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From Craig Segall <craig.segall@sierraclub.org>
To Ex. 6 - Personal Privacy LisaP Jackson/DC/USEPA/US@EPA
cc
Subject Letter from Sierra Club, Earthjustice, and Riverkeepers Re: LNG Export

Message Body

Dear Chairwoman Sutley and Administrator Jackson,

Attached, please find a letter from Sierra Club and many other environmental groups calling for a full EIS of the environmental impacts of LNG export proposals pending before DOE/FE and FERC. Several comments and protests we have recently filed on these applications are attached as well.

The letter requests meetings with you and your staffs to discuss this pressing matter. Thank you in advance for your help.

Best,

Craig Segall

--
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LNG CEQ letter filed.pdf

Cove Point Protest Final (as filed).pdf

Sabine Pass comments.pdf

Maya_Rossum_and_others_02_06_12_comment.pdf

OEX Processing Information

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Lower Susquehanna Riverkeeper * Rogue Riverkeeper * Sierra Club

February 29, 2012

The Honorable Nancy Sutley, Chair
Council on Environmental Quality
Executive Office of the President
722 Jackson Place NW
Washington, DC 20503

The Honorable Lisa Jackson, Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Ave, NW
Washington, DC 20460

Dear Chairwoman Sutley and Administrator Jackson:

The Department of Energy's Office of Fossil Energy (DOE/FE) and the Federal Energy Regulatory Commission (FERC) are considering proposals to export approximately a fifth of the U.S. domestic gas supply as liquefied natural gas (LNG). Although these export applications are explicitly premised on exports' ability to increase production of unconventional natural gas, DOE/FE and FERC have, thus far, failed to consider the environmental impacts of this increased gas production under the National Environmental Policy Act (NEPA). We are therefore writing to ask you, pursuant to your obligations under NEPA and Section 309 of the Clean Air Act, to make clear that DOE/FE and FERC must consider these impacts, and alternatives which would avoid them, in an environmental impact statement (EIS) before moving forward.

As you know, NEPA provides that "all agencies of the Federal government" must prepare an EIS for every "major Federal action[] significantly affecting the quality of the human environment." 42 U.S.C. § 4332(C). The major federal action at issue here is DOE/FE and FERC's historic decision whether to permit massive amounts of LNG to be exported, largely deriving from unconventional gas plays.

DOE/FE and FERC share this authority under the Natural Gas Act. 15 U.S.C. § 717b(a). DOE/FE has authority to determine whether gas exports to nations with which the United States has not signed a free-trade agreement are in the "public interest," which includes "the authority to consider conservation, environmental, and antitrust questions." *Nat'l Ass'n for the Advancement of Colored People v. Federal Power Commission*, 425 U.S. 662, 670 n.4 & n.6 (1976); *see also* DOE Redelegation Order 00-002.04E (providing this authority to DOE/FE). FERC, in turn, considers where to site such facilities. *See* DOE Delegation Order 00-004.00A.

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Many such facilities are before DOE/FE and FERC. As of earlier this month, DOE/FE is considering applications from at least 9 facilities, which collectively could export at least 12.51 billion cubic feet per day (bcf/d) of LNG. *See* DOE/FE Application Summary (Feb. 12, 2012).[1]

Project proponents generally argue that their applications are in the public interest in large part because they will sustain and increase unconventional natural gas production. One facility in Maryland, Dominion Cove Point (DCP), for instance, describes its ability to "encourage and support increased domestic production of natural gas and [natural gas liquids]" as its "most basic benefit." DCP Application (Oct. 3, 2011) at 35.

As the Shale Gas Subcommittee of the Secretary of Energy's Advisory Board has recognized, the environmental impacts of unconventional gas production are very large and "if action is not taken to reduce the environmental impact accompanying the very considerable expansion of shale gas production expected across the country... there is a real risk of serious environmental consequences." DOE SEAB, *Shale Gas Production Subcommittee Second 90-Day report* (Nov. 18, 2011) at 10. The DOE's Energy Information Administration (EIA) has also identified serious environmental impacts specifically associated with LNG export. Among other consequences, EIA expects LNG exports to raise domestic natural gas prices, leading to increased use of coal generation, with an associated spike in carbon dioxide emissions from combustion (along with other pollutants). *See* EIA, *Effect of Increased Natural Gas Exports on Domestic Energy Markets* (Jan. 2012) at 18-19.

Thus, the consequences of LNG exports must be analyzed under NEPA to ensure that the environmental impacts of such exports, and their associated production increases, are fully disclosed and that alternatives which might avoid those impacts are considered. Such impacts are not only reasonably foreseeable, *see, e.g.*, 40 C.F.R. 1508.8, but are trumpeted by export project proponents: LNG exports are *intended* to cause increased domestic production. Because the agencies must account for the direct and indirect results of their actions, as well as the cumulative impacts of those actions in concert with other extraction activities already taking place in the shale plays, DOE/FE and FERC must address these impacts in an EIS for each project, and, preferably, a programmatic EIS for all such projects. *See* 40 C.F.R §§ 1502.16, 1508.7, 1508.8; *Northern Plains Resource Council v. Surface Transportation Board*, - F.3d -, 2011 WL 6826409 at * 5 (9th Cir. 2011).

The *Northern Plains* case makes this point particularly clearly. In that case, the Court held that the NEPA analysis for a railway line which was developed in order to expand coal production had to fully consider the environmental impacts of this increased production. *See id.* at * 10. The Court held that such impacts were plainly "reasonably

[1] Available at http://fossil.energy.gov/programs/gasregulation/LNG_Summary_Table_2_10_12.pdf.

foreseeable" – indeed, they were the premise for the construction project in the first place. *Id.* The same analysis applies here, where export proponents are seeking to construct facilities which would expand and intensify fossil fuel production.

Yet, thus far, neither DOE/FE nor FERC have developed an EIS for any export proposal, much less one that considers the effects of upstream production. The only NEPA document issued by either agency, an Environmental Analysis (EA) for the Sabine Pass export facility prepared by FERC for its siting analysis, offers no discussion of upstream environmental impacts, even as it acknowledges that the facility's purpose it to "allow further development of unconventional (particularly shale gas-bearing formation) sources in the United States." *See* FERC, *Environmental Assessment for the Sabine Pass Liquefaction Project* (Dec. 2011) at 1-10.[2] The next facility under consideration, the DCP site in Maryland, likewise offers no discussion of upstream environmental impacts in its application to DOE/FE, maintaining that they are "plainly not relevant" to DOE/FE's decision *and* that FERC "almost certainly will not" – and should not – "undertake a comprehensive review of Marcellus Shale drilling impacts as part of its NEPA review of DCP's export facilities." DCP Answer, FE Docket No. 11-128-LNG (Feb. 21, 2012) at 25, 27.[3] DOE/FE and FERC thus far appear to be taking this unwise course.

In doing so, both agencies are violating their own NEPA regulations, in addition to CEQ's rules and the statute's requirements. The DOE's NEPA regulations provide that approvals of LNG export applications involving major increases in export volumes "normally require EISs," 10 C.F.R. Pt. 1021 App. D, D9, and, more generally, commit the agency to "follow the letter and spirit of NEPA; comply fully with the [Council on Environmental Quality ("CEQ")] Regulations and apply the NEPA review process early in the planning stages for DOE proposals." 10 C.F.R. § 1021.100. FERC rules likewise provide that an EIS "will normally be prepared" for "the siting, construction, and operation of [LNG] import/export facilities." 10 C.F.R.§ 380.6(a)(1). Yet, neither agency has acknowledged that an EIS is required for the LNG export facilities before it, and that such an EIS must consider the increased gas production which exports will cause.

DOE/FE and FERC's failures will result in lasting harm by impairing the government's ability to confront the historic LNG export decision intelligently and transparently. "NEPA procedures . . . insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken." 40 C.F.R. § 1500.1(b); *see also Dep't of Transp. v. Public Citizen*, 541 U.S. 752, 768 (2004) (explaining that NEPA requires agencies to "carefully consider [ ] detailed information concerning significant environmental impacts" and "guarantees that the relevant information will be made available to the larger" public) (quoting *Robertson v. Methow*

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[2] Sierra Club's comments on that proposal, describing the many environmental considerations FERC failed to consider, are attached.

[3] Sierra Club's protest of that facility, addressing the environmental impacts which DOE/FE has thus far ignored, is attached, along with comments from many Riverkeepers on the same facility.

Valley Citizens Council, 490 U.S. 332, 349 (1989)). Without such consideration, the historic choice as to whether to massively increase U.S. gas exports will be made with incomplete information.

CEQ and EPA have an obligation to prevent this failure from occurring. CEQ is charged with administering the NEPA process, and, specifically, with "review[ing] and apprais[ing] the various programs and activities of the Federal Government" to ensure that they are consistent with NEPA's purposes and policy. 42 U.S.C. § 4344(3). EPA, likewise, must "review and comment in writing on the environmental impact of any matter relating" to its duties and responsibilities, as natural gas export and production plainly does, given the many environmental impacts associated with these activities. 42 U.S.C. § 7609(a). If DOE/FE and FERC persist in their current course, EPA will ultimately be obliged to refer their unsatisfactory NEPA documents to CEQ. *See id.* § 7609(b), 40 C.F.R. Pt. 1504. It would be far better for EPA and CEQ, instead, to act now to make the scope of DOE/FE and FERC's NEPA duties clear.[4]

We therefore ask you to write DOE/FE and FERC publicly to clarify that they must fully analyze the impacts of increased gas production in an EIS as part of their consideration of natural gas export proposals. Because there are many such proposals before the agencies, and the cumulative impacts of those proposals must be considered, DOE/FE and FERC should begin with a programmatic EIS of the proposals as a whole, before proceeding to focused EISs for each individual facility. *See* 40 C.F.R. § 1508.17(b)(3). Such a programmatic EIS would substantially advance our collective understanding of the impacts of the unconventional gas production process and of the impacts of LNG export on a national basis. This information is critical for sound decision-making as the unconventional gas boom intensifies.

Thank you in advance for your help. We would welcome the opportunity to meet with you and your staffs to discuss these concerns.

Respectfully,

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[4] In the process of reviewing an unsatisfactory FERC NEPA document on a natural gas pipeline project, EPA has already made clear that it is "fully committed to understanding and evaluating the scientific basis for the environmental impacts projected from [that] and other natural gas development and distribution activities." Letter from Jeffrey D. Lapp, EPA Office of Environmental Programs to Kimberly D. Bose, FERC Secretary (July 11, 2011).

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UNITED STATES OF AMERICA
DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY

IN THE MATTER OF	)	
	)	FE DOCKET NO. 11-128-LNG
DOMINION COVE POINT LNG, LP	)	

SIERRA CLUB'S MOTION TO INTERVENE, PROTEST, AND COMMENTS

Dominion Cove Point ("DCP")'s request to export up 1 billion cubic feet per day (bcf/d) of natural gas as liquefied natural gas ("LNG") from its terminal in Cove Point, Maryland, is inconsistent with the public interest, and, in any event, cannot move forward without extensive environmental and economic analyses that DCP has not provided to the Department of Energy Office of Fossil Energy ("DOE/FE").

DCP argues that exports from Cove Point would be in the public interest in significant part because they would "support increased domestic production of natural gas," particularly in the Marcellus Shale play in the Northeast. *See* DCP Application at 5, 21-23, 35, 39-42. Perhaps so, but DCP offers no meaningful analysis of the significant environmental and economic dislocations associated with the shale gas boom that it claims its facility would enhance. DOE/FE cannot authorize exports without fairly weighing these impacts. *See, e.g., Udall v. Federal Power Comm'n*, 387 U.S. 428, 450 (1967). If it did so, it would have to conclude that the export project should not be authorized.

Because Sierra Club's many thousands of members have a direct interest in ensuring that domestic natural gas production is conducted safely, and that any exports do not adversely affect domestic consumers, Sierra Club therefore moves to intervene in this proceeding and protests DCP's application.

I. Sierra Club Should be Granted Intervention

Sierra Club members live and work throughout the area that will be affected by the DCP export plan, including in the regions adjacent to the Cove Point facility and its shipping routes in Chesapeake Bay and in regions near the pipelines and gas fields necessary to supply the plant. Sierra Club members everywhere will also be affected by increased gas prices which would be caused by the plan. As of December 2011, Sierra Club had 13,443 members in Maryland, 1,561 members in Delaware, 23,289 members in Pennsylvania, 2,484 members in DC, 35,973 in New York, and 601,904 members in all. Declaration of

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Yolanda Fortuna at ¶ 7.[1] To protect its members interests, Sierra Club therefore moves to intervene in this proceeding, pursuant to 10 C.F.R. § 590.303(b).
Consistent with that rule, Sierra Club states that its "asserted rights and interests," in this matter include, but are not limited to, its interests in the following:

- The economic impacts of any gas exports from the DCP facility, whether individually or in concert with exports from other such facilities, including the consequences of price changes upon its members' finances, consumer behavior generally, and industrial and electrical generating facilities whose fuel choices may be affected by price changes. Sierra Club, 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 fossil fuels, Sierra Club's interests in this proceeding are directly implicated.
- The environmental consequences of any gas exports from the DCP facility, including emissions and other pollution associated with the gasification and liquefaction processes, environmental damage associated with pipeline, facility construction and operation, 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, including 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 environmental and economic consequences of the proposed DCP export facilities themselves, whether considered by FERC or by DOE/FE, and the implications of such facility construction on the communities and ecosystems surrounding those facilities.
- The public disclosure, in National Environmental Protection Act and other documents, of all environmental, cultural, social, and economic consequences of DCP's proposal, and of all alternatives to that proposal.

Sierra Club has demonstrated the vitality of these interests in many ways. Sierra Club runs national advocacy and organizing campaigns dedicated to reducing American dependence on fossil fuels, including natural gas, and to protecting public health. These campaigns, including its Beyond Coal campaign, and its Natural Gas Reform campaign, are dedicated towards promoting a swift transition away from fossil fuels and to reducing the impacts of any remaining natural gas extraction. Sierra Club members in and around the shale gas plays associated with the DCP proposal are particularly active: The Club's Pennsylvania and Maryland Chapters are focusing many of their advocacy

[1] Attached as Ex. 1.

efforts on gas issues, and are deeply engaged in permitting and regulatory processes in those states. *See* Fortuna Declaration.

Moreover, the Maryland Chapter has a long history of engagement with the Cove Point facility in particular. Its litigation and organizing efforts during earlier efforts to expand the site for import secured a settlement with DCP which limited the facility's expansion and channeled significant funds towards conservation goals. The Chapter remains focused on managing the environmental impacts of operations on the Cove Point site.

Finally, Sierra Club members will be directly affected by the export project in many ways. Members living in and around drilling sites in the Marcellus Shale and other shale plays, who will, according to DCP, see drilling activity continue and intensify in part due to the export project. Gas production brings major industrial activity to previously rural sites, fragmenting formerly intact forests and fields, and can and has caused serious air and water pollution problems, loud noises, foul odors, and crushing traffic on small roads, among many other harms, discussed below. Members living near the facility itself will have to contend with the pollution and nuisance caused by export operations. And members throughout the country will be burdened by higher gas prices and increased climate change harms caused by project. In short, Sierra Club's members have a vital economic, aesthetic, spiritual, personal, and professional in the project.

Thus, although 10 C.F.R. § 590.303 states no particular standard for intervention, Sierra Club's interests in this proceeding would be sufficient to support intervention on any standard. Its motion must be granted.[2]

II. Sierra Club Protests this Application Because It Is Not In the Public Interest and Is Not Supported by Adequate Environmental and Economic Analysis

DOE cannot approve this application under the Natural Gas Act for the reasons set out below. Sierra Club therefore files this protest pursuant to 10 C.F.R. § 590.304.

A. Legal Standard

DOE/FE has significant substantive and procedural obligations to fulfill before it can authorize DCP's export proposal. We discuss some of those obligations, those created by the Natural Gas Act, the National Environmental Policy Act, the Endangered Species Act, and the National Historic Preservation Act, here, before explaining why these obligations require DOE to deny export authorization in this case.

1. Natural Gas Act

Under the Natural Gas Act, and subsequent delegation orders, DOE/FE must determine whether DCP's proposal to export LNG to nations which have not signed a free trade

[2] If any other party opposes this motion, Sierra Club respectfully requests leave to reply. *Cf.* 10 C.F.R. § 590.302 (allowing for procedural motions and briefing in these cases).

agreement ("FTA") with the United States is in the public interest.[3] 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 the [Federal Power Commission] authorizing it do so. The Commission 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.

15 U.S.C. § 717b(a); *see also* Executive Orders 12038 & 10485 (vesting any executive authority to allow construction of export facility in the Federal Power Commission and its successors). DOE/FE has been delegated the former Federal Power Commission's authority to authorize natural gas exports while FERC has been delegated authority to authorize facility permitting and siting for such exports.[4] *See* Department of Energy Redelegation Order No. 00-002.04E (Apr. 29, 2011) (providing DOE/FE its authority); Department of Energy Delegation Order No. 00-004.00A (providing FERC its authority). As such, it is DOE/FE, not FERC, which must ultimately make this public interest determination.

The public interest determination is necessarily rooted in the Natural Gas Act's "fundamental purpose [of] assur[ing] the public a reliable supply of gas at reasonable prices." *See, e.g., United Gas Pipe Line Co v. McCombs*, 442 U.S. 529 (1979). In addition to this consumer protection function, the Act also extends DOE/FE "the authority to consider conservation, environmental, and antitrust questions." *Nat'l Ass'n for the Advancement of Colored People v. Federal Power Commission*, 425 U.S. 662, 670 n.4 (citing 15 U.S.C. § 17b as an example of a public interest provision); n.6 (explaining that the public interest includes environmental considerations) (1976). As Deputy Assistant Secretary Smith has testified, "[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." Testimony of Christopher Smith, Deputy Assistant Secretary of Oil and Gas Before the Senate Committee on Energy and Natural Resources (Nov. 8, 2011); *see also* 10 C.F.R. § 590.202(b)(7) (requiring export applicants to provide information documenting "[t]he potential environmental impact of the project").[5]

DOE has also promulgated "Policy Guidelines" discussing the public interest in the context of gas *imports* which it nonetheless has applied in the gas export context. 49

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[3] The Natural Gas Act provides that DOE/FE will approve exports to nations which have signed a free trade agreement requiring national treatment for trade in natural gas "without modification or delay." 15 U.S.C. § 717b. DOE/FE has approved such an application from DCP. *See* DOE/FE Order No. 3019.

[4] DOE/FE may also *disapprove* export facilities.

[5] Attached as Ex.2.

Fed. Reg. 6,684 (Feb. 22, 1984); *see also* DOE/FE Order No. 2961, *Opinion and Order Conditionally Granting Long-Term Authorization to Export [LNG] from Sabine Pass LNG Terminal to Non-Free Trade Agreement Nations* ("*Sabine Pass*") (May 20, 2011) at 29-31.[6] Under these guidelines, DOE has focused its 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," including DOE/FE's general policy of promoting market competition *Sabine Pass* at 29. Although germane here, these Policy Guidelines are merely guidelines: they "cannot create a norm binding the promulgating agency." *Panhandle Producers and Royalty Owners Ass'n v. Economic Regulatory Administration*, 822 F.2d 1105, 1110-1111 (D.C. Cir. 1987).

DOE/FE imposes a rebuttable presumption that LNG export applications are consistent with the public interest, but this policy is "highly flexible, creating *only* rebuttable presumptions and leaving parties free to assert other factors." *Id.* (emphasis added, internal quotation marks omitted). 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 that an application is, in fact, in the public interest. *See* 10 C.F.R. § 590.404.

DOE/FE may issue "a conditional order at any time during a proceeding." 10 C.F.R. § 590.402.

2. National Environmental Policy Act

The National Environmental Policy Act ("NEPA") provides that "all agencies of the Federal Government" must prepare an Environmental Impact Statement ("EIS") for every "major Federal actions significantly affecting the quality of the human environment," which describes:

> (i) the environmental impact of the proposed action,
> (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
> (iii) alternatives to the proposed action,
> (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
> (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

42 U.S.C. § 4332(C); *see also* 40 C.F.R. § 1508.27 (defining "significant" impacts as arising from both the context and the intensity of a given action).

[6] Attached as Ex. 3.

"NEPA procedures . . . insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken." 40 C.F.R. § 1500.1(b); *see also Dep't of Transp. v. Public Citizen*, 541 U.S. 752, 768 (2004) (explaining that NEPA requires agencies to "carefully consider [ ] detailed information concerning significant environmental impacts" and "guarantees that the relevant information will be made available to the larger" public) (quoting *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989)). If a project will have environmentally significant impacts, then the Corps must prepare a comprehensive environmental impact statement ("EIS"), rather than a more cursory environmental assessment ("EA"). *See* 33 C.F.R. §§ 230.6, 230.7. Indeed, if there is a "substantial question" as to the severity of impacts, an EIS must be prepared. *See Klamath Siskiyou Wildlands Center v. Boody*, 468 F.3d 549, 561-62 (9th Cir. 2006) (holding that the "substantial question" test sets a "low standard" for plaintiffs to meet).

"It is DOE's policy to follow the letter and spirit of NEPA; comply fully with the [Council on Environmental Quality ("CEQ")] Regulations and apply the NEPA review process early in the planning stages for DOE proposals." 10 C.F.R. § 1021.100. It has adopted CEQ's NEPA regulations in full. *Id.* § 1021.103. The NEPA rules apply to "any DOE action affecting the quality of the environment of the United States, its territories or possessions." *Id.* § 1021.102. CEQ directs that agencies must "integrate the NEPA process with other planning at the earliest possible time to insure that planning and decisions reflect environmental values." 40 C.F.R. § 1501.2.

DOE has determined 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." 10 C.F.R. Part 1021, Appendix D, D9; *see also* 40 C.F.R. § 1501.4 (discussing considerations relevant to whether to prepare an EIS). "The primary purpose of an environmental impact statement is to serve as an action-forcing device to insure that the policies and goals defined in [NEPA] are infused into the ongoing programs and actions of the Federal government." 40 C.F.R. § 1502.1. As such, an EIS must provide a "full and fair discussion of significant environmental impacts and shall inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment." *Id.*

In particular, an EIS must fairly present all alternatives to the proposed action (here, to allow export of LNG from Cove Point); this analysis "is the heart of the environmental impact statement." 40 C.F.R. § 1502.14. DOE/FE must take care not to define the project purpose so narrowly as to prevent the consideration of a reasonable range of alternatives. *See, e.g., Simmons v. U.S. Army Corps of Engineers*, 120 F.3d 664, 666 (7th Cir. 1997). If it did otherwise, it would lack "a clear basis for choice among options by the decisionmaker and the public." *See* 40 C.F.R. § 1502.14.

An EIS must also describe the direct and indirect effects, and cumulative impacts of, a proposed action. 40 C.F.R §§ 1502.16, 1508.7, 1508.8; *Northern Plains Resource Council v. Surface Transportation Board*, - F.3d -, 2011 WL 6826409 at * 5(9th Cir. 2011). These terms are distinct from one another: Direct effects are "caused by the action and occur at the same time and place." 40 C.F.R. § 1508.8(a). Indirect effects are also "caused by the action" but:

> are later in time or father 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.

40 C.F.R. § 1508.8(b). Cumulative impacts, finally, 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.

40 C.F.R. § 1508.7. The EIS must give each of these categories of effect fair emphasis.

Agencies may also prepare "programmatic" EISs, which address "a group of concerted actions to implement a specific policy or plan; [or] systematic and connected agency decisions allocating agency resources to implement a specific statutory program or executive directive." 40 C.F.R. § 1508.17(b)(3); *see also* 10 C.F.R. § 1021.330 (DOE regulations discussing this possibility. As we later discuss, such an EIS is appropriate here.

Finally, and critically, 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. 10 C.F.R. § 1021.211. During this time, DOE may take no action which would tend to "limit the choice of reasonable alternatives," or "tend[] to determine subsequent development ." 40 C.F.R. § 1506.1.

The Natural Gas Act designated the old Federal Power Commission as the "lead agency" for NEPA purposes. 15 U.S.C. § 717n. FERC has since generally filled that role, preparing the NEPA documents for LNG export and import decisions, as it did in *Sabine Pass*. *See* 10 C.F.R. § 1021.342 *providing for interagency cooperation). 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 in a valid EIS. Thus DOE/FE cannot approve

DCP's project on the basis of an EIS, or other NEPA document, that considers only the impacts of facility siting which are in FERC's jurisdiction.

3. Endangered Species Act

Pursuant to the Endangered Species Act's (ESA) directive that all agencies "shall seek to conserve endangered species," 16 U.S.C. § 1531(c)(1), DOE/FE must ensure that the its approval of the DCP 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." 16 U.S.C. § 1536(a)(2). "Each Federal agency shall review its actions at the earliest possible time to determine whether any action may affect listed species or critical habitat." 50 C.F.R. § 402.14(a); *see also* 16 U.S.C. § 1536(a)(2).

This determination must be wide-ranging, because DCP's export proposal will increase gas production activities throughout the Northeast, and nationally. Thus, DOE/FE must consider not just the effects of the project at the Cove Point site (although it must at least do that, as endangered tiger beetles, among other species, inhabit the plant site), 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." *See* 50 C.F.R. § 402.12(f). If that assessment determines that impacts are possible, DOE/FE must enter into formal consultation with the Fish and Wildlife Service and the National Marine and Fisheries Service, as appropriate, to avoid jeopardizing any endangered species or adversely modifying its habitat as a consequences of its approval of DCP's proposal. 16 U.S.C. § 1536(a), (b).

4. National Historic Preservation Act

DOE/FE must also fulfill its obligations under the National Historic Preservation Act (NHPA) to "take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register." 16 U.S.C. § 470f; *see also Pit River Tribe v. U.S. Forest Serv.*, 469 F.3d 768, 787 (9th Cir. 2006) (discussing the requirements of the NHPA). Because "the preservation of this irreplaceable heritage is in the public interest," 16 U.S.C. § 470(b)(4), it behooves DOE/FE to proceed with caution.

DOE/FE must, therefore, initiate the NHPA section 106 consultation and analysis process in order to "identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects on historic

properties." 36 C.F.R. § 800.1(a). NHPA regulations make clear that the scope of a proper analysis is defined by the project's area of potential effects, *see* 36 C.F.R. § 800.4, which in turn is defined as "the geographic area . . . within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties," 36 C.F.R. § 800.16(d). This area is "influenced by the scale and nature of an undertaking," *Id.* The area of potential effects should sweep quite broadly here because, as in the ESA and NEPA contexts, the reach of DCP's proposal extends to the entire area in which it will increase gas production. Thus, to approve DCP's proposal, DOE/FE must first understand and mitigate its impacts on any historic properties which it may affect. *See also* DOE Policy P.141.1 (May 2001) (providing that DOE will fully comply with the NHPA and many other cultural resources preservation statutes).

The regulations governing this process provide that "[c]ertain individuals and organizations with a demonstrated interest in the undertaking may participate as consulting parties" either "due to the nature of their legal or economic relation to the undertaking or affected properties, or their concern with the undertaking's effects on historic properties." 36 C.F.R. § 800.2(c)(5). Sierra Club meets that test, because the Club and its members are interested in preserving intact historic landscapes, for their ecological and social value, and reside through the region affected by the DCP proposal. Its members have worked for years to protect and preserve the rich human and natural fabric of the region, and would be harmed by any damage to those resources. Sierra Club must therefore be given consulting party status under the NHPA for this application.

B. DOE Cannot Approve the Cove Point Project under the Natural Gas Act's Public Interest Standard

DCP's application is inconsistent with the public interest for many reasons. At core, DCP proposes to raise domestic gas prices, which, according to the EIA, will harm consumers and increase the use of highly polluting coal power, offering, in exchange, a limited number of localized, and questionable, economic benefits. This course is not in the public interest at the outset, as the fuller context of the application makes clear. DCP entirely fails to acknowledge the significant environmental harms associated with natural gas production and LNG export – harms which are more than substantial enough to outweigh any benefit of export. Moreover, DCP's proposal is the leading edge of a wave of export proposals which, considered cumulatively, will significantly exacerbate the harm DCP alone would cause.

If DOE does not deny this application, serious harm to the public interest will result.

1. DCP's Claimed Economic Benefits are Uncertain

DCP claims billions of dollars in benefits and tens of thousands of jobs will result from its export proposal, *see* DCP Proposal at 16-19 & ICF Study, but the vast majority of these

benefits are not directly associated with the construction or operation of the facility itself. That project will only result in several thousand construction-related job (defined quite broadly by DCP's consultant, ICF, to include "induced" jobs in sectors as far flung as the "food and beverage retail" industry) and several hundred jobs during operations, only 70 of which appear to be direct employees of the facility. *See* ICF Study at Table 2.

Instead, the bulk of the economic benefits DCP claims result from what DCP calls its "most basic benefit": its ability to "encourage and support increased domestic production of natural gas and [natural gas liquids]." DCP Application at 35. In DCP and ICF's view, this increased production will, directly and indirectly, pump money into the economy – to the tune of billions of dollars – and create jobs regionally and nationally. *See* DCP Application at 36-40. Undoubtedly, increasing gas production will increase employment in that sector by some amount, but a more careful look at the data demonstrates that booms in resource extraction industry are far more of a mixed blessing than DCP acknowledges.

DCP's optimistic projections are based on ICF's economic modeling, *see* ICF Report at 6, rather than on direct empirical research on the observed economic consequences of increased gas production in the shale gas plays. Such information is, however, available, and, in combination with academic papers describing recognized limitations in the model ICF used, casts significant doubt on DCP's benefits calculations.

ICF used the "IMPLAN" model to calculate benefits. IMPLAN, as ICF explains, is an "input-output" model: Users input a description of economic activity in a given set of economic sectors, and the model responds by tracing this spending throughout the economy, using economic "flow information" for many industries. *See* ICF Report at 43-44. It is, in other words, ultimately a fairly mechanical system: Given an initial expenditure, it uses "accounting tables" to predict how this expenditure will be allocated among sectors and then uses "local-level multipliers" to conjecture how this allocation will alter employment decisions, among other things. *See id.* Importantly, IMPLAN is not a continuous model: It gives results for individual years, but does not track jobs or expenditures from year-to-year, meaning that multi-year forecasts are simply a series of snapshots, and that a "job" in one year may not be the same job in the next year. ICF Report at 44.

Notably, IMPLAN does not consider counterfactuals and foregone opportunities. It maps the consequences of a particular expenditure, rather than asking how the economy might have grown had investors and regulators made different choices. Nor does it consider how the particular choice at issue might displace other economic activity.

