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**UNITED STATES OF AMERICA
DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY**

IN THE MATTER OF

Eagle LNG Partners Jacksonville LLC)

Docket No. 16-15-LNG

CENTER FOR BIOLOGICAL DIVERSITY'S MOTION TO INTERVENE, PROTEST, AND
COMMENTS

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CENTER FOR BIOLOGICAL DIVERSITY’S MOTION TO INTERVENE,
PROTEST AND COMMENTS

Eagle LNG Partners Jacksonville LLC (“Eagle LNG”), requests authorization to export up to 49.8 billion cubic feet of natural gas per year (Bcf/yr) (0.14 Bcf per day) as liquefied natural gas (“LNG”) from a proposed LNG export terminal on the St. Johns River in Jacksonville, Florida. This proposal cannot move forward without extensive environmental and economic analyses that Eagle LNG has not provided to the Department of Energy, Office of Fossil Energy (“DOE/FE”). In any event, the available evidence demonstrates that this proposal is inconsistent with the public interest.

In particular, the proposal puts endangered species at risk of harm, and would increase natural gas production, especially shale gas production, in the United States. DOE/FE cannot authorize exports without fairly weighing significant environmental and economic impacts of this production. *See, e.g., Udall v. Federal Power Comm’n*, 387 U.S. 428, 450 (1967). The proposed export of LNG will harm the public interest by increasing domestic gas prices and increasing global greenhouse gas emissions. Although Eagle LNG asserts that the project will benefit the region and Florida generally, Eagle LNG gives short shrift to the local environmental impacts of the proposal.

Because the Center for Biological Diversity (the “Center”)¹ has many thousands of members with a direct interest in ensuring that species are protected, that domestic natural gas production is conducted safely, and that any exports do not adversely affect domestic consumers, we move to intervene in this proceeding and protest Eagle LNG’s application.

I. The Center Should be Granted Intervention

Center members live and work throughout the area that will be affected by the Eagle LNG export plan, including in the regions adjacent to the proposed facility and in regions near the pipelines necessary to supply the plant. Center members also live in the domestic gas fields that will likely see increased production as a result of the proposed exports. Center members everywhere will also be affected by increased gas prices which would be caused by the plan. As of August 2016, the Center has approximately 1,500 members in Florida and 48,500 members overall.

To protect its members’ interests, the Center therefore moves to intervene in this proceeding, pursuant to 10 C.F.R. § 590.303(b). Consistent with that rule, the Center states that its “asserted rights and interests,” in this matter include, but are not limited to, interests in the following:

- The environmental consequences of any gas exports from the Eagle LNG facility, including emissions and other pollution associated with the gasification and liquefaction processes, environmental damage associated with construction and operation of the

¹ The Center for Biological Diversity is a national, nonprofit conservation organization with more than 1.1 million members and online activists dedicated to the protection of endangered species and wild places.

facility, environmental impacts caused by shipping traffic, and the emissions associated with all phases of the process from production to combustion.

- The environmental and economic consequences of any expansion or change in natural gas production, especially in shale gas plays, as a result of increased gas exports. Members living in these regions will be affected by the damage to air, land, and water resources caused by the increasing development of these plays, and the public health risks caused by these harms.
- The economic impacts of any gas exports from the Eagle LNG facility, whether individually or in concert with exports from other such facilities, including the consequences of price changes upon the organizations' members' finances, consumer behavior generally, and industrial and electrical generating facilities whose fuel choices may be affected by price changes. The Center, in particular, works to reduce U.S. and global dependence on fossil fuels, including coal, gas, and oil, and to promote clean energy and efficiency in order to protect public health and the environment. To the extent changes in gas prices increase the use and production of coal and oil, the Center's interests in this proceeding are directly implicated.
- The public disclosure, in National Environmental Policy Act and other documents, of all environmental, cultural, social, and economic consequences of Eagle LNG's proposal, and of all alternatives to that proposal.

In short, the Center's members have vital economic, aesthetic, spiritual, personal, and professional interests in the project.

The Center has demonstrated the vitality of these interests in many ways. The Center runs national advocacy and organizing campaigns dedicated to reducing dependence on fossil fuels, including natural gas, and to protecting species and public health from fossil fuel infrastructure projects. These campaigns, including its Keep it in the Ground campaign, are dedicated towards promoting a swift transition away from fossil fuels and to reducing the impacts of natural gas extraction.

Thus, although 10 C.F.R. § 590.303 states no particular standard for intervention, the Center has interests in this proceeding that would be sufficient to support intervention on any standard. This motion to intervene should therefore be granted.

II. Service

Pursuant to 10 C.F.R. § 590.303(d), the Center identifies the following person for service of correspondence and communications regarding this application:

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III. The Center Protests this Application Because it is Not in the Public Interest and is Not Supported by Adequate Environmental and Economic Analysis

Section 3 of the Natural Gas Act provides that DOE/FE cannot authorize exports unless it finds the exports to be in the public interest.² Environmental factors must weigh in to this public interest analysis. Accordingly, DOE/FE cannot proceed with Eagle LNG's application without fully evaluating the environmental impacts of Eagle LNG's proposal. The National Environmental Policy Act ("NEPA"), 42 U.S.C. § 4332 *et seq.*, provides the congressionally mandated procedure for assessment of these impacts, and NEPA requires that these procedures be completed "at the earliest possible time," *i.e.*, "*before* decisions are made and *before* actions are taken."³ Accordingly, DOE/FE cannot proceed with Eagle LNG's request for conditional export authorization until the NEPA process is completed, including preparation of an Environmental Impact Statement.

Eagle LNG's application is silent as to the environmental impacts of its proposal. For this and other reasons, Eagle LNG utterly fails to demonstrate that its proposal is in the public interest. As we explain below, the proposal will cause significant environmental harm. The construction and operation of the terminal, liquefaction facilities, and associated vessel traffic will directly impact local water quality, species and their habitats, and air quality. The project will also induce additional natural gas production in the United States, primarily involving hydraulic fracturing ("fracking") of unconventional gas sources, causing attendant environmental harm. The project will further increase domestic gas prices, likely causing an increase in coal fired electricity generation, increasing emissions of greenhouse gas, conventional, and toxic air pollutants.

For these reasons, and other reasons set forth below, the Center files this protest, pursuant to 10 C.F.R. § 590.304.

A. Legal Standards

DOE/FE has significant substantive and procedural obligations to fulfill before it can authorize Eagle LNG's export proposal. We discuss some of those obligations created by the Natural Gas Act, the National Environmental Policy Act, and the Endangered Species Act here, before explaining why these obligations preclude Eagle LNG's request for authorization.

1. Natural Gas Act

² 15 U.C.C. § 717b.

³ 40 C.F.R. §§ 1501.2, 1500.1(b) (emphases added).

Pursuant to the Natural Gas Act and subsequent delegation orders, DOE/FE must determine whether Eagle LNG's proposal to export LNG to nations which have not signed a free trade agreement ("FTA") with the United States is in the public interest.⁴ Section 3 of the Act provides:

[N]o person shall export any natural gas from the United States to a foreign country or import any natural gas from a foreign country without first having secured an order of [DOE/FE] authorizing it do so. [DOE/FE] shall issue such order upon application unless, after opportunity for hearing, it finds that the proposed exportation or importation will not be consistent with the public interest.⁵

Courts have interpreted this "public interest" provision to include environmental effects.

While the public interest inquiry is rooted in the Natural Gas Act's "fundamental purpose [of] assur[ing] the public a reliable supply of gas at reasonable prices,"⁶ the Natural Gas Act also grants DOE/FE "authority to consider conservation, environmental, and antitrust questions."⁷ In interpreting an analogous public interest provision applicable to hydroelectric power and dams, the Supreme Court has explained that the public interest determination "can be made only after an exploration of all issues relevant to the 'public interest,' including future power demand and supply, alternate sources of power, the public interest in preserving reaches of wild rivers and wilderness areas, the preservation of anadromous fish for commercial and recreational purposes, and the protection of wildlife."⁸ Other courts have applied this *Udall* holding to the Natural Gas Act.⁹

DOE has similarly acknowledged the breadth of the public interest inquiry, including environmental concerns. Deputy Assistant Secretary Smith recently testified that "[a] wide range of criteria are considered as part of DOE's public interest review process, including . . . U.S. energy security . . . [i]mpact on the U.S. economy . . . [e]nvironmental considerations . . . [and] [o]ther issues raised by commenters and/or interveners deemed relevant to the proceeding."¹⁰

⁴ The Natural Gas Act separately provides that DOE/FE must approve exports to nations that have signed a free trade agreement requiring national treatment for trade in natural gas "without modification or delay." 15 U.S.C. § 717b(c). DOE/FE has previously authorized Eagle LNG to export 1.25 bcf/d LNG to such nations. DOE/FE Order No. 3100 (May 31, 2012).

⁵ 15 U.S.C. § 717b(a).

⁶ *United Gas Pipe Line Co v. McCombs*, 442 U.S. 529 (1979)

⁷ *Nat'l Ass'n for the Advancement of Colored People v. Federal Power Commission*, 425 U.S. 662, 670 fns.4, 7 (1976) (citing 15 U.S.C. § 717b as an example of a public interest provision, and explaining that the public interest includes environmental considerations).

⁸ *Udall v. Fed. Power Comm'n*, 387 U.S. 428, 450 (1967) (interpreting § 7(b) of the Federal Water Power Act of 1920, as amended by the Federal Power Act, 49 Stat. 842, 16 U.S.C. § 800(b))

⁹ *See, e.g., N. Natural Gas Co. v. Fed. Power Comm'n*, 399 F.2d 953, 973 (D.C. Cir. 1968) (interpreting section 7 of the Natural Gas Act). Further support for the inclusion of environmental factors in the public interest analysis is provided by NEPA, which declares that all federal agencies must seek to protect the environment and avoid "undesirable and unintended consequences." 42 U.S.C. 4331(b)(3).

¹⁰ Testimony of Christopher Smith, Deputy Assistant Secretary of Oil and Gas Before the Senate Committee on Energy and Natural Resources (Nov. 8, 2011).

DOE rules further require export applicants to provide information documenting “[t]he potential environmental impact of the project.”¹¹ DOE has, in fact, applied its “policy guidelines” regarding the public interest to focus review “on the domestic need for the natural gas proposed to be exports; whether the proposed exports pose a threat to the security of natural gas supplies, *and any other issue determined to be appropriate.*”¹²

Although DOE/FE has adopted a presumption that LNG export applications are consistent with the public interest, this presumption is rebuttable and not determinative. The DC Circuit Court has explained to DOE/FE that this presumption is “highly flexible, creating *only* rebuttable presumptions and leaving parties free to assert other factors.”¹³ Put differently, although DOE/FE may “presume” that an application should be granted, this presumption is not determinative, and DOE/FE retains an independent duty to determine whether an application is complete and, in fact, in the public interest.¹⁴

2. National Environmental Policy Act

NEPA requires federal agencies to consider and disclose the “environmental impacts” of proposed agency actions.¹⁵ This requirement is implemented via a set of procedures that “insure that environmental information is available to public officials and citizens *before* decisions are made and *before* actions are taken.”¹⁶ Agencies must “carefully consider [] detailed information concerning significant environmental impacts” and NEPA “guarantees that the relevant information will be made available” to the public.¹⁷

The Council on Environmental Quality (“CEQ”) directs agencies to “integrate the NEPA process with other planning at the earliest possible time to insure that planning and decisions reflect environmental values.”¹⁸ DOE has adopted CEQ’s NEPA regulations in full.¹⁹ Pursuant to its own regulations, “[i]t is DOE’s policy to follow the letter and spirit of NEPA; comply fully with the [CEQ] Regulations and apply the NEPA review process early in the planning stages for DOE proposals.”²⁰ The NEPA rules apply to “any DOE action affecting the quality of the environment of the United States, its territories or possessions.”²¹

¹¹ 10 C.F.R. § 590.202(b)(7). As discussed herein, the applicant in this matter has failed entirely to meet this requirement.

¹² 49 Fed. Reg. 6,684 (Feb. 22, 1984)) (emphasis added).

¹³ *Panhandle Producers and Royalty Owners Ass’n v. Economic Regulatory Administration*, 822 F.2d 1105, 1110-1111, 1113 (D.C. Cir. 1987) (emphasis added, internal quotation marks omitted).

¹⁴ See 10 C.F.R. § 590.404.

¹⁵ 42 U.S.C. § 4332(C)(i).

