA, *NASA NOAA Data Show 2016 Warmest Year on Record Globally* (Jan. 18, 2017), available at: https://www.nasa.gov/press-release/nasa-noaa-data-show-2016-warmest-year-on-record-globally.

> Most of the warming occurred in the past 35 years, with 16 of the 17 warmest years on record occurring since 2001. Not only was 2016 the warmest year on record, but eight of the 12 months that make up the year – from January through September, with the exception of June – were the warmest on record for those respective months. October, November, and December of 2016 were the second warmest of those months on record – in all three cases, behind records set in 2015.[33]

Earlier this year, researchers developed a mathematical equation to describe the impacts of human activity on the Earth.[34] The equation shows that astronomical and geophysical forces on the Earth system, while complex, tend to zero over time because of their slow nature and rarity. Whereas GHG emissions caused by humans over the past 45 years have increased the rate of temperature rise to 1.7 degrees Celsius per century, representing a change to the climate that is 170 times faster than the natural background rate.[35] The researchers conclude that failing to reduce anthropological climate change "could trigger societal collapse."[36]

Annual Global Temperature: Difference from 20th Century Average, in °F



As noted above, the Paris Agreement commits all signatories—including the United States—to a target holding long-term global average temperature "to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-

[33] *Id.*; *see also* NOAA/NASA, *Annual Global Analysis for 2016* (Jan 2017) (attached as Exhibit 27).

[34] Owen Gaffney and Will Steffen, *The Anthropocene Equation*, The Anthropocene Review (2017) (attached as Exhibit 28).

[35] Gaffney at 3.

[36] Gaffney at 7.

industrial levels."[37] As articulated by a team of international climate scientists, including Dr. James Hansen, in a 2013 report: "The widely accepted target of limiting human-made global warming to 2 degrees Celsius (3.6 degrees Fahrenheit) above preindustrial level is too high and would subject young people, future generations and nature to irreparable harm…. Observational data reveal that some climate extremes are already increasing in response to warming of several tenths of a degree in recent decades; these extremes would likely be much enhanced with warming of 2°C or more."[38] "Runaway climate change—in which feedback loops drive ever-worsening climate change, regardless of human activities—are now seen as a risk even at 2°C of warming."[39] "[T]here is an unacceptable risk that before 2°C of warming, significant 'long-term' feedbacks will be triggered, in which warming produces conditions that generate more warming, so that carbon sinks such as the oceans and forests become less efficient in storing carbon, and polar warming triggers the release of significant permafrost and clathrate carbon stores. Such an outcome could render ineffective human efforts to control the level of future warming to manageable proportions."[40] Indeed, the impacts of 2°C temperature rise have been "revised upwards, sufficiently so that 2°C now more appropriately represents the threshold between 'dangerous' and 'extremely dangerous' climate change."[41] "[T]he risks previously believed to be associated with an increase of around 4°C in global temperatures are now associated with the rise of a little over 2°C, while the risks previously associated with 2°C are now thought to occur with only 1°C rise."[42]

Although the Paris Agreement has underscored that immediate action is needed to avoid 'extremely dangerous' warming, meeting the voluntary commitments adopted in Paris alone will be insufficient to meet goal of limiting temperature change to between 1.5°C and 2.0°C above pre-industrial levels. As noted by a 2015 UNEP technical report:

> The emissions gap between what the full implementation of the unconditional [intended nationally determined contributions (INDCs)] contribute and the least-cost emission level for a pathway to stay below 2°C, is estimated to be 14 $GtCO_2e$ (range: 12-17) in 2030 and 7 $GtCO_2e$ (range: 5-10) in 2025. When conditional INDCs are included as fully implemented, the emissions gap in 2030 is estimated to be 12 GtCO2e (range: 10-15) and 5 $GtCO_2e$ (range: 4-8) in 2025.[43]

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[37] Paris Agreement at Art. 2 (Carbon Budget Exhibit 2).

[38] James Hansen, *et al., Assessing "Dangerous Climate Change": Required Reduction of Carbon Emissions to Protect Young People, Future Generations and Nature,* 8 PLoS ONE 8 e81648 (2013) (Carbon Budget Exhibit 8).

[39] Greg Muttitt, *et al.*, *The Sky's Limit: Why the Paris Climate Goals Require a Managed Decline of Fossil Fuel Production*, Oil Change International (Sept. 2016) at 6 (Carbon Budget Exhibit 9).

[40] David Spratt, *Climate Reality Check: After Paris, Counting the Cost* (March 2016) at 8 (Carbon Budget Exhibit 10).

[41] Kevin Anderson and Alice Bows, *Beyond 'Dangerous' Climate Change: Emission Scenarios for a New World*, Phil. Trans. R. Soc. (2011) (Carbon Budget Exhibit 11).

[42] International Energy Agency, *Redrawing the Energy-Climate Map* (June 2013) at 14, (Carbon Budget Exhibit 29).

[43] United Nations Environment Programme (UNEP), *The Emissions Gap Report 2015: A UNEP Synthesis Report* (Nov. 2015) at xviii (Carbon Budget Exhibit 12).

In other words, far greater emissions reductions are necessary to stay below and 2.0°C, let alone aspire to 1.5°C of warming. If no further progress were made beyond the Paris Agreement, expected warming by 2100 would be 3.5°C.[44] In the alternative, if no action is taken and the status quo is maintained—a position long reflected in BLM's management of public lands in the San Juan Basin—estimated warming by 2100 is upwards of 4.5°C.[45] To achieve an outcome consistent with a 50% chance of keeping warming to 2.0°C, the growth in global-energy related CO_2 emissions needs to halt and start to reverse within the current decade.[46] Delaying stronger climate action to 2020 would come at a cost: $1.5 trillion in low-carbon investments are avoided before 2020, but $5 trillion in additional investments would be required between 2020-2035 to get back on track.[47]

With specific regard to United States commitments under the Paris Agreement, the U.S. INDC set specific greenhouse gas emissions reduction target for 2025 of a 26% to 28% reduction below the 2005 emission levels, producing a range in 2005 net GHG emissions from 6,323 to 7,403 $MTCO_2e$.[48] The difference between this target and the estimated 2025 emissions without INDC policies results in an 'emissions gap' ranging from 896 to 2,121 $MTCO_2e$.[49]

Both the IPCC and National Climate Assessment recognize the dominant role of fossil fuels in driving climate change:

> While scientists continue to refine projections of the future, observations unequivocally show that climate is changing and that the warming of the past 50 years is primarily due to human-induced emissions of heat-trapping gases. These emissions come mainly from burning coal, oil, and gas, with additional contributions from forest clearing and some agricultural practices.[50]
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> CO_2 emissions from fossil fuel combustion and industrial processes contributed about 78% to the total GHG emission increase between 1970 and 2010, with a contribution of similar percentage over the 2000–2010 period (*high confidence*).[51]

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[44] Spratt, *Climate Reality Check* at 2 (Carbon Budget Exhibit 10).

[45] *See* Climate Interactive, Climate Scorecard, available at: https://www.climateinteractive.org/programs/scoreboard/*; see also,* Andrew P. Schurer, *et al., Separating Forced from Chaotic Climate Variability over the Past Millennium*, Journal of Climate, Vol. 26 (March 2013) (Carbon Budget Exhibit 13).

[46] IEA (2013) at 13.

[47] IEA (2013) at 114.

[48] Jeffery Greenblatt & Max Wei, *Assessment of the climate commitments and additional mitigation policies of the Unites States*, Nature Climate Change (Sept. 2016), available at: http://www.nature.com/nclimate/journal/vaop/ncurrent/full/nclimate3125.html (Carbon Budget Exhibit 14).

[49] *Id.* at 2; *see also* UNEP, Emissions Gap Report (Carbon Budget Exhibit 12).

[50] Third National Climate Assessment at 2 (Carbon Budget Exhibit 6).

[51] IPCC AR5 Synthesis Report at 46 (Carbon Budget Exhibit 5).

The energy sector accounts for around two-thirds of GHG emissions, and more than 80% of global energy consumption is based on fossil fuels.[52] To keep open a realistic chance of meeting the 2°C target, intensive action is required before 2020. As summarized in a recent report:

> The Paris Agreement aims to help the world avoid the worst effects of climate change and respond to its already substantial impacts. The basic climate science involved is simple: cumulative carbon dioxide (CO_2) emissions over time are the key determinant of how much global warming occurs. This gives us a finite *carbon budget* of how much may be emitted in total without surpassing dangerous temperature limits.[53]

According to the IPCC, as of 2011, the remaining carbon budget of cumulative CO_2 emissions from all anthropogenic sources must remain below 1,000 $GtCO_2$ to provide a 66% probability of limiting warming to 2°C above pre-industrial levels.[54] For years 2012-2014, approximately 107 $GtCO_2$ was emitted, averaging approximately 36 $GtCO_2$ per year, which left us at the start of 2016 with a carbon budget of only 850 $GtCO_2$.[55] These emissions were the highest in human history and 60% higher than in 1990 (the Kyoto Protocol reference year). Of course, the Paris Agreement aim of limiting global warming to 1.5°C requires adherence to a more stringent carbon budget of only 400 $GtCO_2$ from 2011 onward, of which about 250 $GtCO_2$ remained at the start of 2016.[56] "With global annual emissions amounting to 36 $GtCO_2$ in 2015, scientists predict that at current rates global emissions will exceed the carbon budgets necessary to stay under the 1.5°C target by 2021 and the 2°C target by 2036.[57]

The potential carbon emissions from *existing* fossil fuel reserves—the known belowground stock of extractable fossil fuels—considerably exceed both 2°C and 1.5°C of warming. "Estimated total fossil carbon reserves exceed this remaining [carbon budget] by a factor of 4 to 7."[58] "For the 2°C or 1.5°C limits, respectively 68% or 85% of reserves must

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[52] IEA (2013) at 9.

[53] *The Sky's Limit* at 6 (Carbon Budget Exhibit 9).

[54] IPCC AR5 Synthesis Report at 63-64 & Table 2.2 (attached as Exhibit 5). For an 80% probability of staying below 2°C, the budget from 2000 is 890 $GtCO_2$, with less than 430 $GtCO_2$ remaining. Malte Meinshausen *et al., Greenhouse-gas emission targets for limiting global warming to 2°C*, Nature (2009) at 1159 (attached as Exhibit 15). Other sources offer slightly different calculations in order to have a 50% probability of keeping warming below 2°C, with total emissions to 2050 below 1,440 $GtCO_2$ from 2000 onward, of which 420 $GtCO_2$ has already been emitted (as of 2011). It is estimated that another 136 $GtCO_2$ will be emitted from non-energy sources up to 2050, meaning the energy sector can emit a maximum of 884 $GtCO_2$ by 2050. IEA (2013) at 16-17.

[55] *See* Annual Global Carbon Emissions, available at: https://www.co2.earth/global-co2-emissions; *see also* C. Le Quéré, *et al., Global Carbon Budget 2015*, Earth Syst. Sci. Data (Dec. 2015) (Carbon Budget Exhibit 16).

[56] Dustin Mulvaney, *et al.*, *Over-Leased: How Production Horizons of Already Leased Federal Fossil Fuels Outlast Global Carbon Budgets,* EcoShift Consulting (July 2016) (attached as Exhibit 17) at 2 (citing Joeri Rogelj, *et al., Difference between carbon budget estimates unraveled*, Nature Climate Change (2016) (Carbon Budget Exhibit 18).

[57] Mulvaney at 2 (citing Oak Ridge National Laboratories, Carbon Dioxide Information Analysis Center (2015), available at: http://cdiac.ornl.gov/GCP/).

[58] IPCC AR5 Synthesis Report at 63 (Carbon Budget Exhibit 5).

remain in the ground."[59] The reserves in currently operating oil and gas field alone, even with no coal, would take the world beyond 1.5°C.[60]

In order for the world to stay within a carbon budget consistent with Paris Agreement goals—"holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C"[61]—significant fossil fuel resources must remain in the ground. More specifically, to meet the target of 2°C, globally "a third of oil reserves, half of gas reserves and over 80 percent of current coal reserves should remain unused from 2010-2050."[62] These fossil fuel reserves represent "unburnable carbon" and as such would be stranded assets in which countries, industries, and companies are heavily invested but on which they would be unable to recoup returns. Citigroup warned investors that "the total value of stranded assets could be over $100 trillion based on current market prices."[63] Studies estimate that global coal, oil and gas resources considered currently economically recoverable contain potential greenhouse gas emissions of 4,196 $GtCO_2$,[64] with other estimates as high as 7,120 $GtCO_2$.[65]

Critically, the United States carbon quota—equivalent to 11% of the global carbon budget needed for a 50% chance of limiting warming to 2°C—allocates approximately 158 $GtCO_2$ to the United States as of 2011.[66] By way of comparison, federal and non-federal fossil fuel emissions together would produce between 697 and 1,070 $GtCO_2$.[67] Regarding just federal fossil fuel resources, the United States contains enough recoverable coal, oil and gas that, if extracted and burned, would result in as much as 492 $GtCO_2$, far surpassing the entire global carbon budget for a 1.5°C target and nearly eclipsing the 2°C target—to say nothing of the United States 'share' of global emissions.[68] Unleased federal fossil fuels comprise 91% of these potential emissions, with already leased federal fossil fuels accounting for as much as 43

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[59] The Sky's Limit at 6 (attached as Exhibit 9); *see also* Kevin Anderson and Alice Bows, *Reframing the climate change challenge in light of post-2000 emission trends*, Phil. Trans. R. Soc. (2008) (Carbon Budget Exhibit 19) ("to provide a 93% mid-value probability of not exceeding 2°C, the concentration (of atmospheric greenhouse gases) would need to be stabilized at or below 350 parts per million carbon dioxide equivalent (ppm CO_2e)" compared to the current level of ~485 ppm CO_2e.).

[60] The Sky's Limit at 5, 17 (Carbon Budget Exhibit 9).

[61] Paris Agreement at Art. 2 (Carbon Budget Exhibit 2).

[62] Christophe McGlade & Paul Ekins, *The geographical distribution of fossil fuels unused when limiting global warming to 2°C*, Nature (Jan 2015) (Carbon Budget Exhibit 20).

[63] Jason Channell, *et al.*, *Energy Darwinism II*, Citi GPS: Global Perspectives & Solutions (August 2015) at 118 (Carbon Budget Exhibit 30).

[64] Michael Raupach, *et al., Sharing a quota on cumulative carbon emissions*, Nature Climate Change (Sept. 2014) (Carbon Budget Exhibit 21).

[65] IPCC AR5, Mitigation of Climate Change, Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (2014) at Table 7.2 (Carbon Budget Exhibit 22).

[66] Raupach at 875 (Carbon Budget Exhibit 21).

[67] Dustin Mulvaney, *et al.*, *The Potential Greenhouse Gas Emissions from U.S. Federal Fossil Fuels*, EcoShift Consulting (Aug. 2015) at 16 (Carbon Budget Exhibit 23).

[68] *Id.*

$GtCO_2$.[69]

In 2012, "the GHG emissions resulting from the extraction of fossil fuels from federal lands by private leaseholders totaled approximately 1,344 $MMTCO_2e$."[70] Between 2003 and 2014, approximately 25% of all United States and 3-4% of global fossil fuel greenhouse gas emissions are attributable to federal minerals leased and developed by the Department of the Interior.[71] Continued leasing and development of federal fossil fuel resources commits the world to 'extremely dangerous' warming well beyond the 2°C threshold. As one study put it, "the disparity between what resources and reserves exist and what can be emitted while avoiding a temperature rise greater than the agreed 2°C limit is therefore stark."[72] In short, *any* new leasing of federal fossil fuel resources is inconsistent with a carbon budget that would seek to avoid catastrophic climate change.