A recent study by Amanda Weinstein and Dr. Mark Partridge, of Ohio State University, explains why these limitations, among others, matter in the shale gas context. *See* Amanda Weinstein and Mark D. Partridge, *The Economic Value of Shale Natural Gas in*

Ohio, ("*Ohio Study*) Ohio State University, Swank Program in Rural-Urban Policy Summary and Report (December 2010).[7] The absence of a counter-factual is at the core of their critique. *Id.* at 11. As they explain:

> Impact analysis [of the sort that IMPLAN conducts] is usually based on an old input-output technology that is typically not used today by economists to estimate actual economic effects. Impact studies do not include various displacement effects and do not reflect the true counterfactual of comparing what would have happened without natural gas drilling. For example, oil and natural gas drilling would lead to higher local wages and land costs, which reduce employment that would have occurred elsewhere in the economy. Likewise, the environmental effects may reduce activity in the tourism sector and other residents may not want to live near such degrading activity. Finally, greater natural gas employment means that there are fewer jobs in coal that would have occurred without the increase in natural gas employment.

Id.(emphasis in original). Thus, models like IMPLAN are not designed either to measure the full economic effects of resource extraction, and, critically, do not chart what the future would have looked like under different conditions. They also, as the Ohio Study next describes, produce a somewhat misleading picture of employment effects which they *do* describe, for three reasons: First, the model, again, is "static," as ICF puts it, ICF Report at 44, meaning that it does not track employment over time. Second, the model produces an analysis of jobs "supported" – *not* created – by the original input, which turns out to be an overly generous metric. Third, input-output models may fail to account for "leakage" – that is, that some money simply is not passed on through the system or is passed on in other states or regions – and so can overestimate jobs figures.

The first flaw, as the Ohio Study explains, means that the employment figures IMPLAN produces, measured in "job-years" are not equivalent to jobs held from year-to-year. As the study explains:

> One source of confusion is that impact studies do not produce continuous employment numbers. If an impact study says there are 200,000 jobs, this does not mean 200,000 workers are continuously employed on a permanent basis. For example, there are workers that do site preparation. Then there is another group who do the drilling followed by another group who maintains the well when it is in production. Finally, there is an entirely different group doing pipeline construction, and so on. So, while the public is likely more interested in continuous ongoing employment effects, impact studies are producing total numbers of supported jobs that occur in a more piecemeal fashion.

[7] Attached as Ex.4.

Id. So, when DCP claims that thousands of "job-years" will be driven by its project, this claim masks the inherent complexity of the labor market – some of these jobs may endure, others may only take place for a limited time even within the year-by-year accounting that ICF employs.

And, second, it is important to bear in mind that IMPLAN calculates jobs "supported" – not created. It asks whether a given expenditure might ultimately translate into a portion of someone's salary, but, because it lacks a counterfactual, it cannot demonstrate that that expenditure "created" those jobs, because it cannot show that they would not exist in a future without the expenditure. *Id.*

Third, as the Ohio Study explains, empirical analysis of spending patterns matters. *Id.* at 14-15. Landowners given gas production leases may choose to save their money, rather than to spend it. *Id.* Companies may bring in out-of-state workers, rather than hiring in-state. *Id.* And so on. Measuring these effects is important to accurately setting up an input-output model: One recent study, for instance, used estimates of landowner savings and employment choices to change IMPLAN's parameters appropriately, and discovered these results produced estimates quite close to Bureau of Labor Statistics data on actual direct employment. *See id.* at 12, 15. ICF does not appear to have taken this additional, important step.

The upshot is that IMPLAN model results should be seen as estimates of solely the effects of increased expenditures on a particular project (here, gas exports and production), and limited and overly-optimistic ones at that, rather than as a reliable comparison of how the economy would fare with and without gas exports – a real problem for DCP, as the "public interest" test requires that DOE/FE conclude that the country would be better off with DCP's proposal. DOE/FE cannot do so on the data DCP has presented, because that data does not speak to the economic possibilities the U.S. foregoes by embracing gas exports, or to the economic damage such exports could cause, directly or indirectly. Thus, DOE/FE lacks the information necessary to consider the public interest in a future with, or without, DCP exports, and therefore may not approve DCP's proposal.

Moreover, even if DOE/FE were to focus solely on the world *with* exports, available empirical data shows that the real economic effects of increasing gas production are far more limited and equivocal than DCP claims. The Ohio Study works to describe these effects by analyzing the counterfactual that IMPLAN results lack. It begins by noting that Pennsylvania, the center of the shale gas boom, does not appear to be creating nearly as many jobs as industry claims suggest. Bureau of Labor Statistics for 2004-2010 show that *all* oil and gas sector jobs (not just those in shale gas, or those drilling new wells), increased by only about 10,000 in the state over that period. *Id.* at 12.

The study went further, and, using Bureau of Economics Analysis statistics, directly compared employment and income in counties in Pennsylvania with significant

Marcellus drilling and without significant drilling, and before after the boom started. As Table 1, below, shows, counties in both areas *lost* jobs during the boom (after 2005)—and, though that result is reasonable considering the economic downturn in those years, it is striking that drilling counties declined at a slightly *faster* rate in that period, though per capita income also increased more quickly in those counties.

Table 1: Comparing Pennsylvania Counties, With and Without Drilling, Over Time[8]

	Employment Growth Rate 2001-2005	**Employment Growth Rate 2005-2009**	**Income Growth Rate 2001-2005**	**Income Growth Rate 2005-2009**
Drilling Counties	1.4%	-0.6%	12.8%	18.2%
Non-Drilling Counties	5.3%	-0.4%	12.6%	13.6%

The jobs effect, in either direction, turns out to be too small to be statistically significant. *Id.* at 16. This is not a surprising pattern: Incomes likely rise thanks to lease payments to some landowners, and some degree of hiring for high-income production decisions, but extraction displaces other workers, or jobs go to out-of-state workers rather than to residents who likely lack industry experience. *See id.*

A set of more detailed studies from Cornell University's Department of City and Regional Planning largely confirm this pattern. Those researchers spent more than a year studying the economic impacts of the gas boom on Pennsylvania and New York. Their core conclusion is that boom-bust cycle inherent in gas extraction makes employment benefits tenuous, and may leave some regions hurting if they are unable to convert the temporary boom into permanent growth. As the researchers put it:

> The extraction of non-renewable natural resources such as natural gas is characterized by a "boom-bust" cycle in which a rapid increase in economic activity is followed by a rapid decrease. The rapid increase occurs when drilling crews and other gas-related businesses move into a region to extract the resource. During this period, the local population grows and jobs in construction, retail and services increase, though because the natural gas extraction industry is capital rather than labor intensive, drilling activity itself will produce relatively few jobs for locals. Costs to communities also rise significantly, for everything from road maintenance and public safety to schools. When drilling ceases because the commercially recoverable resource is depleted, there is an economic "bust" – population and jobs depart the region, and fewer people are left to support the boomtown infrastructure.

[8] Adapted from Table 1 of the *Ohio Study* at 15.

Susan Cristopherson, CaRDI Reports, *The Economic Consequences of Marcellus Shale Gas Extraction: Key Issues* ("*Cornell Study*") (Sept. 2011) at 4.[9] This boom and bust cycle is exacerbated by the purportedly vast resources of the Marcellus play, because regional impacts will persist long after local benefits have dissipated, as the authors explain, and may be destructive if communities are not able to plan for, and capture, the benefits of industrialization:

> [B]ecause the Marcellus Play is large and geologically complex, the play as a whole is likely to have natural gas drilling and production over an extended period of time. While individual counties and municipalities within the region experience short-term booms and busts, the region as a whole will be industrialized to support drilling activity, and the storage and transportation of natural gas, for years to come. Counties where drilling-related revenues were never realized or could have ended may still be impacted by this regional industrialization: truck traffic, gas storage facilities, compressor plants, and pipelines. The cumulative effect of these seemingly contradictory impacts – a series of localized short-term boom-bust cycles coupled with regional long-term industrialization of life and landscape – needs to be taken into account when anticipating what shale gas extraction will do communities, their revenues, and the regional labor market, as well as to the environment.

Id. (emphasis in original). The benefits of gas development are, in other words, not smoothly distributed, in space or in time. Some people will prosper and some will not during the resultant disruption and, warn the Cornell researchers, the long-term effects may well not be positive, based upon years of research on the development of regions dependent on resource extraction:

> [T]he experience of many economies based on extractive industries warns us that short-term gains frequently fail to translate into lasting, community-wide economic development. *Most alarmingly, a growing body of credible research evidence in recent decades shows that resource dependent communities can and often do end up worse than they would have been without exploiting their extractive reserve.* When the economic waters recede, the flotsam left behind can look more like the aftermath of a flood than of a rising tide.

Id. at 6 (emphasis supplied).

The researchers also outline many of the challenges communities face as they attempt to benefit from natural gas development. Most obviously, it is difficult to convert technical natural gas field jobs directly into sustainable, well-paying local employment. *See* Jeffrey Jacquet, *Workforce Development Challenges in the Natural Gas Industry*

[9] Attached as Ex. 5.

(Feb. 2011).[10] This is in part because the industry's employment patterns are uneven: the researchers cite Pennsylvania employment data showing that "*the drilling phase accounted for over 98% of the natural gas industry workforce* engaged at the drilling site," and complementary Wyoming data showing a similar drop-off. *Id.* at 4 (emphasis in original). As a result, drilling jobs correspond to the boom and bust cycle inherent to resource extraction industries. *Id.* The remaining, small, percentage of production phase and office jobs are far more predictable, *id.* at 4-5, but need to filled with reasonably experienced workers, *id.* at 12-14. Although job training at the local level can help residents compete, the initial employment burst is usually made up for people from out of the region moving in and out of job sites; indeed, "[t]he gas industry consistently battles one of the highest employee turnover problems of any industrial sector." *Id.* at 13.

Meanwhile, communities also confront a panoply of development issues, ranging from coping with sudden population increases, major road damage from drilling operations, damage to the tourism industry, and a host of environmental risks (discussed in more detail below). *See, e.g.*, CJ Randall, *Hammer Down: A Guide to Protecting Local Roads Impacted by Shale Gas Drilling* (Dec. 2010)[11]; Susan Riha & Brian G. Rahm, *Framework for Assessing Water Resource Impacts from Shale Gas Drilling* (Dec. 2010)[12]; *Cornell Study* at 8).

These tourism threats are particularly concerning for many parts of the region, including New York's Southern Tier, because tourism is a major source of income and employer. In the Southern Tier, according to one recent study, the industry directly accounts for $66 million in direct labor income, and 4.7% of all jobs, and supports 6.7% of the region's employment. Andrew Rumbach, *Natural Gas Drilling in the Marcellus Shale: Potential Impacts on the Tourism Economy of the Southern Tier* (2011).[13] Although the study concludes that the near-term economic impact of gas drilling would likely be positive, it identifies two "major caveats" – that the monetary value of the gas industry underestimates its disruption to the region's stability and way of life, and that gas drilling benefits "will be relatively short-term and non-local." *Id.*at 9. Once again, simple arguments for the raw economic benefits of gas extraction's benefits turn out to be conceal complex social and economic consequences, and a complicated mix between benefits and costs in each particular place the industry affects.

The point of all this, of course, is that a simple economic model, like IMPLAN, cannot reliably capture the consequences of transforming an entire region of the country, converting it from a largely rural swath of small towns, farms, and forests into an industrial gas extraction zone. That transformation will benefit some discrete actors

[10] Attached as Ex. 6.
[11] Attached as Ex. 7.
[12] Attached as Ex. 8.
[13] Attached as Ex. 9.

considerably, and some communities, if they are able to navigate the durable challenges of boom and bust economics. But it will also harm people, by displacing existing businesses and lifeways, straining infrastructure, shifting populations, and, potentially, leading to devastating economic crashes in some areas.

IMPLAN results do not paint a fair picture of this difficult set of changes. As one of the Cornell researchers explains, IMPLAN studies have some strengths in their "relative simplicity, familiarity, and widespread use," but have important constraints as well, which prevent them from giving a full answer to the difficult questions expanding gas exports – and, hence, production -- poses. *See* David Kay, *The Economic Impacts of Marcellus Shale Gas Drilling: What Have We Learned? What are the Limitations?* (Apr. 2011).[14] As a result of the model's limitations, explained above, it is not readily able to "evaluate economic circumstances in which the change in the economy has been or will be rapid and large," or to deal with the complicated series of individual choices and community disruptions (including the displacement of existing economic activity) occasioned by the boom. *See id.* at 5-6, 22-30. IMPLAN struggles, particularly, to map these distributional effects, where some prosper while others suffer, and, more generally, is not designed to chart the long-term effects of such major dislocations. *See id.* at 22-30.

In the end, DCP's analysis stands for far less than first appears. No doubt some degree of additional economic activity would result from its proposal;[15] but its results cannot demonstrate that those benefits would not arise from projects or industries which the gas export plan will foreclose. Nor can it show that further tethering an entire region of the United States to an unstable and disruptive natural gas boom, rather than strengthening regional sectors which are not driven by boom-bust cycles, is the better course. In essence, DCP is trying to answer a difficult policy question by presenting one, highly-simplified side of the story, rather than engaging in the difficult, place-specific and empirically-guided analysis required to fully consider, and weigh, the costs and benefits of gas exports and extraction.

Because IMPLAN results offer such a limited piece of a much larger picture, DOE/FE cannot approve DCP's application based upon these simplistic modeling figures. It must, instead, undertake its own independent inquiry into the costs and benefits of the

[14] Attached as Ex. 10.

[15] The large construction project itself will, for instance, no doubt hire people (who may or may not have been hired elsewhere). But even if the construction project itself produces some economic benefits, DOE/FE cannot afford these benefits much weight in its public interest determination because its concern is whether *exports* will be in the public interest, not whether facility construction would be so. Every LNG export proposal will involve construction activities; if these activities could suffice to demonstrate public benefits, every application would be approved, regardless of the merits of the exports which the construction would allow. That rubber-stamp result is not consistent with the letter, or the spirit, of the Natural Gas Act.

proposal, carefully testing DCP's proposal based upon empirical data on experiences of states and citizens confronting the difficult changes inherent in the shale gas boom.

2. DCP's Export Plans Will Cause Significant Economic Harm

Even if the simplistic modeling results in the ICF Report were sufficient to demonstrate that DCP's proposal will have substantial economic benefits, they are fatally one-sided, for several reasons. We begin with major economic costs which even DCP acknowledges (though equivocally): Its proposal will raise natural gas prices, with economy-wide consequences. These consequences become more serious when DCP's proposal is viewed in its context, as it must be, as one of a wave of gas export proposals that already collectively proposed to export over 15 bcf/d of natural gas.

The substantial negative consequences of the price increases associated with these exports are not in the public interest, and so further warrant denying DCP's application.

a. DCP's Proposal, On Its Own, Will Significantly Increase Natural Gas Prices

Exporting domestic natural gas will increase gas demand and so will increase domestic gas prices. Although DCP dismisses the impacts of its project as "minor," DCP Application at 27, even its own application shows significant price increases.

The Navigant Consulting report underlying DCP's application uses four cases: a "reference case" which already includes some exports, a "Cove Point export case" in which the facility begins export in 2016, an "aggregate export case" which assumes other facilities are also approved with 7.1 bcf/d in cumulative exports by 2019, and an "extreme demand" case in which demand for gas-powered vehicles and coal-to-gas switching in the power sector ramps up domestic demand. Navigant Report at 13. The cases are cumulative (that is, each case includes the assumptions of the prior case). Even using Navigant's own results (which are arguably too liberal, as we shortly discuss), it is clear that exports produce notable price increases in coming years, as the table below summarizes:

Table 2: Natural Gas Prices Under the Navigant Cases, Compared to the Energy Information Administration's Annual Energy Outlook 2012[16]

	AEO 2012	**Navigant Reference Case**	**Cove Point Export**	**Aggregate Export**	**Extreme Demand**
Henry Hub Gas Price ($2010/MMBtu)	$4.80	$4.98	$5.27	$5.85	$6.16

[16] Based upon Navigant Report at 42 (Appendix D) and the Energy Information Administration's Annual Energy Outlook 2012 Reference Case, Table A13, attached as Ex. 11.

in 2020					
...in 2030	$6.19	$6.35	$ 6.61	$6.84	$8.03
... in 2035	$7.35	$7.38	$7.77	$8.03	$9.45
...in 2040	[17]	$8.64	$9.16	$9.64	$11.20

A few points are worth highlighting. First, it is important to note that Navigant's reference case does *not* represent business as usual, because it assumes that both the Sabine Pass and Kitimat LNG export proposals go forward, even though neither proposal has been finally approved. *See* Navigant Report at 13. As such, it builds 2.7 bcf/d of exports into its reference case by 2017. *Id.* The Energy Information Administration (EIA), in contrast, includes only 2.2 bcf/d of exports in its reference case in the Annual Energy Outlook (AEO) for 2012, reaching this capacity in 2019. EIA, *AEO 2012 Early Release Overview* (Jan. 2012).[18] So, Navigant's reference case already includes more export capacity than the EIA's, coming online sooner. The EIA's reference case is therefore the more conservative baseline, and DOE/FE must use either it, or a "no exports" baseline, which most fairly captures the additional impacts of gas exports.

Cove Point would significantly increase gas prices, on either baseline. If Cove Point were to come online, but no other proposals other than Sabine Pass and Kitimat went forward, it would increase gas prices from the EIA's reference by just under 10% in 2020, just under 7% in 2030, and just under 6% in 2035. If more export terminals were approved (up to 7.1 bcf/d in Navigant's case), the increase in 2020 is 22% of the AEO 2012 reference case. If gas demand also increases in that year, the price increase is over 28%.

These are major increases in gas price, and will have substantial economic consequences. But even these increases, substantial though they are, are smaller than those which may well occur based only on the current raft of LNG export proposals, as next discuss.

b. The Cumulative Economic Harm Associated with DCP's Proposal and Other Export Applications Is Even Larger

DOE/FE and FERC are considering export proposals from many operators, which cumulatively propose to export 15.8 bcf/d of LNG when operating at maximum capacity, as the table below shows. This is the equivalent of roughly 22% of total domestic gas production. Energy Information Administration ("EIA"), Monthly Natural Gas Gross Production Report (Jan. 30, 2012)[19] (daily production is ~70 bcf). Notably, 13.73 bcf/d of exports have been requested to countries with which the United States has a free trade agreement; DOE/FE lacks discretion to deny those requests, meaning that this volume,

[17] AEO 2012 only projects prices to 2035.
[18] Attached as Ex. 12.
[19] Attached as Ex. 13.

at a minimum, is likely to be cleared for export. Both the 13.73 bcf/d and 15.8 bcf/d figures are far higher than the 7.1 bcf/d *maximum* export figure in DCP's application. Price impacts can reasonably be expected to be commensurately greater.

Table 3: Proposed LNG Export Projects[20]

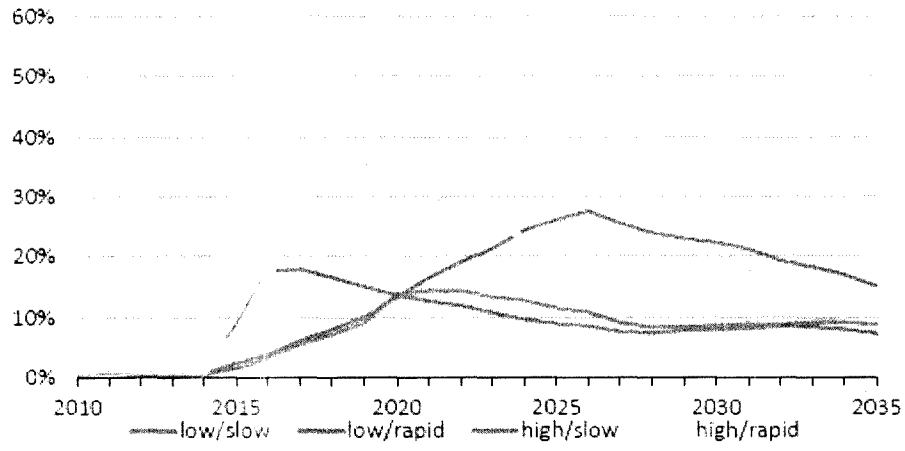
LNG Export Project	State	Proposed Export Capacity (Bcf/day)
Operating Terminals		
Sabine Pass	LA	2.2
Freeport (Phase 1)	TX	1.4
Freeport (Phase 2)	TX	1.4
Lake Charles	LA	2.0
Cove Point	MD	1.0
Cameron	LA	1.7
Subtotal		**9.7**
Other Projects		
Jordan Cove	OR	1.2
Gulf Coast LNG	TX	2.8
Corpus Christi	TX	2.1
Subtotal		**6.1**
Total		**15.8**

The EIA has recently released its analysis of the impacts high export volumes would have – though even the EIA report considers a maximum of 12 bcf/d in exports, which still falls short of the volume DOE/FE has been asked to approve. EIA, *Effect of Increased Natural Gas Exports on Domestic Energy Markets* ("*EIA Study*") (Jan. 2012).[21] Even at the EIA's maximum level, though, price increases are striking.

EIA considered several combinations of conditions, based on both shale gas export rates and economic circumstances. It considered a "low" export case of 6 bcf/d, phased in either quickly or slowly starting in 2015, and a "high" case of 12 bcf/d, again phased in quickly or slowly. EIA Study at 1. It considered the effects of these exports in the context of the EIA's AEO 2011 reference case, and in circumstances where shale recoveries were 50% higher or lower than in the reference case, and in a high economic growth reference case. *Id.* Generally, EIA's results are consistent with Navigant's, although higher export figures, and quicker export ramp-up corresponds with sharper price increases. EIA summarizes its results, for its four cases as follows:

Figure 1:[22] **Natural Gas Wellhead**[23] **Price Percentage Increases from the AEO 2011 Baseline**

[20] Summary: Long-Term Applications Received by DOE/FE to Export Domestically Produced LNG From the Lower-48 States (Jan. 17, 2012), attached as Ex. 14.
[21] Attached as Ex. 15.
[22] From the EIA Study, at 8.



The results are generally consistent with Navigant's figures: Lower exports (around 6 bcf/d – in the range of Navigant's "aggregate export" case) produce price increases of between 10-20% by 2020, while higher exports can push wellhead prices up by just under 40%. If shale gas supplies are more limited, the EIA projects sharper price increases – by over 50% in the high/rapid scenario. *EIA Study* at 9.

These wellhead price increases translate into marked increases in gas and electricity bills. EIA summarizes that:

> Even while consuming less, on average, consumers will see an increase in their natural gas and electricity expenditures. On average, from 2015 to 2035, natural gas bills paid by end-use consumers in the residential, commercial, and industrial sectors combined increase 3 to 9 percent over a comparable baseline case with no exports, depending on the export scenario and case, while increases in electricity bulls paid by end-use customers paid by end-use customers range from 1 to 3 percent. In the rapid growth cases, the increase is notably greater in the early years relative to the later years. The slower export growth cases tend to show natural gas bills increasing more towards the end of the projection period.

EIA Study at 6. These percentage increases are very large in absolute terms. In the low/slow scenario, gas and electricity bills increase by $9 billion *per year*, and this increase grows to $20 billion per year. *EIA Study* at 14.

In short, whatever economic benefits gas exports create also come with multi-billion dollar annual costs to U.S. consumers. These costs are large even with export levels of about 6 bcf/d, which is a level equivalent to just over half of the total volume of exports

[23] Note that Henry Hub prices are generally higher than wellhead prices, meaning that these increases will be more substantial in trading at the Henry Hub.

already proposed. So, even if not all export proposals are approved, consumers will bear massive costs. These costs will be nationally distributed, while the benefits of export, if any, will be more strongly localized in the hands of certain parties in gas-producing areas.

c. Gas and Electricity Price Increases Caused by Gas Exports Are Not In the Public Interest

Natural gas is used for home heating, industrial feedstocks, and electricity generation, among other purposes. Gas price increases are, as a result, felt across the economy, and in many different sectors. As power prices rise, so do the prices of consumer goods and other services, and employment may, in turn, fall as it becomes more expensive to run businesses.[24] DCP's proposal would benefit a small subset of citizens (mostly those in the oil and gas sector) while penalizing millions more. These cost increases appear even if only a few export terminals are permitted, and grow steadily more severe as more terminals are added. DOE/FE must consider the full range of possible increases, but even at low levels, these price increases are not consistent with the public interest, because they outweigh the limited, and uncertain, benefits of short-term increases in gas production. DOE/FE must, therefore, deny DCP's application for this reason as well.

d. The *Sabine Pass* Decision Is Not to the Contrary

It is true that DOE/FE conditionally approved up to 2.2 bcf/d of exports from the Sabine Pass facility last year, *see Sabine Pass* at 1-2, but that decision, even if correct, which Sierra Club does not concede, does not control here, for at least two independent reasons.

First, DOE/FE grounded its opinion on the lack of "factual studies or analyses" demonstrating that gas exports would raise domestic gas and electricity prices, or challenging the benefits IMPLAN modeling predicted. *Id.* at 30. Such evidence is amply supplied here. Sierra Club has demonstrated why IMPLAN modeling must not be seen as conclusive evidence of economic benefits, and has provided extensive data from the EIA itself showing that exports will trigger multi-billion dollar price increases.

Second, DOE/FE, at that time, was only considering Sabine Pass's own proposed exports. Now that it has conditionally approved those exports, they have become part of the new baseline, along with their price increases. Thus, DCP's price increases will drive prices still higher. The fact that DOE/FE was willing to conditionally approve an initial price increase does not mean that it must find that *another* price increase is also not

[24] One of the consequences of these increased costs may be a drop-off in U.S. exports, offsetting DCP's claimed improvements to the U.S. balance of trade. DOE/FE must investigate this possible harm to the public interest.

inconsistent with the public interest. On the contrary, the circumstances demonstrate that further increases are *not* in the public increase.

DOE/FE should therefore take the opportunity to reconsider the course it took in *Sabine Pass* and start afresh, now with the benefit of substantial empirical data which demonstrates that LNG export is not in the public interest.

3. DCP's Export Plans Will Cause Significant Environmental Harm

Even if DCP's claimed economic benefits were clear (which they are not) and even if gas exports did not impose billions of dollars in costs on the economy, as they do, DCP's proposal would still be contrary to the public interest because it will impose significant environmental costs. The increased gas production associated with gas exports – and, thanks to higher gas prices, increased coal use – will threaten many public resources. Gas production is a major air pollution source, including of climate-change causing greenhouse gases. It industrializes entire landscapes, disrupting ecosystems and watersheds. Gas production also poses a host of water and waste issues.

Each of these environmental harms translates into economic damage. If pollution sickens people, or restricts their travel, 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 industries will suffer. Thus, DOE/FE must both consider these environmental impacts in and of themselves *and* monetize them to weigh them against other economic harms in the public interest analysis.

Because the oil and gas industry is exempt, in whole or in part, from many federal environmental laws, gas production regulation has largely been left to the states. Neither state nor federal regulators have yet imposed regulations sufficient to manage the risks of gas extraction, nor demonstrated that they have adequate resources to enforce any regulations.

At the request of President Obama, DOE appointed a Subcommittee of the Secretary of Energy's Advisory Board to consider ways to address the environmental risks of gas production. The Subcommittee concluded, in two reports, that the environmental impact of gas extraction is now too high, and must be reduced through government and private sector initiatives. As the Subcommittee explained:

> The Subcommittee believes that if action is not taken to reduce the environmental impact accompanying the very considerable expansion of shale gas production expected across the country – perhaps as many as 100,000 wells over the next several decades – there is a real risk of serious environmental consequences causing a loss of public confidence that could delay or stop this activity.

DOE, Secretary of Energy's Advisory Board, *Shale Gas Production Subcommittee Second 90-Day Report* (Nov. 18, 2011) at 10.[25] To address these impacts, the Board recommended a wide range of actions, including finalizing comprehensive air pollution rules, *id.* at 5, launching a federal effort to fully understand greenhouse gas emissions from the industry, *id.* at 4, fully disclosing fracking fluid composition, *id.*, banning diesel fuel in fracking fluid, *id.*, tracking drilling waste with a manifest system, *id.* at 7, and adopting best practices in well casing and construction, *id.* Thus far, *none* of these recommendations have been fully implemented. As the Subcommittee stated:

> The Subcommittee has the impression that its initial report stimulated interest in taking action to reduce the environmental impact of shale gas production by the administration, state governments, industry, and public interest groups. However, the progress to date is less than the Subcommittee hoped and it is not clear how to catalyze action at a time when everyone's attention is focused on economic issues, the press of daily business, and an upcoming election. The Subcommittee cautions that whether its approach is followed or not, some concerted and sustained action is needed to avoid excessive environmental impacts of shale gas production and the consequent risk of public opposition to its continuation and expansion.

Id. at 10.

Although the U.S. Environmental Protection Agency (EPA), like some other federal agencies, is moving forward on rulemakings to address some of the many environmental risks inherent to gas extraction, its work is far from done, and EPA will not have the capacity to comprehensively oversee the industry in the foreseeable future. Administrator Lisa Jackson recently explained as much, as InsideEPA reported:

> EPA Administrator Lisa Jackson says the agency's limited resources make it impossible for federal regulators to be able to broadly oversee hydraulic fracturing operations -- even if Congress were to restore EPA's legal authority to regulate the injection process once officials complete their pending study on whether the process impacts drinking water.
>
> "Let me speak really plainly," Jackson told a Jan. 31 teleconference hosted by the American Sustainable Business Council (ASBC). *"There is no EPA setup that allows us to oversee each and every well that's drilled."*

InsideEPA, "Jackson Downplays Concern Over Broad EPA Oversight of Fracking Wells" (Feb. 1, 2012) (emphasis added).[26] As a result, oversight will fall to state regulators. Although some states are more prepared than others, there is no evidence in the record that *any* state has yet been able to fully update its regulations to address the particular

[25] Attached as Ex. 16. The Board's First 90-Day Report is attached as Ex. 17.
[26] Attached as Ex. 18.

issues associated with shale gas extraction, or that any state has the resources to oversee each gas well sufficiently to reduce significant environmental risks to an acceptable level.

In these circumstances, it is not in the public interest to press ahead with export plans which will increase gas production, and so exacerbate the pace and severity of the environmental damage about which the Subcommittee has warned. DOE/FE must not do so until the Subcommittee's recommendations have been carried out, or equivalent steps have been taken to reduce the industry's environmental impacts.