¹⁶ 40 C.F.R. § 1500.1(b) (emphases added).

¹⁷ *Dep’t of Transp. v. Public Citizen*, 541 U.S. 752, 768 (2004) (quoting *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989)).

¹⁸ 40 C.F.R. § 1501.2.

¹⁹ *Id.* § 1021.103.

²⁰ 10 C.F.R. § 1021.100.

²¹ *Id.* § 1021.102.

For purposes of the intersection of NEPA and the NGA, the NGA designated the former Federal Power Commission as the “lead agency” for NEPA purposes.²² The lead agency prepares NEPA documents for an action that falls within the jurisdiction of multiple federal agencies. FERC has since generally filled that role, preparing the NEPA documents for LNG export and import decisions.²³

Whether or not FERC takes a lead role, however, DOE’s ultimate NEPA obligations are the same: It may not move forward until the full scope of the action *it* is considering – here the approval of LNG export – has been properly considered. Thus, if FERC prepares a deficient NEPA analysis, this will not meet DOE/FE’s NEPA obligations, and DOE/FE will be unable to rely thereon. Moreover, DOE/FE must not make a determination in this matter prior to the completion of the NEPA process.

The NEPA process is embodied in preparation of an “environmental impact statement” (“EIS”) where, as here, the proposed major federal action would “significantly affect[] the quality of the human environment.”²⁴ DOE/FE regulations provide that “[a]pprovals or disapprovals of authorizations to import or export natural gas... involving major operational changes (such as a major increase in the quantity of liquefied natural gas imported or exported” will “normally require [an] EIS.”²⁵ We agree that a full EIS is appropriate and required here. Furthermore, if the EIS FERC prepares is inadequate to inform DOE/FE’s decision or discharge DOE/FE’s NEPA obligations, DOE/FE must prepare a separate or supplemental EIS.

An EIS must describe: the environmental impact of the proposed action; any adverse environmental effects which cannot be avoided should the proposal be implemented; alternatives to the proposed action, the relationship between local short-term uses of man’s environment and the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

The alternatives analysis “is the heart of the environmental impact statement.”²⁶ Here, the proposed action is to export LNG from the proposed facility, and DOE/FE must consider alternatives to this action. DOE/FE must take care not to define the project purpose so narrowly as to prevent the consideration of a reasonable range of alternatives.²⁷ If it did otherwise, it would lack “a clear basis for choice among options by the decisionmaker and the public.”²⁸

²² 15 U.S.C. § 717n.

²³ See 10 C.F.R. § 1021.342 (providing for interagency cooperation).

²⁴ 42 U.S.C. § 4332(C).

²⁵ 10 C.F.R. Part 1021, Appendix D, D9.

²⁶ 40 C.F.R. § 1502.14.

²⁷ See, e.g., *Simmons v. U.S. Army Corps of Engineers*, 120 F.3d 664, 666 (7th Cir. 1997).

²⁸ See 40 C.F.R. § 1502.14.

An EIS must also describe the direct and indirect effects, and cumulative impacts of a proposed action.²⁹ Direct effects are “caused by the action and occur at the same time and place,” while indirect effects are “caused by the action” but “are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effect on air and water and other natural systems, including ecosystems.”³⁰

Cumulative impacts are not causally related to the action. Instead, they are: 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.³¹ The EIS must give each of these categories of effect fair emphasis.

Finally, while an EIS is being prepared “DOE shall take no action concerning the proposal that is the subject of the EIS” until the EIS is complete and a formal Record of Decision has been issued.³² During this time, DOE may take no action which would tend to “limit the choice of reasonable alternatives,” or “tend[] to determine subsequent development .”³³

3. Endangered Species Act

Congress enacted the Endangered Species Act (ESA) in 1973 to provide for the conservation of endangered and threatened fish, wildlife, plants and their natural habitats.³⁴ The ESA imposes substantive and procedural obligations on all federal agencies with regard to listed and proposed species and their critical habitats.³⁵

Pursuant to the ESA, all agencies “shall seek to conserve endangered species,” and DOE/FE must ensure that its approval of the Eagle LNG project “is not likely to jeopardize the continued existence of any endangered species . . . or result in the destruction or adverse modification of [critical] habitat of such species.”³⁶ “Each Federal agency shall review its actions at the earliest possible time to determine whether any action may affect listed species or critical habitat.”³⁷

²⁹ 40 C.F.R §§ 1502.16, 1508.7, 1508.8; *Northern Plains Resource Council v. Surface Transportation Board*, 668 F.3d 1067, 1072-73 (9th Cir. 2011).

³⁰ 40 C.F.R. §§ 1508.8(a), (b).

³¹ 40 C.F.R. § 1508.7.

³² 10 C.F.R. § 1021.211.

³³ 40 C.F.R. § 1506.1.

³⁴ *Id.* §§ 1531, 1532.

³⁵ *See id.* §§ 1536(a)(1), (a)(2) and (a)(4) and § 1538(a); 50 C.F.R. § 402.

³⁶ 16 U.S.C. §§ 1531(c)(1), 1536(a)(2).

³⁷ 50 C.F.R. § 402.14(a); *see also* 16 U.S.C. § 1536(a)(2). The definition of agency “action” is broad and includes “all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies.” 50 C.F.R. § 402.02.

If the action agency concludes that an action is “likely to adversely affect” listed species or critical habitat, it must enter into “formal consultation” with FWS.³⁸ The threshold for triggering the formal consultation requirement is “very low;” indeed, “any possible effect ... triggers formal consultation requirements.”³⁹

This determination must be wide-ranging, because Eagle LNG’s export proposal will increase gas production activities nationwide. Thus, DOE/FE must consider not just the effects of the project at the proposed site (although it must at least do that), but the effects of increased gas production across the full region the plant affects.

To make this determination, DOE/FE should, first, conduct a biological assessment, including the “results of an on-site inspection of the area affected,” “[t]he views of recognized experts on the species at issue,” a review of relevant literature, “[a]n analysis of the effects of the action on the species and habitat, including consideration of cumulative effects, and the results of any related studies,” and “[a]n analysis of alternate actions considered by the Federal agency for the proposed action.”⁴⁰ If that assessment determines that impacts are possible (as is the case here), DOE/FE must enter into formal consultation with the Fish and Wildlife Service (FWS) and the National Marine and Fisheries Service (NMFS) (together, the “Services”), as appropriate, to avoid jeopardizing any endangered species or adversely modifying its habitat as a consequences of its approval of Eagle LNG’s proposal.⁴¹

B. All Pending Export Applications, Pipelines, and Studies Must Be Incorporated Into DOE/FE’s NEPA, NGA, and Other Analyses

As explained above, the NGA, NEPA, and ESA all require DOE/FE’s determination to be informed by the context in which the proposed project would occur. Similarly, DOE/FE’s analysis must not be confined to local, direct effects of the particular application; DOE/FE must consider the broader constellation of indirect and cumulative effects. Accordingly, review of this application must also encompass the other LNG export proposals pending before DOE/FE and FERC. The broader backdrop of related and similar projects, in turn, must inform the NEPA alternatives analysis. NEPA bars DOE/FE from granting conditional authorization prior to completion of the NEPA process, including the above analyses.

Eagle LNG’s export proposal is only one of many before DOE/FE. Because the effects of these projects are cumulative, and because each approval alters the price and production effects of exports on the economy, DOE/FE must consider these projects’ interactions. We note that in the

³⁸ 50 C.F.R. §§ 402.12(k), 402.14(a).

³⁹ See 51 Fed. Reg. at 19,926.

⁴⁰ See 50 C.F.R. § 402.12(f).

⁴¹ 16 U.S.C. § 1536(a), (b).

similar proceeding regarding Jordan Cove, LLC's proposal to construct and operate an export terminal in Coos Bay, Oregon, EPA requested consideration of this broader context.⁴²

DOE/FE can do so by conducting a programmatic EIS, considering the impacts of *all* gas export proposals at once. DOE/FE has the discretion to do so, even if it determines that it does not have the duty to do so.⁴³ Such a programmatic EIS would allow DOE/FE, and the public, to understand the impacts of all of these proposals, their interactions, and their cumulative environmental and economic impacts. That understanding would serve to improve decision-making, and allow DOE/FE, the public, and industry to identify prudent alternatives to serve the public interest and minimize environmental impacts. DOE/FE must recognize that it is making what is, functionally, a programmatic decision to radically alter the U.S. market and production system by allowing for large-scale LNG export, and conduct an EIS commensurate with the decision it is making, rather than piece-meal determinations from application to application.

C. The DOE/FE Analysis Must Consider The Broad Context of LNG Exports

Both NEPA and the NGA require DOE/FE to consider alternatives to Eagle LNG's proposal. Specifically, the NGA public interest analysis requires an "exploration of all issues relevant to the 'public interest,'" an inquiry which the Supreme Court held in *Udall* must be wide-ranging. In that case, which concerned hydropower, the regulatory agency was required to consider, for instance, "alternate sources of power," the state of the power market generally, and options to mitigate impacts on wildlife.⁴⁴ Here, likewise, DOE/FE must consider alternatives to the export proposal which would better serve the public interest, broadly analyzing other approaches to structuring LNG exports and gas use generally, given exports' sweeping effects on the economy.

NEPA is designed to support this sort of broad consideration. The alternatives analysis is "the heart of the environmental impact statement," presenting sharply defined issues which offer "clear basis for choice among options by the decisionmaker and the public."⁴⁵ Crucially, the alternatives must include "reasonable alternatives not within the jurisdiction of the lead agency," – meaning that DOE/FE must review actions which it cannot directly order – and must include "appropriate mitigation measures not already included in the proposed action or alternatives."⁴⁶ Because alternatives are so central to decision-making and mitigation, "the existence of a viable but unexamined alternative renders an environmental impact statement inadequate."⁴⁷

Without limiting this consideration, these alternatives should include, at a minimum, consideration of the following:

⁴² EPA, *Scoping Comments – The Jordan Cove Energy Project LP*, FERC Dkt. Nos. PF12-7 and PF12-17, at 3 (Oct. 29, 2012) ("we recommend discussing the proposed project in the context of the larger energy market, including existing export capacity and export capacity under application to the Department of Energy, and clearly describe how the need for the proposed action has been determined.").

⁴³ See 40 C.F.R. § 1508.17(b)(3); see also 10 C.F.R. § 1021.330.

⁴⁴ 387 U.S. at 450.

⁴⁵ 40 C.F.R. § 1502.14.

⁴⁶ *Id.*

⁴⁷ *Oregon Natural Desert Ass'n*, 625 F.3d at 1122 (citations omitted).

- (1) Whether, consistent with the 2014 *EIA LNG Export Study* and 2015 *LNG Export Study*, exports, if allowed, should move forward in smaller quantities or a slower time table to mitigate the domestic economic and environmental impacts associated with large export volumes or rapid export schedules;
- (2) Whether export from other locations would better serve the public interest by mitigating economic or environmental impacts or by limiting the cumulative impacts of multiple terminals located in one region;
- (3) Whether limitations on the sources of exported gas – e.g., limiting export from particular plays, formations, or regions – would help to mitigate environmental and economic impacts;
- (4) Whether to condition export on the presence of an adequate regulatory framework, including the fulfillment of the recommendations for safe production made by the DOE’s Shale Gas Subcommittee, would better serve the public interest by ensuring that the production increases associated with export will not increase poorly-regulated unconventional gas production;
- (5) Whether to delay, deny, or condition exports based upon their effect on the U.S. utility market (including changes in air pollution emissions associated with the impacts of increased export demand on fuel choice);
- (6) Whether to require exporters to certify that any unconventional gas produced as a result of their proposal (or shipped through their facilities) has been produced in accordance with all relevant environmental laws and according to a set of best production practices (such as that discussed by the DOE’s Shale Gas Subcommittee);
- (7) Whether to deny export proposals all together as contrary to the public interest.

Other alternatives are, no doubt, also available, but DOE/FE must at a minimum consider the possibilities listed above, as they are reasonable and bear directly on the public interest determination before it.

D. DOE/FE May Not Conditionally Approve Eagle LNG’s Proposal Prior to NEPA Review

Although as a general matter DOE/FE may issue “conditional” orders,⁴⁸ this general authority cannot trump DOE’s specific rules barring the agency from taking any “action concerning [a] proposal” that is the subject of an EIS, if that action tends to “limit the choice of reasonable alternatives.”⁴⁹ Because FERC, the lead agency for purposes of NEPA review, has already determined that an EIS is needed here, DOE/FE’s regulations prohibit DOE/FE from issuing a conditional authorization now.

