

**UNITED STATES OF AMERICA
DEPARTMENT OF ENERGY
FEDERAL ENERGY REGULATORY COMMISSION**

IN THE MATTERS OF)	
)	
LNG Development Company, LLC)	Docket Nos. CP09-6-000, CP09-6-001
)	
Oregon Pipeline Company, LLC)	Docket Nos. CP09-7-000, CP09-7-001
)	
Northwest Pipeline, LLC)	Docket No. CP13-507-000

Columbia Riverkeeper, the Pacific Coast Federation of Commercial Fishermen’s Associations, the Northwest Guides and Anglers Association, the Association of Northwest Steelheaders, the Institute for Fisheries Research, the Waterkeeper Alliance, the Oregon Shores Conservation Coalition, the Northwest Property Rights Coalition, Columbia Pacific Common Sense, Oregon Physicians for Social Responsibility, Wahkiakum Friends of the River, Sierra Club, the Center for Biological Diversity, Landowners and Citizens for a Safe Community, Forest Grove Oregon Citizens Against the Pipeline, Yamhill County Oregon Citizens Against the Pipeline, Save Our Wild Salmon, Food and Water Watch, the Northwest Environmental Defense Center, Northwest Environmental Advocates, Oregon Wild, and the Willapa Hills Audubon Society (collectively the Coalition) submit the following comments on the Oregon LNG and Washington Expansion Project Draft Environmental Impact Statement.

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1.0 INTRODUCTION.

The Oregon LNG and Washington Expansion Project Draft Environmental Impact Statement (the DEIS) concerns a liquefied natural gas (LNG) project that requires construction of massive infrastructure, directly impacting people and the environment throughout Oregon and Washington, and indirectly and cumulatively impacting the environment throughout the regions where exported gas is produced and, by significantly contributing to climate change, the environment worldwide. The DEIS is deficient because it glosses over many of the Oregon LNG and Washington Expansion Project's significant impacts and completely ignores many others. The Coalition discusses these deficiencies below. The Coalition urges FERC to prepare a revised DEIS that discloses fully the project's impacts.

On or about September 18, 2015, Columbia Riverkeeper (Riverkeeper) requested the lead federal agency responsible for preparing the DEIS, the Federal Energy Regulatory Commission (FERC), to extend the public comment period for the DEIS. FERC released its DEIS on August 6th and requested public comments by October 6th, which is only fifteen days longer than the minimum public comment period required by the National Environmental Policy Act (NEPA). *See* 40 C.F.R. § 1506.10. FERC clearly had the discretion under Section 1506.10(d) to extend that sixty day comment period as requested by Riverkeeper, but FERC has abused that discretion by not responding to Riverkeeper's request and thereby insisting that the public comment on this DEIS within just 60 days. "NEPA's public comment procedures are at the heart of the NEPA process . . . To effectuate this aim NEPA requires not merely public notice, but public participation in the evaluation of the environmental consequences of a major federal action." *State of California v. Block*, 690 F.2d 753, 770–771 (9th Cir. 1982); 40 C.F.R. § 1500.1(b) (under NEPA public scrutiny is "essential"); *see also* 40 C.F.R. § 1500.2(d) (agency must "encourage and facilitate public involvement in decisions"). FERC's failure to extend the deadline is also arbitrary in light of the agency's decision to extend the Jordan Cove LNG DEIS comment period earlier this year.

Riverkeeper's requested extension, supported by both of Oregon's U.S. senators and Congresswoman Suzanne Bonamici, was necessary because of the length and complexity of the DEIS, its incomplete nature, and the public interest in and public controversy regarding the project. Limiting the public to a sixty day comment period when the application at issue has been pending for many years and there is no obvious or imminent deadline requiring FERC to act immediately, is a clear abuse of discretion.

FERC's refusal to extend the comment period has done the opposite of encouraging and facilitating public involvement, as required by Section 1500.2(d), and has instead caused actual prejudice to the efforts of Riverkeeper and others to provide complete comments. For example, FERC has arbitrarily refused to include in this DEIS any consideration or analysis of the impacts

of the induced natural gas drilling and fracking that is necessary to supply the Oregon LNG export terminal because such impacts are supposedly not “reasonably foreseeable.” Riverkeeper has had to spend considerable time and effort tracking down the available evidence that shows that such induced fracking is not only foreseeable, but it is the very reason the applicant is seeking to build this project. By limiting the comment period to sixty days, Riverkeeper’s efforts to locate such evidence, which is much more readily available to FERC and the applicant, and include the evidence in these comments has been prejudiced. Riverkeeper therefore objects to having to submit these comments only sixty days after FERC released the DEIS.

2.0 OREGON LNG AND THE WASHINGTON EXPANSION PROJECT.

In the following section, the Coalition summarizes the Oregon LNG and Washington Expansion Project. Throughout these comments, the Coalition refers to Oregon LNG’s terminal as “the Terminal,” Oregon LNG’s 86-mile long pipeline as “the Pipeline,”¹ the 136-mile long Washington Expansion Project pipeline as “the WEP Pipeline,” and the combination of Oregon LNG’s pipeline and the WEP pipeline as “the Pipelines.” The Coalition refers to the Terminal, Pipeline, and WEP Pipeline as “the project.”

- **Natural Gas Extraction.** Oregon LNG proposes using natural gas feedstock primarily from Western Canada and potentially the western U.S.² Oregon LNG’s primary source of gas would be shale gas.³ Shale gas production requires the controversial practice of hydraulic fracturing, or fracking, the impacts of which are discussed in greater detail below.
- **LNG Terminal – Upland.**⁴ The Terminal would occupy 88.7 acres of a 96-acre parcel of state-owned land located on the northern portion of the East Bank of the Skipanon Peninsula (East Skipanon Peninsula) near the confluence of the Skipanon and Columbia rivers. Oregon LNG subleases the upland property from the Port of Astoria, which leases the property from the Oregon Department of State Lands (DSL). The Corps holds a dredge spoil disposal easement on the East Skipanon Peninsula, including the portion of the Peninsula where Oregon LNG proposes building the Terminal. The Corps’ easement, and Oregon LNG’s pending lawsuit against the Corps, are discussed in greater detail below.

¹ Oregon Pipeline Company, LLC, dba Oregon LNG, proposes the Oregon LNG Pipeline.

² Oregon LNG Prefiling Review Draft Resource Report 1 at 1-4.

³ DEIS at 1-12 (stating that shale gas drilling is outside the DEIS scope).

⁴ Oregon LNG’s Joint Permit Application (JPA), NWP-2005-748, describes the dredge and fill activities at the Warrenton, Oregon, Terminal site and the section of pipeline extending from the Terminal to Woodland, Washington.

To build the Terminal and access road, Oregon LNG proposes filling 33.78 acres of palustrine and estuarine wetlands.⁵

The Terminal includes two 160,000-cubic meter LNG storage tanks and a gas flare system. No impervious surfaces currently exist at the Terminal site.⁶ The Terminal would result in approximately 28 acres of impervious surfaces.⁷ The Terminal access road would create 2.5 acres of impervious surface.⁸

To operate the Terminal, Oregon LNG proposes withdrawing 10,100-acre feet of water per year from the Columbia River estuary.⁹ According to Oregon LNG's water pollution discharge permit application, the Terminal would discharge between 1,000 and 2,600 gallons per minute of process wastewater and up to 1,500 gallons per minute of stormwater to the Columbia River.¹⁰

- **LNG Terminal – Below the High Water Line.** The marine facilities associated with the Terminal cover approximately 148 acres of aquatic area at the mouth of Youngs Bay.¹¹ Oregon LNG proposes building a 2,128-foot pier with a ship berth for one LNG vessel.¹² The 12-foot-wide pier provides access for two-way vehicle traffic and an 11-foot-wide pipeway.¹³ Oregon LNG also proposes dredging 135.2-acres to create a turning basin and 17.1 acres to create an LNG vessel berthing area.¹⁴ This requires dredging 1.2 million cubic yards in Youngs Bay.¹⁵ To maintain the turning basin, Oregon LNG would dredge 300,000 cubic yards every three years.¹⁶
- **Dredge Spoil Disposal.** Oregon LNG proposes transporting dredged material from the marine berth and turning basin to an open-water disposal site in the Pacific Ocean.