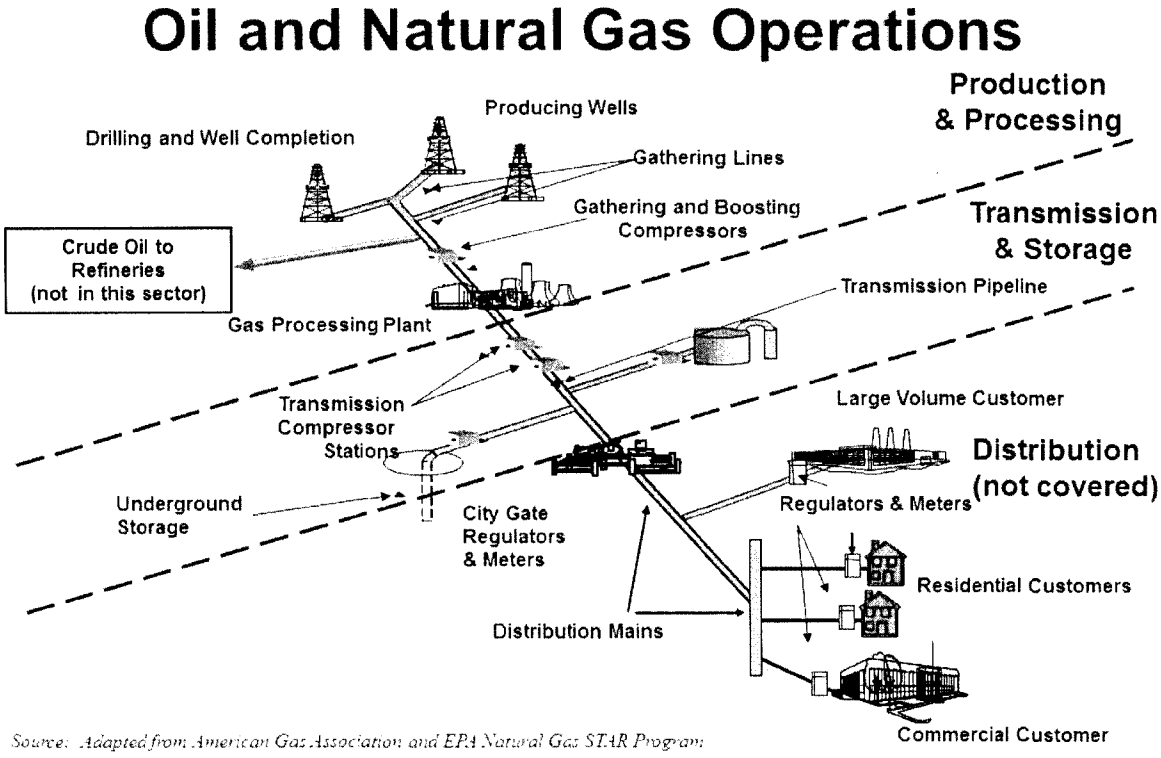
Below, we describe these impacts in more detail. Notably, DCP has failed even to *acknowledge* any of these impacts, much less explain whether or how it could reduce them. Although DCP premises its application on its project's ability to "encourage and support increased domestic production of natural gas," DCP Application at 35, it nowhere acknowledges that this increased production even has environmental impacts. In the scanty two paragraphs DCP devotes to the impacts of its plans, it offers only a vague discussion of the "facilities" it intends to construct at the Cove Point site. *Id.* at 45. Yet, the environmental impacts of increased gas production are very large, and demonstrate that, for this reason as well, DCP's proposal is not in the public interest.

a. Natural Gas Production Is a Major Source of Air Pollution

Oil and gas development includes numerous stages and facilities, all of which contribute to substantial amounts of air emissions and resultant dangerous air pollution. As depicted below, the sector includes four stages: (1) oil and natural gas production, (2) natural gas processing, (3) natural gas transmission, and (4) natural gas distribution.[27]

Figure 2: The Oil and Natural Gas Sector

[27] 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), attached as Ex. 19.



Within these development stages, the major sources of air pollution include wells, compressors, pipelines, pneumatic devices, dehydrators, storage tanks, pits and ponds, natural gas processing plants, and trucks and construction equipment. Major air pollutants of concern from these operations include methane (CH_4), volatile organic compounds (VOCs), nitrogen oxides (NO_x), sulfur dioxide (SO_2), hydrogen sulfide (H_2S), and particulate matter (PM_{10} and $PM_{2.5}$). Oil and natural gas operations also emit listed hazardous air pollutants (HAPs) in significant quantities, and so contribute to cancer risks and other acute public health problems.

Below, we briefly describe some of the primary air pollution problems caused by the industry. These issues include direct emissions from production equipment and indirect emissions, caused by natural gas replacing cleaner energy sources. EPA is moving to correct some of these problems with new air regulations, to be finalized this April but, as we later discuss, these standards, though important, will not fully address the problem, meaning that DOE/FE must still consider it, even if the rules are, indeed, finalized.

i. Air Pollution Problems from Natural Gas

Oil and gas operations emit methane, volatile organic compounds, nitrogen oxides, sulfur dioxide, and particulate matter, amongst other pollutants. Each of these pollutants is a threat to public health and welfare, and any increase in the emissions of those pollutants is, all else being equal, contrary to the public interest.

Methane and Other Climate-Change-Causing Pollutants: 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."[28] The industry is responsible for over 40% of total U.S. methane emissions, which amounts to 5% of all carbon dioxide equivalent (CO_2e) emissions in the country.[29]

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.[30]

Because of methane's effects on climate, EPA has found that methane, along with five other well-mixed greenhouse gases, endanger public health and welfare within the meaning of the Clean Air Act.[31] The impacts of climate change caused by methane and other greenhouse gases 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."[32] A warming climate will also lead to loss of coastal land in densely populated areas, shrinking snowpack in Western states, increased wildfires, and reduced crop yields.[33] More frequent heat waves as a result of global warming have already 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 climate will lead to

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[28] 76 Fed. Reg. 52,738, 52,792 (Aug. 23, 2011) (EPA proposed air rules for oil and gas production sector), attached as Ex 20.

[29] *Id.* at 52,791–92.

[30] *IPCC 2007—The Physical Science Basis*, Section 2.10.2, attached as Exhibit 21; *see also IPCC 2007-Summary for Policymakers*, attached as Ex. 22. We note that these global warming potential figures may be revised upward in the next IPCC report. A more recent study by Shindell *et al.* estimates methane's 100-year GWP at 33; this same source estimates methane's 20-year GWP at 105.

[31] EPA, Endangerment and Cause or Contribute Findings for Greenhouse Gases, 74 Fed. Reg. 66,496, 66,516 (Dec. 15, 2009) ("Endangerment Finding"), attached as Exhibit 23.

[32] 76 Fed. Reg. at 52,791-22 (citing U.S. EPA, 2011 U.S. GREENHOUSE GAS INVENTORY REPORT EXECUTIVE SUMMARY (2011), http://www.epa.gov/climateexchange/emissions/downloads11/US-GHGInventory-2011-Executive Summary.pdf) attached as Exhibit 24).

[33] *Id.* at 66,532–33.

increased incidence of respiratory and infectious disease, greater air and water pollution, increased malnutrition, and greater casualties from fire, storms, and floods.[34] Vulnerable populations—such as children, the elderly, and those with existing health problems—are the most at risk from these threats.

Further, though natural gas, when burned, produces less greenhouse gas pollution than other fuels, like coal and oil, these benefits are offset by the production sector's status as the largest domestic methane source. These emissions emerge from all facilities in the sector, but well completions are among the largest single sources. EPA recently estimated methane emissions from a conventional well completion at only 0.76 tons, while an unconventional well completion yielded 150.6 tons of methane.[35] Conventional wells remain the largest *overall* source, however, as unconventional wells still constitute a minority of all wells. Thus, whether Cove Point would stimulate unconventional production (as it claims) or conventional production, it will accelerate greenhouse gas emissions from the industry.

Numerous studies have attempted to calculate just how much these upstream methane emissions degrade natural gas's combustion advantage over coal. Although most studies find that natural gas retains *some* advantage, that advantage is clearly diminished. The one of the most recent of these studies, a report from the Worldwatch Institute and Deutsche Bank,[36] synthesizes three other reports, which were prepared by Dr. Robert Howarth et al., of Cornell,[37] Mohan Jiang et al. of Carnegie-Mellon,[38] and Timothy Skone of NETL.[39] As the figure below shows, whether viewed in absolute terms as a very large methane source, on in relative terms in the context of energy production, increased gas extraction is accompanied by increased greenhouse gas emissions.

Figure 3:

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[34] EPA, *Climate Change, Health and Environmental Effects, available at* http://epa.gov/climatechange/effects/health.html, attached hereto as Exhibit 25.

[35] EPA, *Oil and Natural Gas Sector: Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution; Background Technical Support Document for Proposed Standards* (July 2011) at Table 4-6, attached as Exhibit 26.

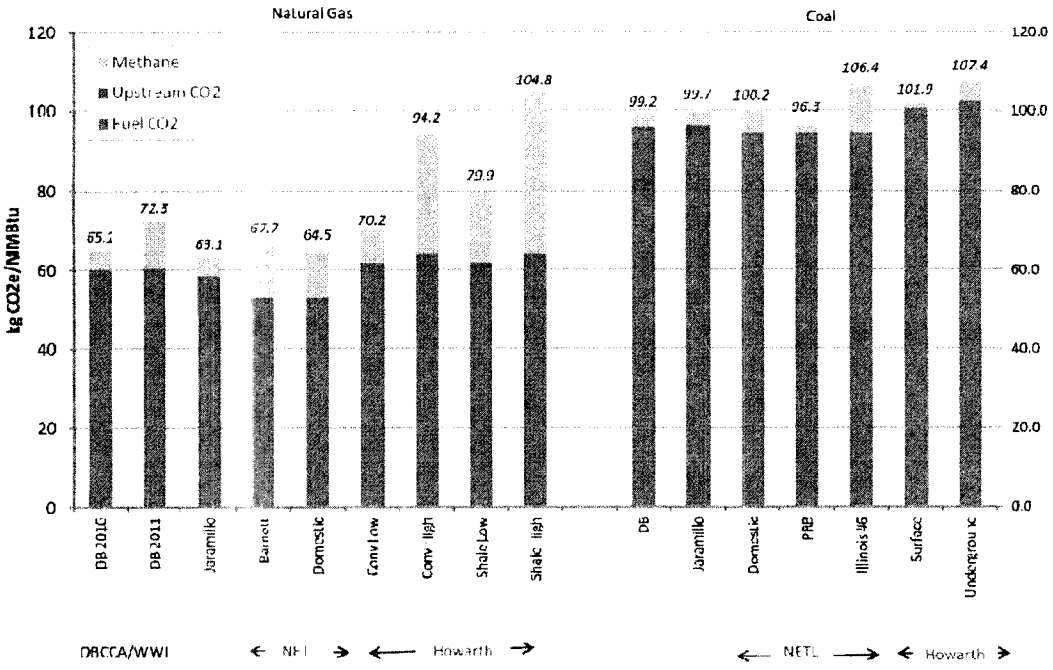
[36] Mark Fulton *et al.*, *Comparing Life-Cycle Greenhouse Gas Emissions from Natural Gas and Coal* (Aug. 25, 2011), attached as Ex. 27.

[37] Robert W. Howarth *et al.*, *Methane and the greenhouse-gas footprint of natural gas from shale formations*, Climactic Change (Mar. 2011), attached as Ex. 28.

[38] Mohan Jiang *et al.*, *Life cycle greenhouse gas emissions of Marcellus shale gas*, Environ. Res. Letters 6 (Aug. 2011), attached as Ex. 29.

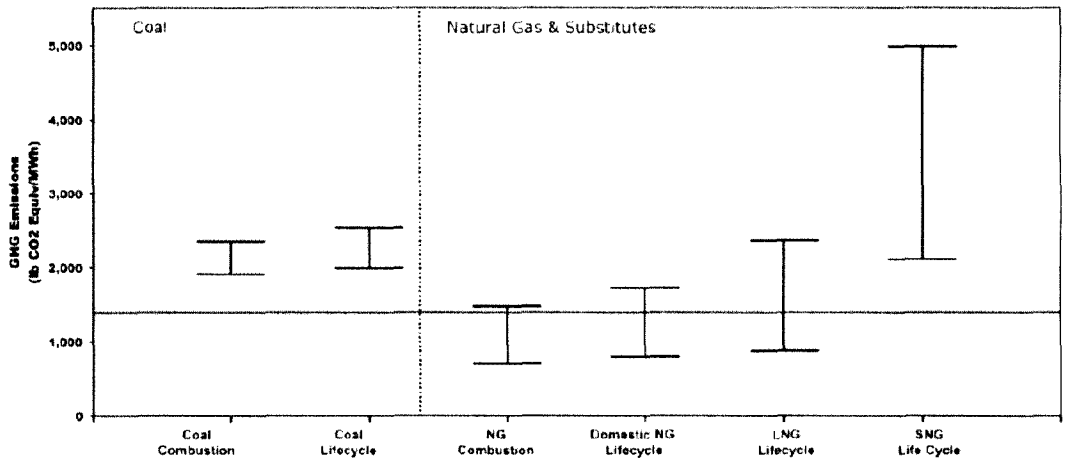
[39] Timothy J. Skone, *Life Cycle Greenhouse Gas Analysis of Natural Gas Extraction and Delivery in the United States*, Presentation to Cornell (May 12, 2011), attached as Ex. 30.. NETL has also put out a fuller version of this analysis. *See* Timothy J. Skone, *Life Cycle Greenhouse Gas Inventory of Natural Gas Extraction, Delivery and Electricity Production* (Oct. 24, 2011), attached as Ex. 31..

Comparison of NG and Coal Burnertip GHG Emissions in Recent LCAs



And there is still another wrinkle in the context of LNG. Because LNG requires additional energy to liquefy, transport, and then regasify, its energy and emissions lifecycle releases substantially more greenhouse pollution than that of gas generally, whether conventionally or unconventionally sourced. In fact, according to the only published lifecycle study of LNG used for electricity generation of which we are aware, these upstream emissions are sufficient to push LNG lifecycle emissiosn well above those of natural gas generally, and into the range of coal emissions.

Figure 4: Life-Cycle Emissions of LNG, Natural Gas, and Coal in Electricity Generation[40]



Notably, this study was conducted before EPA raised its emissions estimates for natural gas, and before unconventional gas plays boomed. Because unconventional gas already ahs higher emissions than conventional gas, *liquefied* unconventional gas will have higher emissions still, further erasing any daylight between LNG and coal emissions in electric power. Thus, DCP's claim that natural gas "significantly reduces total greenhouse gas emissions," which it offers as a justification for export, *see* DCP Application at 19, is plainly unsupported.

Finally, natural gas use, and LNG export in particular, can increase greenhouse gas pollution by displacing other fuels and renewable energy. This can happen in two ways: Cheap gas may outcompete renewable energy in some markets. Second, perversely, more expensive gas may actually drive some utilities towards coal, rather than renewables, if renewables are deemed more expensive than available coal resources. This is precisely what the EIA projects will happen if LNG exports go forward, raising gas prices. According to the EIA, LNG exports would benefit renewable power somewhat (by raising gas prices) but would benefit coal power more (because coal appears cheaper than renewables in some markets). The result is yet more greenhouse gas pollution, in each of the EIA's cases, as the table below demonstrates:

[40] From Jaramillo et al., *Comparative Life-Cycle Air Emissions of Coal, Domestic Natural Gas, LNG, and SNG for Electricity Generation*, 41 Environ. Sci. Technol. 6,290, 6,295 (2007), attached as Ex. 32. "SNG," in the figure, refers to synthetic natural gas made from coal.

Table 4: Cumulative CO_2 Emissions from 2015 to 2035 With Various Export Scenarios[41]

Case	no added exports	low/slow	low/rapid	high/slow	high/rapid
Reference					
Cumulative carbon dioxide emissions	125,056	125,699	125,707	126,038	126,283
Change from baseline		643	651	982	1,227
Percentage change from baseline		0.5%	0.5%	0.8%	1.0%
High Shale EUR					
Cumulative carbon dioxide emissions	124,230	124,888	124,883	125,531	125,817
Change from baseline		658	653	1,301	1,587
Percentage change from baseline		0.5%	0.5%	1.0%	1.3%
Low Shale EUR					
Cumulative carbon dioxide emissions	125,162	125,606	125,556	125,497	125,670
Change from baseline		444	394	335	508
Percentage change from baseline		0.4%	0.3%	0.3%	0.4%
High Economic Growth					
Cumulative carbon dioxide emissions	131,675	131,862	132,016	131,957	132,095
Change from baseline		187	341	282	420
Percentage change from baseline		0.1%	0.3%	0.2%	0.3%

Source: U.S. Energy Information Administration, National Energy Modeling System, with emissions related to natural gas assumed to be consumed in the liquefaction process included.

In short: exports will drive increased natural gas production, which will increase absolute methane emissions. This gas will be converted to LNG, emitting so much carbon dioxide in the process that, when burned, the fuel is roughly equivalent to coal. Meanwhile, higher prices at home will increase the use of coal power, all else being equal, adding yet another increment of emissions. The conclusion is quite clear: LNG export is disastrously bad climate policy.

Finally, we note that methane also reacts in the atmosphere to form ozone.[42] As we discuss below, 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.

Volatile Organic Compounds (VOCs) and NO_x: VOCs and NO_x contribute to the formation of ground-level ozone (also referred to as smog). Smog pollution harms the

[41] From the *EIA Study* at 19.
[42] 76 Fed. Reg. at 52,791

respiratory system and has been linked to premature death, heart failure, chronic respiratory damage, and premature aging of the lungs.[43] 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.[44]

Significant ozone pollution also damages plants and ecosystems.[45] 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.[46]

The gas industry is a major source of the ozone precursors VOCs and NO_x.[47] VOCs are emitted from well drilling and completions, compressors, pneumatic devices, storage tanks, processing plants, and fugitives from production and transmission.[48] The primary sources of NO_x are compressor engines, turbines, and other engines used in drilling and hydraulic fracturing.[49] NO_x is also produced when gas is flared or used for heating.[50]

As a result of significant VOC and NO_x emissions associated with oil and gas development, numerous areas of the country with heavy concentrations of drilling are now suffering from serious ozone problems. For example, the Dallas Fort Worth area in Texas is home to substantial oil and gas development. Within the Barnett shale region, as of September 2011, there were more than 15,306 gas wells and another 3,212 wells

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[43] RIA at 4-25; 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, attached as Exhibit 33.

[44] *See* EPA, *Ground-Level Ozone, Health Effects, available at* http://www.epa.gov/glo/health.html attached hereto as Exhibit 23. EPA, Nitrogen Dioxide, Health, available at http://www.epa.gov/air/nitrogenoxides/health.html, attached hereto as Exhibit 34.

[45] RIA at 4-26.

[46] *Id. See also* 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, attached hereto as Exhibit 35.

[47] *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, attached hereto as Exhibit 35.

[48] *See, e.g.,* TSD at 4-7, 5-6, 6-5, 7-9, 8-1; *see also* Barnett Shale Report at 24.

[49] *See, e.g.,* TSD at 3-6; *See also* Barnett Shale Report at 24. *Air Quality Impact Analysis Technical Support Document for the Revised Draft Supplemental Environmental Impact Statement for the Pinedale Anticline Oil and Gas Exploration and Development Project* at 11 (Table 2.1).

[50] TSD at 3-6; Colorado Department of Public Health and Environment, *Colorado Visibility and Regional Haze State Implementation Plan for the Twelve Mandatory Class I Federal Areas in Colorado*, Appendix D at 1 (2011), available at http://www.cdphe.state.co.us/ap/RegionalHaze/AppendixD/4-FactorHeaterTreaters07JAN2011FINAL.pdf..

permitted.[51] Of the nine counties surrounding the Dallas Forth Worth area that EPA has designated as "nonattainment" for ozone, five contain significant oil and gas development.[52] A 2009 study found that summertime emissions of smog-forming pollutants from these counties were roughly comparable to emissions from motor vehicles in those areas.[53]

Oil and gas development has also brought serious ozone pollution problems to rural areas, such as western Wyoming.[54] On March 12, 2009, the governor of Wyoming recommended that the state designate Wyoming's Upper Green River Basin as an ozone nonattainment area.[55] The Wyoming Department of Environmental Quality conducted an extended assessment of the ozone pollution problem and found that it was "primarily due to local emissions from oil and gas . . . development activities: drilling, production, storage, transport, and treating."[56] Last winter alone, the residents of Sublette County suffered thirteen days with ozone concentrations considered "unhealthy" under EPA's current air-quality index, including days when the ozone pollution levels exceeded the worst days of smog pollution in Los Angeles.[57] Residents have faced repeated warnings regarding elevated ozone levels and the resulting risks of going outside.[58]

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[51] Texas Railroad Commission, http://www.rrc.state.tx.us/data/fielddata/barnettshale.pdf (Accessed Nov. 21, 2011), attached hereto as Exhibit 37.

[52] Barnett Shale Report at 1, 3.

[53] *Id.* at 1, 25-26.

[54] Schnell, R.C, et al. (2009), "Rapid photochemical production of ozone at high concentrations in a rural site during winter," *Nature Geosci.* 2 (120 – 122). DOI: 10.1038/NGEO415, attached hereto as Exhibit 38.

[55] *See* Letter from Wyoming Governor Dave Freudenthal to Carol Rushin, Acting Regional Administrator, USEPA Region 8, (Mar. 12, 2009) ("Wyoming 8-Hour Ozone Designation Recommendations"), *available at* http://deq.state.wy.us/out/downloads/Rushin%20Ozone.pdf, attached hereto as Exhibit 39; Wyoming Department of Environmental Quality, Technical Support Document I for Recommended 8-hour Ozone Designation of the Upper Green River Basin (March 26, 2009) ("Wyoming Nonattainment Analysis"), at vi-viii, 23-26, 94-05, *available at* http://deq.state.wy.us/out/downloads/Ozone%20TSD_final_rev%203-30-09_jl.pdf, attached hereto as Exhibit 40.

[56] Wyoming Nonattainment Analysis at viii.

[57] EPA, *Daily Ozone AQI Levels in 2011 for Sublette County, Wyoming, available at* http://www.epa.gov/cgi-bin/broker?msaorcountyName=countycode&msaorcountyValue=56035&poll=44201&county=56035&msa=-1&sy=2011&flag=Y&_debug=2&_service=data&_program=dataprog.trend_tile_dm.sas, attached hereto as Exhibit 41.; *see also* Wendy Koch, *Wyoming's Smog Exceeds Los Angeles' Due to Gas Drilling*, USA Today, *available at* http://content.usatoday.com/communities/greenhouse/post/2011/03/wyomings-smog-exceeds-los-angeles-due-to-gas-drilling/1, attached hereto as Exhibit 42.

[58] *See, e.g., 2011 DEQ Ozone Advisories*, Pinedale Online! (Mar. 17, 2011) (documenting ten ozone advisories in February and March 2011), *available at* http://www.pinedaleonline.com/news/2011/03/OzoneCalendar.htm, attached hereto as Exhibit 33; Wyoming Department of Environmental Quality, Ozone Advisory for Monday, Feb. 28, Pinedale Online! (Feb. 27, 2011), *available at* http://www.pinedaleonline.com/news/2011/02/OzoneAdvisoryforMond.htm, attached hereto as Exhibit 43

Ozone problems are mounting in other Rocky Mountain states as well. Northeastern Utah recorded unprecedented ozone levels in the Uintah Basin in 2010 and 2011. In the first three months of 2010—which was the first time that winter ozone was monitored in the region—air quality monitors measured more than 68 exceedances of the federal health standard. On three of these days, the levels were almost twice the federal standard.[59] Between January and March 2011, there were 24 days where the National Ambient Air Quality Standard (NAAQS) for ozone were exceeded in the area. Again, ozone pollution levels climbed to nearly twice the federal standard.[60] The Bureau of Land Management (BLM) has identified the multitude of oil and gas wells in the region as the primary cause of the ozone pollution.[61]

Rampant oil and gas development in Colorado and New Mexico is also leading to high levels of VOCs and NO_x. In 2008, the Colorado Department of Public Health and Environment concluded that the smog-forming emissions from oil and gas operations exceed vehicle emissions for the entire state.[62] Moreover, significant additional drilling has occurred since 2008. Colorado is now home to more than 46,000 wells.[63] There is also significant development in the San Juan Basin in southeastern Colorado and northwestern New Mexico, with approximately 35,000 wells in the Basin. As a result of this development and several coal-fired power plants in the vicinity, the Basin suffers from serious ozone pollution.[64] This pollution is taking a toll on residents of San Juan County. The New Mexico Department of Public Health has documented increased emergency room visits associated with high ozone levels in the County.[65]

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[59] Scott Streater, *Air Quality Concerns May Dictate Uintah Basin's Natural Gas Drilling Future*, N.Y. TIMES, Oct. 1, 2010, *available at* http://www.nytimes.com/gwire/2010/10/01/01greenwire-air-quality-concerns-may-dictate-uintah-basins-30342.html?pagewanted=1 (last visited Sept. 28, 2011), attached hereto as Exhibit 44.

[60] *See* EPA, AirExplorer, Query Concentrations (Ozone, Uintah County, 2011), available at http://www.epa.gov/cgi-bin/htmSQL/mxplorer/query_daily.hsql?msaorcountyName=countycode&msaorcountyValue=49047&poll=44201&county=49047&site=-1&msa=-1&state=-1&sy=2011&flag=Y&query=download&_debug=2&_service=data&_program=dataprog.query_daily3P_dm.sas, attached hereto as Exhibit 45.

[61] BLM, *GASCO Energy Inc. Uinta Basin Natural Gas Development Draft Environmental Impact Statement* ("GASCO DEIS"), at 3-13, *available at* http://www.blm.gov/ut/st/en/fo/vernal/planning/nepa_/gasco_energy_eis.html, attached hereto as Exhibit 46.

[62] Colo. Dept. of Public Health & Env't, Air Pollution Control Division, Oil and Gas Emission Sources, *Presentation for the Air Quality Control Commission Retreat*, at 3-4 (May 15, 2008), attached hereto as Exhibit 47.

[63] Colorado Oil & Gas Conservation Commission, *Colorado Weekly & Monthly Oil and Gas Statistics*, at 12 (Nov. 7, 2011), available at http://cogcc.state.co.us/ (library—statistics—weekly/monthly well activity), attached hereto as Exhibit 48.

[64] *See Four Corners Air Quality Task Force Report of Mitigation Options*, at vii (Nov. 1, 2007), *available at* http://www.nmenv.state.nm.us/aqb/4C/TaskForceReport.html, attached hereto as Exhibit 49.

[65] Myers *et al.*, *The Association Between Ambient Air Quality Ozone Levels and Medical Visits for Asthma in San Juan County* (Aug. 2007), *available at*

Air quality in national parks and wilderness areas is also suffering as a result of oil and gas development. Researchers have determined that numerous "Class I areas" – a designation reserved for national parks, wilderness areas, and other such lands[66] – 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.[67] These areas are all near concentrated oil and gas development in the San Juan Basin.[68]

As oil and gas development moves into new areas, particularly as a result of the boom in development of shale resources, ozone problems are likely to follow. For example, regional air quality models predict that gas development in the Haynesville shale will increase ozone pollution in northeast Texas and northwest Louisiana and may lead to violations of ozone NAAQS.[69] Experts also anticipate air quality problems associated with development of the Marcellus shale in the Mid-Atlantic region.[70] In particular, the state of Delaware has conducted an extensive analysis of NOx pollution from the oil and gas sector, in part because Delaware is downwind from the gas plays which projects like Cove Point would support.[71] It demonstrates that Delaware and other downwind states will experience significant NOx pollution if production increases without appropriate controls.

Sulfur dioxide: 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.[72] PM is discussed separately below.

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http://www.nmenv.state.nm.us/aqb/4c/Documents/SanJuanAsthmaDocBW.pdf, attached hereto as Exhibit 50.

[66] *See* 42 U.S.C. § 7472(a).

[67] 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, attached hereto as Exhibit 51.

[68] *Id.* at 1112.

[69] *See* Kemball-Cook et al., *Ozone Impacts of Natural Gas development in the Haynesville Shale* 44 Environ. Sci. Technol. 9357, 9362 (Nov. 18, 2010), attached hereto as Exhibit 52.

[70] Elizabeth Shogren, *Air Quality Concerns Threaten Natural Gas's Image*, National Public Radio (June 21, 2011), *available at* http://www.npr.org/2011/06/21/137197991/air-quality-concerns-threaten-natural-gas-image, attached hereto as Exhibit 53.

[71] *See* Delaware Department of Natural Resources and Environmental Quality, *Background Information Oil and Gas Sector Significant Sources of NOx Emissions* (2011) attached as Exhibit 54.

[72] EPA, Sulfur Dioxide, Health, *available at* http://www.epa.gov/air/sulfurdioxide/health.html, attached hereto as Exhibit 55.

The primary source of sulfur dioxide from the oil and gas industry is natural gas processing plants.[73] Sulfur dioxide is released as part of the sweetening process, which removes hydrogen sulfide from the gas.[74] Sulfur dioxide is also created when gas containing hydrogen sulfide (discussed below) is combusted in boilers or heaters.[75]

Hydrogen sulfide: 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.[76] Although hydrogen sulfide was originally included in the Clean Air Act's list of hazardous air pollutants, it was removed with industry support.[77]

Some natural gas contains hydrogen sulfide. When hydrogen sulfide levels are above a specific threshold, gas is classified as "sour gas."[78] According to EPA, there are 14 major areas in the U.S., found in 20 different states, where natural gas tends to be sour.[79] All told, between 15 and 20% of the natural gas in the U.S. may contain hydrogen sulfide.[80]

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."[81] Hydrogen sulfide may be emitted during all stages of development, including exploration, extraction, treatment and storage, transportation, and refining.[82] For

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[73] 76 Fed. Reg. at 52,756.

[74] TSD 3-3 to 3-5.

[75] 76 Fed. Reg. at 52,756.

[76] 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/R-93-045), at i (Oct. 1993) (hereinafter "EPA Hydrogen Sulfide Report"); *available at* http://nepis.epa.gov/Exe/ZyNET.exe/00002WG3.TXT?ZyActionD=ZyDocument&Client=EPA&Index=1991+Thru+1994&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C91thru94%5CTxt%5C00000006%5C00002WG3.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=p%7Cf&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL, attached hereto as Exhibit 56.

[77] *See* Pub. L. 102-187 (Dec. 4, 1991). We do not concede that this approval was appropriate. Hydrogen sulfide meets section 112 of the Clean Air Act's standards for listing as a hazardous air pollutant, and should be so regulated.

[78] 76 Fed. Reg. at 52,756. Gas is considered "sour" of hydrogen sulfide concentration is greater than 0.25 grain per 100 standard cubic feet, along with the presence of carbon dioxide. *Id.*

[79] *EPA Hydrogen Sulfide Report* at ii.

[80] 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, attached hereto as Exhibit 57.

[81] *EPA Hydrogen Sulfide R*eport at III-35.