The production horizons for already leased federal fossil fuel resources underscore how unwarranted any additional leasing is, and in turn the reasonableness of the FFO's consideration of a no-leasing alternative. Comparing these production horizons to dates at which carbon budgets would be exceeded if current emission levels continue:

- Federal crude oil already leased will continue producing for 34 years beyond the 1.5°C threshold and 19 years beyond the 2°C threshold;
- Federal natural gas already leased will continue producing 23 years beyond the 1.5°C threshold and 8 years beyond the 2°C threshold;
- Federal coal already leased will continue producing 20 years beyond the 1.5°C threshold and 5 years beyond the 2°C threshold.[73]

Not only can the federal government not afford to lease *any* additional public lands for fossil fuel development—underscoring the need to consider a no leasing alternative—but substantial efforts must also be made to limit the production horizon of fossil fuel resources already leased. Accordingly, the FFO must also consider taking an aggressive position on the non-renewal and expiration of non-producing leases, as well as review of agency policy on lease suspensions and unitization.

If new leasing and renewal of existing non-producing leases continues, by 2040 it will contribute about two-thirds of expected federal fossil fuel production (forecast based on EIA and

[69] *Id.*

[70] Stratus Consulting, *Greenhouse Gas Emissions from Fossil Energy Extracted from Federal Lands and Waters: An Update* (Dec. 2014) at 9 (Carbon Budget Exhibit 24).

[71] *See* Energy Information Administration, *Sales of Fossil Fuels Produced from Federal and Indian Lands, FY 2003 through FY 2014* (July 2015) (Carbon Budget Exhibit 25); *see also* Stratus Consulting (Carbon Budget Exhibit 24).

[72] McGlade at 188.

[73] Mulvaney (2016) at 5.

other sources).[74] On the other hand, if new leasing ceases and existing non-producing leases are not renewed, 40% of forecast coal production could be avoided in 2025 and 74% of coal production could be avoided in 2040. As for oil and gas, 12% of oil production could be avoided in 2025 and 65% could be avoided by 2040 while 6% of natural gas production could be avoided in 2025 and 59% could be avoided by 2040.[75]

This avoided production would significantly reduce future U.S. emissions. Cessation of new and renewed leases for federal fossil fuel extraction could reduce CO_2 emissions by about 100 Mt per year by 2030. Annual emission reductions could become greater than that over time as production declines on existing leases and maintaining or increasing production becomes dependent on yet-to-be issued leases.[76]

A comparison with other measures shows that "no leasing" could be a very significant part of U.S. efforts to address climate change. The 100 Mt CO_2 emissions savings that could result from no leasing in 2030 compares favorably with EPA standards for light- and medium-vehicles that are expected to yield 200 Mt in CO_2 savings in 2030, and with standards for heavy-duty vehicles that are expected to yield 70 Mt in CO_2 savings in the same year. The 100 Mt CO_2 emissions reduction from leasing restrictions would be greater than either the emission reductions that the EPA expects to achieve through its existing regulation of oil and gas industry emissions or reductions the BLM expects to achieve from its proposed methane waste standards on oil and gas operations on federal land. Clearly, cessation of new and renewed leases could make an important contribution to U.S. climate change mitigation efforts.[77]

Also, importantly, avoided production through no new leasing and the non-renewal of existing non-producing leases could help avoid further carbon lock-in in terms of investment in both fossil fuel-producing and fossil fuel-using infrastructure.[78] Simply put, the timeframe to avoid catastrophic climate change is short, and the management of our federal minerals is dangerously out of step with this reality.

B. Projected Energy Demands, International Finance, and Stranded Assets

The world's energy needs continue to grow, with projections of a 30% rise in global energy demand to 2040. The International Energy Agency ("IEA") has estimated that for this increasing demand to be met, a cumulative $48 trillion in investment is needed in global energy supply,[79] of which 60% is comprised of fossil fuels and nearly 20% to renewables, with an

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[74] Peter Erickson and Michael Lazarus, *How Would Phasing Out U.S. Federal Leases for Fossil Fuel Extraction Affect CO2 Emissions and 2°C Goals?,* Stockholm Environmental Institute (2016) at 12 (Carbon Budget Exhibit 323).

[75] Erickson and Lazarus at 16.

[76] Erickson and Lazarus at 26.

[77] Erickson and Lazarus at 27.

[78] Erickson and Lazarus at 30.

[79] International Energy Agency, *World Energy Investment Outlook* (2014), at 3 (Carbon Budget Exhibit 31).

additional $23 trillion invested in improvements in energy efficiency.[80] "Countries are generally on track to achieve, and even exceed in some instances, many of the targets set in their Paris Agreement pledges; this is sufficient to slow the projected rise in global energy-related CO_2 emissions, but not nearly enough to limit warming to less than 2°C."[81] By contrast, it would be exceedingly difficult to chart a course toward a 2°C pathway. A major reallocation of investment capital going to the energy sector would be needed, requiring an estimated $40 trillion in cumulative energy supply investment moving away from fossil fuels and toward renewables.[82] The more ambitious target of limiting warming to less than 1.5°C would be even more difficult to achieve, demanding net-zero emissions between 2040 and 2060, a goal that would require radical near-term reductions in energy sector CO_2 emissions.[83] IEA estimates that "$53 trillion in cumulative investment in energy supply and efficiency is required over the period to 2035 in order to get the world onto a 2°C emissions path."[84]

The liability exposure from not acting is enormous, with cumulative 'lost' GDP from the impacts of climate change equating to $44 trillion.[85] Yet, investment decisions being taken today are not consistent with a 2°C climate goal and are not aimed at creating infrastructure that is sufficiently resilient to withstand the increased physical risks that are expected to result from future climate change.[86] "[O]ur current energy infrastructure has already 'locked-in' future carbon-dioxide emissions."[87] Even as this energy infrastructure is quickly sealing our climate fate in the near term, it will become obsolete in the slightly longer term. Indeed, many new energy sector assets are destined to become stranded when carbon reduction policies that limit the utilization of those assets are inevitably adopted in response to climate change impacts. As of 2013, emissions from existing global fossil fuel energy infrastructure already represented four-fifths, or 550 $GtCO_2$, of the total volume of CO_2 emissions that the earth can accommodate under a 2°C trajectory.[88] With delayed climate action to date, in 2017 we now find ourselves at an investment watershed, where energy infrastructure now locks in the entire remaining carbon budget to 2035.[89] From this point forward, far more costly actions are going to be required to subsequently undo the lock-in effect, and every additional investment in the energy sector committed to fossil fuels would become stranded assets under policies to achieve a 2°C pathway.

At the same time, the capital expenditures required to maintain current energy sector

[80] International Energy Agency, *World Energy Outlook 2016: Executive Summary* (2016), at 2 (Carbon Budget Exhibit 32).

[81] IEA (2016) at 2.

[82] IEA (2016) at 5.

[83] IEA (2016) at 5.

[84] IEA (2014) at 14.

[85] Citi at 8.

[86] IEA (2013) at 84.

[87] IEA (2013) at 98.

[88] IEA (2013) at 99.

[89] IEA (2013) at 113.

demand for fossil fuels have more than doubled since 2000, to $950 billion annually.[90] In other words, more capital investment is being required to maintain our current reliance on fossil fuels at a time, paradoxically, when from a climate perspective all of the new investment must be redirected towards renewable energy sources to effect a radical transformation of the energy sector, as necessary to avoid catastrophic warming. The market value of oil and gas produced globally was around $4.2 trillion in 2012, which was almost double what it was in 2005.[91] Yet, this has not resulted in a financial windfall to the oil and gas industry, as costs and royalties have more than kept pace with increased revenues.[92] In short, oil and gas companies are merely maintaining a fossil fuel treadmill where increasingly costly investments are needed to meet demand but lead to rising costs for the oil and gas industry as well as significant costs to society as reliance on oil and gas fuels climate change, an irrational system. In the face of these increasing capital requirements, there is growing awareness of significant financial exposure for individual companies from the possible future stranding of new fossil fuel investments. For example, among major oil and gas companies, the estimated cost of stranded assets over the next decade ranges from $21.5 billion for ConocoPhillips to $76.9 billion for Shell.[93] Nevertheless, the global capital markets have yet to internalize these risks and charge premiums that would steer investment towards renewable energy.

"Analysis of the entire energy system shows that delaying action on climate change is a false economy. Investments of around $1.5 trillion are avoided in the period to 2020, but an additional $5 trillion of investments are required between 2020 and 2035."[94]

According to the 2°C pathway modeled by IEA, from 2015-2035 the carbon budget for energy-based emissions from all fossil fuels is 593 $GtCO_2$.[95] If global energy investment continues on its current course, there will be over $2 trillion in investment in energy sources that will emit around 156 $GtCO_2$ of emissions over the 2°C target of 593 $GtCO_2$.[96] This can also be viewed through the lens of specific fossil fuel demand to 2035 under a 2°C pathway. For coal, zero additional capital investment is needed, as production from existing coalmines would exceed demand.[97] For gas, approximately $460 billion—or over 40% of anticipated capital expenditures—is unneeded, resulting in 9.3 $GtCO_2$ of avoided emissions.[98] For oil, it is projected that demand peaks around 2020, meaning that the oil sector does not need to continue to grow. Based on current Paris Agreement commitments, oil production required in the period to 2035 amounts to around 760 billion barrels, but falls to 690 billion barrels to maintain a course for

[90] IEA (2014) at 51, 52.

[91] IEA (2014) at 54.

[92] IEA (2014) at 54.

[93] Carbon Tracker Initiative, *The $2 trillion stranded assets danger zone: How fossil fuel firms risk destroying investor returns* (Nov. 2015) at 23, (Carbon Budget Exhibit 33).

[94] IEA (2013) at 114.

[95] Carbon Tracker (2015) at 7.

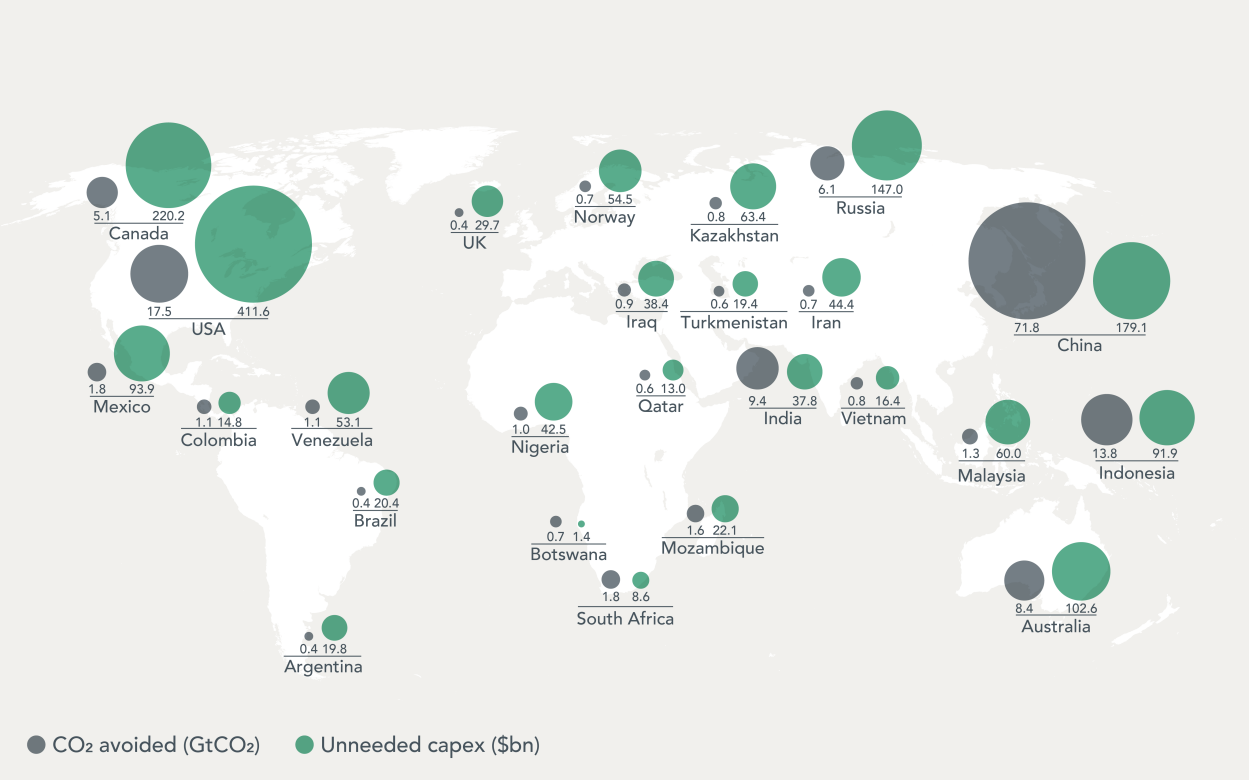
[96] Carbon Tracker (2015) at 2.

[97] Carbon Tracker (2015) at 10.

[98] Carbon Tracker (2015) at 14.

2°C.[99] Yet the estimated level of proven oil reserves are close to 1.7 trillion barrels.[100] This results to between a 940 and 1,010 billion barrel surplus of proven reserves that cannot be burned. Avoided capital expenditures for oil are nearly $1.5 trillion, avoiding 27.6 $GtCO_2$ of emissions.[101]

Unneeded capital expenditures to 2025 and related CO_2 to 2035 under a 2°C pathway



It is cheaper for the world to address climate change than bear its economic consequences. As detailed above, there are enough coal, oil and gas reserves that are technically recoverable to equal up to 7,120 $GtCO_2$ of emissions.[102] Only a portion of this carbon is already locked-in—i.e., total reserves held by fossil fuel companies and state owned assets—but this 'embedded' carbon still amounts to 2,860 $GtCO_2$—already enough to take us beyond 3°C of warming.[103] Only 20% of these fossil fuel reserves can be burned to 2050 if the world is to have a chance of not exceeding global warming of 2°C.[104]

The total coal, oil and gas reserves listed on the world's stock exchanges equaled 762

[99] IEA (2014) at 87.

[100] IEA (2014) at 87.

[101] Carbon Tracker (2015) at 18.

[102] IPCC AR5 at Table 7.2.

[103] Carbon Tracker Initiative, *Unburnable Carbon 2013: Wasted capital and stranded assets* (2013), at 14 (Carbon Budget Exhibit 34).

[104] Carbon Tracker (2013) at 4.

$GtCO_2$ in 2013—an amount that continues to grow.[105] "If listed fossil fuel companies have a pro-rata allocation of the global carbon budget, this would amount to around 125–275 $GtCO_2$, or 20 - 40% of the 762 $GtCO_2$ currently booked as reserves. The scale of this carbon budget deficit poses a major risk for investors. They need to understand that 60 - 80% of coal, oil and gas reserves of listed firms are unburnable."[106] The systemic risks threatening the stability of financial markets related to unburnable carbon are growing more entrenched, with 200 fossil fuel companies having a market value of $4 trillion and debt of $1.5 trillion.[107]

> As provided by Citigroup in a warning to investors:
>
> > Emissions contained in current 'reserves' figures are around three times higher than the so called 'carbon budget'. Some studies suggest that globally a third of oil reserves, half of gas reserves and over 80% of current coal reserves would have to remain unused from 2010 to 2050 in order to have a chance of meeting the 2°C target. In financial terms, we estimate that the value of unburnable reserves could amount to over $100 trillion out to 2050.[108]

The longer climate action is delayed the more expensive it becomes to avoid each additional ton of GHG emissions, and the more capital expenditures will become stranded. [109] In other words, climate action is directly tied to economic resilience, and the longer action is delayed the larger the lead balloon becomes. This is not only a problem for the fossil fuel industry, but for our economy and the wellbeing of our communities. These financial implications also bear directly on BLM's decisionmaking relative to the leasing and development of our public lands for fossil fuel resources. Not only do each additional acre leased and well authorized contribute to societies collective carbon burden, but inherent financial risk and market instability has far reaching implications for public lands remediation. When fossil fuel resources become stranded it is the public, not financially struggling fossil fuel companies, who are left holding the bag.

VII. <u>The BLM Fails to Take a Hard Look at the Direct, Indirect and Cumulative Impacts of Oil and Gas Leasing and Development</u>.

The National Environmental Policy Act ("NEPA"), 42 U.S.C. §§ 4321–4370h, and its implementing regulations, promulgated by the Council on Environmental Quality ("CEQ"), 40 C.F.R. §§ 1500.1–1518.4, is our "basic national charter for the protection of the environment." 40 C.F.R. § 1500.1. Recognizing that "each person should enjoy a healthful environment," NEPA ensures that the federal government uses all practicable means to "assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings," and to "attain the widest range of beneficial uses of the environment without degradation, risk to

[105] Carbon Tracker (2013) at 4.