⁴⁸ *see* 10 C.F.R. § 590.402.

⁴⁹ 10 C.F.R. § 1021.211; 40 C.F.R. § 1506.1.

Specifically, a conditional approval would limit alternatives, and determine subsequent choices, in precisely this forbidden way. The Sabine Pass EA and DOE/FE conditional approval in that case provide a good example of this problem. In *Sabine Pass*, DOE/FE expressed its “conditional” view that the project was in the public interest, conditioned on “the satisfactory completion of the environmental review process [by FERC] and on issuance by DOE/FE of a finding of no significant impact or a record of decision pursuant to NEPA.”

This decision was, first, irrational: As we have discussed at length above, DOE/FE cannot complete a public interest determination without weighing environmental factors. Because these factors are integral to DOE/FE’s decision, and NEPA is procedural statute, DOE/FE must weigh environmental interests at the same time that weighs all other interests. It may not parcel them into a separate process without ignoring required statutory factors and important aspects of the problem before it on the record.

Second, DOE/FE’s approval, even if nominally “conditional,” plainly influenced the NEPA process. In the Sabine Pass EA, although FERC acknowledged that DOE/FE was making a broad public interest determination, FERC functionally treated DOE/FE’s decision as already made. As such, in its alternatives analysis, FERC summarily rejected the “no action” alternative because “the no-action alternative could not meet the purpose and need for the Project.”⁵⁰ This statement is incorrect, since DOE/FE had not made an actual decision. DOE/FE is, after all, considering *whether* to allow gas exports. Because that decision had *not* been made, it is wholly appropriate to select a “no-action” alternative (including, for FERC, a decision not to site a facility whose exports have not been permitted). The fact that FERC felt that it was not free to do so indicates that conditional approvals in fact tend to limit alternatives and steer the development decision-making process.

To avoid this illegal effect, DOE/FE may not approve the Eagle LNG export proposal, conditionally or not, until it has considered all alternatives to doing so through the NEPA and NGA processes.

E. Eagle LNG’s Proposal Will Have Numerous Harmful Environmental Effects and Is Contrary to The Public Interest

Eagle LNG’s proposal will harm the local environment surrounding the proposed terminal, it will induce environmentally harmful gas production, it will increase prices domestic consumers and industry pay for natural gas, and it will increase domestic coal consumption causing attendant harm to public health and the environment. Eagle LNG’s application does not address any of these economic and environmental costs. These environmental harms translate into economic damage. If pollution sickens people, economic productivity will suffer – as it will, more directly, if clean air and water and adequate waste disposal capacity are not available. Similarly, as landscapes are industrialized, tourism, agricultural, forestry, hunting and angling, and other place-dependent

⁵⁰ Sabine Pass EA at 3-1.

industries will suffer. Thus, DOE/FE must both consider these environmental impacts and monetize them to weigh them against other economic harms in the public interest analysis.

In light of these costs, if DOE/FE were to make a decision on the available record (rather than engaging in further study of these issues), DOE/FE would have to conclude that these impacts outweigh any possible benefit of the project and deny the application.

F. The Project Will Have Significant Adverse Impacts Not Discussed in Eagle LNG's Application

Eagle LNG's proposal will impose significant environmental costs. The environmental costs fall into three categories: direct effects of the terminal and associated construction, indirect effects of the additional gas production the project will induce, and non-localized effects resulting from increased domestic gas prices and resultant increases in coal consumption. As we explain below, each of these categories of effects must be considered in DOE/FE's analyses, and each weighs against finding that the proposed project is consistent with the public interest.

1. Environmental Impacts

The proposed project involves major infrastructure construction. According to the application, "Current plans include construction of one LNG storage tank with a capacity of 12 million gallons, a marine load-out facility, and a dock that could accommodate small to mid-size LNG vessels (for export to nearby markets) and bunkering barges (for domestic ship fueling at the Port of Jacksonville), as well as a truck load-out facility." Construction and operation of these facilities will have significant impacts on air, water, landscapes, and wildlife. These impacts must be considered in both the NEPA analysis and in DOE/FE's public interest determination. We offer preliminary comments on these impacts now, although these impacts cannot be fully identified until additional information is presented in the NEPA process.

i. Air Pollution

Operation of the proposed project and related facilities will emit harmful carbon monoxide (CO), nitrogen oxides (NO_x), volatile organic compounds (VOC), greenhouse gases (GHGs), sulfur dioxides (SO_x), particulate matter (PM₁₀ and PM_{2.5}), and hydrogen sulfide (H₂S) pollution. At this stage, we discuss solely the emissions associated with operation of the project, but construction of the project will also result in significant additional emissions.

VOC and NO_x

The proposed Eagle LNG project will cause significant emissions of volatile organic compounds ("VOCs") and NO_x, emitted directly from project facilities and indirectly from tanker and other ship traffic and operations. Eagle LNG has failed, however, to estimate such emissions, rendering the application entirely incomplete.

These emissions will harm the environment by increasing the formation of ground level ozone, (also referred to as smog). Smog pollution harms the respiratory system and has been linked to

premature death, heart failure, chronic respiratory damage, and premature aging of the lungs.⁵¹ Smog may also exacerbate existing respiratory illnesses, such as asthma and emphysema, or cause chest pain, coughing, throat irritation and congestion. Children, the elderly, and people with existing respiratory conditions are the most at risk from ozone pollution.⁵²

Significant ozone pollution also damages plants and ecosystems.⁵³ Ozone also contributes substantially to global climate change over the short term. According to a recent study by the United Nations Environment Program (UNEP), behind carbon dioxide and methane, ozone is now the third most significant contributor to human-caused climate change.⁵⁴

Carbon Monoxide (CO)

Operation of the proposed terminal will directly emit CO, with additional emissions from marine vessels. As with NO_x and VOC, the applicant has failed to discuss any of these matters in its application. CO can cause harmful health effects by reducing oxygen delivery to the body's organs and tissues.⁵⁵ CO can be particularly harmful to persons with various types of heart disease, who already have a reduced capacity for pumping oxygenated blood to the heart. "For these people, short-term CO exposure further affects their body's already compromised ability to respond to the increased oxygen demands of exercise or exertion."⁵⁶

Greenhouse Gasses (GHGs)

Eagle LNG will directly emit carbon dioxide and equivalent greenhouse gases ("CO₂e"), with additional emissions from marine vessel traffic. The application contains no discussion of GHGs or their impacts to the local and global environment. Climate change fueled by GHG emissions will lead to loss of coastal land in densely populated areas, shrinking snowpack in Western states, increased wildfires, and reduced crop yields.⁵⁷ More frequent heat waves as a result of global warming already have affected public health, leading to premature deaths, and threats to public health are only expected to increase as global warming intensifies. For example, a warming

⁵¹ EPA, *Proposed New Source Performance Standards and Amendments to the National Emissions Standards for Hazardous Air Pollutants for the Oil and Natural Gas Industry: Regulatory Impact Analysis*, 4-25 (July 2011), available at <http://www.epa.gov/ttnecas1/regdata/RIAs/oilnaturalgasfinalria.pdf> (hereinafter O&G NSPS RIA) Jerrett *et al.*, *Long-Term Ozone Exposure and Mortality*, *New England Journal of Medicine* (Mar. 12, 2009), available at <http://www.nejm.org/doi/full/10.1056/NEJMoa0803894#t=articleTop>.

⁵² See EPA, *Ground-Level Ozone, Health Effects*, available at <http://www.epa.gov/glo/health.html> attached as Exhibit 8. EPA, *Nitrogen Dioxide, Health*, available at <http://www.epa.gov/air/nitrogenoxides/health.html>.

⁵³ See United Nations Environment Programme and World Meteorological Organization, (2011): *Integrated Assessment of Black Carbon and Tropospheric Ozone: Summary for Decision Makers* (hereinafter "UNEP Report," available at http://www.unep.org/dewa/Portals/67/pdf/Black_Carbon.pdf), at

7

⁵⁴ *Id.*

⁵⁵ <http://www.epa.gov/air/carbonmonoxide/health.html>

⁵⁶ *Id.*

⁵⁷ US EPA, *Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act*, 74 Fed. Reg. 66,496, 66,532–33.

climate will lead to increased incidence of respiratory and infectious disease, greater air and water pollution, increased malnutrition, and greater casualties from fire, storms, and floods.⁵⁸ Vulnerable populations—such as children, the elderly, the poor and those with existing health problems—are the most at risk from these threats.⁵⁹

The impacts of climate change caused by greenhouse gases further include “increased air and ocean temperatures, changes in precipitation patterns, melting and thawing of global glaciers and ice, increasingly severe weather events, such as hurricanes of greater intensity and sea level rise.”⁶⁰ DOE must consider these impacts in assessing the public interest.

The Council on Environmental Quality (“CEQ”) has released draft guidance that reinforces NEPA’s mandate to consider a proposed project’s climate change impacts. The CEQ Guidance plainly states that “Climate change is a fundamental environmental issue, and the relation of Federal actions to it falls squarely within NEPA’s focus.”⁶¹

Sulfur Dioxide

The proposed terminal and compressor stations will directly emit SO₂, with additional emissions from marine vessel traffic. Once again, these emissions have not been discussed in the application. Sulfur dioxide causes respiratory problems, including increased asthma symptoms. Short-term exposure to sulfur dioxide has been linked to increased emergency room visits and hospital admissions. Sulfur dioxide reacts in the atmosphere to form particulate matter (PM), an air pollutant which causes a great deal of harm to human health.⁶² PM is discussed separately below.

Particulate Matter

The proposed terminal and compressor stations will directly emit particulate matter, with additional emissions from marine vessel traffic. PM consists of tiny particles of a range of sizes suspended in air. Small particles pose the greatest health risk. These small particles include “inhalable coarse particles,” which are smaller than 10 micrometers in diameter (PM₁₀), and “fine particles” which are less than 2.5 micrometers in diameter (PM_{2.5}). PM₁₀ is primarily formed from crushing, grinding or abrasion of surfaces. PM_{2.5} is primarily formed by incomplete combustion of fuels or through secondary formation in the atmosphere.⁶³

⁵⁸ *Climate Change, Health and Environmental Effects*, ENVIRONMENTAL PROTECTION AGENCY, <http://epa.gov/climatechange/effects/health.html>.

⁵⁹ CEQ Guidance, *supra* note **Error! Bookmark not defined.** at 28.

⁶⁰ 76 Fed. Reg. at 52,791-22 (citing U.S. EPA, 2011 U.S. GREENHOUSE GAS INVENTORY REPORT EXECUTIVE SUMMARY (2011))

⁶¹ *Id.* at 2.

⁶² EPA, Sulfur Dioxide, Health, available at <http://www.epa.gov/air/sulfurdioxide/health.html>.

⁶³ See EPA, Particulate Matter, Health, available at <http://www.epa.gov/pm/health.html>; BLM, *West Tavaputs Plateau Natural Gas Full Field Development Plan Final Environmental Impact Statement* (“West Tavaputs FEIS”), at 3-19 (July 2010), available at http://www.blm.gov/ut/st/en/fo/price/energy/Oil_Gas/wtp_final_eis.html.

PM causes a wide variety of health and environmental impacts. PM has been linked to respiratory and cardiovascular problems, including coughing, painful breathing, aggravated asthma attacks, chronic bronchitis, decreased lung function, heart attacks, and premature death. Sensitive populations, include the elderly, children, and people with existing heart or lung problems, are most at risk from PM pollution.⁶⁴ PM also reduces visibility, and may damage important cultural resources.⁶⁵ Black carbon, a component of PM emitted by combustion sources such as flares and older diesel engines, also warms the climate and thus contributes to climate change.⁶⁶ These impacts must be considered by DOE in determining whether the project is in the public interest.

ii. Terminal and Pipeline Water Quality Impacts

The proposed project will impact water quality in numerous ways, including water withdrawals during construction, stormwater runoff from terminal facilities, and discharge and suspension or re-suspension of sediment as a result of dredging and ship transits.

Stormwater runoff from the terminal site will adversely affect water quality. Stormwater from the terminal site is likely to contain heavy metals, petroleum products and brake chemicals and compounds that are deleterious to fish and fish habitat.