[82] *Id.* at ii.

example, hydrogen sulfide is emitted as a result of leaks from processing systems and from wellheads in sour gas fields.[83]

Hydrogen sulfide emissions from the oil and gas industry are concerning because this pollutant may be harmful even at low concentrations.[84] 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. For example, North Dakota reported 3,300 violations of an odor-based hydrogen sulfide standard around drilling wells.[85] People in northwest New Mexico and western Colorado living near gas wells have long complained of strong odors, including but not limited to hydrogen sulfide's distinctive rotten egg smell. Residents have also experienced nose, throat and eye irritation, headaches, nose bleeds, and dizziness.[86] An air sample taken by a community monitor at one family's home in western Colorado in January 2011 contained levels of hydrogen sulfide concentrations 185 times higher than safe levels.[87]

Particulate Matter (PM): 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 (PM_{10}), and "fine particles" which are less than 2.5 micrometers in diameter ($PM_{2.5}$). PM_{10} 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.[88]

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.[89] PM also reduces visibility,[90] and may damage important cultural resources.[91] Black carbon, a

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[83] TSD at 2-3.

[84] *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, attached hereto as Exhibit 58.

[85] EPA Hydrogen Sulfide Report at III-35.

[86] *See* Global Community Monitor, *Gassed! Citizen Investigation of Toxic Air Pollution from Natural Gas Development*, at 11-14 (July 2011), attached hereto as Exhibit 59.

[87] *Id.* at 21.

[88] *See* EPA, Particulate Matter, Health, *available at* http://www.epa.gov/pm/health.html, attached hereto as Exhibit 60; 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..

[89] RIA at 4-19; EPA, Particulate Matter, Health, *available at* http://www.epa.gov/pm/health.html

[90] EPA "Visibility – Basic Information" http://www.epa.gov/visibility/what.html, attached hereto as Exhibit 61.

[91] *See* EPA, Particulate Matter, Health West Tavaputs EIS, at 3-19; RIA at 4-24.

component of PM emitted by combustion sources such as flares and older diesel engines, also warms the climate and thus contributes to climate change.[92]

The oil and gas industry is a major source of PM pollution. This pollution is generated by heavy equipment used to move and level earth during well pad and road construction. Vehicles also generate fugitive dust by traveling on access roads during drilling, completion, and production activities.[93] Diesel engines used in drilling rigs and at compressor stations are also large sources of fine PM/diesel soot emissions. VOCs are also a precursor to formation of $PM_{2.5}$.[94]

PM emissions from the oil and gas industry are leading to significant pollution problems. For example, monitors in Uintah County and Duchesne County, Utah have repeatedly measured wintertime $PM_{2.5}$ concentrations above federal standards.[95] These elevated levels of $PM_{2.}$ have been linked to oil and gas activities in the Uinta Basin.[96] West Tavaputs FEIS at 3-20. Modeling also shows that road traffic associated with energy development is pushing PM_{10} levels very close to violating NAAQS standards.[97]

ii. EPA's Air Rules Will Not Fully Address These Air Pollution Problems

Although EPA's proposed new source performance standards and standards for hazardous air pollutants should, if finalized, reduce some of these pollution problems, they will not solve them. The rules, first, do not even address some pollutants, including NOx, methane, and hydrogen sulfide. Second, the rules do not control existing sources of air pollution (though, as proposed, they do require emissions controls at well completions of existing unconventional wells), meaning that increased use of existing infrastructure will produce emissions uncontrolled by the rules. Third, without full enforcement, the rules will not reduce emissions completely. Fourth, the rules will not address important emissions effects of LNG in particular, including LNG exports' tendency to increase the use of coal power. Thus, though DOE/FE might work with EPA to fully understand the emissions levels likely after the rules are fully implemented, it may not rely upon the EPA rules to avoid weighing and disclosing these impacts.

b. Land Use Impacts of Gas Production

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

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[92] UNEP Report at 6; IPCC (2007) at Section 2.4.4.3.
[93] *See* BLM, GASCO Energy Inc. Uinta Basin Natural Gas Development Project Draft Environmental Impact Statement, at App. J at 2 (Oct. 2010) ("GASCO DEIS")
[94] RIA at 4-18.
[95] GASCO DEIS at 3-12.
[96] West Tavaputs FEIS, at 3-20 (July 2010).
[97] *See* GASCO DEIS at 4-27.

Landscape impacts occur through direct habitat loss, where land is cleared for gas uses, and indirect loss, where land adjacent to direct losses loses some of its important characteristics.

Regarding direct losses, land is lost through development of well pads, roads, pipeline corridors, corridors for seismic testing, and other infrastructure. The Nature Conservancy (TNC) estimated that in Pennsylvania, "Well pads occupy 3.1 acres on average while the associated infrastructure (roads, water impoundments, pipelines) takes up an additional 5.7 acres, or a total of nearly 9 acres per well pad." TNC, Pennsylvania Energy Impacts Assessment, Report 1: Marcellus Shale Natural Gas and Wind (2010) at 10, *see also id.* at 18.[98] New York's Department of Environmental Conservation reached similar estimates. New York Department of Environmental Conservation's Revised Draft Supplemental General Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program, 5-5 (Sept. 2011) (hereinafter "NY RDSGEIS").[99] 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. *Id.* at 6-13. Associated infrastructure such as roads and corridors will likewise remain disturbed. Because these disturbances involve clearing and grading of the land, directly disturbed land is no longer suitable as habitat. *Id.* at 6-68.

Indirect losses occur on land that is not directly disturbed, but where habitat characteristics are affected by direct disturbances. "Adjacent lands can also be impacted, even if they are not directly cleared. This is most notable in forest settings where clearings fragment contiguous forest patches, create new edges, and change habitat conditions for sensitive wildlife and plant species that depend on "interior" forest conditions." TNC, *Pennsylvania Energy Impacts Assessment, Report 1: Marcellus Shale Natural Gas and Wind* at 10. "Research has shown measureable impacts often extend at least 330 feet (100 meters) into forest adjacent to an edge." NY RDSGEIS 6-75.

TNC's study study of the impacts of gas extraction in Pennsylvania is particularly telling. TNC mapped projected wells across the state, considering how the wells and their associated infrastructure, including roads and pipelines, interacted with the landscape. TNC's conclusions make for grim reading. It concluded:

- About 60,000 new Marcellus wells are projected by 2030 in Pennsylvania with a range of 6,000 to 15,000 well pads, depending on the number of wells per pad;

- Wells are likely to be developed in at least 30 counties, with the greatest number concentrated in 15 southwestern, north central, and northeastern counties;

- Nearly two thirds of well pads are projected to be in forest areas, with forest clearing projected to range between 34,000 and 83,000 acres depending on the number of number of well pads that are

[98] Attached as Ex. 62

[99] Available at http://www.dec.ny.gov/energy/75370.html

developed. An additional range of 80,000 to 200,000 acres of forest interior habitat impacts are projected due to new forest edges created by well pads and associated infrastructure (roads, water impoundments);

· On a statewide basis, the projected forest clearing from well pad development would affect less than one percent of the state's forests, but forest clearing and fragmentation could be much more pronounced in areas with intensive Marcellus development;

· Approximately one third of Pennsylvania's largest forest patches (>5,000 acres) are projected to have a range of between 1 and 17 well pads in the medium scenario;

· Impacts on forest interior breeding bird habitats vary with the range and population densities of the species. The widely-distributed scarlet tanager would see relatively modest impacts to its statewide population while black-throated blue warblers, with a Pennsylvania range that largely overlaps with Marcellus development area, could see more significant population impacts;

· Watersheds with healthy eastern brook trout populations substantially overlap with projected Marcellus development sites. The state's watersheds ranked as "intact" by the Eastern Brook Trout Joint Venture are concentrated in north central Pennsylvania, where most of these small watersheds are projected to have between two and three dozen well pads;

· Nearly a third of the species tracked by the Pennsylvania Natural Heritage Program are found in areas projected to have a high probability of Marcellus well development, with 132 considered to be globally rare or critically endangered or imperiled in Pennsylvania. Several of these species have all or most of their known populations in Pennsylvania in high probability Marcellus gas development areas.

· Marcellus gas development is projected to be extensive across Pennsylvania's 4.5 million acres of public lands, including State Parks, State Forests, and State Game Lands. Just over 10 percent of these lands are legally protected from surface development.

TNC, *Pennsylvania Energy Impacts Assessment, Report 1: Marcellus Shale Natural Gas and Wind* (2010) at 29.[100] Increased gas production will exacerbate these problems, which is bad news for the state's lands and wildlife, and the hunting, angling, tourism, and forestry industries which depend upon them. Although TNC adds that impacts could be reduced with proper planning, *id.*, more development makes mitigation more difficult. Indeed, the Pennsylvania Department of Conservation and Natural Resources recently concluded that "zero" remaining acres of the state forests are suitable for leasing with surface disturbing activities, or the forests will be significantly degraded. PA DCNR, *Impacts of Leasing Additional State Forest for Natural Gas Development* (2011).[101] These costs are not in the public interest.

These effects will harm rural economies and decrease property values, as major gas infrastructure transforms and distorts the existing landscape. They will also harm endangered species in Pennsylvania, Maryland, and other states where production would increase in response to DCP's exports. Dozens of endangered and threatened

[100] Attached as Ex. 63.
[101] Attached as Ex. 64.

species inhabit the region, including in forests, streams, and coastal areas which will be affected by gas development.[102] Harm to these species and their habitat is, too, against the profound public interest in species conservation, as expressed in the Endangered Species Act and similar statutes.

c. Water Impacts of Gas Production

Hydraulic fracturing involves injecting water,[103] 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. 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.

i. Water Withdrawals

The first step is the procurement of water. Fracking a Marcellus Shale well requires between 4 and 5 million gallons of water. TNC, *Pennsylvania Energy Impacts Assessment, Report 1: Marcellus Shale Natural Gas and Wind*, 5.[104] Even where operators recycle "flowback" water from the fracking of one well for use in fracking

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[102] *See* Maryland DNR, *Rare, Threatened & Endangered Animals* & *Rare, Threatened & Endangered Plants* (2012), attached as Ex 65; Pennsylvania Game Commission, *Threatened and Endangered Species* (2012), attached as Ex 66. Indeed, according to FERC, seven endangered and threatened species use areas in the vicinity of Cove Point itself, including the Northeastern beech beetle, the puritan tiger beetle, the shortnose sturgeon, Kemp's Ridley sea turtle, green sea turtle, leatherback sea turtle, and loggerhead sea turtle. FERC, EA for the Cove Point LNG Project (2001). If DCP's proposal harms any of these species, or their habitat, directly or indirectly, it will be against the public interest. DOE/FE must consider harms to all endangered and threatened species in its public interest analysis.

[103] The majority of hydraulic fracturing operations are conducted with a water based fracturing fluid. Fracking may also be conducted with an oil or synthetic-oil based fluid, with foam, or with gas.

[104] Accord New York Department of Environmental Conservation's *Revised Draft Supplemental General Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program*, (September 2011) ("Between July 2008 and February 2011, average water usage for high-volume hydraulic fracturing within the Susquehanna River Basin in Pennsylvania was 4.2 million gallons per well, based on data for 553 wells."), *available at* http://www.dec.ny.gov/data/dmn/rdsgeisfull0911.pdf. Other estimates are that as much as 7.2 million gallons of frack fluid may be used in a 4000 foot well bore. NRDC, *et al.*, *Comment on NY RDSGEIS on the Oil, Gas and Solution Mining Regulatory Program* (Jan. 11, 2012) (Attachment 2, Report of Tom Myers, at 10), attached as exhibit 67 (hereafter *Comment on NY RDSGEIS*).

Water needs in other geological formations vary. Ex. ????, DOE, Secretary of Energy's Advisory Board, *Shale Gas Production Subcommittee First 90-Day Report* (August 18, 2011) at 19 (estimating that nationwide, fracking an individual well requires between 1 and 5 million gallons of water).

another well, recycled water constitutes only a minority of the water used, with fresh water constituting 80% to 90% of the water used in the second fracking job. New York Department of Environmental Conservation's *Revised Draft Supplemental General Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program*, 6-13 (Sept. 2011) (hereinafter "NY RDSGEIS").[105]

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. *Id.* 6-3 to 6-4. Even when flow reductions are not themselves problematic, the intake structures can harm aquatic organisms. *Id.* at 6-4. Where water is withdrawn from aquifers, rather than surface sources, withdrawal risks permanent depletion. 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. *Id.* 6-5; DOE Subcommittee First 90 day report at 19 ("in some regions and localities there are significant concerns about consumptive water use for shale gas development.").

ii. Fracturing

Fracturing 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. NY RDSGEIS 5-40. Chemicals are added as solvents, surfactants, friction reducers, gelling agents, bactericides, and for other purposes. *Id.* 5-49. New York recently identified 322 unique ingredients used in fluid additives, recognizing that this constituted a partial list. *Id.* 5-41. 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. *Id.* 5-75 to 5-78. Many of these chemicals present health risks. *Id.* Of particular note is the use of diesel, which the DOE Subcommittee has singled out for its harmful effects and

[105] Attached as exhibit 68.

recommended be banned from use as a fracturing fluid additive. DOE Subcommittee First 90-Day Report, 25. The minority staff of the House Committee on Energy and Commerce determined that despite diesel's risks, between 2005 and 2009 "oil and gas service companies injected 32.2 million gallons of diesel fuel or hydraulic fracturing fluids containing diesel fuel in wells in 19 states." Natural Resources Defense Council, Earthjustice, and Sierra Club, *Comments [to EPA] on Permitting Guidance for Oil and Gas Hydraulic Fracturing Activities Using Diesel Fuels* (June 29, 2011) at 3 (quoting Letter from Reps. Waxman, Markey, and DeGette to EPA Administrator Lisa Jackson (Jan. 31, 2001) at 1) (hereafter Comment on Diesel Guidance).[106]

Contamination may also result from chemicals naturally occurring in the formation. Flowback and produced water "may include brine, gases (e.g. methane, ethane), trace metals, naturally occurring radioactive elements (e.g. radium, uranium) and organic compounds."DOE Subcommittee first 90 day report at 21; *see also* Comment on NY RDSGEIS (attachment 3, Report of Glen Miller, at 2). For example, mercury naturally occurring in the formation becomes mixed in with water-based drilling muds, resulting in up to 5 pounds of mercury in the mud per well drilled in the Marcellus region. Comment on NY RDSGEIS (attachment 1, Report of Susan Harvey, at 92).

There are several vectors by which these chemicals can reach groundwater supplies. Perhaps the most common or significant are inadequacies in the casing of the vertical well bore. DOE Subcommittee First 90 Day Report, 20. The well bore inevitably passes through geological strata containing groundwater, and therefore provides a conduit by which chemicals injected into the well or traveling from the target formation to the surface may reach groundwater. The well casing isolates the groundwater from intermediate strata and the target formation. This casing must be strong enough to withstand the pressures of the fracturing process--the very purpose of which is to shatter rock. Multiple layers of steel casing must be used, each pressure tested before use, then centered within the well bore. Each layer of casing must be cemented, with careful testing to ensure the integrity of the cementing. Comment on Diesel Guidance, 5-9. Proper casing construction is an elaborate engineering effort, with multiple layers of steel casing (that have been pressure tested), centralizers to center the casing in the well bore, careful cementing of the casing strings (together with testing to ensure the integrity of this cementing). *Id.*

Separate from casing failure, contamination may occur when the zone of fractured rock intersects an abandoned and poorly-sealed well or natural conduit in the rock. Comment on NY RDSGEIS (Attachment 3, Report of Tom Myers, 12 - 15).

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[106] Attached as Ex. 69.

Available data indicates that fracking has resulting in groundwater contamination in at least five documented 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." DOE Subcommittee first 90 day report at 20 (citing 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)). 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. *Id.* The DOE Subcommittee referred to this as "a recent, credible, peer-reviewed study." *Id.* Two other reports "have documented or suggested the movement of fracking fluid from the target formation to water wells linked to fracking in wells." Comment on NY RDSGEIS (Attachment 2, Report of Tom Meyers, 13). "Thyne (2008)[[107]] had found bromide in wells 100s of feet above the fracked zone." *Id.* "The EPA (1987)[[108]] documented fracking fluid moving into a 416- foot deep water well in West Virginia; the gas well was less than 1000 feet horizontally from the water well, but the report does not indicate the gas-bearing formation." *Id.*

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." EPA, Draft Investigation of Ground Water Contamination near Pavillion, Wyoming (Dec. 2011), at xiii.[109] EPA tested water from wells extending to various depths within the range of local groundwater. At the deeper tested wells, EPA discovered inorganics (potassium, chloride), synthetic organic (isopropanol, glycols, and tert-butyl alcohol), and organics (BTEX, gasoline and diesel range organics) at levels higher than expected. *Id.* at xii. At shallower levels, EPA detected "high concentrations of benzene, xylenes, gasoline range organics, diesel range organics, and total purgeable hydrocarbons." *Id.* at xi. EPA determined that surface pits previously used for storage of drilling wastes and produced/flowback waters were a likely source of contamination for the shallower waters, and that fracturing likely

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[107] Dr. Meyers relied on Thyne, G. 2008. *Review of Phase II Hydrogeologic Study*. Prepared for Garfield County, Colorado.

[108] Environmental Protection Agency. 1987. *Report to Congress, Management of Wastes from the Exploration, Development, and Production of Crude Oil, Natural Gas, and Geothermal Energy, Volume 1 of 3, Oil and Gas.* Washington, D.C.

[109] Attached as exhibit 70, available at http://www.epa.gov/region8/superfund/wy/pavillion/EPA_ReportOnPavillion_Dec-8-2011.pdf

explained the deeper contamination. *Id.* at xi, xiii. Although this is a draft report in an ongoing investigation, it demonstrates a possibility of contamination that DOE must consider in its public interest evaluation.

EPA is also investigating groundwater contamination in Dimock, Pennsylvania. EPA Region III, *Action Memorandum - Request for Funding for a Removal Action at the Dimock Residential Groundwater Site* (Jan. 19, 2012).[110] In Dimock, EPA has determined that "a number of home wells in the Dimock area contain hazardous substances, some of which are not naturally found in the environment." *Id.* at 1. Specifically, wells are contaminated with arsenic, barium, bis(2(ethylhexyl)phthalate, glycol compounds, manganese, phenol, and sodium. *Id.* at 3-4. Many of these chemicals are hazardous substances as defined under CERCLA section 101(14); *see also* 40 C.F.R. § 302.4. EPA's determination is based on "Pennsylvania Department of Environmental Protection (PADEP) and Cabot Oil and Gas Corporation (Cabot) sampling information, consultation with an EPA toxicologist, the Agency for Toxic Substances and Disease Registry (ATSDR) Record of Activity (AROA), issued, 12/28/11, and [a] recent EPA well survey effort." *Id.* The PADEP information provided reason to believe that drilling activities in the area led to contamination of these water supplies. Drilling in the area began in 2008, and was conducted using the hazardous substances that have since been discovered in well water. *Id.* at 1, 2. Shortly thereafter methane contamination was detected in private well water. *Id.* at 2. In addition, there were several surface spills in connection with the drilling operation. *Id.* at 1. After the contamination was detected, PADEP entered a consent decree with Cabot which required permanent restoration or replacement of the water supply. *Id.* at 2. Cabot has installed or is installing a "gas mitigation" system for the affected wells. *Id., see also* Agency for Toxic Substances and Disease Registry, *Record of Activity/Technical Assist* (Dec. 28, 2011) at 2 (hereafter ATSDR).[111]

Pursuant to the consent decree, Cabot was providing replacement water to all 18 homes until November 30, 2011, at which point Cabot halted deliver with PADEP's consent. ATSDR at 2. EPA has intervened because "EPA does not know what, if any, hazardous substances these 'gas mitigation' systems, originally designed to address methane, are removing." EPA Action Memorandum at 2. EPA plans to sample water from approximately 61 home wells, and to provide alternative drinking water supplies to the four homes with the most contaminated wells in the interim. *Id.* at 6.

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[110] Attached as exhibit 71, available at http://www.epaosc.org/sites/7555/files/Dimock%20Action%20Memo%2001-19-12.PDF

[111] Attached as exhibit 72, available at http://www.epa.gov/aboutepa/states/dimock.pdf.

iii. Waste Management

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 contain the same contaminants described in the preceding section. They present environmental hazards with regard to their onsite management and with their eventual disposal.

On site, drilling mud, drill cuttings, flowback and produced water are often stored in pits. Such open pits can have harmful air emissions, can leach into shallow groundwater water, and can fail and result in surface discharges. Many of these harms can be minimized by the use of seal tanks in a "closed loop" system. *See, e.g.*, NY RDSGEIS at 1-12. Presently, only New Mexico mandates the use of closed loop waste management systems, and pits remain in use elsewhere.

Flowback and produced water must ultimately be disposed of off site. Some of these fluids may be recycled and used in further fracturing operations, but even where a fluid recycling program is used, recycling leaves concentrated contaminants that must be disposed of. 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. Gas production wastes are not categorized as hazardous under the Safe Drinking Water Act, 42 U.S.C. § 300f *et seq.*, and may be disposed of in Class II injection wells. Class II wells are brine wells, and the standards and safeguards in place for these wells were not designed with the contaminants found in fracking wastes in mind. *See also* NRDC *et al.*, Petition for Rulemaking Pursuant to Section 6974(a) of the Resource Conservation and Recovery Act Concerning the Regulation of Wastes Associated with the Exploration, Development, or Production of Crude Oil or Natural Gas or Geothermal Energy (Sept. 8, 2010).[112]

Additionally, underground injection of fracking wastes appears to have induced earthquakes in several regions. Underground injection of fracking waste in Ohio has been correlated with earthquakes as high as 4.0 on the Richter scale. Columbia University, Lamont-Doherty Earth Observatory, *Ohio Quakes Probably Triggered by*

[112] Attached as exhibit 73, available at http://docs.nrdc.org/energy/files/ene_10091301a.pdf

Waste Disposal Well, Say Seismologists (Jan. 6, 2012).[113] Underground injection may cause earthquakes by causing movement on existing fault lines: "Once fluid enters a preexisting fault, it can pressurize the rocks enough to move; the more stress placed on the rock formation, the more powerful the earthquake." *Id.* Underground injection is more likely than fracking to trigger large earthquakes via this mechanism, "because more fluid is usually being pumped underground at a site for longer periods." *Id.* In light of the apparent induced seismicity, Ohio has put a moratorium on injection in the affected region. *Id.* Similar associations between earthquakes and injection have occurred in Arkansas, Texas, Oklahoma and the United Kingdom. *Id.*, Alexis Flynn, *Study Ties Fracking to Quakes in England*, Wall Street Journal (Nov. 3, 2011).[114] In light of these effects, Ohio and Arkansas have placed moratoriums on injection in the affected areas. Lamont-Doherty Earth Observatory; Arkansas Oil and Gas Commission, *Class II Commercial Disposal Well or Class II Disposal Well Moratorium* (Aug. 2, 2011).[115]

As an alternative to underground injection, flowback and produced water is also sent to water treatment facilities, leading to eventual surface discharge. This presents a separate set of environmental hazards, because these facilities (particularly publicly owned treatment works) are not designed to handle the nontraditional pollutants found in fracking wastes. For example:

> One serious problem with the proposed discharge (dilution) of fracture treatment wastewater via a municipal or privately owned treatment plant is the observed increases in trihalomethane (THM) concentrations in drinking water reported in the public media (Frazier and Murray, 2011), due to the presence of increased bromide concentrations. Bromide is more reactive than chloride in formation of trihalomethanes, and even though bromide concentrations are generally lower than chloride concentrations, the increased reactivity of bromide generates increased amounts of bromodichloromethane and dibromochloromethane (Chowdhury, et al., 2010). Continued violations of an 80microgram/L THM standard may ultimately require a drinking water treatment plant to

[113] Attached as exhibit 74, available at http://www.ldeo.columbia.edu/news-events/seismologists-link-ohio-earthquakes-waste-disposal-wells

[114] Attached as exhibit 75, available at http://online.wsj.com/article/SB10001424052970203804204577013771109580352.html

[115] Attached as exhibit 76, available at http://www.aogc.state.ar.us/Hearing%20Orders/2011/July/180A-2-2011-07.pdf

> convert from a standard and cost effective chlorination disinfection treatment to a more expensive chloramines process for water treatment. Although there are many factors affecting THM production in a specific water, simple (and cheap) dilution of fracture treatment water in a stream can result in a more expensive treatment for disinfection of drinking water. This transfer of costs to the public should not be permitted.

Comment on NY RDSGEIS (attachment 3, Report of Glen Miller, at 13). Similarly, municipal treatment works typically to not treat for radioactivity, whereas produced water can have high levels of naturally occurring radioactive materials. In one examination of three samples of produced water, radioactivity (measured as gross alpha radiation) were found ranging from 18,000 pCi / L to 123,000 pCi/L, whereas the safe drinking water standard is 15 pCi/L. *Id.* (Miller Report at 4).

d. Summary of Environmental Impacts

In short, DOE/FE's proposal would have major environmental effects through the country, and, especially, in the Northeast, where it will intensify Marcellus Shale extraction activities. DOE/FE must consider all of these impacts in its public interest determination. Cumulatively, as the Secretary's Subcommittee on Shale Gas explained, the impacts are severe, and are not yet adequately controlled. Until they are, export is not in the public interest: The domestic impacts are substantial enough without adding to them to supply foreign markets.

4. DOE/FE Must Not Approve DCP's Export Plan Without Considering the Cumulative Impact of All Reasonably Foreseeable Projects

We have demonstrated that gas exports produce substantial economic and environmental costs. It is also clear on the record that DOE/FE will face many export applications: already over 20% of domestic production has been slated for export. As it considers these applications, including DCP's application, it would be arbitrary and capricious, an abuse of discretion, and otherwise not in accordance with law, *see* 5 U.S.C. § 706, for DOE/FE to fail to consider the cumulative impacts of these proposals.

It is true that DOE/FE must consider each application on its own merits: Some proposals may be more compelling than others, after all. But this requirement does not mean that DOE/FE may decline to consider the context in which it is working, or the record before it. The public, after all, will not experience each proposed terminal as an individual project: It will experience them cumulatively, through the gas and electricity prices that they will rise and the environmental damage that they will cause.

Therefore, to determine whether any one export proposal is consistent with the public interest, DOE/FE must consider whether a given proposal will harm the public in concert with (a) all proposals which have already been approved and (b) whether it will cause harm if all reasonably foreseeable proposals were approved. If the answer to this second question is yes, DOE/FE must be able to justify why it is still in the public interest to approve the project before it.

5. DOE/FE Cannot Rationally Approve DCP's Export Plan On the Record Before It

The Natural Gas Act, and subsequent DOE delegation orders and regulations, charge DOE/FE with determining whether or not a gas export application is in the public interest. *See, e.g.* 15 U.S.C. § 717b(a). 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. *Panhandle Producers and Royalty Owners Ass'n*, 822 F.2d at 1110-1111. 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." *Motor Vehicle Mfrs. Ass'n of the United States v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (emphasis supplied). DOE/FE cannot rationally find for DCP on the record in this case.

As we have demonstrated, record support for DCP's claimed benefits is extraordinarily thin. DCP has submitted IMPLAN-based model results to support its economic benefit claims, but this model does not show whether the economy would benefit *more* without DCP's proposal, nor address the many costs and displacement effects associated with natural gas booms. Beyond this scanty evidence, DCP can point only to a Navigant report which, in fact, shows that its export plans will raise gas prices.

Sierra Club, on the other hand, has shown that the gas and electricity price increases associated with exports (which have already been proposed in volumes more than double the quantity Navigant assessed) will add billions of dollars in costs to the consumers. These costs will propagate through the economy, retarding growth. Sierra Club has also shown that the economic benefits, if any, associated with gas production increases may actually do long-term damage to the U.S. economy by plunging large regions of the country into a boom-and-bust extractive cycle. Further, Sierra Club has shown that gas extraction and export have major environmental (and, hence, additional economic) costs, which DCP has failed even to address.

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. *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).

In this case, this record review data requires that DOE/FE play particularly close regard to both the positive and negative impacts of gas export and extraction. DCP's application discusses only the purported benefits of its proposal; as in the case of upstream environmental impacts, DCP often fails to even acknowledge the costs of its actions. It is, plainly, irrational and arbitrary to deem a proposal in the public interest upon consideration of only its benefits. Were DOE/FE to do so – by, for instance, deciding that increased gas production was in the public interest, without acknowledging the economic disruption and environmental harm that will accompany that disruption, it would have "entirely failed to consider an important aspect of the problem, [or] offered an explanation for its decision that runs counter to the evidence before the agency. *State Farm*, 463 U.S. at 43. It must not do so.

At bottom, the decision to export U.S. gas resources is a major public policy decision and must, by law, be made with extraordinary care. DOE/FE cannot justify moving forward on the scanty and incomplete record before it.

C. DOE/FE Must Not Approve DCP's Export Plan Without a Proper NEPA Analysis

As we have demonstrated, DOE/FE can – and indeed must – ground its decision upon a full consideration of the environmental impacts of gas export and extraction. The NEPA process must be "coordinate[d] with its decisionmaking," 10C.F.R. § 1021.210, and can usefully inform it. Indeed, because approval of a gas export application is a major federal action which may significantly affect the environment, DOE/FE is barred from moving forward without a full EIS. Sierra Club therefore protests this application to the extent that DOE/FE grants either a conditional or a full approval without the completion of a full and legal EIS and Record of Decision which support its decision.

1. DOE/FE Must Fully Analyze the Direct, Indirect, and Cumulative Impacts of Increased Gas Production Linked to Gas Exports from Cove Point

As we have explained, DCP rests its public interest claims on its claimed ability to stimulate enhanced natural gas production, especially in the Marcellus Shale upstream of its facility. DCP Application at 35, ICF Study at 20-37. Environmental impacts of this increased production, including "growth inducing effects," are thus manifestly "reasonably foreseeable" indirect effects of DCP's proposal. *See* 40 C.F.R. § 1508.8. These effects will be added to the effects of gas production (and other environmental burdens from other industries) already present in the gas plays which DCP affects, along with any induced production associated with other export proposals. DOE/FE must fully describe all of these effects and develop alternatives which would avoid them, including

the alternative of denying DCP's application, limiting exports to a smaller quantity, or imposing environmental controls on gas produced for export.[116]

Although this requirement is clear on the face of the statute and binding regulations, it is also clear on the NEPA case law. As the Ninth Circuit Court of Appeals recently explained:

> Because "NEPA places upon an agency the obligation to consider every significant aspect of the environmental impact of a proposed action," *Vt. Yankee Nuclear Power Corp. v. Natural Res. Def. Council*, 435 U.S. 519, 553, 98 S.Ct. 1197, 55 L.Ed.2d 460 (1978), the considerations made relevant by the substantive statute driving the proposed action must be addressed in NEPA analysis.

Oregon Natural Desert Ass'n v. Bureau of Land Management, 625 F.3d 1092, 1109 (9th Cir. 2010). DOE/FE is determining whether or not gas exports are in the "public interest," a term which the Supreme Court has repeatedly held includes consideration of environmental impacts. *Nat'l Ass'n for the Advancement of Colored People v. Federal Power Commission*, 425 U.S.at 670 n.4; *Udall v. Federal Power Comm'n*, 387 U.S. at 450. Thus, just as DOE/FE must consider upstream environmental impacts in its Natural Gas Act determination, so, too, it must analyze and disclose these impacts in the NEPA analysis that will support its final determination.