[106] Carbon Tracker (2013) at 4.

[107] Carbon Tracker (2013) at 5, 30.

[108] Citi at 82.

[109] IEA (2014) at 43.

health or safety, or other undesirable and unintended consequences," among other policies. 43 U.S.C. § 4331(b).

NEPA regulations explain, in 40 C.F.R. §1500.1(c), that:

> Ultimately, of course, it is not better documents but better decisions that count. NEPA's purpose is not to generate paperwork – even excellent paperwork – but to foster excellent action. The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment.

Thus, while "NEPA itself does not mandate particular results, but simply prescribes the necessary process," *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989), agency adherence to NEPA's action-forcing statutory and regulatory mandates helps federal agencies ensure that they are adhering to NEPA's noble purpose and policies. *See* 42 U.S.C. §§ 4321, 4331.

NEPA imposes "action forcing procedures … requir[ing] that agencies take a *hard look* at environmental consequences." *Methow Valley*, 490 U.S. at 350 (citations omitted) (emphasis added). These "environmental consequences" may be direct, indirect, or cumulative. 40 C.F.R. §§ 1502.16, 1508.7, 1508.8. A cumulative impact—particularly important here—is defined as:

> the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

40 C.F.R. § 1508.7.

Federal agencies determine whether direct, indirect, or cumulative impacts are significant by accounting for both the "context" and "intensity" of those impacts. 40 C.F.R. § 1508.27. Context "means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality" and "varies with the setting of the proposed action." 40 C.F.R. § 1508.27(a). Intensity "refers to the severity of the impact" and is evaluated according to several additional elements, including, for example: unique characteristics of the geographic area such as ecologically critical areas; the degree to which the effects are likely to be highly controversial; the degree to which the possible effects are highly uncertain or involve unique or unknown risks; and whether the action has cumulatively significant impacts. *Id.* § 1508.27(b).

Furthermore, the Federal Land Policy and Management Act ("FLPMA"), 43 U.S.C. §§ 1701–1781, directs that "the public lands be managed in a manner that will protect the quality of [critical resource] values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use." 43 U.S.C.

§ 1701(a)(8). This substantive mandate requires that the agency not elevate the development of oil and gas resources above other critical resource values in the planning area. To the contrary, FLPMA requires that where oil and gas development would threaten the quality of critical resources, that conservation of these resources should be the preeminent goal. As detailed, below, for several critical resource values in the planning area, the proposed action conflicts with the BLM's mandate under FLMPA.

A. The BLM Cannot Defer a Site-Specific Analysis of the Impacts from the Lease Sale Because Leases Constitute Irretrievable Commitments of Resources.

In its EA for the March 2018 lease sale, the BLM indicates in multiple places in the EA that it is appropriate to defer its site-specific analysis of the impacts from the lease to the Application Permit to Drill ("APD") states. *See, e.g.*, EA at 9 ("An appropriate level of site-specific analysis of individual wells or roads would occur when a leaseholder submits an APD."). But, this determination is undermined by the BLM's own conclusion that "[a]fter a lease has been issued, the lessee has the right to use as much of the leased land as necessary to explore (or drill) for, extract, remove, and dispose of oil and gas deposits located under the leased lands with exceptions for restrictions that may be imposed consistent with the standard lease terms and stipulations and notices attached to the lease." EA at 7.

BLM has previously relied on *Park County Resource Council v. U.S. Department of Agriculture*, 817 F.2d 609 (10th Cir. 1987), to support its contention that site-specific NEPA analysis is not required until the APD stage. In *Park County*, the Court provided that "*with appropriate lease stipulations* aimed at protecting the environment, lease issuance itself, essentially a paper transaction, does not *usually* require prior preparation of an EIS." *Park County*, 817 F.2d at 621 (emphasis added). *Park County*, however, does not stand for the proposition—as BLM has implied—that there is a categorical rule exempting BLM from ever performing site-specific analysis at the lease sale stage. Indeed, the Ninth Circuit has consistently held that the sale of oil and gas leases is an irretrievable commitment of resources for which an EIS must be prepared. *See, e.g., Conner v. Burford,* 848 F.2d 1441 (9th Cir.1988); *Bob Marshall Alliance v. Hodel,* 852 F.2d 1223, 1227 (9th Cir.1988). Further, *Park County* cannot be understood in a vacuum; as the Tenth Circuit more recently explained:

> [T]here is no bright line rule that site-specific analysis may wait until the APD stage. Instead, the inquiry is necessarily contextual. Looking to the standards set out by regulation and by statute, assessment of all 'reasonably foreseeable' impacts must occur at the earliest practicable point, and must take place before an 'irretrievable commitment of resources' is made. 42 U.S.C. § 4332(2)(C)(v); *Pennaco Energy v. U.S. Dept. of Interior*, 377 F.3d 1147, 1160 (10th Cir. 2004); *Kern v. U.S. Bureau of Land Management*, 284 F.3d 1062, 1072 (9th Cir. 2002); 40 C.F.R. §§ 1501.2, 1502.22. Each of these inquiries is tied to the existing environmental circumstances, not to the formalities of agency procedures. Thus, applying them necessarily requires a fact-specific inquiry.

New Mexico ex rel. Richardson, 565 F.3d at 717–18. The Court has unambiguously stated that "[t]he operative inquiry [is] simply whether all foreseeable impacts of leasing [are] taken into

account before leasing [can] proceed." *Id.* at 717.

Indeed, in *Pennaco Energy,* the Court found: "A plan-level EIS for the area failed to address the possibility of [coal-bed methane ("CBM")] development, and a later EIS was prepared only after the leasing stage, and thus 'did not consider whether leases should have been issued in the first place.'" *New Mexico,* 565 F. 3d. at 717 (citing *Pennaco Energy,* 377 F.3d at 1152). Moreover, the Court held that "[b]ecause the issuance of leases gave lessees a right to surface use, the failure to analyze CBM development impacts before the leasing stage foreclosed NEPA analysis from affecting the agency's decision." *Id.* (citing *Pennaco Energy,* 377 F.3d at 1160).

Unlike *Park County* where site-specific impacts were difficult to anticipate, here, like in *Pennaco Energy*, the impacts of leasing parcels are reasonably foreseeable—more than 90% of the FFO planning area has already been leased and expansive oil and gas development has already occurred. Moreover, the agency has identified the reasonably foreseeable impacts of development stemming from the lease of these parcels, *see* EA at 19, including an estimate of the number of potential wells. EA at 56 ("The proposed action could result in a maximum of 35 horizontal and 28 vertical wells, totaling 63 potential wells.") Thus, as in *Pennaco Energy*, an EIS assessing the specific effects of oil and gas development from this lease sale is required before leases are conferred to industry.

Moreover, irrespective of BLM's ultimate conclusion with regard to stipulations, an irretrievable commitment of resources will be conferred at the lease sale stage; oil and gas leases confer "the right to use so much of the leased lands as is necessary to explore for, drill for, mine, extract, remove and dispose of all the leased resource in a leasehold." 40 C.F.R. § 3101.1-2; *Sierra Club v. Hodel*, 848 F.2d 1068, 1093 (10th Cir. 1988) (agencies are to perform hard look NEPA analysis "before committing themselves irretrievably to a given course of action so that the action can be shaped to account for environmental values"); *see also* EA at 7 ("After a lease has been issued, the lessee has the right to use as much of the leased land as necessary to explore (or drill) for, extract, remove, and dispose of oil and gas deposits located under the leased lands.").

Yet, even if there were a NSO stipulation covering an entire parcel—which is not the case here—the mere issuance of the lease confers a right to the resources thereunder. Whether through directional drilling or some other method of extraction, the leaseholder has an exercisable interest as soon as the lease is conferred, which it then relies upon in proceeding with its development plan. Therefore, significant environmental impacts, based on those lease rights, may also occur once a lease is issued. Although it is true that "some or all of the environmental consequences of oil and gas development may be mitigated through lease stipulations, it is equally true that the purpose of NEPA is to examine the foreseeable environmental consequences of a range of alternatives *prior* to taking an action that cannot be undone." *Montana Wilderness Ass'n*, 310 F.Supp.2d at 1145; *see also* 40 C.F.R. § 1501.2.

Here, the BLM refuses to perform site-specific analysis at the lease stage, and, once lease right are conferred, BLM's authority will thereafter be limited to imposing mitigation measures consistent with the terms of the lease. Consequently, if BLM discovers significant impacts at the

APD stage, it may no longer be able to prevent them. Because BLM is irretrievably committing resources at the lease sale stage, it must consider the impacts of its decision to lease parcels before it can confer public resources to a private developer in a lease—analysis which would be inherently flawed if performed without the benefit of a completed Mancos Shale RMP and EIS.

While the EA purports to evaluate the sale of oil and gas lease parcels which will allow drilling, completion, and production components, the agency also contends that consideration of impacts from development stage activity will actually occur later once APDs are submitted. EA at 9, 14, 19, 22, 26. This is a classic example of segmentation that is prohibited by NEPA.

As NEPA provides, to adequately assess the environmental impacts of a proposed action, BLM must assess three types of actions: (1) connected actions, (2) cumulative actions, and (3) similar actions. 40 C.F.R. § 1508.25. Connected actions "are closely related and therefore should be discussed in the same impact statement. Actions are connected if they: (i) Automatically trigger other actions which may require environmental impact statements; (ii) Cannot or will not proceed unless other actions are taken previously or simultaneously; (iii) Are interdependent parts of a larger action and depend on the larger action for their justification." *Id.* Cumulative actions are those actions that "when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement." *Id.* Similar actions are those actions that "when viewed with other reasonably foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography. An agency may wish to analyze these actions in the same impact statement. It should do so when the best way to assess adequately the combined impacts of similar actions or reasonable alternatives to such actions is to treat them in a single impact statement." *Id.*

There are two steps necessary to drill this area: first, BLM's proposed action to lease the subject parcels, and, second, BLM's promise of separate NEPA for the review and approval of APDs. The second cannot be accomplished without the first, and the act of drilling does not have independent utility. Instead, they are, for all intents and purposes, interdependent parts of a single action—to drill this area for oil and gas—that has been improperly segmented into two pieces. As detailed above, BLM knows enough about current oil and gas development in the southern San Juan Basin to look at the impacts that will occur if the lease sale occurs and oil and gas development commences. Among those impacts are immense amounts of nitrogen deliveries, the need for extensive storage, the need for ancillary development for oil that does not currently exist, flaring of natural gas and industrial infrastructure delivery development in rural, undeveloped areas, among others.

Finally, the BLM consistently avoids its duty to analyze and assess the direct, indirect, and cumulative impacts from the drilling stage. For example, just last week, the FFO issued a decision record approving the development of two natural gas wells through a categorical exclusion.[110] This means that no analysis of environmental impacts ever occurs. The BLM's shell game of deferring its analysis of its oil and gas leasing decisions to the APD stage violates

[110] Exhibit 3, BLM, *Decision Record for Heros 2308 09L 3H and COM 4H Oil and Natural Gas Wells* (Oct. 12, 2017), https://eplanning.blm.gov/epl-front-office/projects/nepa/89077/122647/149657/2017.10.12_2017-0113-CX_DR.pdf.

the requirements and spirit of NEPA.

B. The BLM Fails Take a "Hard Look" at Cumulative Impacts.

A cumulative impact is the "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." 40 C.F.R. § 1508.7. While BLM includes a "*Cumulative Impacts*" section in their EA, *see* EA at 73–74, BLM fails to actually conduct any cumulative analysis of those impacts. *See Natural Resources Defense Council v. Hodel*, 865 F.2d 288, 298 (D.C. Cir. 1988) (providing that section headings without the "requisite analysis" are insufficient); *see also* 40 C.F.R. § 1508.27(b)(7) (BLM must consider whether the proposed action is related to other actions that together may have cumulatively significant *impacts*. "Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.").

Here, the FFO's cumulative impacts analysis is remarkably insufficient. The area overlying the Mancos Shale is an area besieged by fossil fuel development. The FFO has over 23,000 active oil and gas wells, as well as two massive mine-to-mouth coal-fired power plant complexes—the Navajo Mine and Four Corners Power Plant, and the San Juan Mine and San Juan Generating Station. The impact of such development on the area's air, water, land, and human communities cannot be overstated. Yet, the FFO dismissively provides that "[c]onserving as much land as possible and applying appropriate mitigation measures will alleviate the cumulative impacts." EA at 74.

Furthermore, although BLM includes a cursory section of resource values cumulatively effected by the proposed action, the agency consistently avoids any actual cumulative analysis by claiming that it lacks the required data to conduct a cumulative impacts analysis or that the scope of the lease sale is de minimis given the scale of the resource considered. For example, the BLM acknowledges that although "[g]uidelines for estimating project-specific GHG emissions are available (URS Corporation, 2010), [because] some additional data, including the volume of oil produced and the number of wells, are not available for the Proposed Action," the BLM cannot estimate cumulative GHG emissions. EA at 76. But, the BLM estimates the number of proposed wells that will result from leasing in the EA—35 horizontal wells and 28 vertical wells. EA at 56. The BLM also estimates the oil and gas volumes per parcel. EA at 60. From this, the BLM could easily estimate, what GHG emissions will result from the project and from surrounding wells already in production. But, the BLM chooses not to take this final step.

The BLM also claims that the de minimis nature of the impacts from the project make cumulative impacts impossible to quantify. The agency states:

> The very small increase in GHG emissions that could result from approval of the Proposed Action Alternative would not produce climate change impacts that differ from the No Action Alternative. This is because climate change is a global process that is impacted by the sum total of GHGs in the Earth's atmosphere. The

> incremental contribution to global GHGs from the proposed action cannot be translated into effects on climate change globally or in the area of this site-specific action. It is currently not feasible to predict with certainty the net impacts from the proposed action on global or regional climate.

EA at 76. But, this statement is in direct contradiction with the CEQ in its Final Guidance. The CEQ states:

> Climate change results from the incremental addition of GHG emissions from millions of individual sources, which collectively have a large impact on a global scale. CEQ recognizes that the totality of climate change impacts is not attributable to any single action, but are exacerbated by a series of actions including actions taken pursuant to decisions of the Federal Government. Therefore, a statement that emissions from a proposed Federal action represent only a small fraction of global emissions is essentially a statement about the nature of the climate change challenge, and is not an appropriate basis for deciding whether or to what extent to consider climate change impacts under NEPA. Moreover, these comparisons are also not an appropriate method for characterizing the potential impacts associated with a proposed action and its alternatives and mitigations because this approach does not reveal anything beyond the nature of the climate change challenge itself: the fact that diverse individual sources of emissions each make a relatively small addition to global atmospheric GHG concentrations that collectively have a large impact.

BLM also cites state and national emissions levels to conclude emissions from this particular lease sale represents only a small fraction of these emissions, and are therefore insignificant. EA at 76. (Notably, BLM makes this assertion without actually estimating resulting emissions). In so doing, however, BLM is defining the cumulative impacts area with respect to GHG emissions at a state and national scale. Using this baseline, the appropriate scope of the BLM's cumulative analysis must similarly be at this scale, which would include disclosing and considering the cumulative emissions from BLM's Oil and Gas Leasing Program—including emissions from all active producible wells managed by BLM—and the incremental contribution to these emissions from the proposed lease sale. BLM must not only disclose and quantify these emissions, but also consider the effect that these emissions will have to resource values and communities across the planning area, and to our nation as a whole.

The BLM also attempts to satisfy their NEPA obligation for air resources by solely by tiering to the Air Resources Technical Report for Oil and Gas Development ("ARTR"). *See* EA at 74. Although the ARTR does broadly describe the air resource conditions and impacts for the New Mexico, Oklahoma, Texas and Kansas region, a document of this scope cannot satisfy the site-specific cumulative impacts to air resources stemming from this lease sale, which is the level of analysis NEPA demands. "Conclusory remarks," as are consistently provided throughout BLM's EA, "do not equip a decisionmaker to make an informed decision about alternative courses of action." *NRDC*, 865 F.2d at 298. "Perfunctory references do not constitute analysis useful to a decisionmaker in deciding whether, or how, to alter the program to lessen cumulative

environmental impacts." *Id.* at 275. BLM's conclusory treatment of their cumulative impacts analysis fails to meet their hard look requirement under NEPA.