⁵ JPA Public Notice at 2.

⁶ JPA at 6-3.

⁷ *Id.*

⁸ *Id.*

⁹ Oregon LNG Water Right Application S-87920. Oregon LNG also proposes withdrawing water for pipeline testing, Terminal construction, and fire suppression testing. *See* Oregon LNG Water Right Applications S-87921, LL-1486, LL-1487.

¹⁰ Oregon LNG NPDES Permit Application (July 3, 2013).

¹¹ Oregon LNG Applicant Prepared Biological Assessment (hereafter OLNG BA) at 2-12.

¹² *Id.*

¹³ *Id.*

¹⁴ JPA Public Notice at 3.

¹⁵ OLNG BA at 2-25.

¹⁶ *Id.* at 2-27.

- **LNG Tanker Traffic.** One LNG tanker alone is longer than three football fields and towers 20-stories high. The Terminal would require 127 new inbound vessels crossing the Columbia River Bar every year, for a total of 254 new vessel trips (inbound and outbound). Each ship requires a moving safety/security zone of a minimum of 500 yards.¹⁷ The U.S. Coast Guard (Coast Guard) also imposes a safety/security zone around the waterside area of the Terminal.¹⁸ LNG vessel impacts include engine cooling water and ballast water intakes and discharges, with amounts varying depending on vessel design and whether the vessel is importing or exporting LNG.¹⁹
- **Oregon LNG's Pipeline in Oregon & Washington.** Oregon LNG proposes building 86 miles of 36-inch diameter, high-pressure pipeline through the City of Warrenton and Clatsop, Tillamook, and Columbia counties. Oregon LNG would then drill under the Columbia River to build a pipeline through Cowlitz County (an approximate 5030 linear foot horizontal directional drill (HDD)). The Pipeline would connect to the proposed Williams Pipeline in Woodland, Washington. The Pipeline route crosses agricultural and forest lands, residential properties, rivers, streams, and wetlands. Oregon LNG would employ HDD to cross 21 rivers and larger streams and dry open trench methods to cross the 164 streams, including wetlands.²⁰ Total Pipeline construction-related ground disturbance equals approximately 1195.2 acres.
- **WEP Pipeline in Washington State.** Williams Pipeline (Williams) proposes building 136-miles of new, high-pressure pipeline in ten different segments in or near the existing Northwest Pipeline right-of-way. This project is referred to as the Washington Expansion Project Pipeline, or WEP Pipeline. Segments of the WEP Pipeline would run from Washington's northern border south to Woodland, Washington. Williams would also increase existing compression horsepower at five existing compressor stations. Construction of the WEP Pipeline would temporarily impact approximately 176.6 acres of wetlands and permanently impact approximately 30.6 acres of wetlands.²¹

¹⁷ Waterway Suitability Assessment (WSA) for the Proposed Oregon LNG Receiving Terminal in Warrenton, Oregon at v.

¹⁸ *Id.*

¹⁹ OLNG BA at 2-4.

²⁰ DEIS at 4-108.

²¹ *Id.* at ES-5.

- **Mitigation.** To mitigate impacts caused by the Terminal, Oregon LNG proposes wetland restoration at 120 acres located at the mouth of the Youngs River in Clatsop County.²² Oregon LNG proposes breaching a levee to create estuarine wetland habitat. To mitigate impacts caused by the Pipeline, Oregon LNG proposes to: (1) mitigate temporary impacts to wetlands through onsite wetland rehabilitation, and (2) use offsite, in-kind mitigation through an approved in-lieu fee program. For the WEP Pipeline, Williams proposes: (1) following FERC’s Plan and Procedures during construction and using HDD to minimize wetland impacts near certain river crossings, and (2) mitigating permanent, unavoidable impacts through off-site wetland mitigation banking.²³

3.0 THE COLUMBIA RIVER ESTUARY.

Oregon LNG proposes building the Terminal in the Columbia River estuary, an area at the center of a regional and national effort to restore endangered and threatened salmonids and other species. The Columbia River estuary is a federally-designated Estuary of National Significance under the Clean Water Act’s National Estuary Program.²⁴ The estuary is also an “ecologically critical area,” 40 CFR § 1508.27(b)(3), that is essential to the survival of juvenile salmon and steelhead, waterfowl, and many other species.²⁵ In addition, the U.S. Environmental Protection Agency (EPA) designated the Columbia River as one of seven Priority Large Aquatic Ecosystems.²⁶

The Columbia River estuary provides vital habitat for salmon throughout the Columbia River Basin, and is particularly important for threatened and endangered species recovery.²⁷ The

²² The DEIS contains conflicting descriptions of the size of Oregon LNG’s wetland mitigation site. Compare DEIS at 2-17 (describing wetland mitigation site as 120 acres) to DEIS at 4-110 (describing wetland mitigation site as 140 acres). The majority of the DEIS discussion on Oregon LNG’s mitigation refers to the wetland mitigation as 120 acres.

²³ DEIS at ES-5.

²⁴ EPA, National Estuary Program in Region 10, <http://yosemite.epa.gov/R10/ECOCOMM.NSF/6da048b9966d22518825662d00729a35/c7a2ab5e252f309688256fb600779ea6!OpenDocument>.

²⁵ NOAA, *Columbia River Estuary ESA Recovery Plan Module for Salmon and Steelhead* (2011); Fresh *et al.*, *NOAA Technical Memorandum NMFS-NWFSC-69: Role of the Estuary in the Recovery of Columbia River Basin Salmon and Steelhead* (2005); 78 Fed. Reg. 2,726 (Jan. 14, 2013) (*Proposed Critical Habitat Designation for Lower Columbia Coho Salmon*).

²⁶ EPA, *Columbia River Basin: State of the River Report for Toxics* (Jan. 2009), http://www2.epa.gov/sites/production/files/documents/columbia_state_of_the_river_report_jan2009.pdf.

²⁷ See generally Exhibit 1, Williams, Richard N., *Review of the draft Biological Assessment and Essential Fish Habitat for Proposed Oregon LNG Terminal Project* (Jan. 8, 2015) (hereafter Williams Expert Report), Exhibit 2, Bierly, Kenneth, *Oregon LNG Terminal Wetland Impacts*

estuary is designated as critical habitat for 17 species of ESA-listed fish and Essential Fish Habitat for Pacific salmon.²⁸ Multiple studies identify the Columbia River estuary as vitally important for juvenile salmonid rearing and endangered species recovery.²⁹ The estuary is one of three major habitats that all Columbia River salmon transit in their life history pathway moving between freshwater and marine environments. All salmon migrating out of and back into the Columbia River Basin pass through the estuary twice. “A growing body of evidence, much of it quite recent (Bottom *et al.* 2005; Roegner *et al.* 2012; Weitkamp *et al.* 2012), provides increasing insight into the important role that shallow water estuarine habitats in the [lower Columbia River estuary] play in stabilizing production of Columbia River salmon and steelhead.”³⁰ Estuarine habitats provide high growth opportunities for outmigrating juvenile salmon and also provide protection from predators. Research in the Columbia River estuary demonstrates that the estuary is an important staging area where juvenile and adult salmon, steelhead, and trout undergo significant physiological changes that allow transitions to and from saltwater.