Furthermore, dredging, construction of in-water facilities, and ship transits all have the potential to suspend or re-suspend sediment, adversely affecting water quality. This is especially important for the impacts it may have on species protected under the ESA that may be affected by such sediment discharges (see below).

iii. Wildlife

The project will adversely impact wildlife and species habitat in numerous ways. Noise from construction, compressor operations and vessel operations may harass and displace species, and spills threaten habitat. Moreover, the project would intensify the current climate catastrophe, putting many imperiled species at risk of harm.

Several species that are protected under the ESA may be impacted by the proposed project. This includes whales (such as endangered North Atlantic right whale), the Florida manatee, loggerhead, green, Kemp's ridley, hawksbill, and leatherback sea turtles, smalltooth sawfish, Gulf and Atlantic sturgeon, and piping plover, which has designated critical habitat in the vicinity of the project. The Eagle LNG project has the potential to harm these species in a variety of ways, including sediment from construction activities and dredging, contamination from spills or leaks, air pollution (as discussed herein), vessel traffic (discussed below), and climate disruption from the procurement, transportation and eventual use of the fossil fuels that Eagle plans to ship abroad.

⁶⁴ O&G NSPS RIA at 4-19; EPA, Particulate Matter, Health.

⁶⁵ See EPA, Particulate Matter, Health West Tavaputs EIS, at 3-19; O&G NSPS RIA at 4-24.

⁶⁶ UNEP Report at 6; IPCC (2007) at Section 2.4.4.3.

For example, runoff, leaks, and other contamination from the Project in the St. John's rivershed can deteriorate the water quality to a level where seagrass, the manatee's main food source,⁶⁷ can no longer grow.⁶⁸ If the project injures manatees, they will not be able to return to where they normally live and breed to sustain those populations.⁶⁹ The Project may thereby damage the manatee's designated critical habitat. The presence of critical habitat is explicitly identified as a factor to consider when determining if an action will have a significant effect on the environment.⁷⁰ As set forth below, the project further has the potential to harm North Atlantic right whales by increasing vessel traffic. The project therefore clearly "may affect" listed species, requiring formal consultation with the Services.

Pursuant to the ESA agencies must use the best scientific data available and assess impacts to listed species at the earliest possible time. DOE cannot approve this project until it completes formal ESA Section 7 consultation with the Services to ensure that the project will not jeopardize the continued existence of listed species, or degrade critical habitat.

Furthermore, while FERC may initiate Section 7 consultation on this project, that does not relieve DOE of its independent duty to consult – and even if DOE is to rely on any future FERC consultation, it may not approve the application until after that process has been completed to ensure that project-related activities will not jeopardize listed species. Moreover, while FERC may initiate consultation on this project, the scope of that analysis may be truncated to the immediate or local impacts of project construction and operation, due to the nature of FERC's jurisdiction. DOE, however, is considering herein an application to export fracked fossil fuels abroad, which has broad implications for species. As discussed herein, that decision can have upstream and downstream impacts, including the exacerbation of climate change. DOE must fully assess these issues through consultation with the Services.

1. Impacts from Climate Change

Climate models project both continued warming in all seasons across the southeast United States, and an increase in the rate of warming.⁷¹ The warming in air and water temperatures projected for the southeast will create heat-related stress for fish and wildlife. Climate change will alter the

⁶⁷ See *Manatee Habitat*, FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION, <http://myfwc.com/wildlifehabitats/managed/manatee/habitat/>.

⁶⁸ See Frederick Short & Sandy Wyllie-Echeverria, *Natural and human-induced disturbance of seagrass*, 23 ENV'T'L CONSERVATION 17, 17 (1996) ("Human activities most affecting seagrass are those which alter water quality or clarity. . . . Although natural events have been responsible for both large-scale and local losses of seagrass habitat, our evaluation suggests that human population expansion is not the most serious cause of seagrass habitat loss.")

⁶⁹ See generally Deutsch et. al, *Seasonal Movements, Migratory Behavior, and Site Fidelity of West Indian Manatees along the Atlantic Coast of the United States* 67 J. OF WILDLIFE MANAGEMENT 1 (2003) (Describing manatee migration on the Atlantic Coast of Florida).

⁷⁰ See 40 C.F.R 1508.27(b)(9).

⁷¹ Karl, T.R., J.M. Melillo, and T.C. Peterson. 2009. *Global Climate Change Impacts in the United States*. Global Change Research Program. New York: Cambridge University Press, at 111-113..

distribution of native plants and animals and will lead to the local loss of imperiled species and the displacement of native species by invasive species.⁷² Concerning the effects climate change is expected to have on southeastern environments, Karl and Peterson (2009 at 115) state, “[e]cological thresholds are expected to be crossed throughout the region, causing major disruptions to ecosystems and to the benefits they provide to people.”

Climate change will increase the incidence and severity of both drought and major storm events in the southeast.⁷³ The percentage of the southeast region experiencing moderate to severe drought has already increased over the past three decades. Since the mid- 1970s, the area of moderate to severe spring and summer drought has increased by 12 percent and 14 percent, respectively. Fall precipitation tended to increase in most of the southeast, but the extent of region-wide drought still increased by nine percent.⁷⁴ Both drought and severe storms could threaten Florida species with habitat alteration, altered vegetation, and altered prey base and food availability.⁷⁵

The warming climate will likely cause ecological zones to shift upward in latitude and altitude and species’ persistence will depend upon, among other factors, their ability to disperse to suitable habitat.⁷⁶ Because of species’ already limited range and the high degree of development in the surrounding area, there is likely no suitable habitat where species could disperse, making climate change a dire threat to survival.

Global average sea level rose by roughly eight inches over the past century, and sea level rise is accelerating in pace.⁷⁷ As summarized by the Third National Climate Assessment, “Since the late 1800s, tide gauges throughout the world have shown that global sea level has risen by about 8 inches. A new data set shows that this recent rise is much greater than at any time in at least the past 2000 years. Since 1992, the rate of global sea level rise measured by satellites has been roughly twice the rate observed over the last century, providing evidence of additional acceleration.”⁷⁸ Many areas of the Southeast Atlantic and Gulf of Mexico coasts have experienced significantly higher rates of relative sea-level rise than the global average during the past 50

⁷² *Id.* at 113.

⁷³ *Id.* at 111-116.

⁷⁴ *Id.* at 111.

⁷⁵ Seager, R., A. Tzanova, and J. Nakamura. 2009. Drought in the Southeastern United States: causes, variability over the last millennium, and the potential for future hydroclimate change. *Journal of Climate*, 22: 5021-5045.

⁷⁶ Peters, R.L. and J.D.S. Darling. 1985. The greenhouse effect and nature reserves. *Bioscience*, 35(11), 707-717.

⁷⁷ Melillo, J.M., T.C. Richmond, and G.W. Yohe (Eds.). (2014). *2014: Climate Change Impacts in the United States: The Third National Climate Assessment*. doi:10.7930/J0Z31WJ2, U.S. Global Change Research Program, at 373.

⁷⁸ *Id.* at 44.

years.⁷⁹ Large regions of Florida have elevations at or below 3 to 6 feet, making these areas particularly vulnerable to sea-level rise and flooding.⁸⁰

According to the Third National Climate Assessment, global sea level is projected to rise another 1 to 4 feet by 2100, with sea-level rise of 6.6 feet possible.⁸¹ Sea level rise could increase by another 6 inches in just the next decade.⁸² In its 2012 sea-level rise assessment, the National Research Council similarly estimated global sea-level rise at 8 to 23 cm by 2030, 18 to 48 cm by 2050, and 0.5 m to 1.4 m by 2100.⁸³ The effects of sea-level rise will be long-lived. Scientists estimate that we lock in 8 feet of sea-level rise over the long term for every degree Celsius (1.8 degrees Fahrenheit) of warming.⁸⁴

Regional projections for Florida also indicate that sea level rise of three to four feet or more is highly likely within this century. The Southeast Florida Regional Climate Change Compact Counties—Monroe, Miami-Dade, Broward, and Palm Beach counties—released the Southeast Florida Regional Climate Change Action Plan in October 2012, which included a detailed “Unified Sea Level Rise Projection” for south Florida. The sea level rise projections for south Florida are similar what has been estimated globally by the National Research Council: 8 to 18 cm (3 to 7 inches) by 2030, 23 to 61 cm (9 to 24 inches) by 2060, and 48 cm to 1.45 m (19 to 57 inches) by 2100.⁸⁵

Increasingly intense storms and storm surge pose additional climate threats to coastal wildlife species in Florida. Studies have found that the frequency of high-severity hurricanes is increasing in the Atlantic,⁸⁶ along with an increased frequency of hurricane-generated large surge events and wave heights.⁸⁷ The risk of extreme storm surges has already doubled as the planet warms, and

⁷⁹ Karl 2009 at 37.

⁸⁰ Weiss, J.L., J.T. Overpeck, and B. Strauss. 2011. Implications of recent sea level rise science for low-elevation areas in coastal cities of the coterminous U.S.A. *Climate Change*, 105, 635-645; Strauss, B.H., R. Ziemiński, J.L. Weiss, and J.T. Overpeck. 2012. Tidally adjusted estimates of topographic vulnerability to sea level rise and flooding for the contiguous United States. *Environmental Research Letters*, 7:014033, at 3-4.

⁸¹ Melillo 2014 at 589.

⁸² Melillo 2014 at 400.

⁸³ National Research Council of the National Academies. (2012). *Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future*, at 4.

⁸⁴ Levermann, A., P.U. Clark, B. Marzeion, G.A. Milne, D. Pollard, V. Radic, and A. Robinson. 2013. The multimillennial sea-level commitment of global warming. *PNAS*, 110:13745-13750, at 13746.

⁸⁵ Southeast Florida Regional Climate Change Compact Technical Ad hoc Work Group. April 2011. *A Unified Sea Level Rise Projection for Southeast Florida*. A document prepared for the Southeast Florida Regional Climate Change Compact Steering Committee. 27 p., at 9-10.

⁸⁶ Elsner, J.J., J.P. Kossin, and T.H. Jagger. 2008. The increasing intensity of the strongest tropical cyclones. *Nature*, 455: 92-95; Bender, M. T. 2010. Modeled impact of anthropogenic warming on the frequency of intense Atlantic hurricanes. *Science*, 327: 454-458; Kishtawal, C.M., N. Jaiswal, R. Singh, and D. Niyogi. 2012. Tropical cyclone intensification trends during satellite era (1986-2001). *Geophysical Research Letters*, Vol 39.

⁸⁷ Grinsted, A.J., J.C. Moore, and S. Jevrejeva. 2012. Homogenous record of Atlantic hurricane surge threat since 1923. *Proceedings of the National Academy of Sciences of the United States of America*,

these events could become 10 times more frequent in the coming decades.⁸⁸ High winds, waves, and surge from storms can cause significant damage to coastal habitat. When storm surges coincide with high tides, the chances for damage are greatly heightened.⁸⁹ As sea levels rise, storm surge will be riding on a higher sea surface which will push water further inland and create more flooding of coastal habitats.⁹⁰ For example, one study estimated that hurricane flood elevations along the Texas coast will rise by an average of 0.3 meters by the 2030s and 0.8 meters by the 2080s, with severe flood events reaching 0.5 meters and 1.8 meters by the 2030s and 2080s, respectively.⁹¹

Coastal species face significant risks from coastal squeeze that occurs when habitat is pressed between rising sea levels and coastal development that prevents landward movement.⁹² Human responses to sea level rise including coastal armoring and landward migration pose significant risks to the ability of species threatened by sea-level rise to move landward, if other suitable habitats were even available.⁹³ Projected human population growth and development in Florida may thus threaten Florida species with coastal squeeze.⁹⁴ These impacts must be considered by DOE in determining whether the project is in the public interest.

2. The Applicant must analyze the impacts to marine mammals and turtles

The proposed project would increase the amount of tanker traffic moving through the Port and offshore of Florida. The increase in tanker traffic associated with the proposed Project (up to 100 round trip ships per year) poses risks to marine mammals and turtles in several ways, including through elevated risk of ship strike, increased noise in the aquatic environment, elevated risk of exposure to toxic contaminants through spills, and the introduction of invasive species in ballast water. Several of the species put at risk by the proposed Project are protected under the Endangered Species Act (“ESA”) and/or Marine Mammal Protection Act (“MMPA”). Allowing activities that may harm these species opens up both the agency and private actors to liability under these acts.⁹⁵

109(48): 19601-19605; Komar, P.D. and J.C. Allan. 2008. Increasing hurricane-generated wave heights along the U.S. east coast and their climate controls. *Journal of Coastal Research*, 24(2): 479-488.

⁸⁸ Grinsted 2012.