Finally, the BLM also fails to account for GHG emissions from cumulative and similar actions in its EA. As NEPA requires, an agency must analyze the impacts of "similar" and "cumulative" actions in the same NEPA document in order to adequately disclose impacts in an EIS or provide sufficient justification for a FONSI in an EA. *See* 40 C.F.R. §§ 1508.25(a)(2) and (3). Here, the BLM fails to take into account the greenhouse gas emissions resulting from other proposed lease sales in the New Mexico State Office (including New Mexico, Texas, Oklahoma, and Kansas) and surrounding Western states.

In 2017, the BLM has leased or is planning to lease, the following parcels:

- New Mexico, Texas, & Oklahoma: The BLM held lease sales on January 25, 2017 where it sold 4 parcels (842.66 acres), https://eplanning.blm.gov/epl-front-office/projects/nepa/68428/96009/116065/Jan2017_SaleResults.pdf, and on June 8, 2017 where it sold 17 parcels (4,230.56 acres), https://eplanning.blm.gov/epl-front-office/projects/nepa/68426/109289/133858/June_8_2017_Sale_Results.pdf. The lease sale scheduled for September sold 61 parcels (15,331.91 acres). *See* https://eplanning.blm.gov/epl-front-office/projects/nepa/69506/119984/146392/NM_090717_LeaseSaleResults.pdf. And, for the December sale, the BLM is slated to lease 7 parcels (2,104.15 acres). *See* https://eplanning.blm.gov/epl-front-office/projects/nepa/80914/119523/145878/Final_Sale_Notice_12072017.pdf.

- Colorado: On March 9, 2017, the BLM sold 17 parcels covering 16,447.180 acres. *See* https://eplanning.blm.gov/epl-front-office/projects/nepa/70207/99188/120209/Sale_Results_March2017.pdf. On June 8, 2017, the BLM sold 70 parcels covering 63,268.120 acres in western Colorado. *See* https://eplanning.blm.gov/epl-front-office/projects/nepa/70241/109218/133789/Sale_Results_June2017.pdf. In September, the BLM sold 3 parcels totaling 403.808 acres. *See* https://eplanning.blm.gov/epl-front-office/projects/nepa/70242/119585/145943/Sept_2017_Sale_Results_LSS.pdf. In December, the BLM is planning to lease 28 publicly owned oil and gas lease parcels covering 27,283.79 acres. *See* https://eplanning.blm.gov/epl-front-office/projects/nepa/72396/119652/146009/Dec_2017_Final_Sale_Notice_posting.pdf.

- Utah: In March, 2017, the BLM sold 4 parcels covering 4,174.46 acres in the Canyon Country District of Utah. *See* https://www.blm.gov/sites/blm.gov/files/Programs_OilandGas_Leasing_RegionalLeaseSales_Utah_2017_SaleResults.pdf. And on June 15, 2017, the agency sold 8 parcels, totaling 7,479 acres in the Color Country District Office for sale. *See* https://www.blm.gov/sites/blm.gov/files/Programs_EnergyandMinerals_OilandGas_Leasing_RegionalLeaseSales_Utah_2017_SaleResults.pdf. In September, the BLM

sold 9 parcels containing 4,101.7 acres for sale in the West Desert District. *See* https://www.blm.gov/sites/blm.gov/files/Programs_OilandGas_Leasing_RegionalLeaseSales_Utah_2017_SALERESULTS.pdf. And, in December the BLM is proposing to lease in the Price Field Office in December 2017, while simultaneously proposing leasing in the adjacent Vernal Field Office. *See* https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/leasing/regional-lease-sales/utah. These actions are clearly similar and must be analyzed together in a single NEPA document.

The need to take into account "similar" and "cumulative" actions is underscored by the fact that the BLM acknowledges that the proper geographic area for analyzing and assessing the impacts of greenhouse gas emissions is on a national scale. The EA in fact assesses greenhouse gas emissions from the proposed leasing in the context of both statewide and national greenhouse gas emissions. *See* EA at 76. Although this assessment was apparently prepared to try to mislead the public into believing that emissions from the proposed leasing are not significant, it actually emphasizes the need for the BLM to not simply account for emissions from the proposed leasing, but likely for all greenhouse gas emissions associated with BLM-approved oil and gas leasing nationwide. Indeed, the BLM cannot claim that emissions are insignificant in the context of state or national emissions, but then fail to disclose the direct, indirect, and cumulative greenhouse gases that would result from all other "similar" and "cumulative" actions within a statewide or national scope. The failure to do so renders the EA inadequate and fails to provide support for a FONSI.

C. The BLM Fails to Take a "Hard Look" at Impacts to Air Quality.

In addition to its meager cumulative impacts analysis, the BLM also fails to take a hard look at the air quality impacts from oil and gas leasing and development in the planning area. 40 C.F.R. § 1506.6. Here, the BLM's air quality analysis fails because it relies on the outdated RMP and the broad scale Air Resources Technical Report and because the agency completely fails to calculate and analyze the site-specific emissions that will result from the March 2018 lease sale.

To start, the FFO's air resources analysis is tiered to the existing 2003 RMP and EIS, which, as detailed above and functionally admitted by BLM, is no longer capable of guiding agency decision-making. The 2003 RMP/EIS is also fatally flawed specifically with regards to air quality. Indeed, significant new information demonstrates that emissions associated with oil and gas development are significantly higher than what the 2003 Farmington RMP contemplated. According to recent inventory data prepared by the Western Regional Air Partnership ("WRAP"), the 2003 Farmington EIS underestimates emissions of VOCs from oil and gas operations by nearly 30-fold. In 2003, BLM estimated that within 20 years, VOC emissions would amount to 2,008.5 tons/year. According to the most recent WRAP inventory, VOC emissions from oil and gas activities in San Juan and Rio Arriba Counties were estimated to be nearly 60,000 tons/year in 2006 and projected to be more than 55,000 tons per year by 2012.[111] The table below illustrates this discrepancy between the amount of VOC emissions

[111] *See* ENVIRON, *Final Report: Development of 2012 Oil and Gas Emissions Projections for the South San Juan Basin* (Dec. 2009) (prepared for Western Regional Air Partnership) (included as Old Leasing Exhibit 121);

projected in 2003 and the most recent estimates.

Source of Emission Inventory	VOC Emission Estimate (tons/year)
RMP 20-Year Projection (RMP EIS at J-11)	2,008.5
WRAP Phase III 2006 Inventory for San Juan/Rio Arriba Counties	59,933
WRAP Phase III 2012 Projection for San Juan/Rio Arriba Counties	55,049

This discrepancy is significant because it indicates that BLM cannot reasonably tier to the 2003 RMP/EIS to justify that air quality impacts will not be significant. If anything, BLM must either prepare an EIS to address the air quality impacts of the proposed leases, supplement the 2003 RMP/EIS prior to moving ahead with the proposed leases, or, as discussed above, defer further leasing and development until the Mancos Shale RMP and EIS are completed.

This discrepancy also indicates that the county-level emissions data presented in the EA, which shows dramatically lower VOC emissions in San Juan and Rio Arriba Counties, is flawed. *See* EA at 23–24. The EA indicates that EPA emission inventory data from 2014 was utilized in reporting overall emissions in San Juan and Rio Arriba Counties. However, the EPA's inventory data does not reflect the actual emission inventory data presented by the WRAP as it relies solely on point source inventory data submitted by the New Mexico Environment Department.[112] Yet, as the WRAP data indicates, the vast majority of oil and gas-related VOC emissions are non-point source emissions.

In other words, the limited county-level emissions data BLM presents in the EA fails to accurately account for oil and gas emissions, raising further concerns that the EA is inadequate and fails to justify a finding of no significant impact. BLM must revise the EA and analyze and assess impacts in terms of accurate emissions data for the oil and gas industry. Moreover, the agency admits that additional near-field air quality modeling is needed. The agency states: "Due to the proximity of occupied buildings and residences to potential well sites[,] to develop these proposed lease parcels, information about the air quality impacts at these locations needs to be determined and disclosed as part of the NEPA analysis prior to decision making on the APDs for wells on these parcels." EA at 65. The agency later continues: "At the time of the lease sale, there is still not enough information available about how the lease will be developed to accurately determine the near-field air quality impacts." *Id.* The agency also admits "[a]fter a lease has been issued, the lessee has the right to use as much of the leased lands as necessary to

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ENVIRON, *Final Report: Development of Baseline 2006 Emissions from Oil and Gas Activity in the South San Juan Basin* (Nov. 2009) (prepared for Western Regional Air Partnership) (included as Old Leasing Exhibit 122).

[112] Exhibit 4, EPA, *2014 National Emissions Inventory, Version 1, Technical Support Document DRAFT* (Dec. 2016) at 2-14, available at https://www.epa.gov/sites/production/files/2016-12/documents/nei2014v1_tsd.pdf.

explore and drill oil and gas within the lease boundaries." EA at 7. In other words, regardless of what additional modeling tells us about impacts to air quality, once leases are sold, the agency cannot prevent development. This is precisely the type of scenario that NEPA forbids.

The FFO also incorporates in the EA broad technical information related to air resources from the ARTR for New Mexico, Oklahoma, Texas and Kansas, which is too general in scope to sufficiently analyze the site-specific impacts of oil and gas leasing and development from the proposed action. These documents, as well as the agency's assertion that "leasing the subject tracts would have no direct impacts to air quality[,]" and that "[a]ny potential effects to air quality from the sale of lease parcel would occur at such time that the lease is developed[,]" is the extent of BLM's analysis of air resources. EA at 57. With no analysis, quantified data, or reference to any of NEPA's significance factors, 40 C.F.R. § 1508.27, the agency has failed to satisfy their statutory mandate. The BLM's hard look analysis "must be taken objectively and in good faith, not as an exercise in form over substance, and not as a subterfuge designed to rationalize a decision already made." *Forest Guardians,* 611 F.3d at 712. What the agency offers in one-and-a-half pages fails to satisfy this obligation. In addition, NEPA requires an agency to analyze site specific impacts of a proposal. *See High Country Conservation Advocates v. U.S. Forest Service*, 52 F.Supp. 3d 1174 (D. Colo. 2014) ("The EA, while typically a more concise analysis than an EIS, must still evaluate the need for the proposal, alternatives as required by NEPA section 102(2)(E), and the environmental impacts of the proposed action and alternatives."). Thus, the BLM cannot rely on the broad-scale Air Resources Technical Report to meet its requirement to analyze the impacts of the March 2018 lease sale.

The EA also does not actually analyze or assess the impacts of developing the proposed leases to a number of national ambient air quality standards ("NAAQS"). We are especially troubled that the EA fails to analyze the direct, indirect, and cumulative air quality impacts in the context of NAAQS promulgated since the RMP was adopted. These NAAQS include the 1-hour nitrogen dioxide NAAQS (promulgated in 2010), the 1-hour sulfur dioxide NAAQS (also promulgated in 2010), the 24-hour $PM_{2.5}$ NAAQS (promulgated in 2006), the annual $PM_{2.5}$ NAAQS (promulgated in 2012), and the 8-hour ozone NAAQS (promulgated in 2015).[113] We are particularly concerned over the impacts to the 1-hour NO_2 NAAQS given that short-term NO_2 concentrations are linked to near-field, near ground-level emissions, including compressor engines exhaust stacks and other combustion sources. Because the RMP does not analyze or assess impacts to these air quality standards, in particular the NO_2 NAAQS, the EA cannot reasonably tier to the analysis in the 2003 RMP/EIS or otherwise reasonably conclude that the direct, indirect, and cumulative impacts of the proposed leasing will not be significant.

The failure to analyze and assess impacts to air quality is especially hard to understand because the EA acknowledges the relevant NAAQS. *See* EA at 23 (Table 3). Yet nowhere in the EA does BLM attempt to analyze what the consequences of developing the proposed leases will be in terms of future air quality concentrations. Indeed, the BLM summarily concludes that "[t]he potential amounts of ozone precursor emissions of NOx and VOCs from the proposed lease sale are not expected to impact the current design value for ozone in San Juan County

[113] The EPA also retained prior ozone NAAQS, including the 2008 ozone NAAQS, which limited ambient concentrations to no more than 0.075 parts per million over an eight hour period. *See* 40 C.F.R. § 50.15.

under the Proposed Action Alternative," despite the fact that ozone levels from Navajo Dam monitoring station are at 0.068 part per million–just below the 2015 NAAQS for ozone.

Although no air quality violations are currently occurring, this does not mean that the NAAQS will never be violated. Moreover, the U.S. District Court for the District of Colorado in fact rejected a similar analysis prepared by the BLM in support of an oil and gas drilling plan in the Roan Plateau area of western Colorado. In that case, the BLM asserted that the lack of ozone violations indicated that future impacts would not be significant. In her ruling, Judge Krieger stated: "The mere fact that the area has not exceeded ozone limits in the past is of no significance when the purpose of the EIS is to attempt to predict what environmental effects are likely to occur in the future[.]" *Colo. Envtl. Coal. v. Salazar*, 875 F. Supp. 2d 1233, 1257 (D. Colo. 2012). This is particularly relevant here where the current monitoring stations are hovering just below the 2015 NAAQS for ozone.

Critically, the BLM failed to consider the stricter EPA ozone standards that were recently finalized. By court order, EPA's new ozone standard was required to be finalized by October 1, 2015.[114] Therefore, EPA's new NAAQS standard for ozone was not only sufficiently foreseeable, but has been finalized well in advance of BLM's release of the EA, and therefore it should have been included in the agency's analysis of alternatives and should have guided consideration of the proposed project.

Compounding BLM's failure in the EA to actually analyze and assess air quality impacts is that BLM entirely fails to even address emissions impacts. Although the EA discloses county-level emissions data from 2014, there is no actual analysis or assessment as to how emission levels would be affected by development of the proposed leases. Simply disclosing the affected environment does not amount to an analysis or assessment of reasonably foreseeable impacts. Particularly when the BLM asserts that future emissions will not be significant, a lack of any actual analysis of emissions impacts is especially troublesome. The EA must be revised to include an actual analysis of how development of the proposed leases will impact emission levels.

D. The BLM Fails to Take a "Hard Look" at the Impacts from Climate Change.

The BLM fails to take a hard look at the climate change impacts from oil and gas leasing and development in the planning area for a number of reasons. 40 C.F.R. § 1506.6.

To start as with air quality, the FFO relies on the ARTR to satisfy the agency's NEPA obligations for climate change and GHG emissions. *See* EA at 58. As noted above, although the ARTR provides a broad overview of oil and gas emissions for a four-state region, the document, in isolation, is incapable satisfying the type of site-specific NEPA analysis that is demanded here. Further the BLM again claims that leasing the parcels will have no direct impacts to climate change from GHG emissions because any impacts will occur at the development stage, and the BLM will analyze the impacts at that point. But, as discussed above, the BLM cannot defer analyzing the impacts from the lease sale until the APD stage because leasing is an

[114] *See Sierra Club v. EPA,* No. 13-2809 (N.D. Cal., Apr. 30, 2014).

irretrievable commitment of resources and BLM loses any power to limit development at the APD stage.

Although Citizen Groups appreciate the fact that the BLM includes an analysis of the direct GHG emissions from the lease sale, the agency's analysis vastly underestimates potential emissions because it relies on national, as opposed to site-specific data, in violation of NEPA. For example, the BLM estimates that one well will emit 98.4[115] metric tons of carbon dioxide equivalent ("CO_2e") annually. Assuming 63 wells are developed on the lease parcels, the BLM concludes that all of these wells will emit a combined total of 6,199.2 metric tons of CO_2e per year. But, this number is wildly inaccurate. In a 2013 report prepared for the BLM by Kleinfelder, the agency was able to estimate per well emissions for many major oil and gas producing regions in the western U.S., including the San Juan Basin of New Mexico, the Green River Basin of Wyoming, and others.[116] This report estimated total per well greenhouse gas emission to range from a low of 791 tons (717.6 metric tons) per year for San Juan Basin coalbed methane wells, to a high of 3,682 tons (3,340.3 metric tons) for oil wells in North Dakota. *See* Table below. In either case, the estimates are far greater than the 98.4 metric tons per well per year proffered in the EA, especially because almost all of the new wells will likely be deeper wells that use hydraulic fracturing and directional drilling.