Public and private entities have invested, and continue to spend, billions of dollars in efforts to restore endangered and threatened salmon in the Columbia River Basin.³¹ This includes federal agencies’ obligations under the Federal Columbia River Power System Biological Opinion (FCRPS BiOp). The estuary is ground zero for restoration efforts. For example, the federal government, tribes, states, and others have made significant investments in riparian and wetland restoration projects in the estuary. The federal government has funded—and will continue to fund for the foreseeable future—a significant portion of the salmon restoration efforts in the Columbia River estuary.

and Proposed Mitigation Review: Analysis of Available Information (Jan. 8, 2015) (hereafter Bierly Expert Report), and Exhibit 3, Rhodes, Jonathan, J. *Summary of likely impacts of construction and maintenance of pipeline for the proposed Oregon LNG Terminal and Oregon Pipeline Project (Project) on watersheds and aquatic resources and adequacy and veracity of the discussion and assessment of these impacts in the Project’s Biological Assessment (BA), Joint Permit Application (JPA), and supplements thereto* (Jan. 12, 2015) (hereafter Rhodes Expert Report).

²⁸ Exhibit 5, Letter from National Marine Fisheries Service to FERC, Oregon LNG NEPA Scoping (Dec. 20, 2012).

²⁹ NOAA, *Columbia River Estuary ESA Recovery Plan Module for Salmon and Steelhead* (2011); Fresh *et al.*, *NOAA Technical Memorandum NMFS-NWFSC-69: Role of the Estuary in the Recovery of Columbia River Basin Salmon and Steelhead* (2005); 78 Fed. Reg. 2,726 (Jan. 14, 2013) (*Proposed Critical Habitat Designation for Lower Columbia Coho Salmon*).

³⁰ Exhibit 106, Williams, Richard N., *Review of the draft Biological Assessment and Essential Fish Habitat for Proposed Oregon LNG Terminal Project* at 5 (Jan. 8, 2015).

³¹ See Thom, R. *et al.*, *Columbia River Estuary Ecosystem Restoration Program, 2012 Synthesis Memorandum*, PNNL-21477 FINAL (Jan. 2013).

The Columbia River estuary supports tribal fisheries throughout the Columbia River Basin. Since time immemorial, Columbia River Basin tribes have relied on salmon that depend on the estuary for survival. As the Columbia River Inter-Tribal Fish Commission (CRITFC) explains:

To call salmon a staple of the tribal diet would be an understatement. Historically, the typical tribal member ate almost a pound of salmon every day, but salmon represented much more than a source of nutrition—they shaped our societies and our religions.³²

Indian people have lived in the Columbia River Basin for thousands of years. Salmon is their staple of life and the foundation of their culture and economy. According to conservative estimates, prior to European settlement, the Columbia River’s annual salmon returns ranged from 11 to 16 million fish.³³ In 1855, the U.S. government signed treaties with some Columbia River tribes. In these treaties, tribes ceded most of their lands, but reserved the right to fish at “all usual and accustomed fishing places...in common with citizens.” CRITFC summarizes the tribes’ focus on salmon restoration in the Columbia River Basin:

Today the tribes are doing everything in their power to make sure that salmon return to as many of their traditional waters as they can. Enormous amounts of resources are being poured into this effort, and tribal youth are joining the fight to save salmon. Every year, more and more tribal members are becoming fish biologists, environmental engineers, and other scientists who are offering their minds as well as their hearts for the protection of the salmon, the water, and ultimately, their traditional way of life.³⁴

Salmon and other fisheries in the Columbia River estuary also support vibrant traditions of non-tribal subsistence, commercial, and sport fishing.³⁵ The Buoy 10 fishery, spanning the mouth of the Columbia River and reaching into Youngs Bay, is one of the Pacific Northwest’s most renowned fisheries. Oregon LNG’s Waterway Suitability Analysis states:

The most notable sport fishing season is the ‘Buoy 10’ season, which is the primary salmon season. This fishery, which runs from approximately August 1 through early September, extends from Buoy #10, near the entrances to the Columbia River, upriver past the Astoria-Megler Bridge to Tongue Point. A pamphlet published by the Oregon State Marine Board states that an estimated

³² CRITFC website, <http://www.critfc.org/salmon-culture/we-are-all-salmon-people/>.

³³ CRITFC website, <http://www.critfc.org/about-us/fisheries-timeline/>.

³⁴ CRITFC website, <http://www.critfc.org/salmon-culture/we-are-all-salmon-people/>.

³⁵ Exhibit 58, Oregon Department of Fish and Wildlife and Washington Department of Fish and Wildlife, 2014 Joint Staff Report: Stock Status and Fisheries for Spring Chinook, Summer Chinook, Sockeye, Steelhead, and Other Species, and Miscellaneous Regulations (Jan. 22, 2014).

5,000 boats are on hand on the weekends in August. The Salmon University Web page states that it is not uncommon to see 300+ boats trolling in an area of ½ mile near the buoy.³⁶

Despite significant declines in the salmon fishery, commercial fishing in the Columbia River estuary persists. The primary commercial fisheries operating in the Columbia River estuary are gill-netters and crabbers. Gill nets are used on the Columbia River for salmon, sturgeon, shad, and smelt, with salmon as the primary target. In addition to commercial and sport fishing on the Columbia River, a number of fishing vessels operate out of the Columbia River in ocean fisheries.³⁷

Upper Columbia River and Snake River Chinook salmon are essential for the survival of Puget Sound's Southern Resident Killer Whale (SRKW) population. The birth rate of the SRKWs is strongly correlated with the abundance of Chinook salmon. New information shows that abundant runs of Columbia and Snake River Chinook salmon are important to the long-term survival of the SRKW.³⁸ Juvenile Chinook salmon use the lower Columbia River estuary for migration and sustenance. Adult salmon must migrate along the Columbia River past the proposed Terminal site.

Oregon LNG proposes building the Terminal at the mouth of Youngs Bay, located within the Columbia River estuary. Youngs Bay is one of four Select Area Fisheries Enhancement (SAFE) sites, also known as "terminal fisheries" sites, in the Columbia River estuary. "Funded since 1993 by the Bonneville Power Administration, the SAFE project uses existing hatchery facilities to spawn, hatch and conduct initial rearing of juvenile salmon for subsequent out-planting to net pen facilities in or around bays in the lower Columbia River."³⁹ The purpose of the SAFE program is to provide sport and commercial fisheries on the lower Columbia River with minimal impacts to non-local salmon stocks, including those protected under the Endangered Species Act (ESA).⁴⁰ Pursuant to the FCRPS BiOp, the Bonneville Power

³⁶ Exhibit 6, Oregon LNG Waterway Suitability Analysis (March 2008) (citations omitted) (hereafter OLNNG WSA).

³⁷ *Id.* at 2-18.

³⁸ NOAA, 2015 Southern Resident Killer Whale Satellite Tagging (May 2015), http://www.nwfsc.noaa.gov/research/divisions/cb/ecosystem/marinemammal/satellite_tagging/blg2015.cfm

³⁹ WDFW, Columbia River Fish Working Group at 3 (Oct. 2008) http://www.co.clatsop.or.us/Assets/Dept_10014/PDF/selective_fishingOct08.pdf.

⁴⁰ Columbia Basin Bulletin, *ODFW Seeking Lower Columbia Commercial Fisherman for Testing of Expanded Fisheries in 'Select Areas'* (Jan. 10, 2014), <http://www.cbbulletin.com/429474.aspx>.