⁸⁹ Cayan, D. P., P.D. Bromirski, K. Hayhoe, M. Tyree, M.D. Dettinger, and R.E. Flick. 2008. Climate change projections of sea level extremes along the California coast. *Climate Change*, 87: 857-873.

⁹⁰ Tebaldi, C., B.H. Strauss, and C.E. Zervas. 2012. Modelling sea level rise impacts on storm surges along U.S. coasts. *Environmental Research Letters*, 7:014032.

⁹¹ Mousavi, M.E., J.L. Irish, A.E. Frey, F. Olivera, and B.L. Edge. 2011. Global warming and hurricanes: the potential impact of hurricane intensification and sea level rise on coastal flooding. *Climate Change*, 104: 575-597.

⁹² Noss, R. 2011. Between the devil and the deep blue sea: Florida’s unenviable position with respect to sea level rise. *Climate Change*, 107(1): 1-16.

⁹³ Defeo, O., A. McLachlan, D.S. Schoeman, T.A. Schlacher, J. Dugan, A. Jones, M. Lastra, and F. Scapini. 2009. Threats to sandy beach ecosystems: a review. *Estuarine, Coastal and Shelf Science*, 81: 1-12.

⁹⁴ Zwick, P.D. and M.H. Carr. 2006. *Florida 2060: a population distribution scenario for the state of Florida*. Gainesville, FL: University of Florida, GeoPlan Center.

⁹⁵ See 16 U.S.C. § 1538(a)(1)(B); 16 U.S.C. § 1362.

i. *Elevated risk of ship strike.*

Ship strikes involving large vessels are the “principal source of severe injuries to whales.”⁹⁶ Most ship strikes to large whales result in death.⁹⁷ Ship strike-related mortality is a documented threat to populations of endangered North Atlantic right whales, which have critical habitat along the coast where the project is planned. In recent years, ship strikes have become an increasing problem for these critically endangered species along the Atlantic Coast.

According to NMFS, “North Atlantic right whales are the world’s most critically endangered large whale species and one of the world’s most endangered mammals.”⁹⁸ NMFS has further found that “the primary cause of the species’ failure to recover is believed to be mortality caused by collisions with ships and entanglement in commercial fishing gear.”⁹⁹ Since 1970, there have been “more than 73 confirmed right whale deaths, nearly half of which (49 percent) have been attributed to ship collisions (29 deaths). Further, “The number of documented deaths may be as little as 17 percent of the actual number of deaths,” as some deaths likely go undetected or unreported.¹⁰⁰

NMFS further found that “the number of human-caused right whale deaths and serious injuries may be increasing.” Moreover, many of the impacts occur from large vessels, such as those that would transport LNG as part of the Eagle LNG project:

Most right whales that died as a result of ship collision were first reported dead in or near major shipping channels off east coast ports between Jacksonville, Florida and New Brunswick, Canada. Based on massive injuries found on whales killed by ships (e.g., crushed skulls, severed tail stocks, and deep, broad propeller wounds), it appears that a large majority of right whales killed by vessels are victims of collisions with large ships.¹⁰¹

These collisions have the potential to jeopardize the species, since “[t]he effect of vessel-related deaths on right whale recovery is especially significant because a disproportionate number of ship strike victims are female right whales.”¹⁰²

These same threats could impact Florida manatee as well, and must therefore be fully evaluated prior to approving the proposed project.

⁹⁶ Laist, D.W., Knowlton, A.R., Mead, J.G., Collet, A.S. and Podesta, M., 2001, Collisions between ships and whales, *Marine Mammal Science*, 17(1): 35-75.

⁹⁷ Jensen, A.S. and Silber, G.K., 2004, Large Whale Ship Strike Database. U.S. Department of Commerce, *NOAA Technical Memorandum*. NMFS-OPR-25.

⁹⁸ 73 Fed. Reg. at 60173.

⁹⁹ *Id.*

¹⁰⁰ *Id.*

¹⁰¹ 73 Fed. Reg. at 60174.

¹⁰² *Id.*

Given the foregoing, there can be no doubt that the significant increase in deep draft vessel traffic from the proposed Project will increase the risk of vessel strikes of marine mammals, as well as turtles, such as loggerhead, green, Kemp's ridley, hawksbill, and leatherback sea turtles, and Atlantic sturgeon. The Applicant has failed to address this issue; however, DOE must take it into consideration when determining whether the project is in the public interest.

ii. *Increasing chronic ocean noise levels in important marine habitats.*

The proposed Project would substantially increase the amount of ship-related noise in the water, posing a risk of harm to marine mammals. Sound is the key sense for dolphins and whales to find their way around, detect predators, find food and communicate. The sound frequency range within which whales communicate and echolocate corresponds to the frequency range of ship noise. Ships hundreds and even thousands of miles away interfere with the acoustic space of these animals. With more ship traffic, the ability for whales and dolphins to communicate, search for prey, and avoid predators will be compromised. These impacts were not even mentioned in the application.

Oceans are much louder today than they were a century ago, primarily due to increased anthropogenic noise.¹⁰³ Ocean noise pollution, predominantly from large shipping vessels, has created an "omnipresent hum" in our ocean.¹⁰⁴ Large commercial shipping vessels are the primary source of anthropogenic low-frequency sound contributing to ambient (background) noise in the ocean. Because very loud low-frequency sound can travel great distances in the deep ocean, increasing noise impacts areas far beyond the source of the noise.¹⁰⁵ This poses a severe threat to marine mammals.

NOAA has recently begun mapping marine noise levels using its SoundMap and CetMap mapping tools.¹⁰⁶ These maps show that human-caused cumulative and ambient ocean noise pollution has increased ambient sound levels to over 100 decibels (dB) over the majority of the Pacific and Atlantic oceans.¹⁰⁷ This sound level is equivalent to attending a live rock concert or standing next to a running chainsaw.¹⁰⁸

¹⁰³ *Phase 1-CetSound*, NOAA, <http://cetsound.noaa.gov/cetsound>.

¹⁰⁴ For example, tests conducted near San Nicolas Island, one of the Channel Islands just south of the Channel Islands NMS, indicate that ambient noise pollution in that area has increased by 10-12 decibels over the past 40 years. McDonald *et al.* suggest that this increase, potentially reflected throughout the Northeast Pacific, is most likely due to changes in commercial shipping. McDonald, M.A., Hildebrand, J. and Wiggins, S.M., 2006, Increases in deep ocean ambient noise in the Northeast Pacific west of San Nicolas Island, California, *Journal of the Acoustical Society America*, 120(2): 711-718.

¹⁰⁵ Hildebrand, J. 2005. Impacts of anthropogenic sound, *In: Marine Mammal Research: Conservation Beyond Crisis*. Edited by: J.E. Reynolds III, W.F. Perrin, R.R. Reeves, S. Montgomery and T.J. Ragen. Johns Hopkins University Press, Baltimore, Maryland, pp. 101-124.

¹⁰⁶ See <http://cetsound.noaa.gov/>

¹⁰⁷ *Summed Outputs—Sound Field Data Availability*, NOAA, http://cetsound.noaa.gov/SoundMaps/NorthAtlantic/Basin/Chronic/NA_OceanBasin_Chronic_Sum/NorthAtlantic_Sum_ThirdOctave/Atl_Sum_0050Hz_0005m_ThrdOct.png (last accessed Oct. 29, 2014)

Marine mammals use different song, chirp, and whistle frequencies for a variety of purposes, including echolocation for feeding, long-distance communication, environmental imaging, individual identification, and breeding.¹⁰⁹ Odontocetes, or toothed mammals such as dolphins and killer whales, produce broad-spectrum clicks and whistles that can range between 1 and 200 kilohertz (kHz).¹¹⁰ Mysticetes, or baleen whales such as blue and right whales, have much lower-frequency calls, ranging between 0.2 and 10 kHz.¹¹¹

Anthropogenic noise pollution can mask marine mammal communications at almost all frequencies these mammals use.¹¹² “Masking” is a “reduction in an animal’s ability to detect relevant sounds in the presence of other sounds.”¹¹³ Ambient ship noise can cover important frequencies these animals use for more complex communications.¹¹⁴ Some species, such as the highly endangered right whale, are especially vulnerable to masking.¹¹⁵ Ship noise can completely and continuously mask right whale sounds at all frequencies.¹¹⁶ NOAA has recognized that this masking may affect marine mammal survival and reproduction by decreasing these animals’ ability to “[a]ttract mates, [d]efend territories or resources, [e]stablish social relationships, [c]oordinate feeding, [i]nteract with parents, or offspring, [and] [a]void predators or threats.”¹¹⁷

(Atlantic Ocean noise pollution levels); *Summed Outputs—Sound Field Data Availability*, NOAA, http://cetsound.noaa.gov/SoundMaps/NorthPacific/Basin/Chronic/NP_OceanBasin_Chronic_Sum/NorthPacific_Sum_ThirdOctave/Pac_Sum_0050Hz_0005m_ThrdOct.png (last accessed Oct. 29, 2014) (Pacific Ocean noise pollution levels).

¹⁰⁸ *Comparative Examples of Noise Levels*, INDUSTRIAL NOISE CONTROL, INC. (Feb. 2000), <http://www.industrialnoisecontrol.com/comparative-noise-examples.htm>.

¹⁰⁹ *Id.* at 42-44; Jason Gedamke, *Ocean Sound & Ocean Noise: Increasing Knowledge Through Research Partnerships*, NOAA 2 (2014), available at

<http://cetsound.noaa.gov/Assets/cetsound/documents/MMC%20Annual%20Meeting%20Intro.pdf>; Clark, C.W. et al., *Acoustic Masking in Marine Ecosystems as a Function of Anthropogenic Sound Sources*, available at

https://www.academia.edu/5100506/Acoustic_Masking_in_Marine_Ecosystems_as_a_Function_of_Anthropogenic_Sound_Sources.

¹¹⁰ OCEAN NOISE AND MARINE MAMMALS, NAT’L RES. COUNCIL 41-42 (2003), available at http://www.nap.edu/openbook.php?record_id=10564&page=R1.

¹¹¹ *Id.* at 42.

¹¹² See, e.g., Hildebrand, J.A., *Impacts of Anthropogenic Sound*, in MARINE MAMMAL RESEARCH: CONSERVATION BEYOND CRISIS (Reynolds, J.E. III et al., eds. 2006); Weilgart, L., 2007, The Impacts of Anthropogenic Ocean Noise on Cetaceans and Implications for Management, 85 CANADIAN J. ZOOLOGY 1091-1116 (2007).

¹¹³ OCEAN NOISE AND MARINE MAMMALS, *supra* note 51, at 96.

¹¹⁴ *Id.* at 42, 100 (“An even higher level, an understanding threshold” may be necessary for an animal to glean all information from complex signals”).

¹¹⁵ Clark, C.W. et al., *Acoustic Masking in Marine Ecosystems: Intuitions, Analysis, and Implication*, 395 MARINE ECOLOGY PROGRESS SERIES 201, 218-19 (2009), available at

<http://www.int-res.com/articles/theme/m395p201.pdf>; Clark et al., *supra* note 50, at *17, fig. 8.

¹¹⁶ *Id.* (showing anthropogenic noise masking 100 percent of the frequencies right whales used over the majority of a six-hour study).

¹¹⁷ Jason Gedamke, *supra* note 50, at 2; Clark, C.W., et al., *supra* note 56, at *3.

Studies have also found that chronic exposure to boat traffic and noise can cause whales to reduce their time spent feeding.¹¹⁸

In addition to masking effects, marine mammals have displayed a suite of stress-related responses from increased ambient and local noise levels. These include “rapid swimming away from [] ship[s] for distances up to 80 km; changes in surfacing, breathing, and diving patterns; changes in group composition; and changes in vocalizations.”¹¹⁹ Some avoidance responses to localized marine sounds may even lead to individual or mass strandings.¹²⁰ Louder anthropogenic sounds may also lead to permanent hearing loss in marine mammals.¹²¹

NOAA and legislative leaders have recognized the threat to ocean species posed by increased anthropogenic ocean noise levels.¹²² On the issue of ocean noise, NOAA has stated:

Rising noise levels can negatively impact ocean animals and ecosystems in complex ways. Higher noise levels can reduce the ability of animals to communicate with potential mates, other group members, their offspring, or feeding partners. Noise can reduce an ocean animal’s ability to hear environmental cues that are vital for survival, including those key to avoiding predators, finding food, and navigation among preferred habitats. NOAA’s approach to managing ocean noise aims to reduce negative physical and behavioral impacts to trust species, as well as conserve the quality of acoustic habitats.¹²³

Though difficult to detect, noise-induced stress is a serious threat for cetaceans.¹²⁴ In a noise exposure study using a captive beluga whale, increased levels of stress hormones were

¹¹⁸ See *i.e.* Williams, R. D., et al., 2006, Estimating relative energetic costs of human disturbance to killer whales (*Orcinus orca*), *Biological Conservation*, 133: 301-311.