Per Well Greenhouse Gas Emission Estimates by Major Western U.S. Oil and Gas Producing Region.

Region (Type)	Total CO_2	Total CH_4	Total CO_2e
San Juan, NM (gas)	651.9	6.1	791
Denver, CO (oil)	1,049.0	1.8	1,099
Upper Green River, WY (gas)	2,882.1	14.1	3,194
Willison, ND (oil)	3,156.4	16.6	3,682
Uinta/Piceance (gas)	2,552.1	12.2	2,825

In sum, CEQ's Final Guidance explains the application of NEPA principles and practices to the analysis of GHG emissions and climate change, including, among others: (1) that agencies quantify a proposed action's projected direct and indirect GHG emissions, taking into account available data and GHG quantification tools; (2) that agencies use projected GHG emissions as a proxy for assessing potential climate change effects when preparing a NEPA analysis; (3) where GHG emission tools, methodologies, or data inputs are not reasonably available, agencies include a qualitative analysis in the NEPA document and explain the basis for determining that quantification is not reasonably available; (4) analyze foreseeable direct, indirect, and cumulative GHG emissions and climate effects; (5) consider reasonable alternatives and the short- and long-term effect and benefits in the alternatives and mitigation analysis; (6) consider alternatives that would make the actions and affected communities more resilient to the effects of a changing climate; and (7) assess the broad-scale effects of GHG emissions and climate change, either to inform programmatic decisions, or at both the programmatic and project-level. BLM falls

[115] The BLM comes up with this number by dividing the total direct emissions from all San Juan Basin federal leases by the total number of active federal wells in the Basin (1,476,440 CO2e / 15,000).

[116] *See* Exhibit 5, Kleinfelder, "Air Emissions Inventory Estimates for a Representative Oil and Gas Well in the Western United States," Report Prepared for Bureau of Land Management (March 25, 2013).

dramatically short of this level of analysis and consideration, as required by NEPA.

a. Social Cost of Carbon.

An EIS must do more than merely identify impacts. An EIS must also enable the agency and other interested parties to "evaluate the severity" of the effects. *See Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 352 (1989); *see also* 40 C.F.R. § 1508.27-(b) (a factor in assessing intensity or severity, and hence significance for NEPA purposes, is "the degree to which the proposed action affects public health or safety").

BLM's EA offers estimates of the amount of GHGs that will be emitted under the lease sale, but fails to include any meaningful discussion of the impacts of these emissions. Where information relevant to foreseeable adverse impacts is unavailable, agencies must nonetheless evaluate "such impacts based upon theoretical approaches or research methods generally accepted in the scientific community." 40 C.F.R. § 1502.22(b)(4).

One widely used approach to evaluating the impact of GHG emissions is to estimate the costs of those emissions to society. The federal Interagency Working Group on the Social Cost of Carbon has developed estimates of the present value of the future costs of carbon dioxide emissions as a proxy for the magnitude and severity of those impacts. The EPA has relied on a similar peer-reviewed estimate for the social cost of methane emissions, which adjusts the social cost of carbon dioxide to account for the different effects of methane on climate change and its greater global warming potential. These tools are easy to use by agencies, easy to understand by the public, and supported by years of peer-reviewed scientific and economic research. The EPA and other federal agencies have used these social cost protocols to estimate the effects of rulemakings on climate, and certain BLM field offices have used these tools in leasing level NEPA analysis. These protocols estimate the global financial cost of each additional ton of GHG pollution emitted to the atmosphere, taking into account factors such as diminished agricultural productivity, droughts, wildfires, increased intensity and duration of storms, ocean acidification, and sea-level rise.

Here, BLM included a social cost of carbon section in its EA, but states: "the BLM finds that including monetary estimates of the social cost of GHGs (SC GHG) in its NEPA analysis for this Proposed Action would not be useful. There is no court case or existing guidance requiring the inclusion of SCC in the NEPA context." EA at 64. The agency later continues, stating: "Given the global nature of climate change, estimating SCC of an individual decision requires assessing the impact of the project on the global market for the commodity in question. While BLM is able to estimate the GHG emissions associated with reasonably foreseeable oil and gas development, this EA does not estimate the net effect of this action on global GHG emissions or climate change." *Id.* Although these statements attempt to insulate the agency from including such analysis, BLM misses the fundamental NEPA obligation that employing SCC would satisfy, which is acting as a proxy for the magnitude and severity of climate impacts. Instead, BLM seems to rely solely on the Air Resources Technical Report and subsequent analysis at the APD stage to fill this gap. *See* EA at 58. In fact, BLM concludes a sentence later, without any analysis, that "[l]easing the subject tracts under the Proposed Action Alternative would have no direct impacts to climate change as a result of GHG emissions. Any potential effects to air

quality as a result of lease development would be considered at the time of application for specific projects." EA at 58.

Simple calculations applying the SCC to GHG emissions from this lease sale offer a straightforward comparative basis for analyzing impacts, and identifying very significant costs. For example, the agency recognizes that "Total Potential GHG Emissions from Oil and Gas Field Production at Full Development (63 wells)" is 6,199.2 metric tons of CO_2e.[117] EA at 61. Applying the IWG central value of $43 per ton of CO_2 results in a SCC of $266,565.60 for 63 wells.[118] But, as Citizen Groups discuss above, this amount is likely much greater because the BLM underestimates direct carbon emissions from the proposed leases.

Instead of considering these costs, the agency attempts to evade the necessary NEPA analysis of the magnitude and severity of GHG emission impacts by erroneously concluding that "[i]t is currently not feasible to predict with certainty the net impacts from the proposed action on global or regional climate" EA at 76. But, as noted by Judge Jackson, the SCC protocol provides such a tool. *See High Country Conservation Advocates v. U.S. Forest Service,* 52 F.Supp.3d 1174, 1190 (D.Colo. 2014); *see also Mont. Envtl. Info. Ctr. v. U.S. Office of Surface Mining*, No. CV 15-106-M-DWM (D. Mont. Aug. 14, 2017) (affirming the reasoning in *High Country*). By failing to consider the costs of GHG emissions from the Proposed Action, the agency's analysis effectively assumes a price of carbon that is $0. *See High Country*, 52 F.Supp.3d at 1192 (holding that although there is a "wide range of estimates about the social cost of GHG emissions[,] neither the BLM's economist nor anyone else in the record appears to suggest the cost is as low as $0 per unit. Yet by deciding not to quantify the costs as all, the agencies effectively zeroed out the cost in its quantitative analysis."). The agency's failure to consider the SCC is arbitrary and capricious, and ignores the explicit directive of EO 12866.

An agency must "consider every significant aspect of the environmental impact of a proposed action." *Baltimore Gas & Elec. Co. v. Natural Resources Defense Council*, 462 U.S. 87, 107 (1983) (quotations and citation omitted). This includes the disclosure of direct, indirect, and cumulative impacts of its actions, including climate change impacts and emissions. 40 C.F.R. § 1508.25(c). The need to evaluate such impacts is bolstered by the fact that "[t]he harms associated with climate change are serious and well recognized," and environmental changes caused by climate change "have already inflicted significant harms" to many resources around the globe. *Massachusetts v. EPA*, 549 U.S. 497, 521 (2007); *see also id.* at 525 (recognizing "the enormity of the potential consequences associated with manmade climate change."). Among other things, the agency's analysis must disclose "the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity[,]" including the "energy requirements and conservation potential of various alternatives and mitigation measures." 42 U.S.C. § 4332(c); 40 C.F.R. § 1502.16(e). As explained by CEQ, this requires agencies to "analyze total energy costs, including possible hidden or indirect costs, and total energy benefits of proposed actions." 43 Fed. Red. 55,978, 55,984 (Nov. 29, 2978); *see also* Executive Order 13514, 74 Fed. Reg. 52,117 (Oct. 5, 2009)

[117] As noted above, the Citizen Groups believe that this calculation is flawed.

[118] It is important to note that, although the 2010 IWG SCC protocol did not address methane impacts, the 2013 IWG Technical Update explicitly addresses methane impacts. Thus, it is appropriate to calculate a SCC outcome that takes into account the full CO_2e emissions associated with the proposed leasing.

(requiring government agencies to disclose emissions information annually from direct and indirect activities). Failing to perform such analysis undermines the agency's decisionmaking process and the assumptions made.

Moreover, BLM typically measures a project's GHG emissions against a baseline of national and/or global GHG emissions—thereby marginalizing the Proposed Actions contribution to our climate crisis while concluding the agency is powerless to avoid or mitigate such impacts. Here, the agency provides that "climate change is a global process that is impacted by the sum total of GHGs in the Earth's atmosphere. The incremental contribution to global GHGs from the proposed action cannot be translated into effects on climate change globally or in the area of this site-specific action." EA at 76. The EPA has cautioned "against comparing GHG emissions associated with a single project to global GHG emission levels" because it erroneously leads to a conclusion that "on a global scale, emissions are not likely to change" as a result of the project.[119] As noted above, CEQ has offered similar guidance, recognizing that "the totality of climate change impacts is not attributable to any single action, but are exacerbated by a series of actions including actions taken pursuant to decisions of the Federal Government. Therefore, a statement that emissions from a proposed federal action represent only a small fraction of global emissions is essentially a statement about the nature of the climate change challenge, and is not an appropriate basis for deciding whether or to what extent to consider climate change impacts under NEPA." Applying the SCC, as provided above, takes these abstract emissions and places them in concrete, economic terms. It also allows the agency to easily perform the cost-benefit analysis mandated by EO 12866, as well as BLM's own policy. Specifically, Instruction Memorandum No. 2013-131 (Sept. 18, 2013) is reflective of the BLM's attempt to internalize the costs of such emissions:

> All BLM managers and staff are directed to utilize estimates of nonmarket environmental values in NEPA analysis supporting planning and other decision-making where relevant and feasible, in accordance with the attached guidance. At least a qualitative description of the most relevant nonmarket values should be included for the affected environment and the impacts of alternatives in NEPA analyses….
>
> Nonmarket environmental values reflect the benefits individuals attribute to experiences of the environment, uses of natural resources, or the existence of particular ecological conditions that do not involve market transactions and therefore lack prices. Examples include the perceived benefits from hiking in a wilderness or fishing for subsistence rather than commercial purposes. The economic methods described in this guidance provide monetary estimates of nonmarket values. Several non-economic, primarily qualitative methods can also be used to characterize the values attributed to places, landscapes, and other environmental features. Guidance on qualitative methods for assessing environmental values, including ethnography, interviews, and surveys, is in preparation.

[119] *See* Sarah E. Light, *NEPA's Footprint: Information Disclosure as a Quasi-Carbon Tax on Agencies*, 87 Tul. L. Rev. 511, 546 (2013).

> Ideally, economic analysis for resource management should consider all relevant values, not merely those that are easy to quantify. Utilizing nonmarket values provides a more complete picture of the consequences of a proposed activity than market data alone would allow. The BLM's Land Use Planning Handbook, Appendix D encourages inclusion of information on nonmarket values, but does not provide detail.

The agency simply cannot continue to ignore its obligation to consider the costs of GHG emissions in its decisionmaking, as it has done here.

Nor can the agency continue to tout the benefits of oil and gas development without similarly disclosing the costs. *See* 40 C.F.R. § 1502.23. Although the BLM's EA includes only a short mention of the economic benefits from the lease sale, the agency does note that "[d]irect effects of leasing are the creation of valid mineral exploration rights, and the revenue generated by the lease sale." Furthermore, the BLM regularly touts the amount of money federal lease sales generate. For example, on September 7, 2017, the BLM issued a press release stating that "[i]n keeping with the Administration's goals of promoting America's Energy independence, the Bureau of Land Management New Mexico quarterly oil and gas lease sale resulted in competitive bids for 15,331.91 acres. The combined bids from the sale brought in $130,855,717, which will be distributed between the federal government and New Mexico."[120] This approach is misleading and frustrates the purposes of NEPA.

In sum, here, the agency violated NEPA by relying on analysis that partially disclosed the amount of GHG pollution from foreseeable oil and gas development, while also failing to take the essential next step required for a hard look: disclosing the costs and impacts that such pollution would have. An economic cost-benefit must be performed before the agency authorizes the proposed development. As detailed herein, such an analysis will reveal dramatically greater costs to people and the environment than anticipated benefits from the project, which seriously undermines the economic logic of proceeding with the proposed sale. At the very least, however, failing to provide any cost-benefit analysis is impermissible according to the agency's multiple legal obligations, including NEPA, EO 12866, as well as BLM's own policy IM No. 2013-131.

b. Methane Emissions and Waste.

By making absolutely no commitment on mitigation measures and BMPs to address the GHG emissions from oil and gas leasing and development, the FFO is missing a critical opportunity and, indeed, obligation, to address the serious issue of methane ("CH_4") emissions and waste. *See* EA at 65 ("The FFO would work with industry to facilitate the use of the relevant BMPs for operations proposed on Federal mineral leases where such mitigation is consistent with agency policy."). There readily available and cost-effective mitigation technologies that can drastically reduce the amount of methane lost during production. And, as discussed above, the EPA's new global warming potential ("GWP") estimates for methane (based on the most recent

[120] Exhibit 6, *BLM New Mexico Oil and Gas Lease Sale Nets More Than $130 Million* (Sept. 7, 2017), https://www.blm.gov/press-release/blm-new-mexico-oil-and-gas-lease-sale-nets-more-130-million.

IPCC study)[121] of 28–36 over a 100-year period,[122] and 84–87 over a 20-year period underscore the importance of eliminating methane waste, which is a critical step the FFO can take *now* to reduce GHG emissions in the planning area. That the FFO failed to make the use of *any* methane mitigation technology a requirement for the future development of these parcels is inexcusable. Instead of making a specific commitment to address the serious waste of a harmful climate pollutant, BLM offers that "USEPA promulgated air quality regulations controlling VOC emissions at gas wells. These rules require air pollution mitigation measures that reduce the emissions of volatile organic compounds. These same mitigation measures have a co-benefit of reducing methane emissions." EA at 29.

To the agency's credit, BLM has finally acknowledged the methane "hot spot" that exists over the San Juan Basin, citing "pioneering research using space-borne (satellite) and airborne (aircraft) determination of methane concentrations have indicated anomalously large methane concentrations may occur in the Four Corners region (Kort, et al., 2014)." EA at 29. Yet, in an apparent attempt to avoid taking action on the methane hot spot, BLM continues: "While space-borne studies can determine the pollutant concentration in a column of air, these studies cannot pinpoint the specific sources of air pollution. Further study is required to determine the sources responsible for methane concentrations in the Four Corners region; however, it is known that a significant amount of methane is emitted during oil and gas well completion (Howarth, et al., 2011)." *Id.* This uncertainty is no longer the case. Last summer, NASA released a study of methane emissions in the San Juan Basin identifying 250 large methane plumes emitted from well pads, storage tanks, pipelines, gas processing plants, and venting from the San Juan coal mine.[123] Together these sources make up roughly half of all basin-wide methane emissions, and all but one of these sources is from the oil and gas industry. But, the BLM has failed to update the EA to reflect this study.

To comply with NEPA, the BLM must take a hard look at direct, indirect, and cumulative impacts, as discussed above. 40 C.F.R. §§ 1502.16(a), (b); 1508.25(c). In evaluating impacts, the agency must discuss "[e]nergy requirements and conservation potential of various alternatives and mitigation measures," "[n]atural or depletable resource requirements and conservation potential of various alternatives and mitigation measures," and "[m]eans to mitigate adverse environmental impacts (if not fully covered under 1502.14(f))." 40 C.F.R. §§ 1502.16(e), (f), (h). The FFO's EA fails to provide any such analysis or comparison.