Thus, infrastructure projects, like DCP's proposal, that enable resource extraction activities to expand upstream naturally must fully analyze those impacts in the NEPA framework. In *Northern Plains Resource Council v. Surface Transportation Board*, - F.3d - , 2011 WL 6826409, for instance, the Court considered a railway line which was developed in order to expand coal production at several mines. *Id.* at *10. It held that the Surface Transportation Board's NEPA analysis for the line was illegal because the Board had refused to consider the mines' impacts. The Court held that such impacts were plainly "reasonably foreseeable" – and, indeed, were the premise for the construction project in the first place. *Id.* They therefore had to be considered in the NEPA analysis.

The same analysis applies here. Upstream gas production provides the justification for DCP's proposal – because gas is being produced in historically large quantities, DCP argues that export is appropriate, and important to stabilize and enhance gas production – and is a reasonably foreseeable result of DCP's exports. Indeed, DCP has been at pains to demonstrate that such production will occur. DOE/FE must therefore fully account for this production in an EIS for its decision.

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[116] Thus, the EIS must address each of the many impacts we have discussed above. Likewise, appropriate ESA and NHPA analysis must address these impacts as they bear upon ESA- and NHPA-protected resources.

Notably, DOE/FE has failed to do so in the past. As we observed in our comments on the Sabine Pass facility's Environmental Assessment (EA),[117] FERC, the lead agency on that EA, failed even to acknowledge the upstream impacts of the facility. Although DOE/FE may again allow FERC to take lead agency status, it may not move forward unless either it or FERC completes an adequate EIS that *does* cover all upstream impacts of DOE/FE's decision. Because FERC is, instead, focused on the environmental consequences of facility siting, DOE/FE make clear to FERC that this upstream consideration *must* be included in a full EIS for the Cove Point project.

2. DOE/FE May Not Conditionally Approve DCP's Proposal Without a Full EIS

It is true that, as a general matter, DOE/FE may issue "conditional" orders, *see*10 C.F.R. § 590.402, but 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, 10 C.F.R. § 1021.211, if that action tends to "limit the choice of reasonable alternatives," or "tend[] to determine subsequent development ." 40 C.F.R. § 1506.1. A conditional approval limits alternatives, and determines 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." *Sabine Pass* at 41.

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 purely 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 irrationally 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, it functionally treated that 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." Sabine Pass EA at 3-1. This statement is incoherent, if FERC truly understood DOE/FE not to have made a decision. DOE/FE is, after all, considering *whether* to allow gas exports. Because that decision has *not* been made, it is wholly appropriate to selected a "no-action" alternative (including, for FERC, a decision not site a facility whose exports have not been permitted). The fact that FERC felt that it was

[117] Attached as Ex. 77. We incorporate those comments in full by reference.

not free to do so indicates that conditional approvals in fact tend to limit alternatives and steer the development decisionmaking process.

To avoid this illegal effect, DOE/FE therefore may not approve the DCP export proposal, conditionally or not, until it has considered all alternatives to doing so through the NEPA and Natural Gas Act processes.

3. A Programmatic EIS is Appropriate

Finally, we again emphasize that the DCP 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.

It can best 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. *See* 40 C.F.R. § 1508.17(b)(3); *see also* 10 C.F.R. § 1021.330. 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 improved decisionmaking, and allow DOE/FE, the public, and industry, to identify prudent alternatives to serve the public interest and minimize environmental impacts.

Programmatic EISs are designed to serve precisely this purpose. Rather than proceeding in a piecemeal fashion, 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-mealing that decision from application to application.

D. If DOE/FE Does Move Forward, It Must Impose Rigorous Monitoring Conditions

If DOE/FE nonetheless approves DCP's application, it must recognize its continuing duty to protect the public interest, as it explained in its *Sabine Pass* decision. This duty is of crucial importance in the context of LNG export, where circumstances are rapidly changing. DOE/FE therefore announced its intention to monitor environmental, economic, and other relevant considerations. *Sabine Pass* at 31-33. Such a monitoring provision must be imposed here, as well, but must be significantly expanded.

Specifically, although *Sabine Pass* announces an intention to monitor many different considerations, it most clearly states that the agency will act if there is a "reduction in the supply of natural gas needed to meet essential domestic needs." *Id.* at 32. This consideration is undoubtedly of great importance, but it is not the only way in which changing circumstances could imperil the public interest.

On the contrary, as we have demonstrated at length in these comments, there is strong evidence that the public interest will be impaired by gas exports. 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. DOE/FE must therefore state that it will monitor each of these areas, providing specific monitoring terms and thresholds which will trigger agency actions of various types, ranging from further study through reductions in export volume or changes in timing to a revocation of DOE/FE's approval.[118]

If DOE/FE fails to include such provisions in any final approval, it will fail to fulfill its "continuing duty to protect the public interest," *id.* at 31, and so violate the Natural Gas Act. Because neither DCP nor DOE/FE have described or proposed such terms, Sierra Club also protests this application to the extent that DOE/FE fails to develop adequate monitoring terms of the sort we have described.

III. Conclusion

Sierra Club therefore moves to intervene, offers the above comments, and protests DCP's export proposal for the reasons described above. DCP's application is not consistent with the public interest and must be denied.

Respectfully submitted,

Craig Holt Segall
Nathan Matthews
Sierra Club Environmental Law Program
50 F St NW, Eighth Floor
Washington, DC, 20001

[118] Providing a clear monitoring plan of this sort will also benefit DCP, which will be better able to determine when and how DOE/FE may act, improving the company's ability to plan its actions and investments.

UNITED STATES OF AMERICA
BEFORE THE
DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY

IN THE MATTER OF	)	
	)	**FE DOCKET NO. 11-128-LNG**
DOMINION COVE POINT LNG, LP	)	

CERTIFICATE OF SERVICE

I hereby certify that I caused the above documents to be served on the applicant and all other parties in this docket, in accordance with 10 C.F.R. § 590.107, on February 6, 2012.

Dated at Washington, D.C., this 6th of February, 2012.

Craig Holt Segall
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UNITED STATES OF AMERICA
BEFORE THE
DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY

IN THE MATTER OF	)	
	)	**FE DOCKET NO. 11-128-LNG**
DOMINION COVE POINT LNG, LP	)	

CERTIFIED STATEMENT OF AUTHORIZED REPRESENTATIVE

Pursuant to C.F.R. §590.103(b), I, Craig Holt Segall, hereby certify that I am a duly authorized representative of the Sierra Club, and that I am authorized to sign and file with the Department of Energy, Office of Fossil Energy, on behalf of the Sierra Club, the foregoing document and in the above captioned proceeding.

Dated at Washington, D.C., this 6th of February, 2012.

Craig Holt Segall
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UNITED STATES OF AMERICA
BEFORE THE
DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY

IN THE MATTER OF	)	
	)	**FE DOCKET NO. 11-128-LNG**
DOMINION COVE POINT LNG, LP	)	

VERIFICATION

WASHINGTON	§
	§
DISTRICT OF COLUBIA	§

Pursuant to C.F.R. §590.103(b), Craig Holt Segall, being duly sworn, affirms that he is authorized to execute this verification, that he has read the foregoing document, and that facts stated herein are true and correct to the best of his knowledge, information, and belief.

Craig Holt Segall
Associate Attorney
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Email: Craig.Segall@sierraclub.org

Subscribed and sworn to before me this 6 day of February, 2012.

Mary F. Vincent
Notary Public

My commission expires: March 31, 2013

MARY F. VINCENT
Notary Public, District of Columbia
My Commission Expires March 31, 2013

UNITED STATES DEPARTMENT OF ENERGY

BEFORE THE DEPARTMENT OF ENERGY
FEDERAL ENERGY REGULATORY COMMISSION

In the Matter of:	
Sabine Pass Liquefaction, LLC and Sabine Pass LNG, L.P	FERC Docket Nos. CP11-72-000, PF10-24

SIERRA CLUB'S NOTICE OF INTERVENTION, MOTION TO INTERVENE, and COMMENT on THE DECEMBER 28, 2011 SABINE PASS LIQUEFACTION PROJECT ENVIRONMENTAL ASSESSMENT

January 27, 2012

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UNITED STATES DEPARTMENT OF ENERGY

BEFORE THE DEPARTMENT OF ENERGY
FEDERAL ENERGY REGULATORY COMMISSION

In the Matter of:	
Sabine Pass Liquefaction, LLC and Sabine Pass LNG, L.P	FERC Docket No. CP11-72-000

SIERRA CLUB'S NOTICE OF INTERVENTION, MOTION TO INTERVENE, and COMMENT on THE DECEMBER 28, 2011 SABINE PASS LIQUEFACTION PROJECT ENVIRONMENTAL ASSESSMENT

I. Background and Motion to Intervene

Pursuant to Rule 214 of the U.S. Department of Energy's Rules of Practice and Procedure the Sierra Club hereby moves to intervene in the above-captioned docket. [1] Sierra Club's principal place of business is 85 Second St., Second Floor, San Francisco, CA 94105. Service in this proceeding may be made upon counsel for Sierra Club designated below.

Sierra Club is a national, non-profit environmental and conservation organization with more than 600,000 members nationwide. Through its Natural Gas Reform campaign, Sierra Club members work to ensure that the natural gas industry is subject to strong national and state safeguards that protect our air, water, and communities. The Sierra Club's work includes submitting comments in numerous state and federal agency energy-related proceedings and rulemakings,

[1] 18 C.F.R. § 385.214(a)(3), (b)(1), (b)(2)(iii).

pursuing energy-related litigation, attending and speaking at public hearings, speaking to students and civic and other organizations, and holding seminars and symposia – all in support of policies to limit fossil fuels' impacts to human health, climate change and the environment and to promote clean energy alternatives and energy efficiency.

On January 31, 2011, Sabine Pass LNG, L.P. and Sabine Pass Liquefaction, LLC (collectively "Sabine Pass") filed an application with the Federal Energy Regulatory Commission ("FERC") under Section 3(a) of the Natural Gas Act[2] to construct and operate liquefaction and export facilities at the existing LNG import facility in Cameron Parish, Louisiana.[3] This application is docketed as FERC Docket No. CP11-72-000.

The construction/operation application follows earlier applications before the Department of Energy's Office of Fossil Energy ("DOE FE") requesting authority to export LNG to free-trade-agreement[4] and non-free-trade-agreement[5] countries. DOE has granted both applications, although the application for export to non-free-trade-agreement countries is conditioned on completion of FERC's National Environmental Policy Act[6] ("NEPA") review of the construction/operation application.

As a result of the separate construction/operation and export applications, there are effectively two dockets in this case. The construction/operation docket is

[2] 15 U.S.C. § 717b.
[3] FERC Docket No. CP11-72
[4] Application filed August 11, 2010, FE Docket No. 10-85-LNG. Application granted Sept. 7, 2010.
[5] Application filed Sept. 7, 2010, FE Docket No. 10-111-LNG. Application conditionally granted May 20, 2011, pending completion of National Environmental Policy Act analysis.
[6] 42 U.S.C. § 4321.

FERC Docket No. CP11-72-000, while FERC previously opened a "pre-filing" docket in connection with the DOE FE export applications, FERC Docket No. PF10-24. The environmental assessment was filed in CP11-72-000, with notice of the filing lodged in PF10-24. No separate environmental assessment will be filed in PF10-24.

Sierra Club has a direct interest in these dockets because the environmental, climate and human health effects of exports and the siting, construction, and operation of this export facility are potentially significant. Accordingly, an environmental impact statement must be prepared under NEPA and DOE's NEPA regulations at 10 CFR Part 1021. These effects are articulated below, together with other concerns regarding the application. The Sierra Club's interests in this proceeding are not represented by any current party to the proceeding. Sierra Club's participation will advance the public interest in full disclosure and assessment of environmental effects associated with the Sabine Pass application.[7]

II. Comments on The EA

a. The EA Unlawfully Looks Only at The Impacts of Construction and Operation of the Export Facilities, Ignoring The Effects of Export Itself and Failing to Take A Hard Look at Whether LNG Export Is in The Public Interest

Section 3(a) of the Natural Gas Act requires the Secretary of Energy to deny an export application if he finds that the proposed exportation "will not be consistent with the public interest." The public interest includes environmental effects in addition to effects on natural gas markets. Here, in DOE FE's order

[7] 18 C.F.R. § 385.214 (a)(3), (b)(2)(iii).

conditionally granting Sabine Pass's application for export authority, DOE FE acknowledged that the public interest assessment "the domestic need for the natural gas proposed to be exported; whether the proposed exports pose a threat to the security of domestic natural gas supplies; and any other issue determined to be appropriate."[8] These other issues include environmental impacts. The open-ended requirement to assess the public interest, interpreted in light of the policies and obligations imposed by NEPA, requires "DOE to give appropriate consideration to the environmental effects of its proposed decisions."[9]

Under the FERC and DOE FE's proposed framework, the instant environmental assessment provides the sole opportunity to examine environmental effects of exports themselves or of construction, operation, and siting of export facilities. DOE FE is relying on FERC: DOE FE's authorization of exports was "conditioned on the satisfactory completion of the environmental review process in FERC Docket No. PF10-24-000 and on issuance by DOE/FE of a finding of no significant impact or a record of decision pursuant to NEPA."[10] PF10-24 is FERC's "pre-filing" docket for this matter. The EA at issue here is docketed in CP11-72-000 and referred to in PF10-24.[11]

Although environmental review of export itself was deferred until this EA, the EA wrongly limits its scope to solely the siting, construction and operation of the

[8] NFTA Export Order at 29 (emphasis added)
[9] *Id.* The NFTA order further cited DOE FE Order No. 1473, *Phillips Alaska Natural Gas Corporation and Marathon Oil Company*, 2 FE ¶ 70,317 and DOE Delegation Order No. 0204-111 for the proposition that DOE must regulate exports "based on a consideration of the domestic need for the gas to be exported and such other matters as the Administrator finds in the circumstances of a particular case to be appropriate."
[10] NFTA order at 41 (citing 10 CFR § 590.402)
[11] See FERC filing of Oct. 29, 2010 in PF10-24 (explaining FERC's NEPA process), FERC filing of Dec. 16, 2011 in PF10-24 (notice of availability of EA in CP11-72-00)

liquefaction and loading facilities, ignoring the impacts of export itself. This cabined review violates NEPA. NEPA's implementing regulations require agencies to consider the effects of their actions, and do not allow consideration of a subset of the action. NEPA also requires that all environmental analyses be conducted at "the earliest possible time" and to the "the fullest extent possible."[12] NEPA requires that an "assessment of all 'reasonably foreseeable' impacts must occur at the earliest practicable point, and must take place before an 'irretrievable commitment of resources' is made."[13]

Export of LNG will induce additional shale gas extraction, increase domestic gas prices, induce additional coal consumption for electricity generation, and increase greenhouse gas emissions and global warming. Each of these effects should have been analyzed in the EA but were omitted from discussion. Furthermore, these effects bear on the question of whether export is in the public interest, and must be factored into the DOE FE's forthcoming final assessment of the public interest pursuant to the Natural Gas Act.

i. Export Will Induce Additional Shale Gas Extraction, but The EA Does Not Examine The Impacts of This Extraction

The stated purpose of the export and associated facilities is to "provide a market solution to allow further development of unconventional (particularly shale

[12] See N.M. ex rel. Richardson v. BLM, 565 F.3d 683, 718 (10th Cir. 2009)

[13] *Id.* (citing 42 U.S.C. § 4332(2)(C)(v); *Pennaco Energy, Inc. v. U.S. Dept. of Interior*, 377 F.3d 1147, 1160 (10th Cir. 2004); 40 C.F.R. §§ 1501.2, 1502.2240 C.F.R. § 1501.2)), *see also Kern v. U.S. Bureau of Land Mgmt.*, 284 F.3d 1062, 1072 (9th Cir. 2002) ("NEPA is not designed to postpone analysis of an environmental consequence to the last possible moment. Rather, it is designed to require such analysis as soon as it can reasonably be done.").

gas-bearing formation) sources in the United States."[14] Despite this explicit recognition that the project will encourage additional shale gas extraction, the EA contains no analysis of the impacts of such extraction. This violates NEPA's command to consider both direct and indirect impacts of the proposed action.[15]

As a threshold matter, the EA's prediction that exports will "facilitate" shale gas extraction appears well-founded. The Energy Information Administration ("EIA") recently concluded that "natural gas markets in the United States balance in response to increased natural gas exports largely through increased natural gas production," and that in most foreseeable scenarios, "about three-quarters of this increased production is from shale sources."[16]

Shale gas is typically extracted through a combination of horizontal drilling and hydraulic fracturing techniques. These techniques, and their health and environmental consequences, were recently summarized by the Natural Gas Subcommittee of the Secretary of Energy Advisory Board,[17] other government agencies,[18] and in expert reports submitted by the Sierra Club and other groups in a variety of regulatory proceedings.[19] We summarize this process and these impacts

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[14] EA 1-10

[15] 40 CFR § 1508.8 (indirect effects defined as those "caused by an action and [that] are later in time or farther removed in distance, but are still reasonably foreseeable")

[16] Exhibit 1, Energy Information Administration, Effects of Increased Natural Gas Exports on Domestic Energy Markets, 6 (January 2012) available at http://www.eia.gov/analysis/requests/fe/pdf/fe_lng.pdf

[17] Exhibit 2, Natural Gas Subcommittee, *90-day interim report*, (August 18, 2011), *available at* http://www.shalegas.energy.gov/resources/081811_90_day_report_final.pdf, Exhibit 3, *180-day interim report* (Nov. 18, 2011) *available at* http://www.shalegas.energy.gov/resources/111811_final_report.pdf.

[18] While it would be infeasible to include every such assessment here, a recent and notable example is the New York Department of Environmental Conservation's *Revised Draft Supplemental General Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program* (September 2011), *available at* http://www.dec.ny.gov/data/dmn/rdsgeisfull0911.pdf and attached here as Exhibit 4.

[19] The Sierra Club and other organizations have also provided extensive expert analysis of the impacts of hydraulic fracturing. For analysis of water impacts, *see* Natural Resources Defense Council, Earthjustice, and Sierra Club,

here. Hydraulic fracturing involves injecting water, sand, and various fracturing chemicals into the gas-bearing formation at high pressures to fracture the rock and release additional gas. Thus, the first step in the process requires procurement of large quantities of water and sand, often in areas with limited water resources. These materials must then be transported to the well site, imposing significant transportation impacts. The fracturing process then poses a risk to groundwater resources, as fractures in the formation and failure of the well casing can lead to contamination of groundwater. Contaminants may include chemicals introduced into the well, such as fracturing fluid and drilling muds, as well as naturally occurring substances previously isolated from the ground water sources, such as methane, salts, and naturally occurring radioactive material. On the surface, the fracturing fluid, drilling mud, and produced water must be stored and disposed of. The storage facilities for these substances can fail, introducing environmental and erosion hazards into the surrounding environment. Disposal of produced water is a challenge because of, inter alia, its volume, salinity, and unusual contaminants. Thus, publicly owned water treatment works are often incapable of processing hydraulic fracturing produced water. After the initial fracturing, gas from the well is often vented or flared as the initial "flowback" is cleared from the well. Because of this flaring or venting process, fractured wells typically have air emissions much higher than those of traditional wells.

Comments [to EPA] on Permitting Guidance for Oil and Gas Hydraulic Fracturing Activities Using Diesel Fuels (June 29, 2011), attached here as Exhibit 5. For a discussion of the air impacts of natural gas extraction, with a focus on hydraulic fracturing, *see* Sierra Club, et al., *Comments on New Source Performance Standards: Oil and Natural Gas Sector; Review and Proposed Rule for Subpart OOOO,* Docket No. EPA-HQ-OAR-2010-0505 (Nov. 30, 2011), attached here as Exhibit 6. We further submitted extensive technical reports on the NY RDSGEIS, attached here as Exhibits 7 and 8

In light of the stated purpose of the project and the Energy Information Administration's predictions, an increase in shale gas extraction (and concomitant environmental effects) is indisputably an effect likely to be "caused by" the project, 40 CFR § 1508.8. NEPA requires analysis of the effects of increased driling. The EA's failure to address these effects is unlawfully deficient.

ii. Export Will Increase Domestic Gas Prices

The EIA recently concluded that LNG export will increase domestic gas prices.[20] This rebuts conclusions reached by DOE FE in the order conditionally granting authority to export to non-free-trade-agreement countries.[21] Specifically, the DOE FE's public interest determination explicitly rested on the conclusion that export would minimally affect domestic gas prices. Id. Although some commenters had argued to the contrary, DOE FE rejected these comments as lacking scientific foundation. The EIA report provides the missing foundation. At a minimum, the EA must revisit this issue in light of the EIA report, and consider the effects that increased domestic gas prices would entail.

iii. The EA Fails to Examine the Effect LNG Export Will Have on Domestic Electricity Production and the Consequences Associated with These Effects

As noted above, the Energy Information Administration concluded that exports will increase domestic natural gas prices. These higher prices will cause "the electric power sector primarily [to] shift[] to coal-fired generation, and

[20] Exhibit 1, Energy Information Administration, *Effects of Increased Natural Gas Exports on Domestic Energy Markets*, 6 (January 2012) *available at* http://www.eia.gov/analysis/requests/fe/pdf/fe_lng.pdf
[21] DOE FE NFTA Order at 30.

secondarily of renewable resources."[22] The increase in domestic coal consumption for purposes to electricity generation is therefore an indirect effect caused by LNG export. Because coal burning power plants emit more hazardous pollutants than natural gas fired plants, this shift will negatively affect human health and the environment. The EA should have analyzed this impact.

iv. The EA Unlawfully Failed to Take A Hard Look at Impacts on Global Warming, Because It Improperly Concluded That The Export Facility's GHG Emissions Were Insignificant and Improperly Failed to Indirect Effects on Greenhouse Gas Emissions

The EA acknowledges that the liquefaction facility will emit greenhouse gasses ("GHGs")[23], and that direct emissions of the liquefaction project will amount to 3.9 million tons per year of carbon dioxide equivalent.[24] This will increase Louisiana's total GHG emissions by 2% on a CO2-equivalent basis.[25] Sabine Pass completed a GHG Best Available Control Technology analysis as part of its Clean Air Act Prevention of Significant Deterioration permit application with the Environmental Protection Agency. The EA summarizes this analysis, explaining that carbon capture and sequestration technology is infeasible because of the distance to carbon dioxide pipelines.[26] The EA then states:

[22] Exhibit 1, Energy Information Administration, *Effects of Increased Natural Gas Exports on Domestic Energy Markets*, 6 (January 2012) *available at* http://www.eia.gov/analysis/requests/fe/pdf/fe_lng.pdf
[23] EA 2-57
[24] *Id.*
[25] EA 2-99
[26] Id.

> Currently there is no standard methodology to determine how the Project's incremental contribution to GHGs would translate into physical effects on the global environment. However, the emissions would increase the atmospheric concentration of GHGs, in combination with past and future emissions from all other sources, and contribute incrementally to climate change that produces the impacts previously described. Because we cannot determine the Project's incremental physical impacts due to climate change on the environment, we cannot determine whether the Project would result in significant impacts related to climate change.[27]

This analysis is inadequate for several reasons. First, the claimed inability to identify incremental physical impacts is not sufficient to support a finding of insignificance. The Supreme Court has explained that global warming is a problem that will be addressed one piece at a time.[28] Here, GHG emissions are over an order of magnitude greater than the threshold EPA set for identifying major sources of GHG emissions. Accordingly, the claimed inability to quantify incremental impacts does not render the impacts insignificant.

Second, the EA fails to account for indirect GHG emissions. LNG has higher lifecycle greenhouse gas emissions than traditional natural gas.[29] Liquefying natural gas is an energy intensive process. The EA includes the emissions directy attributable to the liquefaction process, although as described in the previous paragraph, the EA fails to take a hard look at the effects of those emissions. Liquefaction, however, is only one part of the gas lifecycle. Once liquefied, LNG

[27] EA 2-99 – 2-100

[28] Massachusetts v. EPA, 549 U.S. 497, 524 (2007) (describing GHG emissions from the US transportation sector as a "meaningful contribution" to global emissions)

[29] Exhibit 9, Jamarillo, et al., *Comparative Life Cycle Carbon Emissions of LNG Versus Coal and Gas for Electricity Generation* (Oct. 12, 2005) *available at* http://www.ce.cmu.edu/~gdrg/readings/2005/10/12/Jaramillo_LifeCycleCarbonEmissionsFromLNG.pdf.

must be transported by truck or tanker, with inherent transportation emissions.[30] It is then regassified, typically using equipment that runs of natural gas and entails further emissions.[31] When these additional steps are considered, LNG has lifecycle greenhouse gas emissions that rival or even exceed those of coal in terms of electricity generation on a per-kilowatt-hour basis.[32] Furthermore, as explained above, GHG emissions from shale gas are higher than those for traditional gas, in part because of the gasses released during the completion process. As noted, the export project is likely to induce further shale gas drilling. All of these additional GHG emissions are indirect effects of the project, yet none of these are included in the EA.

b. The EA Uses The Wrong Baseline for Ship Traffic

The EA states that "The number of ships utilizing the [Sabine Pass Natural Gas] Terminal would not increase as a result of the project. Sabine Pass is currently permitted for a maximum of 400 ships that could call on the terminal per year. Because loading rates proposed for the Project are the same as the unloading rates for the [existing] Terminal, no increase in ship traffic is anticipated."[33]

Rather than comparing anticipated ship traffic with existing permit, the EA should have compared anticipated traffic with existing practice. The EA does not indicate how the current level of actual ship traffic. In light of existing natural gas market conditions, with US prices lower than international prices, it is unlikely

[30] *Id.* at 10.
[31] *Id.* at 10.
[32] *Id.* at 13.
[33] EA 1-9

that the terminal is being used to its full permitted import capacity. Indeed, it is likely that the terminal has never been used at this capacity, as the construction of the terminal coincided with the shale gas boom and accompanying change in the domestic gas market. Thus, it is likely that construction of export facilities and authorization of exports will increase the number of ships actually calling on the terminal.

At least one state supreme court has explicitly considered such a scenario in interpreting a state NEPA analogue, holding that when actual practice has lesser impacts than allowed by existing permits, meaningful environmental review requires measurement against the actual practice.[34] There, a refinery had licenses to operate four boilers, each specifying a maximum operating level.[35] Although these licenses in principle authorized all four boilers to simultaneously operate at maximum capacity, this never occurred in practice.[36] Instead, no boiler operated at the maximum level unless one or more other boilers had been shut down for maintenance.[37] The state Environmental Impact Report used the legally authorized but never realized limit, rather than actual practice, as the environmental baseline. The Court overturned this report. "An approach using hypothetical allowable conditions as the baseline results in 'illusory' comparisons that 'can only mislead the public as to the reality of the impacts and subvert full consideration of the actual environmental impacts,' a result at direct odds with [the state environmental

[34] *Cmtys. for a Better Env't v. S. Coast Air Quality Mgmt. Dist.*, 48 Cal.4th 310, 328, 106 Cal.Rptr.3d 502, 226 P.3d 985 (2010).
[35] *Id.*, 48 Cal.4th at 322, 106 Cal.Rptr.3d 502, 226 P.3d 985
[36] *Id.*
[37] *Id.*

review statute's] intent."[38] This reasoning is equally applicable to NEPA and to the facts here.

c. The EA Fails To Take A Hard Look at Water Requirements

The project will require 3,500 gallons per minute ("gpm") of water, but the EA only describes the provision of 2,300 to 2,400 gpm of supply. Failure to identify the remaining supply renders the EA deficient.

Sabine Pass proposes to construct four liquefaction trains. The EA states that "[o]peration of all four liquefaction trains would require a water supply of approximately 3,500 gpm."[39] This demand exceeds existing on-site supply, which provides only 100 to 200 gpm.[40] Sabine Pass (the company) proposes to augment this supply by constructing a pipe to Sabine Pass, Texas (the town).[41] This "12-inch diameter, 1.2-mile water supply line" is designed to supply "approximately 2,200" gpm.[42]

The EA provides no discussion of how the remaining 1,100 to 1,200 gpm of water will be supplied, or what consequences will arise if the water is unavailable. Instead, the EA merely states that if additional water supplies are needed, Sabine Pass will "consult with the appropriate state and federal resource agencies to obtain or update its existing permits or authorizations."[43] As explained above, NEPA requires that all environmental analyses be conducted at "the earliest possible time"

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[38] *Id.*
[39] EA 2-15
[40] *Id* EA 1-10
[41] *Id*
[42] *Id*
[43] *Id*

and to the "the fullest extent possible."[44] Postponing inquiry into to the satisfaction of known water needs violates this obligation.

d. The EA Relies on Methods to Remedy Identified Deficiencies in Particulate Management without Addressing Whether These Methods Will Be Effective

The EA determined that construction of the facilities will cause significant particulate emissions in the form of fugitive dust, included 658 tons per year (tpy) of PM10 and 99 tpy of PM2.5 across the multi-year construction period. EA 2-52. Sabine Pass proposes to limit these emissions by spraying water and/or applying calcium chloride or other dust suppressants. EA 2-54. The EA assumes that these techniques will have a "control factor" of 50%. The EA properly concludes that these measures are therefore insufficient to ensure adequate mitigation of fugitive dust emissions. The EA therefore recommends requiring Sabine Pass to file a "Fugitive Dust Control Plan" that identifies "precautions" and "additional mitigation measures" to control fugitive dust emissions. EA 2-54. These measures may include "measures to limit track-out onto the roads," a speed limit on unsurfaced roads, and "covering open-bodied haul trucks." EA 2-55. Absent from the EA is any assessment of the efficacy of these measures in this context. Without knowing how effective these measures can be, the EAs' conclusion that these measures will render fugitive dust emissions insignificant is arbitrary and capricious.

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[44] See N.M. ex rel. Richardson v. BLM, 565 F.3d 683, 718 (10th Cir. 2009)

e. **Hydrogen Sulfide**

The proposed project includes facilities to remove carbon dioxide and hydrogen sulfide from natural gas prior to liquefaction. This removed hydrogen sulfide will periodically be vented to the atmosphere. EA 2-69. Such venting will emit concentrations of hydrogen sulfide as high as 0.1%. Id. The EA includes a cursory discussion of the placement of hydrogen sulfide detectors, but includes no discussion of whether these emissions will pose a threat to human health or the environment. Absent such a discussion, FERC cannot conclude that these effects are insignificant.

f. **An Environmental Impact Statement Is Required**

The authorization to export LNG and to construct and operate LNG export facilities merits an Environmental Impact Statement ("EIS") under NEPA because both aspects of the project will have significant effects on the human environment. Under NEPA, an agency must prepare an EIS when there is a major Federal action that significantly affects the quality of the human environment.[45]

FERC's own regulations identify export of natural gas as an activity that will ordinarily require an EIS.[46] Specifically, FERC's regulations provide that an EIS is "generally" required for "authorizations to . . . export natural gas under section 3 of the Natural Gas Act involving construction of . . . liquefied natural gas terminals and regasification or storage facilities[] or significant expansions and modifications

[45] 42 U.S.C. §4332(C)
[46] 10 C.F.R. § 1021 app. D ("Classes of Actions that Normally Require EISs")

of existing pipelines or related facilities."[47] An EIS is also generally required for "Approvals or disapprovals of authorizations to import or export natural gas under section 3 of the Natural Gas Act involving major operational changes (such as a major increase in the quantity of liquefied natural gas imported or exported)."[48] The export proposals before FERC and DOE FE appear to fall into both categories. Although the agencies may argue that the regulation only states that an EIS is "generally" required, before departing from this general rule, the EA must at the very least explain why a departure is warranted. Here, however, the EA includes no discussion of the regulation or regarding why these "general" rules are inapplicable here, nor does there appear to be any other such discussion in the docket.