¹¹⁹ OCEAN NOISE AND MARINE MAMMALS, *supra* note 51, at 94.

¹²⁰ *Id.* at 132; BRANDON L. SOUTHALL ET AL., FINAL REPORT OF THE INDEPENDENT SCIENTIFIC REVIEW PANEL INVESTIGATING POTENTIAL CONTRIBUTING FACTORS TO A 2008 MASS STRANDING OF MELON-HEADED WHALES 3 (*PEPONOCEPHALA ELECTRA*) IN ANTISOHIHY, MADAGASCAR, INT’L WHALING COMM’N 4 (2013), available at <http://iwc.int/private/downloads/4b0mkc030sg0gogkg8kog4o4w/Madagascar%20ISRP%20FINAL%20REPORT.pdf>.

¹²¹ Kastak, D. et al., 2008, *Noise-Induced Permanent Threshold Shift in a Harbor Seal*, 123 J. ACOUSTICAL SOC’Y OF AM. 2986; Kujawa, S.G. & Liberman, M.C., 2009, *Adding Insult to Injury: Cochlear Nerve Degeneration After “Temporary” Noise-Induced Hearing Loss*, 29 J. NEUROSCIENCE 14,077.

¹²² See *Phase 2-NOAA’s Ocean Noise Strategy* (<http://cetsound.noaa.gov/cetsound>); *Congressional Briefing on Marine Mammal Health and Stranding* (Sept. 24, 2014), http://www.mmc.gov/special_events/capitalhill_briefing/capitalhill_briefing_summary.shtml; see generally Jason Gedamke, *Supra Note 50*.

¹²³ *Underwater Noise and Marine Life*, NOAA, <http://cetsound.noaa.gov/index>.

¹²⁴ Weilgart, L., 2007, *The Impacts of Anthropogenic Ocean Noise on Cetaceans and Implications for Management*, 85 CANADIAN J. ZOOLOGY 1091-1116 (2007).

documented.¹²⁵ Stress due to noise can lead to long-term health problems, and may pose increased health risks for populations by weakening the immune system and potentially affecting fertility, growth rates and mortality.¹²⁶

Species that communicate over vast distances in the ocean, such as North Atlantic right whales, will increasingly have trouble hearing one another as the ambient noise level continues to rise. The masking of reproductive calls may prevent widely distributed mates from finding each other and reproduction rates may fall as a consequence.¹²⁷ This could have a significant impact on the survival of these species.

Hearing loss, classified as either “temporary threshold shift” or “permanent threshold shift,” is also a concern for animals exposed to the intense noise pollution produced by human activities. Hearing loss reduces the range in which communication can occur, interferes with foraging efforts and increases vulnerability to predators. Hearing loss may also change behaviors with respect to migration and mating and it may cause animals to strand, which is often fatal. For marine mammals such as whales and dolphins that rely heavily on their acoustic senses, both permanent and temporary hearing loss should be regarded as a serious threat.¹²⁸

Furthermore, noise impacts to marine mammals are predicted to increase with global climate change, wherein the absorption of carbon dioxide by the ocean could create noisier oceans.¹²⁹ When greenhouse gas reacts in the ocean, it lowers pH, creating more acidic waters. The more acidic the water, the less that sound waves are absorbed. Keith Hester, a researcher with the Monterey Bay Aquarium Research Institute, predicts sounds will travel 70% further by 2050 because of increased carbon dioxide acidifying our oceans.¹³⁰ A louder ocean will negatively affect cetaceans that rely on sound to navigate, communicate, find food, and avoid predators.

The greatest source of human-caused marine noise by far is ship propeller cavitation—the sound poorly designed propellers make as they spin through the water.¹³¹ Cavitation accounts for as

¹²⁵ Romano, T.A. *et al.*, 2004, Anthropogenic sound and marine mammal health: measures of the nervous and immune systems before and after intense sound exposure, *Canadian Journal of Aquatic Science*, 61: 1124-1134.

¹²⁶ *Id.*

¹²⁷ Weilgart, L., 2007, The impacts of anthropogenic ocean noise on cetaceans and implication for management. *Canadian Journal of Zoology*, 85 CANADIAN J. ZOOLOGY 1091-1116.

¹²⁸ Hildebrand, J., 2005, Impacts of anthropogenic sound, *In: Marine Mammal Research: Conservation Beyond Crisis. Edited by: J.E. Reynolds III, W.F. Perrin, R.R. Reeves, S. Montgomery and T.J. Ragen.* Johns Hopkins University Press, Baltimore, Maryland, pp. 101-124.

¹²⁹ Hester, K. C., *et al.*, 2008, Unanticipated consequences of ocean acidification: A noisier ocean at lower pH. *Geophysical Research Letters*, 35:31.

¹³⁰ *Id.*

¹³¹ Joseph J. Cox, *Evolving Noise Reduction Requirements in the Marine Environment*, MARINE MAMMAL COMM’N: CONGRESSIONAL BRIEFING ON OCEAN NOISE, at 12 (2014), available at http://www.mmc.gov/special_events/capitalhill_briefing/cox_capitalhill_briefing_0914.pdf; GUIDELINES FOR THE REDUCTION OF UNDERWATER NOISE FROM COMMERCIAL SHIPPING TO ADDRESS ADVERSE

much as 85 percent of human caused noise in the world's oceans.¹³² Cavitation may also increase due to hull designs that create non-homogenous wake fields behind ships.¹³³ And even well-designed propellers and hulls may begin to cavitate if they are not regularly cleaned and smoothed.¹³⁴

The Applicant has failed to discuss any of these sources of marine noise or the impacts to marine mammals in its application, rendering it entirely incomplete; however, DOE must consider these impacts in determining whether the project is in the public interest.

G. Induced Gas Production

Further environmental impacts will result from increased gas production to supply the project. The EIA, essentially every other LNG export applicant, and other informed commenters all agree that LNG exports will induce additional production in the U.S. The Eagle LNG proposal is no exception. Moreover, available tools allow DOE to predict where this increased production will occur. NEPA and the NGA therefore require DOE/FE to consider the effects of this additional production.

1. Eagle LNG's Proposal Will Induce Additional U.S. Gas Production

Eagle LNG will increase U.S. gas production. Inducement of production from increased export of LNG is obvious in light of the interconnected nature of the North American gas market. Although Eagle LNG does not estimate the amount by which its proposal would increase U.S. production, other studies suggest that production increases closely correspond with the volume of exported gas. For example, the Energy Information Administration, in a study of effects of U.S. exports commissioned by DOE/FE, estimated that the majority of exported gas would come from increased production, primarily from shale gas.¹³⁵ Specifically, EIA predicts that "about 60 to 70 percent" of the volume of LNG exported would be supplied by increases in domestic production, with the remainder supplied reductions in domestic consumption of current production, and that "about three quarters of this increased production is from shale sources."

Furthermore, EIA and DOE have more precise tools to estimate how U.S. production will change in response to Eagle LNG's proposed exports, including the ability to predict how and when production will increase in individual gas plays. EIA's core analysis tool is the National Energy Modeling System ("NEMS"). NEMS was used to produce the EIA exports study. NEMS models the economy's energy use through a series of interlocking modules that represent different energy

IMPACTS ON MARINE LIFE, INT'L MARITIME ORGANIZATION 1-2 (2014) (definition of cavitation) [hereinafter GUIDELINES].

¹³² Joseph J. Cox, *supra* note 75, at 12.

¹³³ GUIDELINES, *supra* note 75, at 4.

¹³⁴ GUIDELINES, *supra* note 75, at 5.

¹³⁵ *EIA Export Study*, 6, 11.

sectors on geographic levels.¹³⁶ Notably, the “Natural Gas Transmission and Distribution” module already models the relationship between U.S. gas production, consumption, and trade, specifically projecting U.S. production.¹³⁷ For each region, the module links supply and demand annually, taking transmission costs into account, in order to project how demand will be met by the transmission system.¹³⁸

Importantly, the Transmission Module is *already* designed to model LNG imports and exports, and contains an extensive modeling apparatus to do so on the basis of production in the U.S., Canada, and Mexico.¹³⁹ Right now, the Module focuses largely on LNG imports, which have been the status quo up to this point, but it also already links the Supply Module to the existing Alaskan *export* terminal to project exports from that site and their impacts on production. Thus, there is no technical barrier to such modeling going forward. Indeed, EIA used this model for its export study, which forecast production and price impacts.

Similarly, the “Oil and Gas Supply” module models individual regions and describes how production responds to demand across the country. Specifically, the Supply Module is built on detailed state-by-state reports of gas production curves across the country.¹⁴⁰ As EIA explains, “production type curves have been used to estimate the technical production from known fields” as the basis for a sophisticated “play-level model that projects the crude oil and natural gas supply from the lower 48.”¹⁴¹ The module distinguishes coalbed methane, shale gas, and tight gas from other resources, allowing for specific predictions distinguishing unconventional gas supplies from conventional supplies. The module further projects the number of wells drilled each year, and their likely production – which are important figures for estimating environmental impacts.¹⁴²

In short, the supply module “includes a comprehensive assessment method for determining the relative economics of various prospects based on future financial considerations, the nature of the undiscovered and discovered resources, prevailing risk factors, and the available technologies. The model evaluates the economics of future exploration and development from the perspective of an operator making an investment decision.” Thus, for each play in the lower 48 states, the EIA is able to predict future production based on existing data. Importantly, the EIA makes clear that “the model design provides the flexibility to evaluate alternative or new taxes, environmental, or other policy changes in a consistent and comprehensive manner.”¹⁴³

¹³⁶ Energy Information Administration (“EIA”), *The National Energy Modeling System: An Overview*, 1-2 (2009), available at [http://www.eia.gov/oiaf/aeo/overview/pdf/0581\(2009\).pdf](http://www.eia.gov/oiaf/aeo/overview/pdf/0581(2009).pdf)

¹³⁷ *Id.* at 59

¹³⁸ EIA, *Model Documentation: Natural Gas Transmission and Distribution Module of the National Energy Modeling System*, 15-16 (2012), available at [http://www.eia.gov/FTP/ROOT/modeldoc/m062\(2011\).pdf](http://www.eia.gov/FTP/ROOT/modeldoc/m062(2011).pdf)

¹³⁹ *See id.* at 22-32.

¹⁴⁰ EIA, *Documentation of the Oil and Gas Supply Module*, 2-2 (2011), available at [http://www.eia.gov/FTP/ROOT/modeldoc/m063\(2011\).pdf](http://www.eia.gov/FTP/ROOT/modeldoc/m063(2011).pdf)

¹⁴¹ *Id.* at 2-3

¹⁴² *See id.* at 2-25 -2-26.

¹⁴³ *Id.*

EIA is not alone in its ability to predict localized effects of LNG exports. A study and model developed by Deloitte Marketpoint claims the ability to make the sort of localized predictions that FERC claims are necessary to assessment of environmental impacts, and numerous other LNG export terminal proponents have relied on this study in applications to FERC and DOE.¹⁴⁴ According to Deloitte, its “North American Gas Model” and “World Gas Model” allow it to predict how gas production, infrastructure construction, and storage will respond to changing demand conditions, including those resulting from LNG export: “The end result is that valuing storage investments, identifying maximally effectual storage field operation, positioning, optimizing cycle times, demand following modeling, pipeline sizing and location, and analyzing the impacts of LNG has become easier and generally more accurate.”¹⁴⁵

2. Induced Production Must Be Considered in the NEPA and NGA Analyses

DOE/FE must consider the environmental effects of this induced production. As noted above, NEPA requires consideration of “indirect effects” of the proposed action, which include “growth inducing effects” and “reasonably foreseeable” effects “removed in distance” from the site of the proposed action.¹⁴⁶ For example, the Ninth Circuit recently held that, where the Surface Transportation Board was considering a proposal to expand a railway line which would enable increased coal production at several mines, NEPA required the Board to consider the impacts of increased mining.¹⁴⁷ Similarly, in a prior DOE proceeding regarding an electricity transmission line, DOE was required to consider the effect this line would have on inducing upstream electricity generation, including the environmental effects thereof.¹⁴⁸ In that case, consideration of induced impacts was required even though the upstream electricity generation would occur in Mexico, outside the jurisdiction of DOE or any other U.S. agency.