Administration funds the Youngs Bay SAFE site.⁴¹ In particular, the FCRPS BiOp identifies funding for the Youngs Bay Select Areas Fisheries as a Reasonable and Prudent Alternative (RPA), explaining that the federal and state agencies established the program “to mitigate fisheries by providing the opportunity to harvest locally-produced salmon stocks in off-channel areas of the Columbia River.”⁴² According to a Washington Department of Fish and Wildlife Columbia River Fishing Group report, “[t]he Youngs Bay site has been the most successful to date, due in large part to the fact that it is the largest body of water included in the program.”⁴³

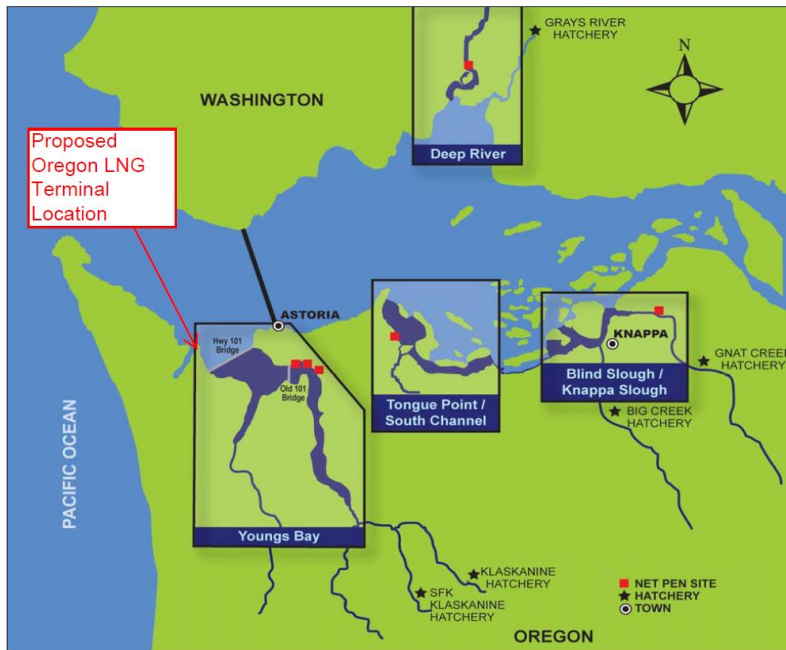


Figure 1. Map of Select Area Fisheries Enhancement sites. Credit: ODFW, WDFW, Clatsop County (Oregon LNG project location added to graphic).

Overall, the Columbia River estuary is a local and regional treasure, and a national priority for watershed health and salmon recovery. For the reasons explained below, Oregon LNG’s project will contribute to the degradation of an ecosystem that is at the center of a national and regional effort to restore endangered salmon and other fish runs, Southern Resident Killer Whales, and other marine birds and mammals.

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⁴¹ Columbia Basin Fish & Wildlife Program, Project No. 1993-060-00, Select Area Fisheries Enhancement, <http://www.cbfish.org/Project.mvc/Display/1993-060-00>.

⁴² *Id.*

⁴³ WDFW, Columbia River Fish Working Group (Oct. 2008), http://www.co.clatsop.or.us/Assets/Dept_10014/PDF/selective_fishingOct08.pdf.

4.0 THE NATIONAL ENVIRONMENTAL POLICY ACT.

NEPA, 42 U.S.C. §§ 4321–4370f, is our “basic national charter for protection of the environment.” 40 C.F.R. § 1500.1(a). It makes environmental protection a part of the mandate of every federal agency. 42 U.S.C. § 4332(1); *Calvert Cliffs Coordinating Comm. v. U.S. Atomic Energy Comm’n*, 449 F.2d 1109, 1112 (D.C. Cir. 1971). NEPA requires federal agencies to take environmental considerations into account in their decisionmaking “to the fullest extent possible.” 42 U.S.C. § 4332; 40 C.F.R. § 1500.2. NEPA also supplements the existing authority of agencies to allow them to act based on environmental considerations. 42 U.S.C. § 4335.

NEPA seeks to ensure that federal agencies take a “hard look” at environmental concerns. *Young v. Gen. Servs. Admin.*, 99 F. Supp. 2d 59, 67 (D.D.C. 2000); *Klamath-Siskiyou Wildlands Ctr. v. BLM*, 387 F.3d 989, 996 (9th Cir. 2004). One of NEPA’s primary purposes is to ensure that an agency, “in reaching its decision, will have available, and will carefully consider, detailed information concerning significant environmental impacts.” *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989). NEPA also “guarantees that the relevant information [concerning environmental impacts] will be made available to the larger audience,” including the public, “that may also play a role in the decisionmaking process and the implementation of the decision.” *Id.* To effectuate this aim NEPA requires not merely public notice, but public participation in the evaluation of the environmental consequences of a major federal action.” *State of California v. Block*, 690 F.2d 753, 770–771 (9th Cir. 1982); 40 C.F.R. § 1500.1(b) (under NEPA public scrutiny is “essential”) *see also* 40 C.F.R. §1500.2(d) (agency must “encourage and facilitate public involvement in decisions”).

The cornerstone of NEPA’s protections is the environmental impact statement (EIS). NEPA requires federal agencies to prepare an EIS before undertaking any “major federal action significantly affecting the quality of the human environment.” 42 U.S.C. § 4332(2)(C). The EIS requires a detailed, “hard look” at the environmental impact of—and alternatives to—the proposed action. *Id.* The EIS supports informed decisionmaking. Specifically, NEPA ensures “the agency will not act on incomplete information, only to regret its decision after it is too late to correct.” *Marsh v. Or. Natural Res. Council*, 490 U.S. 360, 371 (1979). By considering the environmental consequences of agency decisions, compliance with NEPA’s procedure is “almost certain to affect the agency’s substantive decision.” *Robertson*, 490 U.S. at 350. Of course, the development of an EIS is not an end in itself—its purpose is to inform the substantive decision that an agency will ultimately make. *Id.* at 350.

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An EIS must describe:

- 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). The alternatives analysis “is the heart of the environmental impact statement.” 40 C.F.R. § 1502.14. Federal agencies 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).

NEPA's governing regulations define what “range of actions, alternatives, and impacts [must] be considered in an environmental impact statement.” 40 C.F.R. § 1508.25. This is in part what is known as the “scope” of the EIS. First, the EIS must consider direct and indirect effects. The direct effects of an action are those effects “which are caused by the action and occur at the same time and place.” 40 C.F.R. § 1508.8(a). The indirect effects of an action are those effects “which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.” 40 C.F.R. § 1508.8(b). For example, “[i]ndirect 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 effects on air and water and other natural systems, including ecosystems.” *Id.* In fact, “[f]or many projects, these secondary or induced effects may be more significant than the project's primary effects.”⁴⁴

An EIS must also analyze and address the cumulative impacts of a proposed project. 40 C.F.R. § 1508.25(c)(3). Cumulative impacts are the result of any past, present, or future actions that are reasonably certain to occur. Such effects “can result from individually minor but collectively significant actions taking place over a period of time.” 40 C.F.R. § 1508.7. By way of comparison, indirect effects are effects caused by a project, albeit potentially later in space or

⁴⁴ *Fifth Annual Report of the Council on Environmental Quality (CEQ)*, 410-11 (Dec. 1974), <http://www.slideshare.net/whitehouse/august-1974-the-fifth-annual-report-of-the-council-on-environmental-quality>.

time. Cumulative effects are separate actions that are not caused by the action under review, but that increase the level of concern when added to the effects of the project.