Even absent FERC's own regulations, NEPA and the statute's general implementing regulations demonstrate that an EIS is required. Many of the project's impacts cross the threshold of "significance" and thereby trigger the EIS requirement. In determining whether or not the effects will be "significant," or whether substantial questions exist as to the significance of the effects, NEPA's implementing regulations require FERC to consider the "context" and "intensity" of the likely impacts. "Context" means "that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality."[49] Also, "[b]oth short- and

[47] *Id at D8*
[48] *Id.* at D9 (emphasis added)
[49] 40 C.F.R. § 1508.27(b)

long-term effects are relevant" for context.[50] "Intensity" means the "severity of impact" and is to be judged according to several criteria.[51]

Finally, the failure to consider many pertinent impacts in the EA warrants completion of an EIS. As explained above, the EA wholly fails to consider many of the impacts associated with the proposal. When an agency gives a "cursory and inconsistent treatment" of an issue, or no references or defense of a statement is given, an agency must prepare an EIS.[52]

III. Conclusion

As explained above, the EA violates NEPA by failing to take a hard look at the effects of the proposed action. The EA wholly ignores indirect effects resulting from export, considering only construction and operation of the facility itself. This exclusion of indirect effects violates NEPA and is incompatible with DOE FE's decision to rely on FERC to assess the impacts of export authorization. The EA further falls short in its evaluation with regard to several of the factors it did consider. In light of these reasons, as well as FERC's general guidelines, FERC must prepare an EIS for the action.

In order to continue to assert the above arguments, and to generally advocate the public interest in the environment in these proceedings, the Sierra Club respectfully requests to intervene.

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[50] *Id*
[51] *Id*
[52] Blue Mountains Biodiversity Project v. Blackwood, 161 F.3d 1208, 1213-14 (9th Cir. 1998)

Dated: January 27, 2012

Respectfully Submitted,

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UNITED STATES OF AMERICA
DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY

IN THE MATTER OF	)	
	)	FE DOCKET NO. 11-128-LNG
DOMINION COVE POINT LNG, LP	)	

COMMENTS ON APPLICATION TO EXPORT LNG

Pursuant to 10 C.F.R. § 590.303 of the Administrative Procedures with respect to the Import and Export of Natural Gas,[1] the undersigned submit these comments in opposition to the application of Dominion Cove Point LNG, LP ("DCP") for long-term authorization to export domestically produced liquefied natural gas ("LNG") from its LNG terminal in Lusby, Maryland filed in this docket on October 3, 2011 ("Application"), on behalf of our members and ourselves.

I. COMMUNICATIONS AND CORRESPONDANCE

All communications and correspondence regarding this docket should be directed to the following representatives:

Maya K. van Rossum, the Delaware Riverkeeper, 925 Canal Street, Suite 3701, Bristol, PA 19007; keepermaya@delawareriverkeeper.org.

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[1] 10 C.F.R. § 590.303 (2011)

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II. DCP'S APPLICATION

On October 3, 2011, DCP filed its Application with the Department of Energy, Office of Fossil Energy ("DOE/FE").[2] In the Application DCP seeks long-term, multicontract authority to export domestically produced LNG from its Lusby, Maryland terminal, up to a cumulative total of the equivalent of 1 Bcf of natural gas per day, or approximately 7.82 million metric tons per year. The authority sought by DCP would span 25 years, commencing on the sooner of the date of the first LNG export, or six years from the date the authorization is issued. The authority requested would permit DCP to export LNG to any country with the capacity to import LNG via ocean going carrier and with which the United States does not prohibit trade but also does not have a Free Trade Agreement.[3] DCP states that it does not intend to hold title to the LNG itself; rather, DCP would act as agent for LNG owners that wish to export LNG and that will provide their own gas supply.

DCP further states that it intends to seek authority from the Federal Energy Regulatory Commission ("FERC") to construct new facilities at its LNG terminal to provide natural gas liquefaction ("Liquefaction Project") and to provide LNG export services. DCP states that its Liquefaction Project facilities will be integrated with existing facilities at its LNG terminal, and that "much of the existing facilities at the terminal will be used as part of the liquefaction project."[4] DCP states that it intends to operate its LNG terminal as a "bi-directional facility" following construction of its Liquefaction Project.[5] DCP states that it is in the process of conducting commercial negotiations with potential customers.[6] DCP states that it anticipates placing its Liquefaction Project in service by the end of 2016.

DCP states that the authorization it has requested in this docket is consistent with the public interest.[7] DCP further states that the construction of new facilities at the existing terminal will not constitute a major federal action significantly affecting the quality of the human

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[2] On October 4, 2011, DCP supplemented its Application by withdrawing and replacing Appendix B (Navigant Price Repot) and Appendix C (ICF Economic Benefit Study) to the Application.

[3] DCP's Application represents the second part of its two-part request for authorization to export domestic natural gas in the form of LNG from its terminal. Previously, on September 1, 2011, in FE Docket 11-115-LNG DCP sought (and subsequently was granted) authority to export domestically produced LNG to any country with which the United States has a Free Trade Agreement requiring national treatment for trade in natural gas and which has the capacity to import LNG via ocean-going carrier.

[4] These existing facilities may include DCP's offshore pier (with two berths), insulated LNG and gas piping from the pier to the on-shore terminal and within the terminal, the seven LNG storage tanks, on-site power generation, and control systems.

[5] *See* Application at p. 5.

[6] *See* Application at p. 6.

[7] *See* Application at pp. 5-6

environment within the meaning of the National Environmental Policy Act ("NEPA").[8][9] DCP states that it plans to file an application with the FERC for the necessary authorizations for facilities to allow for the liquefaction of domestically produced natural gas and export of LNG from its terminal, and that an environmental review under NEPA will be conducted by FERC prior to granting DCP authorization.[10] DCP states that, as a practical matter, the authorization it is requesting in this docket from DOE/FE "will not be actionable" until FERC grants authorization for the Liquefaction Project and the export of LNG, and the DOE/FE should condition any authorization it may issue in this docket on DCP's acceptance of a FERC authorization.[11] DCP requested that the DOE/FE grant its Application by June 1, 2012.

III. EXECUTIVE SUMMARY OF COMMENTS

The undersigned oppose DCP's proposal to convert its Calvert County, Maryland, LNG facility from an import to a bi-directional facility. We believe that the instant proposal, as well as the overarching policy of exporting domestically produced natural gas, is not in the public interest based upon analysis of DOE's Policy Guidance, nor supported by the best available economic, scientific, and environmental data. Furthermore, we categorically dispute DCP's statement that the instant project does not constitute a major federal action significantly affecting the quality of the human environment, as we believe this proposal necessitates appropriate analysis pursuant to the National Environmental Policy Act ("NEPA").[12] Discussion of that issue is provided *infra* at Part V.

IV. THE PUBLIC INTEREST

A. Applicable Legal Standard

Under Section 3 of the Natural Gas Act, DOE must make a determination that the proposed exportation of natural gas "will not be inconsistent with the public interest."[13] Section 3(a) thus establishes DOE's authority to deny an application requesting authorization to export natural gas to foreign countries upon a showing of inconsistency with the public interest.[14] This provision indicates that, for the proposed DCP LNG export terminal, DOE must look at whether exportation of natural gas in general is in the public interest.

DOE has previously used policy guidelines to help direct implementation of Section 3 of the NGA and determination of whether the statutorily undefined 'public interest' is met when considering objections to applications for natural gas import and export.[15] While normally

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[8] *See* Application at p.45.

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

[10] *See* Application at p. 45.

[11] *See* Application at pp. 10-11.

[12] *See* Application at p. 45.

[13] 15 U.S.C. § 717b(a).

[14] *Id.*; *see also Sabine Pass Liquefaction, LLC,* FE10-111-LNG, DOE Order No. 2961 (May 20, 2011); *Sabine Pass Liquefaction, LLC.* FE10-85-LNG, DOE Opinion and Order No. 2833 (Sept. 7, 2010).

[15] "New Policy Guidelines and Delegation Orders Relating to the Regulation of Natural Gas," 49 Fed. Reg. 6684-01 (Feb. 22, 1984)(hereinafter the 'Policy Guidelines"); *see also Sabine Pass*, Order No. 2961, at pp. 28-29.

applicable only to gas import cases, DOE held in Order No. 1473 and subsequent cases that the same policies will be applied to natural gas export applications.[16] The Policy Guidelines stand for the proposition that the goal of DOE oversight of LNG export should be to foster an adequate supply of energy at reasonable costs. Further, the Policy Guidelines state that the government's objective is to ensure natural gas is available to the American consumer at competitive prices, while avoiding undue dependence on unreliable sources of supply.[17] Of note, the Policy Guidelines do not set binding and inflexible rules; rather, they set forth rebuttable presumptions concerning the competitiveness of the export, the propriety of exporting natural gas, the security of the domestic supply relative to the proposed exportation, and any other issue determined to be appropriate.[18]

B. Exports from Cove Point Are Not in the Public Interest

The proposed export of domestically produced natural gas from the Cove Point terminal fails to provide the requisite certainty that it will be competitive for the contract term of 25 years. DOE must evaluate the instant proposal to assure that the export terms will be competitive throughout the contract period, where price is but one factor determining competitiveness. An appropriate indicator of competitiveness for the instant application is projected Mid-Atlantic shale gas supply and demand, taken in conjunction with an understanding of pace and scale.

1. Competitiveness of Exporting Natural Gas

The extraction of non-renewable natural resources such as natural gas is typically characterized by a "boom-and-bust" cycle where a rapid increase in production and economic activity is followed by a corresponding decrease.[19] Whereas DCP anticipates a primary and substantive portion of its exports to come from the Marcellus and Utica shale plays, it is relevant to consider the pace and scale of high-volume hydrofracking ("HVHF"), the developmental mechanism used to produce the natural gas in quantities allegedly ripe for export. Understanding the pace and scale of HVHF will determine the duration of the boom period, and thus a better understanding of DCP's anticipated domestic supply, allowing a rational, fact-driven assessment of competitiveness.

Market & Supply Volatility

DOE should approach the pace and scale of production in the Marcellus & Utica shale plays, and correspondingly its assessment of competitiveness, via both an analysis of (a) total potential natural gas reserves and capacity of existing or anticipated technologies, and via (b) an assessment of the likely firm strategies in response to profit opportunities in particular and overall. Indeed, the Policy Guidance contemplates DOE assessing competitiveness by taking into

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[16] *Phillips Alaska Natural Gas Corporation and Marathon Oil Company*, DOE Order No. 1473, at 14, 2 FE ¶ 70,317.

[17] Policy Guidelines at p. 3.

[18] *Id.* at pp. 8-9.

[19] Christopherson, Susan and Ned Rightor. May 2011. "How Should We Think About the Economic Consequences of Shale Gas Drilling?," from "Working Paper Series: A Comprehensive Economic Impact Analysis of Natural Gas Extraction In the Marcellus Shale." p.8.

account gas prices as one of several key considerations.[20] The Policy Guidance also suggests DOE consider price evaluations along with consideration of the export agreement's provisions detailing the basis for price and price adjustments.[21] Notably, DCP's application does not contain any firm commitments or provisions establishing price or price adjustments. Instead, the application solely argues that production and development of domestic gas will be sufficient to allow competitive export without providing key price control provisions, a dubious proposition considering the highly speculative and novel nature of exporting domestic natural gas.

DCP's application fails to rationally explain how its request for export authorization is competitive under the public interest standard when compared with the most current data concerning potential natural gas reserves and foreseeable price impacts arising from authorization of exports. Previous estimates of shale gas resources in the Marcellus deposit - a resource of key importance to DCP's proposal - from Penn State geological scientist Terry Engelder, showed as much as 500 trillion cubic feet (tcf) of natural gas reserves, and in a 2008 report with Gary Lash of SUNY Fredonia, Engelder estimated that perhaps 10% of that gas (50tcf) might be recoverable.[22] In 2009, he estimated that recoverable reserves could be as high as 489 tcf.[23] More recent estimates of recoverable gas fall in the 200-300 tcf range.[24]

It is important to compare those previous figures widely used by the natural gas industry to the Energy Information Administration's (EIA) January 2012 report entitled "Effect of Increased Natural Gas Exports on Domestic Energy Markets" (Export Report).[25] That report responds to an August 2011 request from DOE for an analysis of the potential impact of increased domestic natural gas demand, as exports, to help inform DOE's decision-making in circumstances exactly like the application here: determination of whether applications to export LNG to non free-trade agreement countries fulfills the public interest standard under Section 3 of the NGA. As discussed extensively below, the best available economic and environmental data concerning natural gas production, demand, and export related to DCP's application weighs strongly against finding DCP's instant application as being in the public interest.

The Export Report considers four scenarios of export-related increases in natural gas demand with EIA beginning its assessment by specifically acknowledging the inherent difficulties of accurately projecting any certain estimates of energy markets over a 25-year period, calling the process "highly uncertain."[26] In representing natural gas markets the report explains that due to the non-integrated nature of natural gas globally, and due to variable U.S. market conditions, gas markets as a whole are dynamic and predictions are likely specious at this

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[20] Policy Guidelines at p.7.

[21] *Id.* at 7.

[22] Engelder, Terry and G.G. Lash. 2008. "Marcellus shale play's vast resource potential creating stir in Appalachia." *American Oil and Gas Reporter*, v. 51, n. 6, p. 76-87.

[23] Engelder T. 2009, "Marcellus 2008: Report card on the breakout year for gas production in the Appalachian Basin." *Fort Worth Basin Oil & Gas Magazine*. August 2009, p. 19-22. Available at: http://www.geosc.psu.edu/~jte2/references/link155.pdf

[24] Christopherson and Rightor, 2011. p.9.

[25] U.S. Energy Information Administration, "Effect of Increased Natural Gas Exports on Domestic Energy Markets," January 2012. Available online at: http://www.eia.gov/analysis/requests/fe/pdf/fe_lng.pdf.

[26] *Id.* at 3.

time. For instance, future exports of U.S. LNG depend on a number of variable factors potentially including but not limited to the greater diversity of supply that North American liquefaction projects potentially represent and a current low-level of regulatory control.[27] The four scenarios essentially entailed a discussion of impacts arising from low export and slow introduction to gas markets, low export and rapid introduction to gas markets, high exports and slow introduction to gas markets, and high exports and rapid introduction to gas markets, referenced *infra* as Scenarios 1-4, respectively.

DCP's Proposal Will Increase Natural Gas Prices

The Export Report summarized EIA's findings as showing that increased natural gas exports lead to higher domestic natural gas prices, increased domestic natural gas production, reduced domestic natural gas consumption, and increased natural gas imports from Canada via pipeline.[28] In other words, four certainties can be drawn. First, larger export levels lead to larger domestic price increases, while rapid increases in export levels lead to large initial price increases that moderate somewhat in time. Even slower increases in export levels lead to price increases, just at a slower scale of price hikes. Second, natural gas markets in the U.S. will increase production to satisfy an estimated 60-70% of the increase in natural gas exports, with three-quarters of this increased production expected from shale resources. Third, the remaining deficit in energy supply correlated to price increases will likely be met by the electric sector, which the EIA anticipates coal-fired generation to primarily produce. Fourth and last, consumers will consume less but still see an increase in their natural gas and electricity costs if export is allowed under any scenario.[29] Increases in domestic natural gas prices, in shale gas production, and in coal-fired electricity production possess serious economic and environmental consequences for the greater public and as well as mid-Atlantic economies that cast significant doubt on the competitiveness of DCP's export proposal.

Because price is a key component of DOE's competitiveness analysis, and because DCP's application is replete with information allegedly proving the proposition that export will not affect domestic gas prices, the following section explains EIA's conclusion that LNG export will cause gas price hikes.

EIA projects that U.S. natural gas prices will rise over the long run, even before considering the possibility of additional exports, with projected pricing varying considerably depending on assumptions concerning supplies and economic growth.[30] However, increases in natural gas prices at the wellhead translate to similar absolute increases in delivered prices to customers under all scenarios and baseline cases. If exports proceed under the assumptions of Scenario 1, phasing in 6 Bcf/d of exports over six years, price impacts peak at about 14% in 2022. In contrast, rapid increases in export levels in Scenario 4, phasing in 12 Bcf/d of exports over 4 years, equates to a 36% price hike at the wellhead. Particularly troubling is the Low Shale EUR case, where the rapid introduction of 12 Bcf/d of exports results in a 54% increase in wellhead price by 2018. Although notably termed "pessimistic" by the EIA, this estimate is

[27] *Id.* at 4.
[28] *Id.* at 6. "Summary of Results."
[29] *Id.*
[30] *Id.* at p. 6.

closely corroborated by current data showing how many LNG export authorizations are currently before DOE and FERC, and by the volumes requested in those applications. If all domestic LNG export applications are approved as written, Scenario 4 and the Low-Shale EUR casestudy may very closely reflect reality where the public experiences a drastic hike in natural gas prices, an outcome that weighs strongly against the competitiveness of DCP's application.

Further, the Export Report clearly corroborates higher gas prices with increased production, particularly in shale reserves. The baseline case anticipates total domestic natural gas production to grow from 22.4 Tcf in 2015 to 26.3 Tcf in 2035, averaging 24.2 Tcf for the 2015-2035 period, where increased export incites higher domestic pricing, reduced domestic consumption, and increased domestic production.[31] However, the Export Report does not provide a substantive analysis of new estimates of recoverable natural gas reserves, data that is crucial to an accurate assessment of whether DCP's export proposal is competitive or secure.

The EIA estimates in the Early Release Overview of its "Annual Energy Outlook 2012" (AEO2012)[32] that domestic natural gas reserve estimations are down 42% from 2011, and estimates for the Marcellus reserve in particular are down 66% from 2011 estimates.[33] That is, the estimated unproven technically recoverable resource of shale gas for the U.S. is 482 Tcf, substantially below the previous estimate of 827 Tcf in 2011. Likewise, this significant decrease is due in large part to the decreased estimate for the Marcellus shale, from 410 Tcf to 141 Tcf. The report notes these updates come from an increase in information available as daily rates of drilling have dramatically increased, in fact doubling for the Marcellus reserve since 2011 alone.

This update is particularly salient to DCP's application as DCP intends to rely heavily on shale gas resources of the Marcellus for export during its proposed 25-year term. These new figures suggest a dramatically smaller supply than previously thought for mid-Atlantic shale reserves, as well as a corresponding decrease in the overall estimated natural gas reserves for the nation over the contract term. A lower potentially recoverable volume of gas in reserves that DCP anticipates utilizing for export equates to uncertainty in the 'security of supply', a primary consideration in assessing whether DCP's proposal satisfies the public interest standard. We disagree with the current policy encouraging hurried extraction of natural gas reserves via HVHF, especially considering the socio-environmental impacts such development inevitably entails, and strongly disagree with the proposition that exporting those limited reserves for higher profit margins – which in turn will increase the aforementioned development and impacts - is in the public interest.

Gas & Electricity Price Increases Are Not in the Public Interest

In addition to price and production estimations DOE's competitiveness analysis should examine the nexus between increased natural gas export, decrease in consumption in electric power sector, and an increase in other power generation for electricity needs. In scenarios 1-4, where there is natural gas export, most of the decrease in consumption occurs in the electrical

[31] Export Report at p. 10.

[32] U.S. Energy Information Administration, AEO2012 Early Release Overview, available online at: http://www.eia.gov/forecasts/aeo/er/.

[33] AEO2012 at p. 9.

power sector, where the tradeoff in sources is between natural gas and coal, especially in the short-term relative to the 25-year reference period.[34] The EIA estimates that increased coal-fired generation will account for approximately 65% of the decrease in natural gas-fired generation under reference case conditions, and likely an even higher percentage in a Low Shale EUR case.[35] The increased use of coal for power generation results in an average increase in coal production from 2015-2035 over reference case levels of between 2 and 4 percent across all export scenarios. In the words of the EIA: "[As natural gas exports increase, along with prices for electricity generation], [a]ccordingly, coal prices also increase slightly which, along with higher gas prices, drive up electricity prices."

In other words, exporting LNG would not only increase domestic gas prices on the order of as much as 50%, but also increase our nation's reliance on coal-fired energy combustion – a dubious endeavor for many health and environmental concerns in and of itself not specifically discussed here – as well as increase general electricity costs for the public. When adding these facts to the highly uncertain and volatile nature of international gas prices, the negative correlation that high domestic energy costs have on the public's economic well-being, and the potentially disastrous effects a collapse of international gas demand due to a glut from North American market entrance, the available evidence weighs strongly against a finding of competitiveness for DCP's export application.

DOE should also consider productivity and its relation to an assessment of competitiveness in light of likely firm strategies responsive to profit opportunities. Given a limited number of drilling rigs, firms will certainly deploy them in those places where profits are most likely, where the question for an energy company is not whether a well is viable in terms of potentially recoverable gas, but whether it is *commercially* viable.[36] Production in shale plays is unpredictable and only a small number of wells may be able to produce commercial volumes of gas over time without costly re-fracking. Evidence from the Barnett and Haynesville shale plays indicates that high initial production rates may drop off rapidly, making it difficult for operators to cover costs. "Shale production is characterized by a steep decline curve early in its productive life. The more oil and/or gas that you can make up front the better the economics."[37]

Similarly, geologist and investment advisor Arthur Berman[38] states the following in regard to production trends across US shale plays:

> *... most wells do not maintain the hyperbolic decline projection indicated from their first months or years of production. Production rates commonly exhibit abrupt, catastrophic departures from hyperbolic decline as early as 12-18 months into the production cycle but, more commonly, in the fourth or fifth years for the control group. Pressure is drawn down and hydraulically produced fractures close...Workovers and additional fracture stimulations may boost rates back to previous*

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[34] Export Report at p. 12.

[35] *Id.*

[36] Christopherson and Rightor, 2011. p.9.

[37] McFarland, Greg. 2010. "Shale Economics: Watch the Curve". *Oil & Gas Evaluation Report*. Website published by Obsidian Energy Company, LLC. March 17. Available at: http://www.oilandgasevaluationreport.com/tags/shale-play/.

[38] Berman, A. 2009. "Lessons from the Barnett Shale suggest caution in other shale plays." Available at: http://www.aspousa.org/index.php/2009/08/lessons-from-the-barnett-shale-suggest-caution- in-other-shale-plays/.

levels, but rarely restore a well to its initial decline trajectory. More often, a steep hyperbolic or exponential terminal decline follows attempts to remedy a well's deteriorating performance.

Christopherson notes the distinct possibility that "few wells will exhibit the hyperbolic production curves that are used to describe trends *across* wells in a shale play,"[39] such unpredictability demonstrated by the 2009 collapse in levels of production of drilling in the Jonah Field in Colorado, indicating the volatility and difficulty in accurate projects for long-term periods. Because shale plays may not produce the long-term results indicated by the hyperbolic curves used by industry, the HVHF boom in the US shows evidence of a speculative "bubble" undermining DCP's reliance thereon in support of its LNG export application.

The EIA's Annual Energy Outlook 2011 ("Annual Report ") concludes that production of natural gas from large shale gas formations in the United States grew by an average of 17 percent per year from 2000 to 2006, and while it predicts further increases in shale gas production, it also states there is a high degree of uncertainty.[40] The uncertainty embodies the aforementioned difficulty in accurate projections due to wide disparities in technically recoverable shale gas resources. For instance, the Report states: "across a single shale formation, there are significant variations ... [giving rise to different] production rates for different wells in the same formations ... by as much as a factor of 10."[41] The report also admits "considerable uncertainty about the ultimate size of the technically and economically recoverable shale gas resource base ... and the amount of gas that can be recovered per well, on average, over the full extent of a shale formation." In other words, the report admits that on the whole "reliable data [corroborating] long-term production profiles and ultimate gas recovery rates for shale gas wells are lacking."[42]

The EIA also conducted a series of self-described "plausible but not definitive" case-studies with potentially significant implications for future natural gas prices, production, and consumption.[43] For instance, and representative of the volatile, unpredictable nature of shale gas reserves, two projections for US shale gas production in 2035 had a difference of 3 magnitudes, at 17.1 tcf versus 5.5 tcf.[44] The same studies show less pronounced price differentials than noted *supra*, however this is because the models contemplate the cost per unit of production from each shale formation as the same as the reference case.

EIA's natural gas production forecast predicts shale gas to be the largest contributor to production growth, mainly due to new exploration and continued development. DCP correctly quotes the EIA model's prediction that in 2035, shale gas makes up 47% of total U.S. production, nearly triple its 16-percent share in 2009. However, DCP conveniently excludes EIA's relevant disclaimer that estimates of technically recoverable resources and well productivity remain highly uncertain. Therein lies the rub. At best DCP's commissioned studies and 210 pages of application make a hyperbolic - but unsubstantiated – argument in favor of

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[39] Christopherson and Rightor, 2011. p.10.

[40] U.S. Energy Information Administration, "Annual Energy Outlook Report 2011," p. 36, available online at: http://www.eia.gov/forecasts/aeo/.

[41] *Id.*

[42] *Id.*

[43] *Id.* at pp. *37-8.*

[44] *Id.* at p. 39.

LNG export competitiveness. The simple truth is that DCP's terminal will largely rely on Mid-Atlantic shale plays for its primary source of LNG, and those plays are not capable of accurate prediction for the 25 year span requested.

Further, in addition to significant variation among published projections is the fact that models uniformly assume that current laws and regulations will continue through the projection period. Indeed, EIA notes that its projections do not assume the implementation of regulations limiting carbon dioxide emissions or other types of emissions beyond those currently in effect.[45] This issue is compounded in the case of shale gas production. While Western states have utilized HVHF for over a decade, the practice is nascent, contentious, and not widespread in Mid-Atlantic shale plays. Of particular note, the states of New York and Maryland have not yet decided to allow shale gas development within their borders. Indeed, those states have yet to even implement necessary regulatory controls for shale gas. Only Pennsylvania, with a rather pock-marked record infamous for ad hoc regulation of natural resource extraction, has decided to uniformly, and largely without adequate regulation, allow shale gas development. That uniformed and rash decision-making is already causing direct, indirect and cumulative impacts that are discussed *infra* at Section IV.

It is inappropriate to assume that the status quo of laisse-faire regulation will continue unabated for the pendency of DCP's requested 25 year contract term. For instance, EPA is expected to propose new regulatory measures safeguarding human health and the environment related to HVHF by 2014. The Pennsylvania Governor's own Marcellus Shale Advisory Commission[46] last year recommended the need for significant additional and/or changed regulatory controls over the use of HVHF gas drilling in the State. These anticipated and recommended new programs cast significant doubt as to the accuracy of estimated shale gas production trends, contributing to the uncertainty of shale gas competitiveness. Thus, on the whole, there exists a preponderance of the evidence casting doubt on the competitiveness of exportation over the duration of the contract period.

2. Need for natural gas

DCP's application poses significant doubt as to the need for export. As domestic shale gas production ramps up, other traditional domestic natural gas are expected to fall.[47] Likewise, imports are expected to fall from 11% of total supply in 2009 to 1% in 2035.[48] The EIA's Annual Report showcases several projections, each evidencing an increase in overall domestic natural gas consumption from 2009-2035, with two studies estimating as much as a 40% or more increase.[49] The Annual Report also provides useful data for estimating various sector's consumption patterns, with data corroborating increases in consumption by electricity generators, by industrial users, and by residential users.

Natural gas is now the cheapest option for power generation, which has led companies to

[45] *Id.* at p. 97.
[46] Governor's Marcellus Shale Advisory Commission, Report, 7/22/2011.
[47] *Id.* at p. 80.
[48] *Id.*
[49] *Id.* at p. 97.

shelve wind and nuclear power projects in the country. The largest wind energy producer, NextEra Energy Inc., canceled plans for new wind projects next year, and Exelon Corp. has decided not to expand its nuclear power plants. CMS Energy Corp. in Michigan has canceled its plans to build a $2 billion coal-fired power plant. The low price of gas has been mirrored in the electricity market. Electricity pricing is linked to the gas market, so profits for power producers have shrunk dramatically. Tighter margins have discouraged investments in coal, nuclear and wind projects. This shift will have an impact on the clean energy sector for decades to come, analysts say.

The low prices have already drained the nuclear industry resurgence as well as carbon capture and sequestration projects related to coal-powered production. Investment in wind is also slowing, due to cheap gas prices, a lack of transmission infrastructure and subsidies that will expire next year.[50] The result is that the dominant dialogue treating natural gas as a transitional fuel is hyperbole, as long-term investments in natural gas such as LNG export contracts threaten to hold the U.S to a path of fossil fuel consumption and increased production indefinitely, instead of prioritizing the development and implementation of clean energy alternatives on appropriate economies of scale. And by logical extension, if natural gas extracted in the U.S. is later to be shipped to communities overseas it cannot in fact be available to serve that transitional role. In other words, the claim of natural gas as a bridge fuel is being used to support its exploitation, which is resulting in a reduction in investment in alternative fuel sources, while at the same time being planned for exportation – so rather than serving as a bridge to alternative sources it is serving as a high hurdle. The point here is that exporting natural gas will cause several negative impacts domestically, all of which weigh against the public interest.

As the discussion above illustrates, reliable demand is key to the stable growth of a reliable supply. While the data referenced *supra* corroborates the *potential* for domestic natural gas to fulfill projected domestic baseloads, the uncertainty inherent in the evolution of shale gas production rightfully demands caution in making *assumptions* in favor of authorizing export authorizations *spanning decades*. The NGA framework does presume increased competition is a public benefit; however, it also leaves for consideration other relevant factors (*see* discussion *infra* of significant and unevaluated environmental and community impacts) which, in conjunction with unverifiable competitiveness discussed above, provide a strong argument that LNG export from DCP's facility is not in the public interest.