Thus, it is clear that induced production is the type of “growth inducing,” “induced changes in the pattern of land use,” or other indirect effect contemplated by 40 C.F.R. § 1508.8(b). EPA, in scoping comments it submitted regarding another LNG export proposal, has opined that in light of the regulatory definition of indirect effects and the EIA Export Study’s prediction of induced production, “it is appropriate to consider available information about the extent to which drilling

¹⁴⁴ Deloitte Marketpoint, *Made in America: The Economic Impact of LNG Exports from the United States* (2011) (hereinafter “*Deloitte Report*”), available at http://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Documents/Energy_us_er/us_er_MadeinAmerica_LNGPaper_122011.pdf

¹⁴⁵ Deloitte, *Natural Gas Models*, available at: http://www.deloitte.com/view/en_US/us/Industries/power-utilities/deloitte-center-forenergy-solutions-power-utilities/marketpoint-home/marketpoint-data-models/b2964d1814549210VgnVCM200000bb42f00aRCRD.htm

¹⁴⁶ 40 C.F.R. § 1508.8(b).

¹⁴⁷ *Northern Plains Resource Council v. Surface Transportation Board*, 668 F.3d 1067, 108182 (9th Cir. 2011).

¹⁴⁸ *Border Power Plant Working Group*, 260 F.Supp.2d 997 (rejecting DOE’s decision to exclude these upstream impacts from analysis). Notably, *Border Power Plant Working Group* also involved a determination as to whether the project was in the public interest. The final EIS for the project (produced after remand from the court) is available at: <http://energy.gov/nepa/downloads/eis0365-final-environmental-impact-statement>. Upstream air quality impacts are considered in pages 4-43 to 4-65 of this final EIS.

activity might be stimulated by the construction of an LNG export facility ..., and any potential environmental effects associated with that drilling expansion.”¹⁴⁹

NEPA requires “[r]easonable forecasting and speculation,” and courts “must reject any attempt by agencies to shirk their responsibilities under NEPA by labeling any and all discussion of future environmental effects as ‘crystal ball inquiry.’”¹⁵⁰ As explained above, every available source concludes that it is *likely* that the majority of exported gas will come from induced additional production. Thus, an aggregate production increase is unarguably “reasonably foreseeable.”

In summary, all the available evidence indicates that Eagle LNG’s proposed exports will induce additional gas production in the U.S., and this increase can be reasonably foreseen so as to support informed analysis. DOE must therefore consider the environmental impacts of induced production.

3. Environmental Harm Resulting from Induced Production

Natural gas production—from both conventional and unconventional sources—is a significant air pollution source, can disrupt ecosystems and watersheds, leads to industrialization of entire landscapes, and presents challenging waste disposal issues. Eagle LNG predicts that its gas will primarily come from the mid-continent and Appalachian regions (Marcellus and Utica shales). A Subcommittee of the DOE’s Secretary of Energy’s Advisory Board, recently highlighted “a real risk of serious environmental consequences” resulting from continued expansion of shale gas production.¹⁵¹ Shale gas production (as well as coalbed and tight sands production) requires the controversial practice of hydraulic fracturing, or fracking. As we explain below, natural gas production in general, and fracking in particular, imposes a raft of environmental problems. Although some states and federal agencies are taking steps to limit these harms, these efforts are uncertain and, even if fully implemented, will not eliminate the environmental harms.

Air Pollution Problems from Natural Gas

Natural gas operations emit methane (CH₄), volatile organic compounds (VOCs), nitrogen oxides (NO_x), sulfur dioxide (SO₂), hydrogen sulfide (H₂S), and particulate matter (PM₁₀ and PM_{2.5}). Gas operations also emit listed hazardous air pollutants (HAPs) in significant quantities, and so contribute to cancer risks and other acute public health problems. Pollutants are emitted during all stages of natural gas development, including (1) oil and natural gas production, (2) natural gas processing, (3) natural gas transmission, and (4) natural gas distribution.¹⁵² Within these development stages, the major sources of air pollution include wells, compressors, pipelines,

¹⁴⁹ EPA, Scoping Comments – The Jordan Cove Energy Project LP, FERC Dkt. Nos. PF12-7 and PF12-17, at 14 (Oct. 29, 2012).

¹⁵⁰ *Scientists’ Inst. for Pub. Info., Inc. v. Atomic Energy Comm’n*, 481 F.2d 1079, 1092 (D.C. Cir. 1973).

¹⁵¹ DOE, Secretary of Energy’s Advisory Board, *Shale Gas Production Subcommittee Second 90-Day Report* (Nov. 18, 2011) at 10.

¹⁵² EPA, Oil and Natural Gas Sector: Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution, Background Technical Support Document for the Proposed Rules (“TSD”) at 2-4 (July 2011).

pneumatic devices, dehydrators, storage tanks, pits and ponds, natural gas processing plants, and trucks and construction equipment.

There is strong evidence that emissions from natural gas production are higher than have been commonly understood. In particular, a recent study by a consortium of researchers led by the National Ocean and Atmospheric Administration (NOAA) Earth System Research Laboratory recorded pollution concentrations near gas fields substantially greater than EPA estimates would have predicted. That research monitored air quality around oil and gas fields.¹⁵³ It observed high levels of methane, propane, benzene, and other volatile organic compounds, in the air around the fields. The researchers write that their “analysis suggests that the emissions of the species we measured” – that is the cancer-causing, smog-forming, and climate-disrupting pollutants released from these operations – “are most likely underestimated in current inventories,” perhaps by as much as a factor of two.¹⁵⁴

These emissions have dire practical consequences. A research team led by the Colorado School of Public Health measured benzene and other pollutants released from unconventional well completions.¹⁵⁵ Elevated levels of these pollutants correspond to increased cancer risks for people living within half of a mile from a well – a very large population which will increase as drilling expands.

Methane is the dominant pollutant from the oil and gas sector. Emissions occur as result of intentional venting or unintentional leaks during drilling, production, processing, transmission and storage, and distribution. For example, methane is emitted when wells are completed and vented, as part of operation of pneumatic devices and compressors, and as a result of leaks (fugitive emissions) in pipelines, valves, and other equipment. EPA has identified natural gas systems as the “single largest contributor to United States anthropogenic methane emissions.”¹⁵⁶ The industry is responsible for over 40% of total U.S. methane emissions.¹⁵⁷ Methane causes harm both because of its contributions to climate change and as an ozone precursor.

Beginning with climate change, methane is a potent greenhouse gas that contributes substantially to global climate change. Methane has at least 25 times the global warming potential of carbon dioxide over a 100 year time frame and at least 72 times the global warming potential of carbon dioxide over a 20-year time frame.¹⁵⁸ The oil and gas production industry’s methane emissions amount to 5% of all carbon dioxide equivalent (CO₂e) emissions in the country.¹⁵⁹

¹⁵³ G. Petron *et al.*, *Hydrocarbon emissions characterization in the Colorado Front Range: A pilot study*, 117 *J. of Geophysical Research* 4304, DOI 10.1029/2011JD016360 (2012).

¹⁵⁴ *Id.* at 4304.

¹⁵⁵ L. McKenzie *et al.*, *Human Health Risk Assessment of Air Emissions from Development of Unconventional Natural Gas Resources*, *Science of the Total Environment* (In Press, Mar. 22, 2012).

¹⁵⁶ 76 Fed. Reg. 52,738, 52,792 (Aug. 23, 2011) (EPA proposed air rules for oil and gas production sector).

¹⁵⁷ *Id.* at 52,791–92.

¹⁵⁸ *IPCC 2007—The Physical Science Basis*, Section 2.10.2, and *IPCC 2007-Summary for Policymakers*.

¹⁵⁹ 76 Fed. Reg. 52,738 at 52,791–92.

Because of methane's effects on climate, EPA has found that methane, along with five other well-mixed greenhouse gases, endangers public health and welfare within the meaning of the Clean Air Act.¹⁶⁰

Methane also reacts in the atmosphere to form ozone. As we discuss elsewhere, ozone is a major public health threat, linked to a wide range of maladies. Ozone can also damage vegetation, agricultural productivity, and cultural resources. Ozone is also a significant greenhouse gas in its own right, meaning that methane is doubly damaging to climate – first in its own right, and then as an ozone precursor.

The gas industry is also a major source of the ozone precursors VOCs and NO_x.¹⁶¹ VOCs are emitted from well drilling and completions, compressors, pneumatic devices, storage tanks, processing plants, and fugitives from production and transmission. The primary sources of NO_x are compressor engines, turbines, and other engines used in drilling and hydraulic fracturing. NO_x is also produced when gas is flared or used for heating.

VOC and NO_x emissions from oil and gas development are also harming air quality in national parks and wilderness areas. Researchers have determined that numerous “Class I areas” – a designation reserved for national parks, wilderness areas, and other such lands – are likely to be impacted by increased ozone pollution as a result of oil and gas development in the Rocky Mountain region, including Mesa Verde National Park and Weminuche Wilderness Area in Colorado and San Pedro Parks Wilderness Area, Bandelier Wilderness Area, Pecos Wilderness Area, and Wheeler Peak Wilderness Area in New Mexico.¹⁶² These areas are all near concentrated oil and gas development in the San Juan Basin.

Oil and gas production also emits sulfur dioxide, primarily from natural gas processing plants.¹⁶³ Sulfur dioxide is released as part of the sweetening process, which removes hydrogen sulfide from the gas. Sulfur dioxide is also created when gas containing hydrogen sulfide is combusted in boilers or heaters.¹⁶⁴

Some natural gas contains hydrogen sulfide. When hydrogen sulfide levels are above a specific threshold, gas is classified as “sour gas.” According to EPA, there are 14 major areas in the U.S.,

¹⁶⁰ EPA, Endangerment and Cause or Contribute Findings for Greenhouse Gases, 74 Fed. Reg. 66,496, 66,516 (Dec. 15, 2009) (“Endangerment Finding”).

¹⁶¹ See, e.g., EPA Fact Sheet at 3; Al Armendariz, Emissions from Natural Gas Production in the Barnett Shale Area and Opportunities for Cost-Effective Improvements (Jan. 26, 2009), available at http://www.edf.org/documents/9235_Barnett_Shale_Report.pdf (hereinafter “Barnett Shale Report”) at 24.

¹⁶² Rodriguez et al., *Regional Impacts of Oil and Gas Development on Ozone Formation in the Western United States*, 59 Journal of the Air and Waste Management Association 111 (Sept. 2009), available at http://www.wrapair.org/forums/amc/meetings/091111_Nox/Rodriguez_et_al_OandG_Impacts_JAWMA9_09.pdf

¹⁶³ 76 Fed. Reg. at 52,756.

¹⁶⁴ 76 Fed. Reg. at 52,756.

found in 20 different states, where natural gas tends to be sour.¹⁶⁵ All told, between 15 and 20% of the natural gas in the U.S. may contain hydrogen sulfide.¹⁶⁶

Given the large amount of drilling in areas with sour gas, EPA has concluded that the potential for hydrogen sulfide emissions from the oil and gas industry is “significant.”¹⁶⁷ Hydrogen sulfide may be emitted during all stages of development, including exploration, extraction, treatment and storage, transportation, and refining. For example, hydrogen sulfide is emitted as a result of leaks from processing systems and from wellheads in sour gas fields.

Hydrogen sulfide emissions from the oil and gas industry are concerning because this pollutant may be harmful even at low concentrations.¹⁶⁸ Hydrogen sulfide is an air pollutant with toxic properties that smells like rotten eggs and can lead to neurological impairment or death. Long-term exposure to hydrogen sulfide is linked to respiratory infections, eye, nose, and throat irritation, breathlessness, nausea, dizziness, confusion, and headaches. Although hydrogen sulfide was originally included in the Clean Air Act's list of hazardous air pollutants, it was removed with industry support.

Although direct monitoring of hydrogen sulfide around oil and gas sources is limited, there is evidence that these emissions may be substantial, and have a serious impact on people's health.

DOE must take all of this into account in deciding whether exporting LNG is in the public interest. Due to the harms to the public from climate change, it is readily apparent that the project does not warrant approval.

4. Gas Production Disrupts Landscapes and Habitats

Increased oil and gas production will transform the landscape of regions overlying shale gas plays, bringing industrialization to previously rural landscapes and significantly affecting ecosystems, plants, and animals. These impacts are large and difficult to manage.