FERC may take no action which would tend to “limit the choice of reasonable alternatives,” or “tend[] to determine subsequent development” before completing an EIS. 40 C.F.R. § 1506.1.

5.0 FERC’s PRACTICE OF ISSUING CONDITIONAL ORDERS VIOLATES MULTIPLE FEDERAL LAWS.

FERC may not conditionally approve the project before complying with NEPA and other federal laws. Sections 3 and 7 of the Natural Gas Act (NGA), 15 U.S.C. §§ 717b, 717f, and FERC Certificate Policy Statement, 88 FERC ¶ 61,227 (1999), require FERC to determine whether Oregon LNG’s proposed LNG terminal is “in the public interest” and that the proposed pipeline is “required by public necessity.” FERC cannot approve the project under the NGA unless it concludes that the project’s benefits outweigh its adverse impacts. FERC’s findings under the NGA require compliance with NEPA and other federal laws, which inform the ultimate public interest findings.

The Coalition concurs with the State of Oregon’s position that FERC must abandon its practice of issuing conditional orders before receiving authorizations delegated to states under Clean Water Act (CWA), Coastal Zone Management Act (CZMA), and the Clean Air Act (CAA). In scoping comments on the Oregon LNG project, the State of Oregon explains, “Such conditional orders violate the substantive provisions of those federal laws as well as circumvent consultation under the Endangered Species Act (ESA).”⁴⁵ Such conditional orders are arbitrary and capricious because FERC cannot balance the public interest in the project *before* the agency has quantified and considered the full extent of the benefits and adverse impacts, including the socioeconomic impact on landowners and public safety risks associated with the overall project. Forthcoming authorizations will inform the scope of FERC’s EIS. In turn, FERC should refrain from issuing a license until the agency complies with the ESA and Oregon LNG receives authorizations required under the CWA, CAA, and CZMA. Moreover, FERC should not issue an FEIS or issue any license that is based on an incomplete analysis. NEPA requires that FERC and its cooperating agencies have the complete NEPA analysis at hand before they make decisions.

⁴⁵ Exhibit 12 at 2 (Letter from State of Oregon to FERC, Comments on NEPA Scoping for Oregon LNG Bidirectional Project (Dec. 19, 2012), *citing* 33 U.S.C. § 1341(a); 16 U.S.C. § 1456(c)(3)(A); 42 U.S.C. § 7416; 16 U.S.C. § 1536(d); *see also* 40 C.F.R. § 402.09) (footnote omitted).

6.0 THE DEIS FAILS TO ANALYZE THE IMPACT OF OREGON LNG'S PROJECT ON THE FEDERAL GOVERNMENT'S DREDGE SPOIL DISPOSAL EASEMENT.

A fundamental flaw undermines multiple sections of FERC's DEIS: FERC fails to recognize the U.S. Army Corps of Engineers' (Corps) significant property right, a dredge spoil disposal easement, on the East Skipanon Peninsula.⁴⁶ The Corps' easement covers nearly the entire footprint of Oregon LNG's proposed Terminal site. The Corps obtained the easement in 1957 in exchange for dredging the Skipanon River and, in turn, opening the river to navigation.⁴⁷ Oregon LNG and FERC have been aware of the easement's existence since at least November 4, 2009, when the Corps raised concerns about the Terminal's impacts on the Corps' easement at an interagency meeting.⁴⁸ FERC's representatives were present at the November 4, 2009, meeting.

FERC's failure to acknowledge and analyze the federal government's property right is a fundamental flaw in the DEIS. To date, Oregon LNG has neither received approval from the Corps to build the Terminal over the Corps' easement area nor prevailed in its attempt to have a federal court declare the easement invalid. Throughout the following comments, the Coalition addresses the relevance of the Corps' easement to FERC's NEPA analysis. In the following section, the Coalition describes background information on the Corps' property right and ongoing federal court litigation.

In August 2014, Oregon LNG filed a lawsuit against the Corps in federal court. *LNG Development Company v. U.S. Army Corps of Engineers*, No. 3:14-cv-1239-AC (D. Or. filed Aug. 1, 2014). Oregon LNG's lawsuit claims that the Corps does not have a valid right to the easement. The Corps filed a motion to dismiss in November, and Oregon LNG filed an amended complaint in December. In January 2015, the Corps filed a second motion to dismiss.

On August 31, 2015, Judge Brown, the Article III judge assigned to the case, affirmed Magistrate Judge Acosta's July 28, 2015, preliminary order and issued a final order dismissing

⁴⁶ See Coalition Testimony at 16–17 (Sept. 2, 2015).

⁴⁷ Exhibit 67, Map produced by Oregon Department of State Lands on March 14, 2014, showing Port of Astoria lease area, which is subleased to Oregon LNG, and 1957 Corps easement; Exhibit 68, *LNG Development Company v. U.S. Army Corps of Engineers*, Findings and Recommendation, Case no. 3:14-cv-1239-AC (D. Or. July 28, 2015).

⁴⁸ Exhibit 68 at 2 (*LNG Development Company v. U.S. Army Corps of Engineers*, Findings and Recommendation, Case no. 3:14-cv-1239-AC (D. Or. July 28, 2015)); Exhibit 90 (Oregon LNG Monthly Interagency Meeting Minutes, Nov. 4 2009 Meeting).

the case.⁴⁹ Specifically, the court held that Oregon LNG's lawsuit is time-barred by the Quiet Title Act's statute of limitation and the court lacks subject matter jurisdiction over the case. The court granted the Corps' motion to dismiss. On August 10, 2015, Oregon LNG filed a second amended complaint adding an abandonment claim. The second amended complaint is pending before Magistrate Judge Acosta.

In a December 14, 2014, letter to FERC, the Corps agreed to serve as a cooperating agency to FERC's NEPA review of the project.⁵⁰ The Corps' letter reminds FERC of the ongoing litigation against Oregon LNG, stating:

Finally, FERC should also be aware that the leased location of the proposed Oregon LNG Terminal at Warrenton, Oregon is currently proposed for co-location with the Corps' longstanding Skipanon Channel Project disposal site easement. This conflict is currently the subject of a quiet title action brought against the Corps by Oregon LNG Development Company, LLC in the U.S. District Court for the District of Oregon. The Corps plans to vigorously defend this action.⁵¹

The Corps' letter removes any doubt that FERC was aware of the Corps' easement while preparing the DEIS.

For unknown reasons, FERC chose not to discuss the Corps' easement in the DEIS. In fact, the DEIS contains only one reference to the Corps' easement, stating:

The USACE is currently in litigation (quiet title action) with LNG Development Company, LLC in the U.S. District Court for the District of Oregon, Portland Division. At issue is which party has superior title to the terminal site: the USACE, by virtue of its 1957 dredged material disposal easement; or LNG Development Company, LLC, pursuant to its sublease over the area. As of April 20, 2015, the USACE's Amended Motion to Dismiss LNG Development Company, LLC's Amended Complaint (for lack of jurisdiction) is pending, for which oral arguments are yet to be scheduled.⁵²

⁴⁹ Exhibit 68 (*LNG Development Company v. U.S. Army Corps of Engineers*, Findings and Recommendation, Case no. 3:14-cv-1239-AC (D. Or. July 28, 2015)); Exhibit 76, *LNG Development Company v. U.S. Army Corps of Engineers*, Order, Case no. 3:14-cv-1239-AC (D. Or. Aug. 31, 2015)).

⁵⁰ Exhibit 7 (Letter from Corps to FERC (Dec. 14, 2014)).

⁵¹ *Id.* at 2.

⁵² DEIS at 4-233.