3. Security of supply

"The security of gas supply and its transportation to the U.S. border remain important components of the public interest, especially those under long-term arrangements. An [export] will be considered secure if it does not lead to undue dependence on unreliable sources of supply."[51] Two important messages are evident: the security of supply, and the security of transportation. DCP correctly states that EIA currently estimates domestic natural gas reserves of 2,543 tcf, representing more than 100 years of supply at current usage rates of approximately 24

[50] Bloomberg News, "US Shale Bubble Inflates After Near-Record Prices for Untested Fields," available online at: http://www.bloomberg.com/news/2012-01-09/shale-bubble-inflates-on-near-record-prices-for-untested-fields.html
[51] Policy Guidelines, p. 9.

tcf per year.[52] However, DCP devotes no time or explanation to the uncertainty surrounding shale gas productivity, nor does it discuss relevant security concerns related to transportation.

Firstly, the undersigned continue to dispute any clear signal concerning the application's competitiveness due to the aforementioned unverifiable uncertainties inherent in modeling domestic shale gas production. Secondly, DCP fails to discuss the foreseeable cumulative implications of all pending LNG export proposals being granted and drawing their maximum allotments on domestic supplies. For instance, if all 7 potential U.S. domestic export terminals were operational, they would draw a cumulative 12.1 Bcfd for export.[53] As a mathematical matter, 7 fully operational and drawing export facilities could then export approximately 4 tcf per annum, or 16% of current domestic baseload. Thus, in at least one plausible scenario, reserves would be depleted at a much faster rate than DCP's projections which, considered next to the uncertainty of shale gas production in the Mid-Atlantic, raise significant questions as to the security of domestic natural gas supplies.

Although adding LNG to the mix of sources of natural gas available worldwide would, in effect, "diversify" the sources of natural gas available, it does not follow that such diversity would lead to more competitive prices within U.S. markets or that such diversity is in the public interest. In fact, logic indicates that LNG is an expensive choice for the use of domestic natural gas (which is only logical, given that the LNG would have to include the price of liquefaction, transportation, and regasification). Further, due to global warming concerns, among other factors, there are significant national and state policies moving away from increased reliance on fossil fuels and towards renewables, and a recognition that for purposes of energy independence, energy security, and positive impact on the future of global climate change, domestically produced natural gas does not make sense as a so-called "transition fuel". There is simply no authority for the conclusion that increasing our dependence on natural gas in the name of 'diversity' satisfies the public interest; however, there is plenty to suggest that it does not serve the public interest.

Likewise, DOE should not allow the market to drive decisions as to which gas projects will go forward. Not only is DOE not allowed to "punt" to "the market" in this way, to do so clearly violates its mandate to protect the public interest. As we should have learned from the rush to develop nuclear power in this country, even if the precedent agreements do bind those companies to take on the burden of the cost of constructing a boondoggle, those costs will eventually be borne by their ratepayers (a subset of the general public) or the taxpayers (a larger subset of the general public) when the project doesn't cost out as companies anticipated and the companies declare financial distress or even bankruptcy. "The market" does not protect the public – that is DOE's responsibility, and DOE has no authority to abdicate that responsibility to "the market" or the signatories – or even worse, to anticipated signatories - to contractual export agreements.

As a practical matter the natural gas reserves DCP's proposal anticipates being developed do not evidence a reliability ensuring a dependable source of gas for domestic baseload and the

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[52] *See* Application, at p. 26.

[53] "North American LNGImport/Export Terminals," "Proposed/Potential," FERC, available online at: http://ferc.gov/industries/gas/indus-act/lng/LNG-proposed-potential.pdf.

proposed export. The Policy Guidance provides that reference can be made to any gas reserves committed to the export arrangement for the term of the contract. Here again, the speculative nature of shale gas production is relevant and casts significant doubt on the security component of DOE's public interest evaluation. DCP anticipates primarily tapping the projected shale gas reserves of the Marcellus and Utica shale plays yet, as documented *supra*, the sufficiency of those plays, their physical accessibility, and their projected yields possess little certainty, in fact exhibiting a substantively speculative nature. The unverifiable nature of these shale plays is compounded by the lack of positive historical precedent for Mid-Atlantic shale gas production, together casting doubt on the reliability of primary anticipated production supplies for DCP's proposed export.

Furthermore, there are a number of regulatory limitations that are coming on line which will further diminish access to identified shale areas. In the Delaware River watershed there is a moratorium on gas drilling that would affect Marcellus and Utica shales in New York, Pennsylvania and New Jersey; in New York there is an ongoing regulatory process that will certainly diminish the areas of shale available for drilling (how much is yet to be determined); in Pennsylvania there are legislative initiatives focused on putting shales located under public lands off limits for drilling; in New Jersey there was proposed and passed a ban on hydrofracking in that state, and while recently vetoed by the Governor there is every expectation the ban will be re-proposed and has a high likelihood of passage once again. These are but a small sampling of the efforts happening just in the region that could, via regulation or legislation, affect the volume of shale that is available for extraction.

The authorization of a new LNG export facility in the Chesapeake Bay also poses significant issues relevant to national security that are relevant to a determination of whether DCP's application fulfills the public interest standard. During a hearing in the United States House of Representatives on 21 March 2007, Jim Wells of the GAO raised doubt that the Coast Guard can marshal the resources needed to meet its responsibilities.[54] While it took 40 years to build the fleet of LNG carriers to 200 tankers worldwide, it could take less than four more years for that number to grow to 300. This rapid growth rate coupled with the anticipated number of LNG proposals in the U.S. presents a real security challenge. The U.S. faces today a potential lack of security measures and resources to protect these new assets.

The rapid growth of LNG does not affect only the ability to safeguard each ship; it also affects the quality of mariners working onboard these vessels. Due to the nature of LNG, highly skilled and trustworthy individuals are required to ensure its safe transport. Currently, LNG tankers have crews consisting of mostly foreigners. Yea Byeon-Deok, professor and LNG initiative coordinator of the International Association of Maritime Universities said, during a conference in Australia, "Many sub-standard vessels have begun to appear as demand for LNG increases, while there is a chronic shortage of experienced crew."[55] Because of sudden rapid growth in the industry, many experts question whether or not there will be enough qualified mariners to crew these vessels. Nearly 1,500 senior officers and 750 senior engineers will be required to man the 100 new LNG ships. Approximately 80 percent of these ships will be fitted

[54] "Securing LNG Tankers to Protect the Homeland," United States House of Representatives, Committee on Homeland Security, a hearing on March 12, 2007.

[55] "Warning on LNG Shipping Standards," *Oil and Gas News Worldwide*, May 7, 2007

with steam turbines, which require engineers with steam experience, which, according to one report, is a "vanishing resource."[56] The fact that many senior LNG officers are due to retire soon, and new, highly skilled mariners will be required to replace them exacerbates the situation. It will be tough enough just to replace crew and officers who are retiring, making these shortages of crew members and officers reach crisis proportions.[57]

The Society of International Gas Tanker and Terminal Operators LTD (SIGTTO) has recognized the acute shortage. "A short-term answer for an LNG vessel operator is to 'poach' its crew from another such operator but, clearly, the long-term answer is training, training, and further training. SIGTTO members, as much as anyone, wish for the quite unique safety record of LNG shipping to be preserved. The influx of new personnel into the industry is of concern, especially if there is a temptation by a minority of operators to 'cut corners' and put officers into positions of responsibility on a LNG carrier before they have been properly trained."[58] The quality-control of shipping is of direct relevance to DCP's proposal as the Chesapeake represents a congested and relatively shallow port host to a slew of other economically important activities aside from natural gas distribution.

A key question for security is whether or not the benefits outweigh the risks and how big the risks truly are. The most inherent problem with LNG is that despite scientists, scholars, officials and academicians conducting various high-profile studies on the safety implications of LNG, in addition to a variety of known hazards, there are many unknown variables and unanswered questions concerning security which still exist. For example, empirical data demonstrating what would happen if there were to be a catastrophic accident are virtually non-existent. This intangible aspect of security lends credence to seriously questioning the propriety of DCP's export proposal as being in the public interest, particularly in light of its location in the economically vital Chesapeake Bay, not to mention its adjacency to a nuclear power plant.

4. Other relevant considerations in the Public Interest

Increased Gas Production Harms Communities & the Environment

DCP claims that the most basic benefit of the proposed LNG export will be to encourage and support increased domestic production of natural gas.[59] Indeed, approval of the proposal would likely facilitate a steady new demand associated with LNG exports that could spur the development of natural gas resources. Admittedly, DOE reached that conclusion in recently authorizing exports from Sabine Pass.[60] However, neither DCP nor DOE in its Sabine Pass authorization provided data corroborating the long-term economic benefit of increased shale gas production with positive economic benefits for the communities from which it is extracted. That impact is certainly relevant to the disposition of American citizens, and thus relevant to

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[56] "Serious LNG Crew Shortage Looms," Summary from *Oil and Gas Journal*, April 4, 2005, http://www.ogj.com/display_article/224811/94/ARCHI/none/none/Qatar,-India,-Egypt-advance-plans;-US-gulf-terminals-break-ground/, May 13, 2007.

[57] *Id.*

[58] SIGTTO News, September 2005, p.5.

[59] *See* Application, at p. 35.

[60] *Sabine Pass*, Order No. 2961 at 35.

determination of whether the instant proposal fulfills the public interest standard. In fact, the majority of scientific and economic literature shows that long-term economic development in regional economies dependent on resource extraction is negatively impacted by continued – and in the instant circumstance increased – development and production. DOE's determination of whether DCP's proposal satisfies the public interest standard must contemplate and rationally reconcile studies proving extractive industrial development overall harms dependent regional economies and jeopardizes existing jobs and economic stability.

One recent study considered 26 Western counties that have concentrated on fossil fuel extraction from public lands for economic development, concluding that at least in recent years such counties have increasingly underperformed economically compared to less energy-industry-focused counties.[61] Another older benchmark review of 19 separate studies of mining-dependent rural economies concluded that, there is surprisingly little evidence that mining will bring about economic good times, while there is a good deal of evidence for expecting just the opposite.'[62] Since the mid-1990's an extensive body of empirical research has also investigated the existence and dynamics of the so-called, resource curse.'[63] [64] Michael Ross summarized the curse literature to date by noting, "There is now strong evidence that states with abundant resource wealth perform less well than their resource poor counterparts, but there is little agreement on why this occurs."[65]

Four of the categories of reasons summarized by Ross are economic. These are 1) a decline in terms of trade for primary commodities, 2) the instability of international commodity markets (making government revenues & foreign exchange unstable and investment risky), 3) the poor economic linkages between resource and nonresource sectors, especially as external investors remove profits from the local economy, and 4) the 'Dutch Disease' that associates resource boom economies with a) increases in the exchange rate, making other domestic exports more expensive, and b) increased competition with other domestic sectors for scarce capital and labor.

In terms of their translatability to a subnational and domestic context, only some of these reasons are even theoretically relevant. The terms of trade logic is completely inapplicable. In contrast, the instability of commodity prices is partially salient, especially as both government revenues and investment risk are affected by unstable prices in regional markets. The linkage argument also seems potentially relevant insofar as nonlocal firms are likely to come into a region only temporarily, extract profits along with the gas, and be likely to purchase only a limited array of local goods and services lacking a well developed economy of strong, locally well linked sectors (again, the share of expenditures going to local landowners vs. local firms

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[61] Headwaters Economics. 2008. *Fossil Fuel Extraction as a County Economic Development Strategy: Are Energy-focusing Counties Benefiting?* accessed December 20,2010, http://www.headwaterseconomics.org/pubs/energy/HeadwatersEconomics_EnergyFocusing.pdf

[62] Freudenburg, W.R. and Wilson, L.J. 2002. ,Mining the Data: Analyzing the Economic Implications of Mining for Nonmetropolitan Regions.' *Sociological Inquiry*, 72(4):549-575.

[63] Sachs, J.D. and Warner, A.M., 1995. revised 1997, 1999. ,Natural resource abundance and economic growth.' *National Bureau of Economic Research Working Paper No. 5398*, Cambridge, MA.

[64] Ross, Michael. 1999. ,The Political Economic of the Resource Curse', *World Politics* 51(2):297- 322.

[65] *Id.*

would have important implications). Part of the Dutch Disease argument also seems potentially relevant. Though the increased cost of domestic currency is obviously not relevant at a regional level, tighter competition of the resource sector for factors of production is quite likely to crowd out competing sectors, at least during some time periods in the adaptation of the local economy.[66]

Perhaps of most significance for the new shale gas economies are several recent subnational empirical studies of the resource curse phenomenon, three of which have investigated the issue within the United States using both state and county level data sets. Each of these studies finds evidence that some version of a resource curse is detectable within a subnational economy, and that poor governance and crowding out effects are contributing factors of varying importance. Papyrakis and Gelragh optimistically conclude that, 'prudent economic policies and cautious planning can reverse the pattern'. Unfortunately, Pennsylvania contains a significant percentage of the shale plays in the Mid-Atlantic with Maryland and New York as yet not choosing to develop those resources, and Pennsylvania's regulatory policies thus far are inapposite to prudent, cautious planning.[67]

Exporting Natural Gas Does Not Create Long-Term Jobs

DCP claims billions of dollars in benefits and tens of thousands of jobs will result from its export proposal,[68] but the vast majority of these benefits are not directly associated with the construction or operation of the facility itself. That project will only result in several thousand temporary construction-related job and several hundred jobs during operations, only 70 of which appear to be direct employees of the facility.[69]

Instead, the bulk of the economic benefits DCP claims result from what DCP calls its "most basic benefit": its ability to "encourage and support increased domestic production of natural gas and [natural gas liquids]."[70] In DCP's view, increased production will, directly and indirectly, pump money into the economy and create jobs regionally and nationally.[71] Increasing gas production will increase employment in that sector by some amount, but a more careful look at the data demonstrates that booms in resource extraction industry are far more of a mixed bag than DCP acknowledges.

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[66] Kay, David. "The Economic Impact of Marcellus Shale Gas Drilling, What Have We Learned? What Are the Limitations?" part of the "Working Paper Series: A Comprehensive Economic Impact Analysis of Natural Gas Extraction in the Marcellus Shale." April 2011, p. 28, available online at: http://ccc.cornell.edu/EnergyClimateChange/NaturalGasDev/Documents/PDFs/KayFormattedMarcellus%20WorkingPaperREvised4-4-2011.pdf

[67] *Id.* at 30.

[68] *See* DCP Proposal at 16-19 & ICF Study.

[69] *See* ICF Study at Table 2.

[70] DCP Application at 35.

[71] *See* DCP Application at 36-40.

Nearly all jobs in the natural gas industry earn among the highest wages of any industrial sector, with a mean hourly wage of $34 per hour, typically excellent benefits,[72] and dramatically increasing wages among highly skilled positions, including skilled trades such as specialized welding or crane operation, and positions in advanced fields such as engineering and geosciences. Non-experienced roustabouts or construction helpers can start at wages close to $20 an hour, with many opportunities for overtime.[73]

However, to accurately assess whether the shale gas development provides the claimed job numbers, which indirectly would support the economic benefit of increased production for LNG export - it is necessary to assess drilling phase jobs versus production phase jobs. Clearing and constructing a natural gas well site, drilling and casing the well, performing the hydro-fracturing process, and constructing the associated pipeline infrastructure are all considered part of the Drilling Phase, a very labor-intensive process. After this work is performed, however, the number of workers needed to keep producing gas for the remainder of the life of the well -- the Production Phase -- is much smaller.

A worker-by-worker tally of the Marcellus Shale industry in Pennsylvania found that *the drilling phase accounted for over 98% of the natural gas industry workforce* engaged at the drilling site.[74] [75] Because most of the job opportunities occur during the drilling phase of operations, and because drilling activity in a given locale can quickly escalate or decline, natural gas employment conforms to a pattern of "Boom" and "Bust" found in other types of mining and natural resource development activity -- where the population base may expand rapidly over a number of years before shifts in commodity prices, energy company business strategies, or natural resource policies cause extraction activity to collapse, leading new residents and workers to leave the community.[76] [77]

While comprising less than 5% of the total workforce, jobs associated with the Production Phase of operations (i.e. the employees of the energy company operator required to manage gas production from existing wells) will remain local and predictable. A 30-year production phase is the typical estimate, although the reality varies by well, location, and market conditions. These production phase jobs will be required even if drilling ceases completely. *Occupations associated with the production phase tend to be less labor intensive, more location*

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[72] United States Bureau of Labor Statistics (USBLS). 2010. *May 2009 National Industry-Specific Occupational Employment and Wage Estimates*

[73] Jacquet, Jeffrey. 2006. *Sublette County Wage Study* Sublette County Community Partnership. July 2006. Available online: http://www.sublettewyo.com/index.aspx?NID=305

[74] Marcellus Shale Education and Training Center (MSETC). 2009. *Marcellus Shale Workforce Needs Assessment: North-Central Pennsylvania*. Publication. Williamsport, PA: Marcellus Shale Education and Training Center.

[75] Marcellus Shale Education and Training Center (MSETC). 2010. *Marcellus Shale Workforce Needs Assessment: Southwest Pennsylvania*. Publication. Williamsport, PA: Marcellus Shale Education and Training Center.

[76] Jacquet, Jeffrey. 2009. *Energy Boomtowns and Natural Gas: Implications for Marcellus Shale Local Governments and Rural Communities*. Working paper no. 43. State College: Northeast Regional Center for Rural Development.

[77] Haefele, Michelle and Morton, Pete 2009. "The Influence of the Pace and Scale of Energy Development on Communities: Lessons from the Natural Gas Drilling Boom in the Rocky Mountains" *Western Economics Forum* Vol 8, Number 2

specific, less hazardous, and more specialized than development phase occupations, while still providing excellent wages and benefits.[78]

Insofar as DCP's proposal anticipates heavy reliance on Eastern regional shale gas plays, and Pennsylvania represents the current and projected largest contributor of those shale gases, it is appropriate to consider job and economic modeling of shale gas development's impacts on that state to assess the truth of 'job-creation.' The Penn College of Technology's Marcellus Shale Education and Training Center (MSETC) has performed a number of regional workforce needs assessments focused on the Marcellus shale gas industry in Pennsylvania. Their study found approximately 250 different occupations comprised of over 400 different individuals are required to drill a Marcellus Shale well. *However, the vast majority of these individuals and occupations are required for only a few hours or days for each well.*

The number of Full Time Equivalent (FTE) workers (an FTE is equal to one worker working full time for a year) for these 410 individuals was about 13 FTE to complete a well.[79] Using the "maximum" amount of development predicted by the NYDEC -- 500 wells drilled in New York State per year -- this would result in the equivalent of approximately 6,500 full-time jobs needed while drilling activity is occurring. It is important to note that these jobs are required only while wells are being drilled; once drilling activity stops, these jobs are no longer needed locally. Many times, drilling activity may pause, or move to another area of the play, or move to another part of the continent, forcing drilling crew workers to follow the work to a new location or find a new source of employment.

DCP's Proposal Entails Significant Unevaluated Environmental and Health Impacts

To the extent that the proposed LNG facility is deemed in the public interest because it will inspire and support increased drilling, the proposal ignores the environmental, health and community ramifications of drilling using HVHF practices. In this case, DOE should be particularly attentive to all impacts of gas export and production. DCP's application discusses only the purported benefits of its proposal, conveniently failing to discuss or even acknowledge the less savory environmental and societal impacts. DOE must determine whether DCP's proposal is in the public interest by considering all the positives and negatives of the requested authorization.

In particular DOE must account for the effects of shale gas extraction in its analysis and decision-making. Shale gas development is an extraordinarily land and water-intensive process that converts agricultural, forest, and range lands to industrial uses, consumes millions of gallons

[78] Jacquet, Jeffrey, "Workforce Development Challenges in the Natural Gas Industry," part of the "Working Paper Series: A Comprehensive Economic Impact Analysis of Natural Gas Extraction in the Marcellus Shale," February 2011, p. 5, available online at: http://ecc.cornell.edu/EnergyClimateChange/NaturalGasDev/Documents/Green%20Choices%20Papers/Marcellus_Jacquet.pdf

[79] *Id.* at notes 48, 49.

of water per well, and generates huge quantities of hazardous wastes.[80] Some of the major water quality impacts shale gas development causes are as follows:

Casing and Cementing Failures

Failures in the integrity of well casing and cementing occur regularly, either because of faulty construction or because of degradation over time, opening potential pathways for contaminants to reach shallow aquifers.[81] It is also plausible that fracking may create fissures that extend above the targeted horizontal shale layer and link with naturally occurring fissures or abandoned wellbores, allowing methane, fracking fluids, and produced waters to reach shallow aquifers.[82]

Hazardous Waste Disposal

Shale gas extraction uses and produces numerous toxic substances that are not governed by uniform national standards for treatment and disposal. Drilling muds and fracturing fluids contain a laundry list of toxic ingredients, while produced waters and drill cuttings bring to the surface naturally occurring hazards such as highly carcinogenic BTEX chemicals (benzene, toluene, ethylbenzene, and xylene) as well as brines, radioactive materials, arsenic, mercury, and hydrogen sulfide. Most of these wastes are exempt from regulation under Subtitle C of the Resource Conservation and Recovery Act governing the generation, transportation, treatment, storage, and disposal of hazardous wastes.[83] Similarly, under the Comprehensive Environmental Response, Compensation, and Liability Act, petroleum and natural gas (including liquefied

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[80] Shale gas extraction is also a significant source of hazardous air pollution, including methane, volatile organic chemicals (VOCs), and air toxics such as benzene and ethylbenzene. In July 2011, EPA proposed a suite of draft regulations under the Clean Air Act to set new source performance standards for VOCs and sulfur dioxide, an air toxics standard for oil and natural gas production, and an air toxics standard for natural gas transmission and storage. Final regulations are due by April 3, 2012. See http://www.epa.gov/airquality/oilandgas/ The Department of Energy's advisory panel on shale gas has urged EPA to extend these rules to existing shale gas production sources and to adopt regulations addressing methane explicitly. Bridget DiCosmo, "DOE Panel Urges EPA to Strengthen Proposed Air Rules for 'Fracking,'" Nov. 10, 2010, http://insideepa.com/201111102381935/EPA-Daily-News/Daily-News/doe-panel-urges-epa-to-strengthen-proposed-air-rules-for-fracking/menu-id-95.html Methane is twenty times more potent a greenhouse gas than carbon dioxide. See http://www.climatescience.gov/infosheets/highlight1/default.htm
The oil and gas industry is the single largest source of methane emissions in the US, accounting for nearly 40% of national methane emissions. See http://epa.gov/airquality/oilandgas/pdfs/20110728factsheet.pdf

[81] See, e.g., Andrew Nikiforuk, "Fracking Contamination 'Will Get Worse': Alberta Expert," The Tyee, Dec. 19, 2011, http://thetyee.ca/News/2011/12/19/Fracking-Contamination/ (quoting University of Alberta geochemist Karlis Muelenbachs); see also Runar Nygaard, Wabamun Area CO2 Sequestration Project: Well Design and Well Integrity at 6, Jan. 4, 2010, available at http://www.ucalgary.ca/wasp/Well%20Integrity%20Analysis.pdf (summarizing data on well integrity).

[82] See Mooney, "The Truth About Fracking," Scientific American, November 2011, pp. 80-85, at 83 (graphic), 84-5.

[83] U.S. Environmental Protection Agency, "Exemption of Oil and Gas Exploration and Production Wastes from Federal Hazardous Waste Regulations," pp. 10-11, available at http://www.epa.gov/osw/nonhaz/industrial/special/oil/oil-gas.pdf (listing exempt and non-exempt wastes). NRDC petitioned EPA in 2010 to regulate these wastes under RCRA. NRDC, "Petition for Rulemaking Pursuant to Section 6974(a) of the Resource Conservation and Recovery Act Concerning the Regulation of Wastes Associated with the Exploration, Development, or Production of Crude Oil or Natural Gas or Geothermal Energy," Sept. 8, 2010, available at http://docs.nrdc.org/energy/files/ene_10091301a.pdf EPA has not yet formally responded to the petition.

natural gas) are excluded from regulation as hazardous substances.[84] These wastes pose water contamination and health hazard risks whether they are buried in pits, applied to land, injected into underground wells, sprayed into the air, spilled, leaked, or intentionally dumped.

Wastewater Treatment and Disposal

Flowback fluids and produced water that result from HVHF and drilling contain all of the chemicals initially injected as part of the fracturing fluid, as well as other naturally occurring hazardous compounds released during the fracturing process. Wastewater pollutants include everything from lead, arsenic, benzene, diesel fuel, and high levels of total dissolved solids to naturally occurring radioactive materials such as uranium and radium.[85] Ground and water contamination may result from spills, leaks, or improper disposal.

Common disposal methods for the wastewater include underground injection and the transport of flowback to wastewater treatment facilities. Underground injection of fracking waste has recently been associated with induced seismicity.[86] With regards to the use of wastewater treatment facilities for treatment and disposal, most commercial and municipal wastewater treatment facilities are ill-equipped to handle fracking waste. Such facilities are unable to remove naturally occurring radioactive material from the waste stream and the high levels of total dissolved solids present may overwhelm a plant's treatment capacity.[87] Once released into surface waters following insufficient treatment, the wastewater may subsequently overwhelm the dilution-capacity of rivers in regions undergoing intensive shale gas development.[88]

Water Consumption

The proliferation of shale gas development has the potential to degrade water systems due to the massive volumes of water consumed. To the extent that fracking fluids remain underground or are disposed of in underground injection wells, much of the freshwater used for fracking is permanently removed from the hydrological cycle. While some improvements have been made in developing wastewater reuse systems, eventually the pollutants in the fracking fluid reach such extreme concentrations that the fluid becomes unusable and must disposed of.[89]

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[84] 42 U.S.C. § 9601(14).

[85] See N.Y.C. Dep't of Envtl. Prot., Final Impact Assessment Report: Impact Assessment of Natural Gas Production in the New York City Water Supply Watershed 6 (2009); NRDC, Land Facts: Protecting New Yorkers' Health and the Environment by Regulating Drilling in the Marcellus Shale 3 (2009), available at http://www.nrdc.org/land/files/marcellus.pdf ; Chemicals Used by Hydraulic Fracturing Companies in Pennsylvania for Surface and Hydraulic Fracturing Activities, Pa. Dep't of Envtl. Prot., http://www.dep.state.pa.us/dep/deputate/minres/oilgas/new_forms/marcellus/Reports/Frac%20list%206-30-2010.pdf

[86] Briana Mordick, "More Earthquakes, This Time from Oil and Gas Disposal," NRDC Switchboard (Jan. 3, 2012), http://switchboard.nrdc.org/blogs/bmordick/more_earthquakes_this_time_fro.html

[87] See, e.g., Joaquin Sapien, "What Can Be Done With Wastewater?," Pittsburgh Post-Gazette, Oct. 4, 2009, http://www.post-gazette.com/pg/09277/1002919-113.stm ; Ian Urbina, "Regulation Lax As Gas Wells' Tainted Water Hits Rivers," New York Times, Feb. 26, 2011, http://www.nytimes.com/2011/02/27/us/27gas.html?pagewanted=all

[88] Id.

[89] Susan Phillips, "New Technology Treats Fracking Water In Pennsylvania," Sept. 6, 2011, http://stateimpact.npr.org/pennsylvania/2011/09/06/new-technology-treats-frack-water-in-pennsylvania/

Accidents, Negligence, and Illegal Actions

Accidents resulting from negligent construction methods and operations are inevitable. In 2011 alone, the Pennsylvania Department of Environmental Protection issued more than a thousand notices of violation to natural gas operators within the Marcellus Shale region.[90] This represents a 400% increase in reported violations as compared to 2008 – thus emphasizing that activities which encourage increased drilling also result in increased harm.[91] These accidents cover a wide spectrum of violations, including surface spills, blowouts, improper casing construction, erosion and sediment control failures, faulty pollution prevention, failures in site restoration, improper waste management, and wastewater impoundment construction failures.[92] One well blowout is estimated to occur for every thousand wells drilled; however, the severe consequences of a blowout make this ostensibly small number significant.[93]

Similarly, DOE must consider the safety concerns authorizing a bidirectional LNG facility entails. These concerns include but are not limited to a siting and carrier analysis,[94] risk and consequence assessment of potential LNG spills over water,[95] and National Protection Association standards applying to LNG.[96] And, as aforementioned, local and international regulatory requirements from such organizations as the International Maritime Organization, U.S. Coast Guard and hosting Port Authority should all be assessed for their roles in mitigating risks of LNG. In particular, DCP's proposal demands re-assessment of the potential for catastrophic LNG explosions due to its proximity to Calvert Cliffs nuclear facility. In fact, prior to DCP being authorized to resume gas imports in 2003 it was required to complete such a reassessment.[97] As citizen advocates for the safety and health of a generous portion of the Chesapeake Bay watershed we take this opportunity to stress the simple, and easily overlooked, issue of safety due to the several serious domestic LNG accidents history has recorded:

• *Staten Island Tank Fire, USA, 1973.* A fire erupted at an out-of-service LNG tank that was being repaired. Forty workers then inside the tank were killed. LNG, which had leaked through the liner during previous

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[90] Matthew Kelso, "2011 Marcellus Shale Violations in PA," http://data.fractracker.org/cbi/dataset/datasetPreviewPage?uuid=~01eff9046c035611e19931a7bb56cb4f26

[91] PADEP Oil & Gas Inspections – Violations – Enforcements: Updated 11/17/11, http://www.dep.state.pa.us/dep/deputate/minres/oilgas/OGInspectionsViolations/OGInspviol.htm (2008 total number of violations: 205; 2011 total number of violations: 1090).

[92] Id.

[93] In April 2011, for example, a natural gas well operated by Chesapeake went out of control for roughly twelve straight hours, spewing more than 10,000 gallons of chemically laced fuel into the local environment, which included a pasture and creek. Dave Fehling, "When Wells Blow Out In Pennsylvania, Texans Step In," Jan. 5, 2012, http://stateimpact.npr.org/texas/2012/01/05/when-wells-blow-out-in-pennsylvania-texans-step-in/

[94] Consequence Assessment methods for Incidents Involving Releases from Liquefied Natural Gas Carriers. (May 13, 2004) ABSG Consulting Inc. for the Federal Energy Regulatory Commission. Available online at: http://www.ferc.gov/industries/lng/safety/reports/cons-model.pdf.

[95] Guidance on Risk Analysis and Safety Implications of a Large Liquefied Natural Gas (LNG) Spill Over Water. (December 2004) Sandia National Laboratories. Available online at: http://fossil.energy.gov/programs/oilgas/storage/lng/sandia_lng_1204.pdf.

[96] NFPA 59A: Standard for the Production, Storage, and Handling of Liquefied Natural Gas (LNG), 2009 Edition. National Fire Protection Association. (Next edition 2012).

[97] "Safety Evaluation Regarding Effect of Modification of Liquefied Natural Gas Facility On Safety of Calvert Cliffs Nuclear Power Plant," available online at: http://pbadupws.nrc.gov/docs/ML0335/ML033500123.pdf.

fillings, had accumulated in the soil below and around the concrete tank wall berm. It has been assumed that an electrical spark in one of the irons or vacuum cleaners ignited the flammable gas reentering the tank.