Land use disturbance associated with gas development impacts plants and animals through direct habitat loss, where land is cleared for gas uses, and indirect habitat loss, where land adjacent to direct losses loses some of its important characteristics.

After initial drilling is completed the well pad is partially restored, but 1 to 3 acres of the well pad will remain disturbed through the life of the wells, estimated to be 20 to 40 years. Associated infrastructure such as roads and corridors will likewise remain disturbed. Because these

¹⁶⁵ EPA, Office of Air Quality Planning and Standards, *Report to Congress on Hydrogen Sulfide Air Emissions Associated with the Extraction of Oil and Natural Gas* (EPA-453/R93-045), at ii (Oct. 1993) (hereinafter “EPA Hydrogen Sulfide Report”)

¹⁶⁶ Lana Skrtic, *Hydrogen Sulfide, Oil and Gas, and People's Health* (“Skrtic Report”), at 6 (May 2006), available at http://www.earthworksaction.org/pubs/hydrogensulfide_oilgas_health.pdf.

¹⁶⁷ EPA Hydrogen Sulfide Report at III-35.

¹⁶⁸ See James Collins & David Lewis, Report to CARB, *Hydrogen Sulfide: Evaluation of Current California Air Quality Standards with Respect to Protections of Children* (Sept. 1, 2000), available at <http://oehha.ca.gov/air/pdf/oehhah2s.pdf>

disturbances involve clearing and grading of the land, directly disturbed land is no longer suitable as habitat. Harm to species and their habitat is against the profound public interest in species conservation, as expressed in the Endangered Species Act and similar statutes.

5. Gas Production Poses Risks to Ground and Surface Water

As noted above, most of the increased production that would result from the proposal will be from shale and other unconventional gas sources, and producing gas from these sources requires hydraulic fracturing, or fracking.¹⁶⁹ Hydraulic fracturing involves injecting a base fluid (typically water), sand or other proppant, and various fracturing chemicals into the gas-bearing formation at high pressures to fracture the rock and release additional gas. Each step of this process presents a risk to water resources (fracking a Marcellus Shale well requires between 4 and 5 million gallons of water). Withdrawal of the water may overtax the water source. Fracking itself may contaminate groundwater with either chemicals added to the fracturing fluid or with naturally occurring chemicals mobilized by fracking. After the well is fracked, some water will return to the surface, composed of both fracturing fluid and naturally occurring “formation” water. This water, together with drilling muds and drill cuttings, must be disposed of without further endangering water resources.

Water withdrawals can drastically impact aquatic ecosystems and human communities. Reductions in instream flow negatively affect aquatic species by changing flow depth and velocity, raising water temperature, changing oxygen content, and altering streambed morphology.¹⁷⁰ This risk is even more prevalent with withdrawals for fracking than it is for other withdrawal, because fracking is a consumptive use - fluid injected during the fracking process is (barring accident) deposited below freshwater aquifers and into sealed formations. Thus, the water withdrawn from the aquifer will be used in a way that provides no opportunity to percolate back down to the aquifer and recharge it.

Fracturing further poses a serious risk of groundwater contamination. Contaminants include chemicals added to the fracturing fluid and naturally occurring chemicals that are mobilized from deeper formations to groundwater by the fracking process. Contamination may occur through several methods, including where the well casing fails or where the created fractures intersect an existing a poorly sealed well. Although information on groundwater contamination is incomplete, the available research indicates that contamination has already occurred on multiple occasions.

One category of potential contaminants includes chemicals added to the drilling mud and fracturing fluid. The fluid used for slickwater fracturing is typically comprised of more than 98% fresh water and sand, with chemical additives comprising 2% or less of the fluid. Chemicals are added as solvents, surfactants, friction reducers, gelling agents, bactericides, and for other purposes. New York recently identified 322 unique ingredients used in fluid additives, recognizing

¹⁶⁹ See DOE, *Shale Gas Production Subcommittee First 90-Day Report* at 8.

¹⁷⁰ New York Department of Environmental Conservation’s *Revised Draft Supplemental General Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program* (Sept. 2011).

that this constituted a partial list.¹⁷¹ These chemicals include petroleum distillates; aromatic hydrocarbons; glycols; glycol ethers; alcohols and aldehydes; amides; amines; organic acids, salts, esters and related chemicals; microbicides; and others.

Available empirical data indicates that fracking has resulting in groundwater contamination in several instances. One study documented the higher concentration of methane originating in shale gas deposits into wells surrounding a producing shale production site in northern Pennsylvania.¹⁷² By looking at particular isotopes of methane, this study was able to determine that the methane originated in the shale deposit, rather than from a shallower source.

More recently, EPA has investigated groundwater contamination in Pavillion, Wyoming and Dimock, Pennsylvania. In Pavillion, EPA's draft report concludes that "when considered together with other lines of evidence, the data indicates likely impact to ground water that can be explained by hydraulic fracturing."¹⁷³

Fracturing produces a variety of liquid and solid wastes that must be managed and disposed of. These include the drilling mud used to lubricate the drilling process, the drill cuttings removed from the well bore, the "flowback" of fracturing fluid that returns to the surface in the days after fracking, and produced water that is produced over the life of the well (a mixture of water naturally occurring in the shale formation and lingering fracturing fluid). These wastes present environmental hazards with regard to their onsite management and with their eventual disposal.

The most common methods of disposal are disposal in underground injection wells or through water treatment facilities leading to eventual surface discharge. Underground injection wells present risks of groundwater contamination similar to those identified above for fracking itself. Additionally, underground injection of fracking wastes appears to have induced earthquakes in several regions.

6. Effects on Global Greenhouse Gas Emissions

Eagle LNG has argued that LNG exports will benefit the environment by allowing importing countries to burn natural gas in place of coal, fuel oil, or other fuels with higher carbon intensities, and that LNG exports will thereby reduce global greenhouse gas emissions. This argument is wrong for two reasons.

First, looking at importing countries' response to exports, a recent study by the International Energy Agency predicts that international trade in LNG and other measures to increase global availability of natural gas will lead many countries to use natural gas in place of wind, solar, or other renewables, displacing these more environmentally beneficial energy sources instead of displacing other fossil fuels, and that these countries may also increase their overall energy

¹⁷¹ *Id.* at 5-41.

¹⁷² Stephen G. Osborn, Avner Vengosh, Nathaniel R. Warner, and Robert B. Jackson, *Methane contamination of drinking water accompanying gas-well drilling and hydraulic fracturing*, Proceedings of the National Academy of Science, 108, 8172-8176, (2011).

¹⁷³ EPA, Draft Investigation of Ground Water Contamination near Pavillion, Wyoming (Dec. 2011), at xiii.

consumption beyond the level that would occur with exports.¹⁷⁴ In the United States alone, the IEA expects the gas boom to result in a 10% reduction in renewables relative to a baseline world without increased gas use and trade. The IEA goes on to conclude that high levels of gas production and trade will produce “only a small net shift” in global greenhouse gas emissions, with atmospheric CO₂ levels stabilizing at over 650 ppm and global warming in excess of 3.5 degrees Celsius, “well above the widely accepted 2°C target.”

Second, even where importing countries do substitute gas for coal or fuel oil, the available evidence indicates that this substitution is likely to cause little, if any, reduction in global greenhouse gas emissions. On this issue, it is important to highlight the energy and environmental costs LNG incurs beyond those incurred by domestic gas use. Liquefying natural gas is an energy intensive process. Additional energy is then consumed in the transportation of the gas, with attendant greenhouse gas emissions. Finally, the LNG must be regasified at the import terminal, often by being heated with the combustion of other gas. These operations drastically increase the lifecycle greenhouse gas emissions of LNG, adding between 24.7 and 27.5 tons of CO₂e per MMBtu.¹⁷⁵

Emissions from liquefaction, transportation and gasification mean that LNG is significantly worse than domestic natural gas in terms of greenhouse gas emissions. The process of liquefying, transporting, and regasifying LNG accordingly emits 19% to 23% of the CO₂e emitted by natural gas combustion itself—a substantial increase. Jaramillo 2007 concluded that this increase could bring LNG’s lifecycle greenhouse gas emissions into parity with coal.

Shale gas production’s methane emissions are drastically higher than those of conventional gas production. Recent studies estimate that aggregate domestic natural gas production releases at least 44 pounds of CO₂e per MMBtu. A report from the Worldwatch Institute and Deutsche Bank summarizes much of the recent work.¹⁷⁶ This substantially erodes any climate advantage LNG-fired electricity generation may have over coal-fired generation.

Finally, any LNG exported from Eagle LNG will likely have life cycle emissions that are even higher than the above estimates. The above studies generally estimate gas production emissions in aggregate, mixing conventional gas extraction with unconventional sources such as shale gas. As noted above, the EIA Export Study predicts that extraction induced by exports will overwhelmingly be from shale gas sources, EIA Export Study at 11, and shale gas has higher

¹⁷⁴ International Energy Agency, *Golden Rules for a Golden Age of Gas*, Ch. 2 p. 91 (2012), and available at http://www.iea.org/publications/freepublications/publication/WEO2012_GoldenRulesReport.pdf

¹⁷⁵ Paulina Jaramillo, W. Michael Griffin, H. Scott Matthews, Comparative Life-Cycle Air Emissions of Coal, Domestic Natural Gas, LNG, and SNG for Electricity Generation, 41 *Environ. Sci. Technol.* 6,290 (2007) (Jaramillo 2007). Available at http://www.ce.cmu.edu/~gdrgr/readings/2007/09/13/Jaramillo_ComparativeLCACoalNG.pdf

¹⁷⁶ Mark Fulton *et al.*, *Comparing Life-Cycle Greenhouse Gas Emissions from Natural Gas and Coal* (Aug. 25, 2011) (“Worldwatch Report”)

production emissions than conventional sources.¹⁷⁷ This fact highlights the need for a thorough study regarding the indirect and cumulative impacts of export prior to any DOE/FE authorization. Further study is similarly needed to combine the analysis of export on fuel switching domestically with life-cycle emissions of LNG exports. Nonetheless, using even the more conservative estimates in the existing record, it is unlikely LNG export will reduce global greenhouse gas emissions.

H. DOE/FE Cannot Rationally Approve Eagle LNG's Export Plan On the Record Before It

The NGA, and subsequent DOE delegation orders and regulations, charge DOE/FE with determining whether or not a gas export application is in the public interest.¹⁷⁸ DOE/FE must make this decision on the record before it. This means that, regardless of DOE/FE's decision to presume, initially, that an application should be granted, this presumption does not, and cannot, absolve DOE/FE of its duty to make its *own* determination.¹⁷⁹ Simply put, "the *agency* must examine the relevant data and articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made."¹⁸⁰ DOE/FE cannot rationally find for Eagle LNG on the record in this case.

As we have demonstrated, gas extraction and export have major environmental (and, hence, economic) costs, which Eagle LNG has failed to even acknowledge. On this record, DOE/FE cannot approve export. Were it do so, it would be violating basic norms of agency record rulemaking, as well as its own rules.¹⁸¹

IV. Conclusion

The Center moves to intervene, offers the above comments, and protests Eagle LNG's export proposal for the reasons described above. As we have demonstrated at length in these comments, there is strong evidence that the public interest will be impaired by the project. These impairments include (1) regional and national economic dislocations and disruptions caused by natural gas extraction, including by the industry's boom-and-bust cycle, (2) national increases in gas and electricity prices and resulting shifts to more polluting fuels, (3) and environmental impacts of many sorts. Any one of these categories of interests could be impaired by gas export. Eagle LNG's application is not consistent with the public interest and must be denied.

¹⁷⁷ EPA recently estimated methane emissions from a conventional well completion at only 0.80 tons, while completion of a hydraulically fractured well yielded 158.55 tons of methane. *See* O&G NSPS TSD at 4-7 (Table 4-2).

¹⁷⁸ *See, e.g.* 15 U.S.C. § 717b(a).

¹⁷⁹ *Panhandle Producers and Royalty Owners Ass'n*, 822 F.2d at 1110-1111.

¹⁸⁰ *Motor Vehicle Mfrs. Ass'n of the United States v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (emphasis added).

¹⁸¹ *See, e.g.*, 5 U.S.C. § 706; 10 C.F.R. § 590.404 (requiring DOE/FE to base its final opinion "solely on the official record of the proceeding" and to impose terms "as may be required by the public interest" after record review).

Respectfully submitted,

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