In the following comments, the Coalition demonstrates that: (1) the Corps' easement is relevant multiple sections of FERC's DEIS, and (2) FERC's failure to analyze the easement renders the DEIS arbitrary and capricious.

7.0 PURPOSE AND NEED.

FERC's purpose and need section contains significant flaws. An EIS must "briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action."⁵³ According to the DEIS, the project purpose is to "facilitate the re-export of Canadian-sourced natural gas (and to a lesser extent, the export of U.S.-sourced gas from the Rocky Mountain region) to foreign markets as well as facilitate the availability of such gas supplies for delivery to Pacific Northwest markets, including the Portland metropolitan area," while also enabling "the delivery of gas to isolated U.S. markets in need of supply, including Hawaii and coastal Alaskan communities."⁵⁴ The DEIS, however, fails to demonstrate a market need for LNG export. Assuming *arguendo* there is a market for the gas, the DEIS fails to demonstrate why this project, in this location, is necessary to fulfill that market need. For the reasons described below, FERC must revise the DEIS to include an appropriate purpose and need statement that focuses on addressing established public needs and providing necessary public benefits.

First, the DEIS adopts the private purpose of the applicants with minimal consideration of the public need for the project. Under NEPA, the "underlying purpose" must include both the goals of the private developer, as well as FERC's broader regulatory responsibilities, and directly address the need for the action. In *National Parks and Conservation Association v. BLM*, 586 F.3d 735 (9th Cir. 2010), the Ninth Circuit vacated an agency's purpose and need statement saying the agency "may not circumvent this proscription by adopting private interests to draft a narrow purpose and need statement that excludes alternatives that fail to meet specific private objectives."⁵⁵ A project applicant often defines a project's scope to reflect only that applicant's goals. Thus, an agency must "look hard at the factors relevant to the definition of purpose . . . and consider the agency's statutory authorization to act."⁵⁶ Similarly, in *Simmons v. U.S. Army Corps*, 120 F.3d 664 (7th Cir. 1997), the Seventh Circuit addressed similar facts when the Corps defined the purpose and need as "finding or creating a single source" of water for the City of Marion, Illinois.⁵⁷ The court concluded that by defining the purpose of the project in this way,

⁵³ 40 C.F.R. § 1502.13.

⁵⁴ DEIS at 1-8; JPA at 2 (stating project purpose as "to export North American natural gas to foreign markets.").

⁵⁵ *Id.* at 748.

⁵⁶ 586 F.3d 746-747 (quoting *Citizens Against Burlington v. Busey*, 938 F.2d 190, 196 (D.C. Cir. 1991)).

⁵⁷ *Id.* at 669.

rather than simply “to supply water,” the Corps had attempted to “ram through a project before first weighing the pros and cons of the alternatives.”⁵⁸ Here, FERC defines the purpose of the project so narrowly as to merely accept the applicant’s private agenda.

Second, the main project objective, to “facilitate the re-export of Canadian-sourced natural gas,” lacks a connection to any expressed public need. The governing statute for the import and export of liquid natural gas, the Natural Gas Act (NGA), states FERC is responsible for authorizing the siting, construction, expansion, and operation of onshore and near-shore LNG import or export facilities.⁵⁹ The NGA states “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.”⁶⁰ The DEIS makes many assertions on the market demands and supposed public need for natural gas, but the DEIS fails to cite any evidence to support these assertions. The DEIS also assumes: (1) a need for both the Oregon LNG project and other pending projects, and (2) that existing facilities are, or soon will be, exceeding their current capacity. The DEIS provides no rationale for these assumptions. For example, FERC states that “the combination of the WEP and the Oregon LNG Project would provide international customers in the Pacific Rim and regional customers in the Pacific Northwest access to natural gas supplies from western Canadian supply basins.”⁶¹ But FERC cites no evidence to demonstrate a need for such access or the current or future availability of such supplies. The DEIS also claims there are markets in Hawaii and coastal Alaska “in need of supply.” FERC also points to “regional demand” as a basis for supporting the Oregon LNG project.⁶² FERC then declares that “under the current economic conditions” the gas supply from the Rocky Mountain region is unlikely to be a significant source for natural gas.⁶³ Similarly, FERC asserts that there may be a need for additional project facilities to import and revaporize “foreign-sourced LNG for consumption in U.S. markets” if “current market conditions of natural gas oversupply” change.⁶⁴ FERC also asserts that that Oregon LNG would “serve other natural gas markets in Washington to address the needs of other interested parties.”⁶⁵ Nowhere in the DEIS does FERC support any of these conclusory assertions regarding the supposed need for this Project.⁶⁶

⁵⁸ *Id.* at 670.

⁵⁹ 15 U.S.C. § 717(e).

⁶⁰ *Id.* at § 717(a)

⁶¹ DEIS at 1-8.

⁶² *Id.*

⁶³ *Id.*

⁶⁴ *Id.*

⁶⁵ *Id.*

⁶⁶ In FERC’s EIS for the Bradwood Landing Project, the Commission defined the project purpose as “to provide a new source of natural gas to the Pacific Northwest through importation

Third, FERC fails to analyze so-called “public necessities” in the DEIS. Relevant public necessities the DEIS should analyze include “meeting unserved demand, eliminating bottlenecks, access to new supplies, lower costs to consumers, providing new interconnects that improve the interstate grid, providing competitive alternatives, increasing electric reliability, or advancing clean air objectives.”⁶⁷ However, FERC does not analyze any of these potential purposes or needs in the DEIS.

Fourth, FERC fails to describe the “need” for siting the Terminal: (1) in the State of Oregon given the project’s primary purpose is to export natural gas sourced from Canada, and (2) adjacent to the Columbia River. These issues are discussed at length in the alternatives analysis section below.

Finally, to the extent Oregon LNG’s proposes importing LNG, the DEIS fails to demonstrate the need for an LNG import terminal in the State of Oregon given the outlook for North American natural gas production. Oregon LNG’s permit application to the Corps appears to acknowledge this reality, stating:

The outlook for North American natural gas production has improved, owing to drilling productivity gains that have enabled rapid growth in supplies from unconventional gas-bearing formations in the United States and Canada. Improvements in drilling and extraction technologies have coincided with rapid diffusion in the natural gas industry’s understanding of the unconventional resource base and best practices in drilling and resource development. These changes have rendered obsolete once prominent fears of declining future domestic natural gas production.⁶⁸

Oregon LNG’s own evidence on the demand for LNG export wholly undercuts the company’s arguments for siting a bidirectional terminal capable of importing natural gas.

Given FERC’s statutory authority, an appropriate purpose and need statement must focus on addressing established public needs by providing benefits to the public. That statement must address how an applicant’s specific proposal would meet public needs and provide public needs in comparison to other reasonable alternatives. At a minimum, rather than using Oregon LNG’s

of LNG.” Although that stated purpose statement was also far too narrow, FERC at least offered six pages of analysis regarding why there was a supposed need to import natural gas. Exhibit 123 (Bradwood Landing FEIS at 1-4). Here, FERC’s entire purpose and need “analysis” occupies less than a page of its DEIS. DEIS at 1-8.

⁶⁷ *Id.* at 25.

⁶⁸ Supplement to the Joint Permit Application for the Oregon LNG Bidirectional Project (Oct. 2014) at 3-1 (hereafter Supp. JPA).

specific proposal as its purpose, FERC's purpose and need statement must focus more broadly on providing facilities and infrastructure to export and import natural gas or supply it to areas in the Western U.S., consistent with established public necessity and public benefit. The purpose and need statement should also address the infrastructure needs to address energy supply and demand needs on the West Coast. Here, FERC considers exclusively a project that would create more fossil fuel infrastructure and induce more fossil fuel production, along with all of the well known short- and long- term adverse impacts of such actions.