We emphasize, again, the "heart" of the NEPA process: BLM's duty to consider "alternatives to the proposed action" and to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved

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[121] *See* IPCC, *Fifth Assessment Report Climate Change 2013* at 8-58 (Old Leasing Exhibit 68).

[122] Interestingly, the BLM states that the GWP for methane is between 28 to 36 times that of CO_2 a 100-year period at the beginning of the EA. EA at 27. But, the BLM misstates the GWP for methane later on in the GHG Impacts section to be 21 to 25 times that of CO_2. This is reflective of the cut and paste nature of the BLM's EA in general. Indeed, the EA seems to be almost exactly the same as the EA from the January 2017 lease sale. This is unacceptable, especially in light of the controversy surrounding these lease parcels.

[123] Christian Frankenberg, et al., *Airborne Methane Remote Measurements Reveal Heavy-Tail Flux Distribution in Four Corners Region*, PNAS, vol. 113 no. 25 (Aug. 30, 2016) available at http://www.pnas.org/content/113/35/9734.full.

conflicts concerning alternative uses of available resources." 42 U.S.C. §§ 4332(2)(C)(iii), 4332(2)(E); 40 C.F.R. § 1502.14(a). Alternatives are critical because, "[c]learly, it is pointless to 'consider' environmental costs without also seriously considering action to avoid them." *Calvert Cliffs' Coordinating Comm., Inc. v. U.S. Atomic Energy Commn.*, 449 F.2d 1109, 1128 (D.C. Cir. 1971). Here, BLM considered only two alternatives: a "no action" alternative in which none of the nominated parcels would be offered for sale, and the "proposed action" where 25 parcels with standard terms and conditions and lease stipulations dating back to the obsolete and ineffective 2003 RMP and EIS. *See* EA 13–14 (discussing alternatives). None of these existing measures or stipulations addresses GHG emissions or methane waste.

Moreover, the FFO's EA fails to quantify the magnitude of methane pollution from oil and gas emissions sources within the planning area—which, given the agency's admission that these parcels will be developed in a business-as-usual manner—is directly relevant to the proposed sale. Petroleum and natural gas systems are the biggest contributor to methane emissions in the United States, accounting for over one quarter of all methane emissions, or 202.3 million metric tons of CO_2e each year (which does not include CH_4 that has been flared, captured, or otherwise controlled).[124] However, methane emission rates can differ quite dramatically from one oil and gas field to the next, and, depending on the type of mitigation and emission controls employed, emissions can range anywhere from 1% to 12% of production.[125] In order to sufficiently understand the scope of methane emission impacts expected from the proposed action, BLM should quantify estimated emission rates and analyze alternatives that would mitigate these impacts. However, even without specific data from the proposed action, we can assume leakage somewhere between these two extremes and, even at the low end, emissions reductions would not be trivial, particularly in a region containing the largest methane plume in the country. The agency's refusal to consider any mitigation measures that would reduce these emissions fails to satisfy BLM's NEPA obligations.

Even setting aside the issue of climate change, every ton of methane emitted to the atmosphere from oil and gas development is a ton of natural gas *lost*. Every ton of methane lost to the atmosphere is therefore a ton of natural gas that cannot be used by consumers. Methane lost from federal leases will also not yield royalties otherwise shared between federal, state, and local governments. This lost gas reflects serious inefficiencies in how BLM oil and gas leases are developed. Energy lost from oil and gas production – whether avoidable or unavoidable – reduces the ability of a lease to supply energy, increasing the pressure to drill other lands to supply energy to satisfy demand. 40 C.F.R. §§ 1502.16(e)-(f). In so doing, inefficiencies create indirect and cumulative environmental impacts by increasing the pressure to satisfy demand with new drilling. 40 C.F.R. §§ 1508.7, 1508.8(b).

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[124] *See* Exhibit 7, U.S. EPA, *Executive Summary: Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2015*, at ES-6 (April 2017) available at https://www.epa.gov/sites/production/files/2017-02/documents/2017_executive_summary.pdf.

[125] *See, e.g.,* David T. Allen, et. al., *Measurements of Methane Emissions at Natural Gas Production Sites in the United States*, PNAS (Aug. 19, 2013) (finding emissions as low as 1.5% of production at select cites) (Old Leasing Exhibit 66); Anna Karion, et. al., *Methane emissions estimate from airborn measurements over a western United States gas field*, GEOPHYSICAL RESEARCH LETTERS (Aug. 27, 2013) (finding emissions of 6 to 12 percent, on average, in the Uintah Basin) (Old Leasing Exhibit 67).

c. Managing for Community and Ecosystem Resiliency.

Critically absent from the FFO's analysis is any mention of the climate change impacts already affecting the planning area. According to experts at the Government Accountability Office ("GAO"), federal land and water resources are vulnerable to a wide range of effects from climate change, some of which are already occurring. These effects include, among others, "(1) physical effects, such as droughts, floods, glacial melting, and sea level rise; (2) biological effects, such as increases in insect and disease infestations, shifts in species distribution, and changes in the timing of natural events; and (3) economic and social effects, such as adverse impacts on tourism, infrastructure, fishing, and other resource uses."[126] There is absolution no mention, much less analysis, in the EA of these growing impacts or the necessity to employ climate mitigation measures to ensure landscape and human resiliency and their ability to adapt and respond to climate change impacts.

Beyond mitigating climate change by reducing contributions of GHG pollution to the atmosphere, the BLM can also help promote ecological resiliency and adaptability by reducing external anthropogenic environmental stresses (like oil and gas development) as a way of best positioning public lands, and the communities that rely on those public lands, to withstand what is acknowledged ongoing and intensifying climate change degradation. It is crucial for the BLM to close the gap in their decision-making regarding the cumulative contribution of oil and gas development authorized in the proposed action, particularly given the conflict between such authorization and the agency's responsibility to manage for healthy, resilient ecosystems. Although the FFO has recognized the threat of climate change, the agency's decision-making is not reflective of this harm and the agency fails to take the many necessary and meaningful steps to ameliorate the impacts to communities, landscapes, and species. The FFO's failure to even mention the relationship between climate change and these impacts is a fundamental deficiency in the EA.

E. The BLM Fails to Take a "Hard Look" at Hydraulic Fracturing.

The BLM also fails to take a hard look at hydraulic fracturing (or "fracking") impacts from oil and gas leasing and development in the planning area. 40 C.F.R. § 1506.6.

The agency's EA acknowledges that it is foreseeable that hydraulic fracturing will occur on leased parcels, and that "[o]il and gas development may include . . . hydraulically fracturing the well." *See* EA at 19. And that "it is anticipated that with more wells being drilled, there will be an increase in the amount of wells being hydraulically fractured and completed." EA at 57.

[126] GAO Report, *Climate Change: Agencies Should Develop Guidance for Addressing the Effects on Federal Land and Water Resources* (2007) (included previously with Citizen Groups June 17, 2016 comments as Scoping Exhibit 35); *see also* Committee on Environment and Natural Resources, National Science and Technology Council, *Scientific Assessment of the Effects of Global Climate Change on the United States* (2008) (Old Leasing Exhibit 36); Melanie Lenart, et. al. *Global Warming in the Southwest: Projections, Observations, and Impacts* (2007) (Old Leasing Exhibit 37) (describing impacts from temperature rise, drought, floods and impacts to water supply on the southwest).

The agency also identifies impacts from fracking, such as: "Volatile organic compounds are emitted during the completion of hydraulically fractured wells," EA at 57; as well as impacts to nearby residents, EA at 68. However, the BLM's section on the impacts of fracking is greatly reduced from the January 2017 lease sale EA and in each instance where the BLM actually mentions it, the FFO either relies on vague and undefined future mitigation, attempts to explain why these impacts actually aren't that big a deal, or ignores these impacts altogether—all without ever providing the hard look analysis that NEPA demands. Although BLM included additional information in Appendix C: Phases of Oil and Gas Development, it offers little more than a factual background on the hydraulic fracturing process without actually analyzing impacts to people and resource values in the planning area. EA at 98–103.

To start, the BLM fails to mention that the advent of hydraulic fracturing coupled with horizontal drilling means that additional, larger gas wells are possible, resulting in increased numbers of compressor stations. Low-frequency noise from compressor stations near homes has been linked to "noise-induced hearing loss, oxidative stress, increased cardiovascular effects, endocrine disruption, and an increased risk of developing diabetes. There is also a growing concern that low frequency noise (10–250 Hz) can disrupt sleep, contribute to poorer performance (e.g., poor concentration and attention span), and cause annoyance."[127] Despite these impacts, the BLM fails to include a section analyzing the impacts from increase noise.

With regard to VOC emissions from fracked wells, the EA cites EPA promulgated air quality regulations for completion of hydraulically fractured gas wells, and states that "[t]hese rules require air pollution mitigation measures that reduce emissions of volatile organic compounds during gas well completions." EA at 24. However, the EA fails to provide what these mitigation measures actually are, or quantify how such measures "constitute an adequate buffer against the negative impacts [and] whether the mitigation measures will render such impacts so minor as to not warrant an EIS." *National Parks*, 241 F.3d at 735.

Critically, the agency also acknowledges impacts to nearby residents, who "may be disturbed while hydraulic fracturing or other completion and stimulation operations are occurring, as these activities involve many vehicles, heavy equipment, and a workover rig." EA at 68. In response, the FFO callously provides that "[t]hese impacts would be limited to the period of time during which drilling operations associated with hydraulic fracturing occur." *Id.* Of course, these sensory impacts represent only some of the far broader effects that local residents will suffer from the proposed action, as detailed below. Plainly, however, the FFO cannot avoid a finding of significance simply because they allege that these impacts are limited in time, as the agency erroneously suggests. *See* 40 C.F.R. §§ 1508.8, 1508.27.

BLM does include a new lease stipulation, and provide that it was "developed to require modeling to determine 'near-field' air quality impacts (see Appendix D). Due to the close proximity of occupied buildings and residences to potential well sites for these proposed lease parcels, information about the air quality impacts at these locations needs to be determined and disclosed as part of the NEPA analysis prior to decision making on the APDs for wells on these

[127] Soneja S. Boyle et al, A Pilot Study to Assess Residential Noise Exposure Near Natural Gas Compressor Stations, PLOS ONE, http://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0174310&type=printable

parcels." EA at 65; Appendix D at 107. As noted above, however, a commitment to perform modeling at the drilling stage is too late, and a point where BLM is necessarily forced to mitigate impacts rather than preventing them altogether.

BLM and the New Mexico Oil & Gas Conservation Division's ("NMOCD") lack of inspection capacity also significantly undermines responsible oil and gas development in the state.[128] As of 2012, NMOCD has only 13 field inspectors to oversee 53,000 producing wells—an impossible task.

F. The BLM Fails to Take a "Hard Look" at Impacts to Water Resources.

The BLM completely fails to take a hard look at water resource impacts from oil and gas leasing and development in the planning area. 40 C.F.R. § 1506.6. Indeed, the BLM has failed to even include a section on impacts to water, let alone consider a significant potential impact to ground and/or surface water associated with Mancos Shale drilling. It is well established that the Mancos Shale formation, and groundwater associated with Mancos Shale beds, contains high concentrations of pollutants including nitrate, selenium, and uranium.[129] Prior to authorizing leases that will foreseeably result in Mancos Shale drilling, the BLM must analyze the potential for drilling and related operations—including produced water and frack fluid storage and disposal, drilling mud and cuttings storage and disposal, cross-contamination of aquifers from induced fractures and/or wellbore communication—to result in contamination of ground and/or surface waters with selenium, uranium, or other Mancos Shale contaminants.

a. Groundwater

The BLM completely fails to consider the impacts of the proposed action on groundwater. As mentioned above, the EA does not even include a specific section on the impacts to water in general in the body of the EA. The only mention of impacts to water occurs in Appendix D, which primarily describes the process of hydraulic fracturing, as opposed to any impacts. *See* EA at 100. Instead, the BLM's chosen approach is to postpone actual analysis of these impacts until the APD stage, where "a BLM Field Office geologist identifies all potential subsurface formations that would be penetrated by the wellbore. This includes all groundwater aquifers and any zones that would present potential safety or health risks that may need special protection measures during drilling, or that may require specific protective well construction measures." *Id.* Following this, "BLM reviews the company's proposed casing and cementing programs to ensure well construction design is adequate to protect the surface and subsurface environment." *Id.* As with other resource values, BLM's shell-game approach to NEPA analysis fails to satisfy the agency's explicit mandate to analyze all reasonably foreseeable impacts at the earliest practicable point, which, here, clearly requires assessment prior to the March 2018 lease sale. *See New Mexico ex rel. Richardson*, 565 F.3d at 718. Unspecified mitigation and unsupported conclusions fail to demonstrate an "adequate buffer against the negative impacts"

[128] *See* Earthworks, *Enforcement Report: New Mexico Oil & Gas Conservation Division* (May 2012), https://www.earthworksaction.org/files/publications/NM-OCD-Enforcement-Report.pdf.

[129] *See* U.S. Dep't of Energy, *Natural Contamination from the Mancos Shale*, LMS/S07480 (April 2011), http://energy.gov/sites/prod/files/S07480_NatContRpt.pdf.

and fail to determine "whether the mitigation measures will render such impacts so minor as to not warrant an EIS." *National Parks*, 241 F.3d at 735.

Given the agency's admission that groundwater contamination could occur—as well as a recently published study demonstrating drinking-water well contamination from fracking[130]—the agency's conclusion that there is no possibility of impacts to groundwater remains unsupported.

b. Surface Water

BLM is remarkably silent with regard to potential impacts to surface waters. Although the agency offers that "[d]uring operation, pipelines could potentially leak or rupture, which could impact groundwater quality," EA at 60, there is no mention of how such accidents would impact surface waters. In fact, all BLM offers is that, "[i]n the event of a leak or rupture, the BLM and NMOCD would work collaboratively to clean up the spill and protect groundwater." EA at 60. In other words, rather than taking steps to mitigate or avoid such accidents, BLM simply commits to cleaning it up once it happens. There is no discussion of mitigation or any other explanation of how these impacts are otherwise so insignificant as to not warrant an EIS. Such a cursory approach by the agency fails to their NEPA obligations seriously.

c. Water Quantity

The FFO's analysis of water quantity impacts is also completely missing. The limited extent of consideration in Appendix D provides: "Because the fluid is composed mostly of water, large volumes of water are usually needed to perform hydraulic fracturing. However, in some cases, water is recycled or produced water is used." EA at 100. This cursory mention clearly does not satisfy the requirements of NEPA. Notably, in an arid region already suffering from prolonged drought, substantial amounts of water—which will primarily come from groundwater sources—is required in developing these leases. BLM fails to take a hard look at how such water use will impact people and resources in the planning area, as NEPA requires. There is no discussion of how the groundwater drawdown from developing these oil wells will impact the land, wildlife, livestock, or human communities in the planning area, or how these impacts are further compounded in a drought-stricken southwest. There is no discussion of alternatives—such as the use of nitrogen fracking, which is already occurring in the area and which was referenced by the FFO in a scoping meeting handout for the Mancos Shale RMP—or the tradeoff between water savings and air quality impacts of employing these technologies. There is no discussion of how impacts to groundwater will be mitigated, let alone with a sufficient enough buffer to avoid significance. Quite simply, the agency's EA does not satisfy the hard look NEPA demands.

[130] *See* Thomas H. Darrah, et al., *Noble Gasses Identify the Mechanisms of Fugitive Gas Contamination in Drinking-Water Wells Overlying the Marcellus And Barnett Shales*, PNAS (Aug. 12, 2014) http://www.pnas.org/content/111/39/14076.full (identifying "discrete clusters of fugitive gas contamination … that showed increased contamination through time" of drinking-water wells as a result of nearby hydraulic fracturing).