• *Massachusetts Barge Spill, July 1974.* After a power failure and the automatic closure of the main liquid line valves, a small amount of LNG leaked from a 1-inch nitrogen-purge globe valve on the vessel's liquid header - pressure surge caused by the valve closure induced the leakage of LNG – caused another LNG accident.

• *Cove Point, Maryland, 1979.* LNG leak from a high-pressure pump found its way into an electrical conduit – caused another LNG accident.

• *Nevada Test Site, Mercury, NV, 1987.* An accidental ignition of an LNG vapor cloud occurred at the US Department of Energy (DOE) Nevada Test Site in August 1987.

• *USA, March 2005.* LNG Causes Pipeline Leaks and house explosion. On July 7, 2005, a company-sponsored study, launched after a District Heights house exploded in late March, found that subtle molecular differences in the imported liquefied natural gas the utility began using in August 2003 were drying the rubber seals of aging metal couplings that link sections of pipe. The breakdown of seals in the couplings of gas pipelines led to about 1,400 gas leaks during the past two years, and has required the company to launch a $144 million project to replace lines and equipment. Two other house explosions in the area are now under investigation.

• *Savannah, GA March 14, 2006.* A potentially disastrous spill was averted early Tuesday morning when the liquefied natural gas tanker Golar Freeze discharging its load at the Southern LNG terminal on Elba Island broke from its moorings and pulled away from the pier. The dock was shut down for about 36 hours while representatives from the Coast Guard and an LNG engineer from the Federal Energy Regulatory Commission investigated the incident.

• *LNG Tanker Adrift Off Cape Cod Needs Rescue February 11, 2008.* Coast Guard and tugboat crews rescued a liquefied natural gas tanker crippled off Cape Cod after many hours of drifting at sea at the mercy of powerful winds and high waves. Just 5-years-old, the fully laden LNG carrier was corraled by four tugboats about 25 miles east of Provincetown.

Impacts of Shale Gas Infrastructure Construction and Maintenance

Shale gas development consumes not only vast quantities of water but also acres of land for well pads, pipelines, and access roads. In the forested and agricultural lands overlaying the Marcellus Shale, this massive industrialization will cause widespread impacts to surface water quality from deforestation, stormwater runoff, and erosion and sedimentation.

Forests play an essential role in water purification.[98] The scientific literature clearly establishes the link between percent forest cover and water quality; for example, reductions in forest cover are directly correlated with negative changes in water chemistry, such as increased levels of nitrogen, phosphorus, sodium, chlorides, and sulfates as well as reduced levels of macroinvertebrate diversity.[99] Reducing forest cover decreases areas available for aquifer

[98] Robert A. Smail & David J. Lewis, Forest Service, U.S. Dep't of Agric., Forest Land Conversion, Ecosystem Services, and Economic Issues for Policy: A Review 12 (2009), available at http://www.fs.fed.us/openspace/fote/pnw-gtr797.pdf

[99] Jackson, J.K. & Sweeney, B.W., "Expert Report on the Relationship Between Land Use and Stream Condition (as Measured by Water Chemistry and Aquatic Macroinvertebrates) in the Delaware River Basin," Stroud Water Research Center, Avondale, PA. available at http://www.state.nj.us/drbc/Sweeney-Jackson.pdf

recharge, increases erosion, stormwater runoff, and flooding, and adversely affects aquatic habitats.[100] Already in Pennsylvania, researchers have correlated areas of high natural gas well density with decreased water quality, as indicated by lower macroinvertebrate density and higher levels of specific conductivity and total dissolved solids.[101]

Both deforestation and shale gas infrastructure construction and operation will, in turn, lead to greatly increased levels of erosion, sedimentation, and stormwater runoff affecting surface water quality. Excess sedimentation is associated with a number of detrimental effects on water quality, stream morphology, and aquatic life, and has been identified by the EPA as one of the primary threats to US surface waters.[102]

Shale gas well sites are like traditional construction sites in terms of stormwater runoff and sediment discharge levels.[103] A 2005 EPA study concluded that "gas well sites have the potential to negatively impact the aquatic environment due to site activities that result in increased sedimentation rates."[104] In Pennsylvania, the Nature Conservancy has estimated that nearly two-thirds of well pads targeting the Marcellus Shale will be developed in forested areas, necessitating the clearing of 38,000 to 90,000 acres.[105] An additional 60,000 to 150,000 acres of forest area will be lost to pipeline construction and right-of-way maintenance.[106] Compressor stations along the pipelines, which occupy an average of five acres each, are likely to number in the hundreds.[107] In New York, deforestation will occur on a similar scale, with losses in forest cover of up to 16%.[108]

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[100] State of N.J. Highlands Water Prot. and Planning Council, Ecosystem Management Technical Report 39 (2008).

[101] Academy of Natural Sciences of Drexel University, "A Preliminary Study of the Impact of Marcellus Shale Drilling on Headwater Streams," available at http://www.ansp.org/research/pcer/projects/marcellus-shale-prelim/index.php

[102] Entrekin, S. et al., "Rapid expansion of natural gas development poses a threat to surface waters," Frontiers in Ecology and Environment 2011, 9(9), 503-11 (Oct. 6, 2011), at 507, 509, available at http://www.esajournals.org/doi/abs/10.1890/110053

[103] Havens, David Loran, Assessment of sediment runoff from natural gas well development sites. M.S. thesis May 2007, available at http://digital.library.unt.edu/ark:/67531/metadc3665/m1/1/high_res_d/thesis.pdf ; see also 55 Fed. Reg. 47,990, 48,044-34 (Nov. 16, 1990) (Phase I stormwater regulation describing scope and significance of water quality impacts from sediment runoff from construction activities); 64 Fed. Reg. 68,722, 68,728-30 (Dec. 8, 1999) (Phase II stormwater regulation reiterating concerns about sediment-laded stormwater discharges and extending permitting requirements to small construction sites).

[104] Banks, Kenneth E., Ph.D., and Wachal, David J., U.S. EPA, Final Report for Catalog of Federal Domestic Assistance Grant Number 66.463 Water Quality Cooperative Agreement for Project Entitled "Demonstrating the Impacts of Oil and Gas Exploration on Water Quality and How to Minimize these Impacts Through Targeted Monitoring Activities and Local Ordinances" (Dec. 2007), available at http://www.epa.gov/npdes/pubs/oilandgas_impactgrant.pdf

[105] Id. at 29.

[106] The Nature Conservancy, "Natural Gas Pipelines," Excerpt from Report 2 of the Pennsylvania Energy Impacts Assessment, December 16, 2011, at 5, available at http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/pennsylvania/ng-pipelines.pdf

[107] Id. at 5-6.

[108] The Nature Conservancy, "An Assessment of the Potential Impacts of High Volume Hydraulic Fracturing (HVHF) on Forest Resources," Dec, 19, 2011, at 4, available at http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/newyork/ny-hydrofracking-impacts-20111220.pdf

Heavy truck traffic on rural roads, especially unpaved roads, that were not built to withstand hundreds or thousands of truck trips also leads to significant erosion and sedimentation problems.[109] Thousands of truck trips (according to DEP officials speaking at public meetings) with each vehicle weighing up to 10 tons, may be required to construct and operate a single well. Ditches along rural roads are the primary pathways for the conveyance of polluted runoff bearing sediments and nutrients to streams, and increase runoff volume and energy as well, contributing to flooding.[110] In addition, access roads constructed or modified to enter gas exploration or extraction facilities contribute significantly to sedimentation and surface water quality degradation.

Pipeline construction and right-of-way maintenance account for a significant proportion of shale gas extraction's land use impacts. Pipelines also create significant erosion and sedimentation problems during construction as well as over the decades-long maintenance of cleared rights-of-way. In joining well pads to transmission infrastructure, a single gathering line may cross numerous streams and rivers, especially in states such as Pennsylvania with a high density of stream mileage per unit of land. Stream and wetland pipeline crossings cause erosion and sedimentation whether implemented through dry ditch or wet ditch crossings.[111] Though erosion and sediment control permits may be required for stream crossings—indeed, in Pennsylvania they are the only permits necessary for gathering line construction—in practice, permit requirements are routinely violated.[112] Both dry and wet ditch crossings necessitate the clearing of area stream banks. Because riparian vegetation functions as a natural barrier along the stream edge, both removing sediment and other pollutants from surface runoff and stabilizing stream banks,[113] its clearing necessarily increases a stream's susceptibility to erosion events. Cumulatively, the construction of numerous crossings across a single watercourse may significantly degrade the quality and flow rate of the water body.[114] Erosion and sedimentation problems are often exacerbated by the staging of construction, during which soils are exposed for long periods and over long distances by clearing, grading, and trench cutting before final pipeline installation and revegetation.[115]

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[109] See C.J. Randall, Hammer Down: A Guide to Protecting Local Roads Impacted by the Marcellus Shale (Dec. 2010), available at http://www.greenchoices.cornell.edu/downloads/development/marcellus/Marcellus_Randall.pdf

[110] Yen Hoang & Keith Porter, Stormwater Management in the Rural New York Headwater Areas of the Chesapeake Bay Watershed, Journal of Water Law 21:6 (2010) at 8.

[111] The Nature Conservancy, "Natural Gas Pipelines," Excerpt from Report 2 of the Pennsylvania Energy Impacts Assessment, December 16, 2011, at 7, available at http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/pennsylvania/ng-pipelines.pdf

[112] Beth Brelje, Pike Conservation Official Fed Up With Gas Company's Violations, Pocono Record, Sept. 20, 2011, http://www.poconorecord.com/apps/pbcs.dll/article?AID=/20110920/NEWS/109200330/-1/rss01 (noting numerous violations documented on Tennessee Gas Pipeline Company project).

[113] David J. Welsch, Forest Service, U.S. Dep't Agric., NA-PR-07-91, Riparian Forest Buffers: Function and Design for Protection and Enhancement of Water Resources (1991), available at http://na.fs.fed.us/spfo/pubs/n_resource/buffer/cover.htm

[114] Canadian Association of Petroleum Producers, Canadian Energy Pipeline Association, and Canadian Gas Association, "Pipeline Associated Watercourse Crossings," 1-4 (2005).

[115] Comments on Environmental Assessment of MARC I Hub Line Project, Exhibit G, FERC Docket No. CP10-480-000, Submittal 20110711-5189 (filed Jul. 22, 2011) (statement of Susan Beecher, Executive Director, Pike County PA Conservation District (Jul. 8, 2011)), available at http://elibrary.ferc.gov/idmws/docket_sheet.asp

Authorizing DCP to export LNG will exacerbate these types of environmental impacts. Each one of the issues described in the section above creates individual, direct impacts of an intense nature. Taken in the context of the widespread boom for shale gas in the mid-Atlantic, these types of impacts also possess an extreme contextual significance. LNG export will in fact increase production of shale gases in the mid-Atlantic, and because LNG export is the causal link inciting such action the aforementioned impacts require a hard look and properly in-depth, informative assessment by DOE.

Health Impacts

Evidence of drinking water contamination resulting from HVHF is increasing. For example, December 8, 2011 the Environmental Protection Agency issued a draft report documenting the initial findings of its investigation into whether drinking water wells in Pavillion, Wyoming were contaminated by gas drilling. According to the EPA, "Chemicals detected in the most recent samples are consistent with those identified in earlier EPA samples and include methane, other petroleum hydrocarbons and other chemical compounds. The presence of these compounds is consistent with migration from areas of gas production."[116] Additionally, having found arsenic, barium and other hazardous substances in drinking water wells that serve homes in Dimock, PA and which could indicate contamination due to nearby drilling; the EPA has opened an investigation into the source of that contamination.[117] These are but two examples of recent investigations and evidence into the potential contamination of drinking water supplies as the result of gas drilling.

Contamination by drilling of surface waters that serve to provide drinking water to communities is also a concern. In September, 2011, concerned about the implementation of drilling and the discharge of drilling wastewater in the watersheds that serve drinking water to New York City and other communities, 59 scientists write Governor Cuomo expressing their concern that there does not exist adequate knowledge to conclude that filtering by municipal drinking water filtration systems "would remove all, or even most, of the hazardous substances found in flow-back fluids from hydraulic fracturing. Potential contaminants of concern known to be in some flow-back fluids include benzene and other volatile aromatic hydrocarbons, surfactants and organic biocides, barium and other toxic metals, and soluble radioactive compounds containing thorium, radium and uranium. ... We believe, however, the best available science suggests that some of these substances would pass through the typical municipal filtration system."[118]

Human Health Impacts.

While there is genuine concern about a lack of investigation and data into the human and livestock health impacts of gas drilling, the body of research and knowledge that is documenting

[116] New Release, EPA Region 8, EPA Releases Draft Findings of Pavillion, Wyoming Ground Water Investigation for Public Comment and Independent Scientific Review, 12/08/2011.

[117] See, EPA Region 3, Action Memorandum – Request for Funding for a Removal Action at the Dimock Residential Groundwater Site, Jan. 19, 2012.

[118] Letter from Physicians Scientists and Engineers for Healthy Energy to Governor Cuomo, dated Sept. 15, 2011.

the human and animal health harms of gas drilling is growing. For example: "Documentation of cases in six states strongly implicates exposure to gas drilling operations in serious health effects on humans, companion animals, livestock, horses, and wildlife."[119]

New Facility Construction & Emissions

DCP anticipates utilizing much of its existing infrastructure to facilitate its transition to a bidirectional facility. Such infrastructure includes docks, piers, land structures. Of direct importance and significance, DCP will need to construct new facilities for storage and liquefaction of LNG. Those projects will entail certain direct, site-specific impacts and, relevant to the larger scope of whether LNG export is appropriate per se under the public interest standard, certain direct, indirect and cumulative air impacts of significant magnitude. In particular, the construction of liquefaction facilities and their subsequent use will increase greenhouse gas emissions for Maryland and the Chesapeake region.

Similarly, because the construction and use of liquefaction facilities at DCP will facilitate and encourage further gas production at inland reserves, DOE must account for emissions and air pollution from wells, compressors, pipelines, pneumatic devices, dehydrators, storage tanks, pits and ponds, natural gas processing plants, and trucks and construction equipment. Major air pollutants of concern from these operations include methane (CH_4), volatile organic compounds (VOCs), nitrogen oxides (NO_x), sulfur dioxide (SO_2), hydrogen sulfide (H_2S), and particulate matter (PM_{10} and $PM_{2.5}$). Oil and natural gas operations also emit listed hazardous air pollutants (HAPs) in significant quantities, and so contribute to cancer risks and other acute public health problems. All these direct, indirect, and cumulative impacts are relevant considerations for DOE's to examine under the NGA, as well as under the required NEPA analysis.

Carbon dioxide equivalent (CO2-e) emissions are of particular concern due to the liquefaction process, when natural gas is used to fuel gas turbines, which in turn power the plants and refrigeration compressors. Fuel consumption is dependent upon the efficiency and productive capacity of the liquefaction plant[120] and subsequently represent an area of further research. The main types of greenhouse gas emissions in LNG liquefaction identified by Arteconi et al (2010):[121]

- Fuel consumption for driving turbines and motors to operate equipment.
- Combustion of waste gases in flares.
- Gas losses from venting associated with pre-treatments, maintenance processes and losses from equipment and pipes.

CO2-e emissions also occur during flare combustion, emissions of raw gas (leaks) and venting. During the liquefaction process, carbon dioxide (CO2) is initially removed from natural gas using

[119] M. Bamberger & R. Oswald, "Impacts of Gas Drilling on Human and Animal Health", New Solutions, Vol. 22(1) 51-77, 2012.

[120] Tamura, I., Tanaka, T., Kagajo, T., Kuwabara, S., Yoshioka, T., Nagata, T., Kurahashi, K., Ishitani, H., 2001. Applied Energy. Volume 68, pages 301-319. "Life cycle CO2 analysis of LNG and city gas".

[121] Arteconi, A., Brandoni, C., Evangelista, D., Polonara, F. 2010. Applied Energy. Volume 87, pages 2005 – 2013. "Life-cycle greenhouse gas analysis of LNG as a heavy vehicle fuel in Europe".

amines as a solvent. This regeneration process causes CO_2 and methane (CH_4) to be dissolved in small quantities.[122] CH_4 is typically recovered and used as fuel for turbines, while CO_2 is released to the atmosphere as off-gas.

At a receiving terminal, CO_2-e emission occur due to the electrical energy required to drive pumps used to transfer the LNG from the ship to storage facilities and re-gassification plant. Boil-off gases are considered to be recovered during re-gassification. Likewise, shipping LNG produces emissions that must also be taken into account. Because LNG requires additional energy to liquefy, transport, and then regasify, its energy and emissions lifecycle releases substantially more greenhouse pollution than that of gas generally, whether conventionally or unconventionally sourced. In fact, according to the only published lifecycle study of LNG used for electricity generation of which we are aware, these upstream emissions are sufficient to push LNG lifecycle emissiosn well above those of natural gas generally, and into the range of coal emissions.

DOE should consider the potential for increased emissions from the LNG lifecycle and shale gas production lifecycle in determining whether DCP's application fulfills the public interest. Currently, the U.S. Environmental Protection Agency (EPA) is promulgating rules and regulations concerning under the Clean Air Act to mitigate greenhouse gases and CO_2 emissions.[123] Similarly, EPA is working to finalize GhG reporting rules and requirements that will enable the United States to better assess and mitigate GhG emissions and their unwanted consequences.[124] Whereas there is an increased awareness of the human health and environmental threats posed by increased emissions and national movement to reduce emissions, and whereas authorizing new LNG export facilities will directly, indirectly, and cumulatively incite further economic, environmental, and social ills discussed above, DOE should deny DCP's application as not in the public interest.

C. DCP's Application is Distinguishable from the *Sabine Pass* Decision

DOE conditionally approved the Sabine Pass LNG facility to export up to 2.2 bcf/d.[125] However that order was premised upon at two distinct rationales which are inapplicable here.

First, DOE's conditional order authorizing Sabine Pass to export LNG relied heavily on the absence of "factual studies or analyses" contrary to the applicant's modeling and reports which substantively stated that as exports would not raise domestic gas and electric prices.[126] Further, that authorization was premised on studies allegedly showing proving a number of economic and public benefits that would follow a grant of the requested authorization. As amply demonstrated above, there is a wealth of scientific and economic data contrary to DCP's commissioned studies. Likewise, taken together the body of evidence presented above outweighs the purported benefits that DCP claims will arise from a grant of the requested authorization.

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[122] Tamura et al 2001.

[123] U.S. EPA Endangerment Finding, available online at: http://www.epa.gov/climatechange/endangerment.html; *see also* GhG rules, available online at: http://www.epa.gov/otaq/climate/regulations.htm.

[124] *See Proposed Rule,* Mandatory Reporting of Greenhouse Gases, 75 Fed. Reg. 18455 (April 12, 2010).

[125] *See* Sabine Pass at 1-2.

[126] *Id.* at 30.

Second, as discussed above, authorizing DCP's facility to export natural gas will increase gas and electricity prices. DOE's conditional order in the Sabine Pass case did not consider the cumulative nature of several authorized export facilities, instead only considering a small price hike relative to the Sabine facilities anticipated exports. DOE must acknowledge the fact that every new approval of LNG export will exponentially increase price hikes in domestic utility costs. While it may have found one price increase from the Sabine Pass order acceptable, innumerable more export facilities and commensurate price hikes cannot be found acceptable as benefiting the public interest.

The new scientific, economic and environmental data submitted in this letter demonstrates that exporting LNG is not in the public interest.

V. CONVERSION OF AN LNG IMPORT FACILITY TO A BI-DIRECTIONAL FACILITY TRIGGERS NEPA ANALYSIS

Congress enacted NEPA in 1969, directing all federal agencies to assess the environmental impact of proposed actions that significantly affect the quality of the environment. 42 U.S.C. § 4332(2)(C). The law requires federal agencies to "consider every significant aspect of the environmental impact of a proposed action . . . [and] inform the public that it has indeed considered environmental concerns in its decision-making process."[127] To accomplish this goal, NEPA imposes procedural requirements to ensure that federal agencies "take a 'hard look' at environmental consequences."[128]

NEPA's disclosure goals are two-fold: (1) to insure that the agency has carefully and fully contemplated the environmental effects of its action, and (2) "to insure that the public has sufficient information to challenge the agency."[129] By focusing the agency's action on the environmental consequences of its proposed action, NEPA "ensures that important effects will not be overlooked or underestimated only to be discovered after resources have been committed and the die otherwise cast."[130] The Council on Environmental Quality (CEQ) promulgated uniform regulations to implement NEPA that are binding on all federal agencies.[131]

DOE is required under NEPA to prepare an environmental impact statement (EIS) for any "major federal actions significantly affecting the quality of the human environment."[132] In determining whether or not the effects will be "significant," or whether substantial questions exist as to the significance of the effects, NEPA's implementing regulations require DOE to consider the "context" and "intensity" of the likely impacts. "Context" means "that the significance of an action must be analyzed in several contexts such as society as a whole (human,

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[127] *Earth Island Inst. v. USFS*, 351 F.3d 1291, 1300 (9th Cir. 2003).
[128] *Id.*
[129] *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989); *Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1151 (9th Cir. 1998).
[130] *Robertson*, 490 U.S. at 349.
[131] 42 U.S.C. § 4342; 40 C.F.R. § 1500 *et seq.*
[132] 42 U.S.C. § 4332(2)(C).

national), the affected region, the affected interests, and the locality."[133] Both short and long-term effects are relevant" for context.[134] "Intensity" means the "severity of impact" and is to be judged according to several criteria.[135]

Pursuant to CEQ implementing regulations DOE may be a cooperating agency with the Federal Energy Regulatory Commission ("FERC") in its role as lead agency performing requisite environmental analyses.[136] An EIS must consider both direct and indirect environmental impacts of the proposed action.[137] Direct effects are caused by the action and occur at the same time and place as the proposed project.[138] Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.[139] Both types of impacts include "effects on natural resources and on the components, structures, and functioning of affected ecosystems." *Id.*

The regulations implementing NEPA also require an agency to assess the cumulative effects of its proposed action on the environment.[140] The pertinent regulation defines cumulative impact as follows:

> Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.[141]

Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.[142] NEPA additionally requires that environmental information be made available to public officials and citizens before decisions are made and before actions are taken.[143] The information must be of high quality.[144] The purpose of this requirement is to ensure that the public has information that allows it to question and understand the decision made by the agency.

NEPA requires an EIS to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning

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[133] 40 C.F.R. § 1508.27(b).
[134] *Id.*
[135] *Id.*
[136] *See* 40 C.F.R. §§ 1500.5, 1501.5,6.
[137] 40 C.F.R. § 1508.8.
[138] *Id.* at § 1508.8(a).
[139] *Id.* at § 1508.8(b).
[140] 40 C.F.R. § 1508.7.
[141] *Id.*
[142] *Id.*
[143] 40 C.F.R. §1500.1 (b).
[144]

alternative uses of available resources."[145] The NEPA process and documents should "identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment."[146]

Relevant here, agencies may also prepare "programmatic" EISs, which address "a group of concerted actions to implement a specific policy or plan; [or] systematic and connected agency decisions allocating agency resources to implement a specific statutory program or executive directive."[147] Importantly, 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.[148] During this time, DOE may take no action which would tend to "limit the choice of reasonable alternatives," or "tend[] to determine subsequent development ."[149]

a. **Authorizing DCP's proposal is a major federal action significantly affecting the quality of the human environment**

Authorizing DCP to export LNG and to construct and operate LNG export facilities demands an EIS because aspects of the project will have significant effects on the human environment. Unquestionably, construction and operation of the export facilities will have effects, however, stopping inquiry there would not suffice as a hard look at other related and reasonably foreseeable actions such authorization would arise as a result of DOE's authorization. Export of LNG will induce additional shale gas production in upstream regions, incite further infrastructure development to transport upstream gas to downstream facilities, increase domestic gas prices and additional coal consumption, and increase greenhouse gas emissions and global warming. Each of these effects has direct importance to DOE's determination of whether authorizing DCP's export proposal is in the public interest and requires individual assessment pursuant to NEPA.

Indeed, DCP's export proposal must specifically take into account cumulative impacts related to the instant authorization. A cumulative impact analysis "must be more than perfunctory; it must provide 'a useful analysis of the cumulative impacts of past, present, and future projects.'"[150] "To be useful to decision makers and the public, the cumulative impact analysis must include "some quantified or detailed information; ... general statements about possible effects and some risk do not constitute a hard look absent justification regarding why more definitive information could not be provided.""[151] The need to assess relevant, project-specific effects over the entire period of a proposed project is key to a cumulative impacts

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[145] 42 U.S.C. § 4332(E).

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[147] 40 C.F.R. § 1508.17(b)(3); *see also* 10 C.F.R. § 1021.330 (DOE regulations discussing this possibility.

[148] 10 C.F.R. § 1021.211.

[149] 40 C.F.R. § 1506.1.

[150] *Kern v. U.S. Bureau of Land Mgmt.*, 284 F.3d 1062, 1075 (9th Cir.2002) (quoting *Muckleshoot Indian tribe v. U.S. Forest Serv.*, 177 F.3d 800, 810 (9th Cir.1999)).

[151] *Northern Plains Resource Council v. Surface Transp. Bd.*, 2011 WL 6826409, 6, --- F.3d ---- (9th Cir.2011), (quoting *Ocean Advocates v. U.S. Army Corps of Eng'rs*, 402 F.3d 846, 868 (9th Cir.2005) (quoting *Neighbors of Cuddy Mountain v. U.S. Forest Serv.*, 137 F.3d 1372, 1379–80 (9th Cir.1998)).

analysis.[152] As the EPA also has noted, "reasonably foreseeable future actions need to be considered even if they are not specific proposals."[153]

DOE is determining whether or not gas exports are in the "public interest," a term which the Supreme Court has repeatedly held includes consideration of environmental impacts.[154] Thus, just as DOE must consider upstream environmental impacts in its public interest determination, so too, it must analyze and disclose these impacts in the NEPA analysis that will support its final determination. Therefore infrastructure projects, like DCP's proposal, that enable resource extraction activities to expand upstream naturally must fully analyze those impacts in the NEPA framework. In *Northern Plains Resource Council v. Surface Transportation Board*, - F.3d -, 2011 WL 6826409, the Court considered a railway line which was developed in order to expand coal production at several mines.[155] It held that the Surface Transportation Board's NEPA analysis for the line was illegal because the Board had refused to consider the mines' impacts. The Court held that such impacts were plainly "reasonably foreseeable" – and, indeed, were the premise for the construction project in the first place. *Id.* They therefore had to be considered in the NEPA analysis. This same rule of law is applicable to DCP's application.

DCP's statement that its project will not require an EIS is simply wrong. The stated purpose of DCP's project is in large part to facilitate the exploitation of shale gas resources in the mid-Atlantic, an action that has both direct and indirect impacts that exceed "context" and "intensity" thresholds,[156] impacts the DOE must account for in its EIS. Further, authorizing DCP to export LNG will also trigger FERC's NEPA regulations, such rules providing that an EIS is 'generally' required for "authorizations to ... export natural gas under Section 3 of the Natural Gas Act involving construction of ... liquefied natural gas terminals and regasification or storage facilities or significant expansions and modifications of existing pipelines or related facilities."[157] Taken together, there can be no question that DCP's export proposal necessitates an EIS.

As previously mentioned, DCP's proposal is but one of many before DOE. Because the effects of these projects are cumulative, and because each approval alters the price and production effects of exports on the economy, DOE must consider these projects' interactions. It can do so by conducting a programmatic EIS considering the impacts of *all* gas export proposals at once. DOE has the discretion to do so, even if it determines that it does not have the duty to do

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[152] *See* Council on Envtl. Quality, *Considering Cumulative Effects Under the National Environmental Policy Act*, Office of NEPA Policy and Compliance, 16 (Jan.1997), available online at: http://energy.gov/nepa/downloads/considering-cumulative-effects-under-national-environmental-policy-act ("The time frame of the *project-specific* analysis should also be evaluated to determine its applicability to the cumulative effects analysis.") (emphasis added).

[153] EPA, *Consideration of Cumulative Impact Analysis in EPA Review of NEPA Documents*, Office of Federal Activities,12–13 (May1999), available online at: http://www.epa.gov/compliance/resources/policies/nepa/cumulative.pdf

[154] *Nat'l Ass'n for the Advancement of Colored People v. Federal Power Commission*, 425 U.S.at 670 n.4; *Udall v. Federal Power Comm'n*, 387 U.S. at 450.

[155] *Northern Plains Resource Council v. Surface Transportation Board*, at *10.

[156] *See supra*, at FN. 125.

[157] 10 C.F.R. § 1021 app. D ("Classes of Actions that Normally Require EISs")

so.[158] Such a programmatic EIS would allow DOE, 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 improved decision-making, and allow DOE, the public, and industry, to identify prudent alternatives to serve the public interest and minimize environmental impacts.

Programmatic EISs are designed to serve precisely this purpose. Rather than proceeding in a piecemeal fashion, DOE 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 perform an EIS commensurate with the decision it is making, rather than conducting piece-meal decisions application to application.

b. **Alternatively, DCP's Proposal at minimum requires a supplemental EIS**

NEPA also requires DOE to prepare a supplemental NEPA analysis when a "major federal action" remains to occur and the initial NEPA document does not adequately discuss "significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts."[159] It is clear that DCP's proposal constitutes a significant change in the fundamental purpose of the import facility warranting at least supplemental NEPA analysis. Failure to prepare a supplemental environmental impact statement would be arbitrary, capricious, and not in accordance with NEPA.[160]

VI. CONCLUSION

For all these reasons the commenting parties urge DOE to find that DCP's proposal to export LNG does not satisfy the public interest and deny its application. Alternatively, should DOE believe DCP's application is in the public interest and approve DCP's application, we urge DOE to make clear in its contingent order the need for an EIS during FERC's subsequent review.

Respectfully submitted,

/s/ Maya van Rossum
The Delaware Riverkeeper

/s/ Michael Helfrich
The Lower Susquehanna Riverkeeper

/s/ Frederick Tutman
The Patuxent Riverkeeper

/s/ Jeff Kelbe
The Shenandoah Riverkeeper

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[158] *See* 40 C.F.R. § 1508.17(b)(3); *see also* 10 C.F.R. § 1021.330.

[159] 40 C.F.R. § 1502.9(c)(1)(ii); *Marsh v. Or. Natural Res. Council*, 490 U.S. 360, 374 (1989); *Or. Natural Res. Council Action v. United States Forest Serv.*, 2004 U.S. Dist. Lexis 59034, 24 (D. Or., Aug. 9, 2006).

[160] 5 U.S.C. § 706(2)(A).

/s/ Ed Merrifield
The Potomac Riverkeeper

Theaux Le Gardeur
The Gunpowder Riverkeeper

/s/ Diana Koslow
The South Riverkeeper

/s/ Jamie Brunkow
The Sassafras Riverkeeper