8.0 SCOPE.

The DEIS ignores and rejects comments filed on behalf of the Coalition, the states of Oregon and Washington, federal agencies, tribes, and others on the appropriate scope of the EIS. The DEIS's scope is a critical threshold question: many of the environmental impacts associated with the project are indirect and cumulative effects that are removed in space or time from the Terminal site and pipeline routes, but require analysis in the EIS.⁶⁹ In the following section, the Coalition describes why FERC must revise its scope of review to account for direct, indirect, and cumulative impacts ignored in the DEIS.

As an initial matter, the Coalition urges FERC to abandon its position that “[w]ith regard to the public benefit or need to export LNG from the United States to foreign nation, the decision rests with the DOE, and is therefore outside of the jurisdiction of FERC.”⁷⁰ For the reasons described in the “Purpose and Need” section, *supra*, FERC has an independent duty to evaluate the public benefit or need to export LNG.

Second, FERC must expand the DEIS scope beyond the facilities that are under FERC's jurisdiction.⁷¹ FERC concludes that issues outside the scope the EIS include: (1) “the need to export LNG”; (2) “horizontal hydraulic drilling through shale formations during exploration for natural gas (often referred to as ‘fracking’)”; (3) “induced production of natural gas”; (4) “‘life-cycle’ cumulative environmental impacts associated with the entire LNG export process”; (5) the concept of a ‘programmatic EIS to cover LNG export terminals throughout the United States’; and (6) “administrative information technology system operations at FERC.”⁷² FERC also

⁶⁹ The Coalition hereby incorporates by this reference the Columbia Riverkeeper *et al.* NEPA scoping comments on the Oregon LNG project, Exhibit 8, Letter from Columbia Riverkeeper *et al.* to FERC, Comments on NEPA Scoping for the Oregon LNG Bidirectional Project (Dec. 21, 2012).

⁷⁰ *Id.*

⁷¹ DEIS at 1-9 (stating “Our analysis in this EIS focuses on facilities that are under FERC's jurisdiction (i.e., the LNG terminal, pipelines, compressor station facilities, and ancillary facilities.”).

⁷² *Id.* at 1-12.

concludes that “LNG vessel design and ocean transportation routes outside of the waterway close to the shore” are not within the EIS’s scope.⁷³ For the reasons described in the Coalition’s 2012 NEPA Scoping Comments, Exhibit 8, and herein, the Coalition urges FERC to reconsider the scope of the DEIS. FERC’s position is inconsistent with NEPA’s implementing regulations and binding case law.

For example, FERC insists it cannot and will not address the impacts of the additional drilling and fracking for natural gas that this Project would induce. FERC asserts the Project “does not depend on additional U.S. production . . . and it is speculative to assume the Oregon LNG Project would cause increased natural gas production.”⁷⁴ But if the Project does not depend on increased production, where does FERC think the Terminal will obtain the gas it intends to export? The entire *sine qua non* of this Project is to induce more natural gas production, primarily in Canada. FERC offers no other rational need for building such increased pipeline capacity and capacity to export natural gas. There is no basis, legally or factually, for FERC to exclude an analysis of the environmental impacts of such increased production.

Third, FERC excludes analysis of environmental impacts within cooperating federal agencies’ jurisdiction. NEPA requires that, prior to making a decision, “the responsible Federal official shall consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved,” and these comments, “shall accompany the proposal through the existing agency review processes.”⁷⁵ As the lead agency, FERC is responsible for submitting a thorough, complete analysis of “the environmental issues, including . . . recommended mitigation measures, as well as non environmental issues.”⁷⁶ In the DEIS, FERC lists the Corps, EPA, U.S. Department of Energy (DOE), U.S. Fish and Wildlife Service (FWS), Coast Guard, and the U.S. Department of Transportation (DOT) as the cooperating agencies. Cooperating agencies are required to participate in the NEPA process by analyzing the scope of the proposal, preparing any requested environmental analyses, and providing advice in the agency’s given area of expertise. A cooperating agency can adopt the resulting EIS prepared by the lead agency when that cooperating agency makes its own regulatory determination.⁷⁷ When it is clear that a cooperating agency intends to depend on the lead agency’s EIS, the lead agency cannot exclude areas as outside the scope of that EIS simply because those areas are under the jurisdiction of the cooperating agency.

⁷³ *Id.* at 2-23.

⁷⁴ DEIS at 1-12.

⁷⁵ 42 U.S.C. 4332(C).

⁷⁶ *Id.* at 1-8.

⁷⁷ *See* 40 C.F.R. §§ 1501.6, 1506.3.

Nevertheless, under the section entitled “Topics Outside the Scope of this EIS,” FERC states “with regard to the public benefit or need to export LNG from the United States to foreign nations, that decision rests with the DOE.”⁷⁸ FERC declares that such an analysis is not within the Commission’s jurisdiction, and therefore must be conducted by DOE. But only two paragraphs above this assertion, and on the same page in the DEIS, FERC admits that DOE conditioned its decision regarding the public benefit of exporting LNG on FERC completing a satisfactory NEPA review. DOE’s conditional decision contained no analysis of environmental impacts.⁷⁹ FERC cannot now avoid including that analysis in its EIS by adopting the circular reasoning that FERC has no jurisdiction over that issue and DOE, a cooperating agency for this EIS, must do it.

Finally, the DEIS fails to fully disclose and evaluate the impacts of the Coast Guard’s Letter of Recommendation and Waterway Suitability Analysis.⁸⁰ Neither of those documents addressed the environmental impacts of the Coast Guard’s regulatory decisions or “recommendations.” The Coast Guard’s own procedures make clear that it, as another cooperating agency, is relying upon FERC’s EIS to address the environmental impacts of the regulatory decisions under the Coast Guard’s jurisdiction. FERC cannot exclude such analysis from its EIS.

9.0 ALTERNATIVES.

9.1 Overview of Alternatives Analysis.

The alternatives analysis is “the heart of the environmental impact statement,” designed to offer a “clear basis for choice among options by the decisionmaker and the public.” 40 C.F.R. § 1502.14. Fundamentally, an agency must “to the *fullest* extent possible . . . consider alternatives to its action which would reduce environmental damage.” *Calvert Cliffs’ Coordinating Comm. v. U. S. Atomic Energy Comm’n*, 449 F.2d 1109, 1128 (D.C. Cir. 1971) (emphasis in original). Absent this comparative analysis, decisionmakers and the public can neither assess environmental trade-offs nor avoid environmental harms. *See id.* at 1114.

The alternatives analysis must include an adequate range of alternatives. This includes “reasonable alternatives not within the jurisdiction of the lead agency,” as well as “appropriate mitigation measures not already included in the proposed action or alternatives.” 40 C.F.R. §

⁷⁸ DEIS at 1-12.

⁷⁹ DOE violated NEPA by making its decision *before* it or anyone else had fully disclosed and considered that decision’s environmental impacts.

⁸⁰ *See* DEIS at 1-9–1-10.

1502.14. Agencies violate this requirement by defining the project purpose and need so narrowly as to preclude alternatives other than the preferred project.

The alternatives analysis must be deep as well as broad. Alternatives must be “rigorously explore[d].” 40 C.F.R. § 1502.14(a). Rigorous exploration requires that the degree of analysis devoted to each alternative must be substantially similar to the degree of analysis devoted to the proposed action.⁸¹ Because alternatives are so central to decisionmaking and mitigation, “the existence of a viable but unexamined alternative renders an environmental impact statement inadequate.” *Oregon Natural Desert Ass’n v. Bureau of Land Mgmt.*, 625 F.3d 1092, 1100 (9th Cir. 2010) (internal alterations and citations omitted).