G. The BLM Fails to Take a "Hard Look" at Lands with Wilderness Characteristics.

The BLM is required to keep a current inventory of lands with wilderness characteristics as part of its multiple-use mandate under FLPMA. *See* Instruction Memorandum 2011-154 ("This Instruction Memorandum (IM) directs offices to continue to conduct and maintain inventories regarding the presence or absence of wilderness characteristics, and to consider identified lands with wilderness characteristics in land use plans and when analyzing projects under the National Environmental Policy Act (NEPA)."). Unfortunately, the EA demonstrates that the BLM is failing to uphold this mandate. On page 13 of the EA, the BLM states:

> Issues determined to not be present within the leasing area were given a determination of not present (NP) in the IDT Checklist. These are Special Recreation Management Areas, Lands with Wilderness Characteristics, Wilderness Areas, Wilderness Study Areas, Research Natural Areas, Riparian Areas and River Tracts, Wild and Scenic Rivers, Wastes (hazardous/solid), Wild Horse and Burros, and Wildlife Specially Designated Areas (SDA).

This assessment is clearly wrong because the BLM fails to acknowledge that the Betonnie Tsosie and Lybrook Fossil SDAs may be affected by the lease sale. Indeed, parcels 20, 21, and 29 are very near, if not adjacent to both of these areas.[131] This omission is in violation of FLPMA's multiple use mandate, the BLM's own IM, and the requirements of NEPA.

H. The BLM Fails to Take a "Hard Look" at Induced Seismic Risks.

BLM completely fails to discuss the possibility of induced seismic risks in the EA as well. For example, BLM did not look at whether there are active fault lines in the area, or fault lines that could be activated by wastewater injection. Furthermore, BLM failed to consider the growing body of scientific evidence showing that increases in wastewater injections might increase seismic activity in the area.[132]

Pore-pressure models have demonstrated that a combination of brine production and wastewater injection near faults in Azle, Texas, for example, generate subsurface pressures sufficient to induce earthquakes on near-critically stressed faults in the area.[133] But earthquake

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[131] Compare BLM, FFO Draft March 2018 Oil and Gas Lease Sale Parcels, https://eplanning.blm.gov/epl-front-office/projects/nepa/90068/120917/147673/March2018_LeaseSale_HighResolutionMaps.pdf, with BLM, *Farmington Field Office Specially Designated Areas Map* (July 2008), http://aztecnm.com/recreation/BLMSpeciallyDesignatedAreas.pdf.

[132] Ellsworth, W.L. Injection-Induced Earthquakes, 341 Science 1225942 (2013) ("Ellsworth 2013"), https://scits.stanford.edu/sites/default/files/science-2013-ellsworth.pdf; Keranen, Katie et al., Potentially Induced Earthquakes in Oklahoma, USA: Links Between Wastewater Injection and the 2011 Mw5.7 Earthquake Sequence, Geology doi:10.1130/G34045.1 (March 26, 2013) ("Keranen 2013") https://profile.usgs.gov/myscience/upload_folder/ci2013May3015351271984Keranen%20etal%20Geology%202013.pdf.

[133] Hornbach, Matthew J. et al., Causal Factors for Seismicity near Azle, Texas, Nature Communications 6:6728 (April 21, 2015), 1, available at: http://www.nature.com/ncomms/2015/150421/ncomms7728/full/ncomms7728.html.

swarms have been observed to be associated with extraction as well, not just injection.[134] Induced seismicity is often associated with subsurface pressure changes, and extensional stresses will concentrate on the boundary of the fluid draw-down region, promoting normal faulting.[135] The fact that there has not yet been much seismic activity in the area does not preclude the possibility that more oil and gas activity will lead to earthquakes.

The BLM is required to look at the region's fault environment by identifying and characterizing all faults in these areas based on sources including but not limited to the USGS Quaternary Fault and Fold database. In its analysis, BLM should assess its ability to identify all faults in these areas, including strike-slip faults and deep faults that can be difficult to detect. BLM should also consider the background seismicity of oil- and gas-bearing lands including the history of earthquake size and frequency, fault structure (including orientation of faults), seismicity rates, failure mechanisms, and state of stress of faults, as well as the geology of oil- and gas-bearing lands including pore pressure, formation permeability, and hydrological connectivity to deeper faults. The BLM also must analyze the potential for fracking and wastewater disposal to induce earthquakes, and the possible risks of induced seismicity in the specific areas for lease, including structures in the area that are at risk. Moreover, many of the archeological features in the region, including the delicately balanced walls of Pueblo Bonito and other Great Houses associated with Chaco Culture National Historical Park and outlying sites, are particularly susceptible to seismic activity. Completely omitting any discuss of the risks from induced seismicity does not meet NEPA requirements.

I. The BLM Fails to Take a "Hard Look" at Impacts to Human Health.

The BLM failed to take a hard look at human health impacts from oil and gas leasing and development in the planning area. 40 C.F.R. § 1506.6.

The FFO generally identifies health impacts throughout the EA, but fails to ever offer the hard look that NEPA demands. For example, health concerns due to air quality are raised in the discussion of the Air Quality Index ("AQI") and National Air Toxics Assessment ("NATA"), EA at 24–25, but the agency erroneously assumes its obligations are satisfied by these references alone, and fails to acknowledge their independent responsibility to analyze these impacts under NEPA before an irretrievable commitment of resources is made.

The BLM acknowledges that it is required to consider the adverse impacts to human health, EA at 43, but there is *no* subsequent analysis of those impacts. *See* EA at 64. As with other resource values, BLM acknowledges the potential impacts to communities and human health without ever analyzing those impacts, as NEPA demands. EA at 67 ("While the act of leasing federal minerals itself would not result in significant social or economic impacts, subsequent development of a lease may generate impacts to people living near or using the area in the vicinity of the lease. Oil and gas exploration, drilling, or production could create a disruption to these people due to increased traffic and traffic delays, air pollution, noise and visual impacts."); EA, App'x D, at 100 ("To ensure that hydraulic fracturing is conducted in a

[134] *Id*. at 5-6.

[135] *Id*.

safe and environmentally sound manner, the BLM approves and regulates all drilling and completion operations, and related surface disturbance on Federal public lands. Operators must submit Applications for Permit to Drill (APDs) to the agency. Prior to approving an APD, a BLM Field Office geologist identifies all potential subsurface formations that would be penetrated by the wellbore. This includes all groundwater aquifers and any zones that would present potential safety or health risks that may need special protection measures during drilling, or that may require specific protective well construction measures.").

None of these references to the human health impacts of oil and gas leasing and development include any actual analysis. The FFO's shell-game approach to NEPA fails to satisfy the agency's explicit mandate to analyze all reasonably foreseeable impacts at the earliest practicable point, which, here, clearly requires assessment prior to the March 2018 lease sale. *See New Mexico ex rel. Richardson*, 565 F.3d at 718.

The EA's failure to take a hard look at the potential health impacts of oil and gas activities on these leases is especially concerning given the EA's acknowledgement of the likelihood that the leases will be in "proximity of occupied buildings and residences." EA at 65. In response, the agency has imposed a lease stipulation for six parcels requiring no surface occupancy ("NSO") within 660 feet of occupied residences. EA at 107. This setback is insufficient to ensure that health impacts will be avoided, and, critically, the agency has failed to provide any justification or data supporting this decision. For example, Colorado's oil and gas commission passed rules in 2013 imposing a 500-foot setback for residences at a minimum, and a buffer zone setback of 1,000-feet wherein mitigation and COGCC approval is required. *See* 2 C.C.R. § 404-1. Here, the agency has failed to justify its decision and has failed to take a hard look, in violation of NEPA.

Scientific research continues to raise concerns about the health risks of living in close proximity to oil and gas wells. There are at least two notable scientific papers BLM should consider in this context. First, a recent review identified 15 different components of unconventional oil and gas development, everything from trucks and tanks to chemicals and venting, which can present a chemical, physical and/or safety hazard.[136] Second, a recent study found that babies whose mothers lived in close proximity to multiple oil and gas wells were 30% more likely to be born with defects in their heart than babies born to mothers who did not live close to oil and gas wells.[137] Rather than merely noting that health impacts may occur, BLM must now take a hard look at the reasonably foreseeable health impacts of its actions.

[136] John L. Adgate *et al.*, *Potential Public Health Hazards, Exposures and Health Effects from Unconventional Natural Gas Development*, 48 ENVIRONMENTAL SCIENCE & TECHNOLOGY 8307 (Feb. 24, 2014) (previously included as Exhibit 14 in Citizen Groups Sept. 23, 2014 comments on the January 2015 lease sale).

[137] Lisa M. McKenzie *et al.*, *Birth Outcomes and Maternal Resident Proximity to Natural Gas Development in Rural Colorado*, 122 ENVIRONMENTAL HEALTH PERSPECTIVES 412 (April 2014) (previously included as Exhibit 15 in Citizen Groups Sept. 23, 2014 comments on the January 2015 lease sale).

J. The BLM Fails to Take a "Hard Look" at Impacts to Human Communities, Cultural Values, and Environmental Justice.

The FFO attempts to avoid taking a hard look at impacts to human communities while at the same time acknowledging that these impacts will occur: "While the act of leasing federal minerals itself would not result in significant social and economic impacts, subsequent development of a lease may generate impacts to people living near or using the area in the vicinity of the lease." EA at 67. The agency recognizes a number of different impacts to local residents, including: "Oil and gas exploration, drilling, or production could create a disruption to these people due to increased traffic and traffic delays, air pollution, noise and visual impacts[;]" and that "nearby residents may be disturbed while hydraulic fracturing or other completion and stimulation operations are occurring, as these activities involve many vehicles, heavy equipment, and a workover rig[;]" and that "[c]reation of new access roads into an area could allow increased public access and exposure of private property to vandalism." EA at 67–68. Yet, the agency is dismissive of all these concerns, concluding that "these impacts would be limited to the period of time during which drilling operations associated with hydraulic fracturing occur[;]" and "[f]or leases where the surface is privately owned and the subsurface is BLM managed, surface owner agreements, standard lease stipulations, and BMPs could address many of the concerns of private surface owners." EA at 68.

Not only does BLM's vague reference to non-specific mitigation measures fail to satisfy the agency's NEPA obligations for these identified impacts to communities, but the agency also ignores the concerns of the Tribes in the area and a whole host of foreseeable impacts, the consideration of which should be fundamental to the agency's decision-making process for the subject lease sale. These considerations are particularly critical here given that "the Navajo Nation Chapter Houses of Counselor, Ojo Encino, and Torreon . . . have expressed concerns about the impacts of continued oil and gas development on the roads in the area, traffic safety, water quality, visual resources, and air quality." EA at 47. Indeed, as noted above, occupied buildings and residences are in close proximity to well sites on these lease parcels, raising the specter impacts to human communities—not just from poor air quality, but myriad other impacts from hydraulic fracturing. Just last summer, on July 11, 2016, a massive fire broke out at a fracking site operated by WPX Energy that was approved by the FFO, setting off several explosions and closing Highway 550.[138] Approximately 36 storage tanks caught fire and burned, local residents were evacuated, and numerous domestic animals and livestock were killed. The massive fire took several days to burn itself out.[139] Furthermore, the fire occurred in an area with limited access to emergency response and similar resources.

Moreover, there are excellent sources the FFO should consider in their assessment and consideration of impacts to human communities and, particularly, native communities, many of

[138] Chow, L. Massive Fracking Explosion in New Mexico, 36 Oil Tanks Catch Fire, EcoWatch, July 13, 2016, available at http://www.ecowatch.com/massive-fracking-explosion-in-new-mexico-1919567359.html.

[139] *See* Exhibit 8, Letter from Diné CARE, *et al*., to Secretary Sally Jewell*, et al.*, RE: Mancos Shale Oil Drilling, Public Participation, and WPX Energy Explosion, July 26, 2016.

which are outlined in an article in THE ATLANTIC.[140] Among the concerns and impacts to native communities raised in this article—and in particular the social and cultural impacts experienced on the Fort Berthold Indian Reservation, located in the heart of North Dakota's Bakken formation—include:

> [North Dakota's U.S. Attorney] noticed a peculiar pattern emerging from Fort Berthold. Many of his filings – a surprising number of them – involved non-Indian perpetrators. "We had five or six in a month," he told me. "Why was this? We realized it's non-enrolled folks moving to the oil patch."
>
> The immediate side-effects are the obvious ones, and they come with any boom: limited jail space, an overworked police force, a glut of men with cash in their pockets. In 2012, the tribal police department reported more murders, fatal accidents, sexual assaults, domestic disputes, drug busts, gun threats, and human trafficking cases than in any year before. The surrounding counties offer similar reports.
>
> But there is one essential difference between Fort Berthold and the rest of North Dakota: The reservation's population has more than doubled with an influx of non-Indian oil workers – over whom the tribe has little legal control.
>
> In 2011, the U.S. Justice Department did not prosecute 65 percent of rape cases reported on reservations. According to department records, one in three Native American women are raped during their lifetimes – two-and-a-half times the likelihood for an average American woman – and in 86 percent of these cases, the assailant is non-Indian.
>
> Between 2009 and 2011, federal case filings on North Dakota reservations rose 70 percent.

With a new oil and gas boom already occurring in the San Juan Basin[141]—with an estimated 30 billion barrels of oil trapped in the Mancos Shale—the impacts described above threaten to compound those already experienced by the native and non-native communities in the planning area. BLM's failure to articulate and analyze such impacts represents a fundamental deficiency of the EA, and overlooks critical information weighing on the conclusions reached therein, in violation of NEPA.

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[140] Sierra Crane-Murdoch, *On Indian Land, Criminals Can Get Away With Almost Anything*, THE ATLANTIC (Feb. 22, 2013), available at: http://www.theatlantic.com/national/archive/2013/02/on-indian-land-criminals-can-get-away-with-almost-anything/273391/ (Old Leasing Exhibit 161).

[141] Staci Matlock, *New Oil Boom Coming to San Juan Basin*, THE NEW MEXICAN (March 13, 2014), available at: http://www.santafenewmexican.com/news/local_news/new-oil-boom-coming-to-san-juan-basin/article_665ff2f2-bd6c-54fd-9dd8-238092c73917.html (Old Leasing Exhibit 158); Ryan Collins, *BP Unlocks a New Shale Gusher in New Mexico*, Bloomberg (Aug. 7, 2017), https://www.bloomberg.com/news/articles/2017-08-07/little-known-new-mexico-shale-play-gives-bp-big-time-results.

VIII. The BLM Fails to Sufficiently Analyze All Reasonable Alternatives.

Through the March 2018 lease sale NEPA process, the FFO is required to "estimate and display the physical, biological, economic, and social effects of implementing each alternative considered in detail. The estimation of effects shall be guided by the planning criteria and procedures implementing [NEPA]." 43 C.F.R. § 1610.4-6. Incumbent to any NEPA process is a robust analysis of alternatives to the proposed action. Consideration of reasonable alternatives is necessary to ensure that the agency has before it and takes into account all possible approaches to, and potential environmental impacts of, a particular project. NEPA's alternatives requirement, therefore, ensures that the "most intelligent, optimally beneficial decision will ultimately be made." *Calvert Cliffs' Coordinating Comm., Inc. v. U.S. Atomic Energy Comm'n,* 449 F.2d 1109, 1114 (D.C. Cir. 1971).

"[T]he heart" of an environmental analysis under NEPA is the analysis of alternatives to the proposed project, and agencies must evaluate all reasonable alternatives to a proposed action." *Colorado Environmental Coalition*, 185 F.3d at 1174 (quoting 40 C.F.R. § 1502.14). An agency must gather "information sufficient to permit a reasoned choice of alternatives as far as environmental aspects are concerned." *Greater Yellowstone*, 359 F.3d at 1277 (citing *Colorado Environmental Coalition*, 185 F.3d at 1174); *see also Holy Cross Wilderness Fund v. Madigan*, 960 F.2d 1515, 1528 (10th Cir. 1992). Thus, agencies must "ensure that the statement contains sufficient discussion of the relevant issues and opposing viewpoints to enable the decisionmaker to take a 'hard look' at environmental factors, and to make a reasoned decision." *Izaak Walton League of America v. Marsh,* 655 F.2d 346, 371 (D.C. Cir.1981) (citing *Kleppe v. Sierra Club,* 427 U.S. 390, 410 n. 21 (1976)).

Here, BLM considered only two alternatives: a "no action" alternative in which none of the nominated parcels would be offered for sale, and the "proposed action" where the agency will offer for lease all 25 parcels covering 4,434,70 acres with standard terms and conditions as well as lease stipulations dating back to the obsolete and ineffective 2003 RMP and EIS. *See* EA at 13–14 (discussing alternatives). In other words, the FFO failed to consider any alternative that would limit or mitigate the impacts of oil and gas development, or consider oil and gas development on equal footing to other multiple use values in the planning area.

FLPMA does not mandate that every use be accommodated on every piece of land; rather, delicate balancing is required. *See Norton v. S. Utah Wilderness Alliance*, 542 U.S. 55, 58 (2004). "'Multiple use' requires management of the public lands and their numerous natural resources so that they can be used for economic, recreational, and scientific purposes without the infliction of permanent damage." *Public Lands Council v. Babbitt*, 167 F.3d 1287, 1290 (10th Cir. 1999) (citing 43 U.S.C. § 1702 (c)). As held by the Tenth Circuit, "[i]f all the competing demands reflected in FLPMA were focused on one particular piece of public land, in many instances only one set of demands could be satisfied. A parcel of land cannot both be preserved in its natural character and mined." *Rocky Mtn. Oil & Gas Ass'n v. Watt,* 696 F.2d 734, 738 n. 4 (10th Cir.1982) (quoting *Utah v. Andrus,* 486 F.Supp. 995, 1003 (D. Utah 1979)); *see also* 43 U.S.C. § 1701(a)(8) (stating, as a goal of FLPMA, the necessity to "preserve and protect certain public lands in their natural condition"); *Pub. Lands Council,* 167 F.3d at 1299 (citing § 1701(a)(8)). As further provided by the Tenth Circuit:

> BLM's obligation to manage for multiple use does not mean that development *must* be allowed on [a particular piece of public lands]. Development is a *possible* use, which BLM must weigh against other possible uses – including conservation to protect environmental values, which are best assessed through the NEPA process. Thus, an alternative that closes the [proposed public lands] to development does not necessarily violate the principle of multiple use, and the multiple use provision of FLPMA is not a sufficient reason to exclude more protective alternatives from consideration.

New Mexico ex rel. Richardson, 565 F.3d at 710. This type of analysis is entirely absent from the FFO's EA, which has elevated oil and gas above the area's other multiple use resources, in violation of NEPA. *See* 43 C.F.R. § 1610.4-6.

IX. The BLM Fails to Comply with the National Historic Preservation Act.

The National Historic Preservation Act ("NHPA"), like NEPA, requires agencies to take a "hard look" at a project's impacts, and was enacted specifically to protect America's historic and cultural heritage. 16 U.S.C. §§ 470(b), 470-1. The heart of the NHPA is Section 106, which prohibits federal agencies from approving any federal "undertaking" unless the agency takes into account the effects of the undertaking on historic properties that are included in, or eligible for, inclusion in the National Register of Historic Places. 16 U.S.C. §§ 470(f), 470(w)(7); *see also Pueblo of Sandia v. United States*, 50 F.3d 856, 859 (10th Cir. 1995). Section 106 is a "stop, look, and listen provision" that requires federal agencies to consider the effects of their actions and programs on historic properties and sacred sites before implementation. *Muckleshoot Indian Tribe v. U.S. Forest Serv.*, 177 F.3d 800, 805 (9th Cir. 1999); *see also Valley Cmty. Pres. Comm'n v. Mineta*, 373 F.3d 1078, 1085 (10th Cir. 2004).

To adequately "take into account" the impacts on historic and cultural properties under Section 106, BLM must first determine whether the "proposed Federal action is an undertaking," and if so, "whether it is a type of activity that has the potential to cause effects on historic properties." 36 C.F.R. §§ 800.3(a), 800.16(y). BLM must then "[d]etermine and document the area of potential effects" and then "[r]eview existing information on historic properties within [that] area." *Id*. § 800.4(a)(1)-(2). The area of potential effects ("APE") is defined as:

> the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties . . . The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.

Id. § 800.16(d).

BLM must make a "reasonable and good faith effort" to identify historic and cultural properties within the APE, and consult with Indian Tribes and the state historic preservation office ("SHPO") regarding the results of identification efforts. *Id*. at § 800.4(b)(1). Consultation involves a comprehensive assessment of actual adverse impacts on historic properties and of

ways to "avoid, minimize or mitigate the adverse effects," including proposing alternatives. *Id*. at § 800.6(a).

If the undertaking is a type of activity where historic properties "may be affected," BLM applies the "criteria of adverse effect" to historic properties within the APE. *Id*. at §§ 800.4(d)(2), 800.5(a)(1). An "effect" is defined broadly to include any alteration that directly or indirectly affects the characteristics of a historic property that make it eligible for listing in the National Register of Historic Places. *Id.* §§ 800.16(i), 800.5(a)(1). An effect is "adverse" when it may "diminish the integrity of the property's location … setting … feeling, or association." *Id*. Adverse effects are not limited to physical destruction of historic properties, but also include "[c]hange of the … physical features within the property's setting that contribute to its historic significance," as well as the "introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historical features." *Id*. at §§ 800.5(a)(2)(iv), (v). In addition to considering an undertaking's direct and indirect impacts to historic properties, BLM must also consider "reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative." *Id*. at § 800.5(a)(1).

BLM may establish a "program alternative" for complying with Section 106 requirements. 36 C.F.R. §§ 800.3(a)(2), 800.14(a). In June 2004, BLM's New Mexico State Director and the New Mexico SHPO entered into a State Protocol Agreement ("Protocol") regarding the manner in which BLM would meet its responsibilities under the NHPA, and renewed the Protocol in 2014. For the March 2018 lease sale, BLM used the Protocol to meet its NHPA obligations in lieu of the Section 106 regulations. *See* EA at 34.

Finally, "[f]ederal agencies are encouraged to coordinate compliance with section 106 and the procedures in this part [setting out compliance with NHPA] with any steps taken to meet the requirements of the National Environmental Policy Act (NEPA). Agencies should consider their section 106 responsibilities as early as possible in the NEPA process, and plan their public participation, analysis, and review in such a way that they can meet the purposes and requirements of both statutes in a timely and efficient manner." 36 C.F.R. 800.8(a)(1).

Chaco Culture National Historical Park ("the Park") is the heart of the greater Chacoan landscape, characterized by a network of outlying sites and ancient roads, and is located within a geographic area that includes lands and federal minerals under the FFO's jurisdiction. The Greater Chaco landscape has been described as the "Chaco Phenomenon" due to its unique archeological signatures. Congress recognized "the national significance of the Chacoan sites" and the need to protect these "unique archaeological resources" when it created the Park in 1980. 16 U.S.C. § 410ii. The Park is listed on the National Register of Historic Places and is designated a World Heritage Site. The World Heritage designation includes not only the Park, but also several satellite villages—known as "Chacoan Outliers"—including Pierre's Site, Halfway House, Twin Angels, Aztec Pueblo, Kin Nizhoni and Casamero. These sites are all linked through a network of roads—the most prominent of which is the Great North Road, which connects Chaco Canyon to a settlement approximately 55 miles to the north known today as Aztec Ruin.

A. The BLM Fails to Adequately Identify Indirect and Cumulative Adverse Impacts to Historic and Cultural Properties.

Here, the BLM fails to comply with the NHPA because the BLM's EA for the March 2018 lease sale does not identify indirect and cumulative adverse effects to historic and cultural properties. For example, Table 7 in the EA demonstrates the BLM has surveyed only one lease parcel completely for cultural properties. EA at 32. The rest of the parcels range from 0% surveyed to 47.5%. Indeed, the BLM admits that "Because prior inventory coverage relates strongly with Class III inventories for oil and gas and associated right-of-way development, undeveloped parcels are poorly represented by most existing cultural data." EA at 32.

The BLM goes on to argue that the July 2017 NMCRIS data can fill these gaps in cultural inventories. But, the agency admits that this data also only covers a limited percentage (18.4%) of the proposed lease parcels. EA at 33–34. The BLM then lamely concludes that "[b]ased on the available data, developers of the parcels under analysis will be able to achieve avoidance of direct effects to potential historic properties through careful placement of facilities, following site-specific analyses including Class III cultural resource inventories." EA at 34. But, nothing in the EA supports this conclusion. Furthermore, unless these inventories are completed before the lease sale, the BLM cannot impose any stipulations to protect these cultural resources because "[a]fter a lease has been issued, the lessee has the right to use as much of the leased land as necessary to explore (or drill) for, extract, remove, and dispose of oil and gas deposits located under the leased lands with exceptions for restrictions that may be imposed consistent with the standard lease terms and the stipulations and notices attached to the lease." EA at 7.

Air and light pollution, noise, and vehicle traffic from BLM-authorized oil and gas development all have the potential to adversely affect landscape-level historic properties such as the Park and Chaco Protection Sites that are within the boundaries of the FFO. Despite the abundance of landscape-level historic properties in the FFO that may be adversely affected by Mancos Shale development, including in and adjacent to areas where BLM has approved hundreds of APDs and leases, BLM has failed to analyze oil and gas development's indirect and cumulative impacts to these properties in the March 2018 EA. Such a "landscape-level" analysis of impacts is required before BLM can approve any more leases for wells in the Mancos Shale formation.

B. The BLM Fails to Adequately Consult with Tribes.

As noted above, the BLM is required to "consult with Indian Tribes and the state historic preservation office ("SHPO") regarding the results of identification efforts. *Id*. at § 800.4(b)(1). Consultation involves a comprehensive assessment of actual adverse impacts on historic properties and of ways to "avoid, minimize or mitigate the adverse effects," including proposing alternatives. 36 C.F.R. § 800.6(a). In particular, "[t]he agency official shall ensure that consultation in the section 106 process provides the Indian tribe or Native Hawaiian organization a reasonable opportunity to identify its concerns about historic properties, advise on the identification and evaluation of historic properties, including those of traditional religious and cultural importance, articulate its views on the undertaking's effects on such properties, and participate in the resolution of adverse effects."

Here, the BLM states that,

> Compliance with Section 106 responsibilities of the National Historic Preservation Act (NHPA) is adhered to per 36 CFR Part 800. Native American consultation is initiated by mail regarding each lease sale activity. A second request for information will be sent to the same recipients if there is no response to the first inquiry. If no response to the second letter is received and no other substantial conflicts or issues are identified, the proposed leasing of parcel(s) may go forward. If any responses are received, BLM cultural resources staff would discuss the information or issues of concern with the respondent to determine if all or portions of a parcel are to be withdrawn from the sale, or if additional terms and conditions will be developed and attached as lease stipulations.

EA at 10. The BLM then notes that "[l]etters were mailed to 39 Tribes and Pueblos on August 16, 2017. Corrected maps were sent to Tribes and Pueblos on August 31, 2017." The BLM does not identify whether it sent a second letter or met in person with Tribes and Pueblos.

It is unlikely that one letter to Tribes and Pueblos is adequate to meet the "reasonable opportunity" requirements of NHPA. Indeed, sending one letter does not even meet the level of compliance that the BLM describes in the EA. EA at 10. This argument is further supported by the fact that the BLM later admits it is inadequate. EA at 31 ("As of 17 August 2017, the Section 106 consultation process with the New Mexico State Historic Preservation Officer (SHPO) and tribes previously identifying an interest in the San Juan Basin is in early stages and has not yet yielded substantive feedback."). Yet, the BLM continues to press forward despite the fact that both the Navajo Nation and the All Pueblo Council of Governors have requested moratoriums on leasing, fracking, and drilling until the RMP Amendment process is complete.[142] The BLM's blatant disregard for Tribal interests and concerns alarming and does not suffice to meet the requirements of the NHPA.

X. The BLM Fails to Balance Multiple Uses under FLPMA's Unnecessary and Undue Degradation Provision.

Finally, pursuant to FLPMA, "[i]n managing the public lands," the agencies "shall, by regulation or otherwise, take any action necessary to prevent unnecessary or undue degradation of the lands." 43 U.S.C. § 1732(b). Written in the disjunctive, BLM must prevent degradation that is "unnecessary" and degradation that is "undue." *Mineral Policy Ctr. v. Norton*, 292 F.Supp.2d 30, 41-43 (D. D.C. 2003). This protective mandate applies to agencies planning and management decisions, and should be considered in light of its overarching mandate that the FFO employ "principles of multiple use and sustained yield." 43 U.S.C. § 1732(a); *see also, Utah Shared Access Alliance v. Carpenter*, 463 F.3d 1125, 1136 (10th Cir. 2006) (finding that BLM's authority to prevent degradation is not limited to the RMP planning process). While these obligations are distinct, they are interrelated and highly correlated. The BLM must balance multiple uses in its management of public lands, including "recreation, range, timber, minerals,

[142] *See* Exhibits 1 & 2.

watershed, wildlife and fish, and [uses serving] natural scenic, scientific and historical values." 43 U.S.C. § 1702(c). It must also plan for sustained yield—"control [of] depleting uses over time, so as to ensure a high level of valuable uses in the future." *Norton v. S. Utah Wilderness Alliance,* 542 U.S. 55, 58 (2004).

"Application of this standard is necessarily context-specific; the words 'unnecessary' and 'undue' are modifiers requiring nouns to give them meaning, and by the plain terms of the statute, that noun in each case must be whatever actions are causing 'degradation.' " *Theodore Roosevelt Conservation P'ship v. Salazar*, 661 F.3d 66, 76 (D.C. Cir. 2011) (citing *Utah v. Andrus,* 486 F.Supp. 995, 1005 n.13 (D. Utah 1979) (defining "unnecessary" in the mining context as "that which is not necessary for mining"—or, in this context, "for oil and gas development"—and "undue" as "that which is excessive, improper, immoderate or unwarranted.")); *see also Colorado Env't Coalition*, 165 IBLA 221, 229 (2005) (concluding that in the oil and gas context, a finding of "unnecessary or undue degradation" requires a showing "that a lessee's operations are or were conducted in a manner that does not comply with applicable law or regulations, prudent management and practice, or reasonably available technology, such that the lessee could not undertake the action pursuant to a valid existing right.").

Here, that action is the oil and gas development authorized by the FFO through the March 2018 lease sale. The inquiry, then, is whether the agency has taken sufficient measures to prevent degradation unnecessary to, or undue in proportion to, the development the proposed action permits. *See Theodore Roosevelt Conservation Partnership*, 661 F.3d at 76. For example, methane waste and pollution may cause "undue" degradation, even if the activity causing the degradation is "necessary." Where methane waste and pollution is avoidable, even if in the process of avoiding such emissions lessees or operators incur reasonable economic costs that are consistent with conferred lease rights, it is "unnecessary" degradation. 43 U.S.C. § 1732(b).

Therefore, drilling activities may only go forward as long as unnecessary and undue environmental degradation does not occur. This is a *substantive* requirement, and one that the BLM must define and apply in the context of oil and gas development authorized through the lease sale. In other words, the FFO must define and apply the substantive UUD requirements in the context of the specific resource values at stake.

Further, these UUD requirements are distinct from requirements under NEPA. "A finding that there will not be significant impact [under NEPA] does not mean either that the project has been reviewed for unnecessary and undue degradation or that unnecessary or undue degradation will not occur." *Ctr. for Biological Diversity,* 623 F.3d at 645 (quoting *Kendall's Concerned Area Residents,* 129 I.B.L.A. 130, 140 (1994)). In the instant case, BLM must specifically account for UUD in its NEPA analysis for the March 2018 lease sale, which is distinct from its compliance under NEPA, and is also actionable on procedural grounds.

XI. Conclusion

The Citizen Groups appreciate your consideration of the information and concerns addressed herein, as well as the information included in the attached exhibits. In general, we are

alarmed at the fatal deficiencies of the EA analysis and the numerous issues overlooked and/or marginalized in the EA. The boilerplate EA continues the trend of BLM rushing oil and gas lease documents to meet prescribed lease sale schedules, rather than performing the analysis required by NEPA and its implementing regulations. Please insure that you incorporate our comments and information (including Exhibits) in any revisions for the March 2018 lease sale EA.

Should you have any questions, please do not hesitate to contact me.

Sincerely,

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