The project’s purpose and need informs the alternatives analysis. For example, alternatives are measured, in part, by their ability to satisfy the project purpose and need. Here, FERC improperly relies on the applicant’s unlawfully narrow and unsupported statement of purpose and need. *See supra* at section 7.0. The following comments demonstrate that: (1) there are multiple practicable alternatives, (2) the DEIS fails to evaluate adequately a reasonable range of alternatives, and (3) the DEIS dismisses without adequate justification and evidence practicable alternatives. For the reasons described below, FERC must revise the DEIS to address a reasonable range of alternatives to the project.⁸²

Oregon LNG initially proposed an LNG import terminal; however, Oregon LNG’s bad gamble on gas markets, and subsequent decision to re-file its FERC application, is not grounds to restrict the alternatives analysis to terminal sites that serve the Portland metro natural gas market. As Oregon LNG’s agency filings makes clear, the overriding purpose of the project is to export natural gas sourced from Canada.⁸³ FERC must therefore reject Oregon LNG’s decision to eliminate the majority of the alternative LNG terminal locations based on those locations’ failure to serve the Portland metro area natural gas market.

⁸¹ Council on Environmental Quality, “Forty Most Asked Questions Concerning CEQ’s National Environmental Policy Act Regulations,” 46 Fed. Reg. 18026, 18027, 18028 (1981), Question 5.

⁸² The Coalition does not support LNG import or export at any location due to the harmful impacts. However, FERC’s alternatives analysis must account for a range of reasonable alternatives and take a hard look at whether, if exports occur at all, one of these alternatives would have lower environmental impacts than Oregon LNG’s proposal. In turn, the Coalition urges FERC to engage in a rigorous review of alternatives to the Oregon LNG project. The following comments are in no way intended to endorse any LNG export or import project.

⁸³ JPA at 2 (“The primary purpose of the Project is to export North American natural gas to foreign markets.”); *id.* (“[T]he project will be able to export Canadian natural gas and, to a lesser extent, U.S. natural gas.”).

Oregon LNG fails to demonstrate that one of the stated project purposes, to import LNG to the Portland metro area, is a viable or significant purpose which warrants restricting the terminal's geographic location to the Columbia River estuary. Multiple practicable alternatives exist, including siting an LNG terminal in Canada, closer to the natural gas feedstock. In addition, energy conservation and efficiency are preferable, practicable alternatives that the DEIS dismisses without adequate justification. Offshore LNG terminals are also alternatives that the DEIS fails to evaluate adequately. Furthermore, multiple design changes at the Terminal site itself offer less harmful, practicable alternatives.

Alternatives to Oregon LNG's project should include, at a minimum, consideration of the following:

- (1) Whether, consistent with the *EIA Export Study*, exports, if allowed, should move forward in smaller quantities or a slower time table to mitigate the domestic economic and environmental impacts associated with large export volumes or rapid export schedules;
- (2) Whether alternative LNG tankers sizes could support a reduction in dredging for the turning basin and berthing area;
- (3) Whether limitations on the sources of exported gas—*e.g.*, limiting export from particular formations or regions—would help to mitigate environmental and economic impacts;
- (4) Whether to condition export on the presence of an adequate regulatory framework, including the fulfillment of the recommendations for safe production made by DOE's Shale Gas Subcommittee, would better serve the public interest by ensuring that the production increases associated with export will not increase poorly-regulated unconventional gas production;
- (5) Whether to delay, deny, or condition exports based upon their effect on the U.S. utility market (including changes in air pollution emissions associated with the impacts of increased export demand on fuel choice);
- (6) Whether to require exporters to certify that any unconventional gas produced as a result of their proposal (or shipped through their facilities) has been produced in accordance with all relevant environmental laws and according to a set of best production practices, such as that discussed by DOE's Shale Gas Subcommittee;
- (7) Whether alternative terminal sites exist on the West Coast, including sites in Canada;

- (8) Whether practicable alternatives exist in conservation, efficiency, and renewable energy;
- (9) Whether alternative terminal site configurations on the East Skipanon Peninsula exist to reduce impacts to wetlands;
- (10) Whether alternative terminal sites exist that are brownfields or redevelopment sites;
- (11) Whether alternative terminal sites exist that are not in close proximity to communities, hospitals, first responders and schools;
- (12) Whether alternative terminal sites exist that are not located within ESA-designated critical habitat;
- (13) Whether alternative terminal sites exist that would not disrupt the Buoy 10 fishery;
- (14) Whether alternative terminal sites exist that would not disrupt to Columbia River's most productive Select Area Fisheries Enhancement site, the Youngs Bay terminal fisheries site;
- (15) Whether alternatives terminal sites exist that would not impact tribal treaty rights;
- (16) Whether alternative terminal sites exist that are not within a tsunami inundation zone;
- (17) Whether alternative terminal sites exist that are not susceptible to liquefaction in the event of an earthquake;
- (18) Whether alternative terminal sites exist that would not result in the loss of a U.S. government dredge spoil disposal site;
- (19) Whether alternatives terminal sites exist that would not result in the loss of a potential high-quality wetland restoration site to support ESA-listed salmonid recovery;
- (20) Whether alternatives terminal sites exist that would not require routing a gas pipeline through over a hundred waterbody crossings;
- (21) Whether alternative terminal sites exist that would not require such large-scale dredging and maintenance dredging; and

(22) Whether alternatives exist that do not involve the significant expansion of existing facilities for producing and transporting fossil fuels like natural gas. Putting in place such expanded infrastructure virtually guarantees that the U.S. and the countries which might import such gas will continue to rely upon and even expand their reliance on fossil fuels for many more decades.

As the following section demonstrates, the DEIS alternatives analysis fails to satisfy NEPA's requirement to evaluate a reasonable range of alternatives.

9.2 No Action Alternative.

The DEIS's "No Action Alternative" section includes inaccurate assumptions about the LNG export market and in turn, reaches unsupported conclusions about the consequences of the No Action Alternative. The DEIS states:

If the Commission denies Oregon LNG's application (the No Action Alternative), the objectives of the proposed project would not be met and the resource impacts, including short- and long-term and permanent impacts, disclosed in this EIS would not occur. However, the section of the No Action Alternative could result in the use or expansion of other existing or proposed LNG facilities and associated interstate natural gas pipeline systems, or in the construction of new infrastructure to meet the objectives of Oregon LNG's project (to export LNG to global markets or import LNG to provide natural gas to markets in the Pacific Northwest should market conditions be favorable).⁸⁴

Market analysis of LNG export undermines FERC's assumption that the "No Action Alternative could result in the use or expansion of other existing or proposed LNG facilities and associated interstate natural gas pipeline systems, or in the construction of new infrastructure to meet the objectives of Oregon LNG's project." Oregon LNG is one of multiple proposals to export LNG from the United States. Pending and authorized LNG export projects amount to 44.83 billion cubic feet per day (bcf/d) of gas.⁸⁵ In August 2015, Platts and Bentek Energy published an in-depth market analysis on LNG exports. The analysis states:

LNG exports have long been touted as the metaphoric savior of the US gas markets, tempting producers and midstream players with the allure of global demand. However, global gas demand growth has flagged over the last year, rising by a mere 0.7 Bcf/d, while at the same time 2.2 Bcf/d of new export

⁸⁴ DEIS at 3-2.

⁸⁵ U.S. DOE, *Applications Received by DOE/FE to Export Domestically Produced LNG from the Lower-48 States* (as of Sept. 10, 2015), <http://energy.gov/sites/prod/files/2015/09/f26/Summary%20of%20LNG%20Export%20Applications.pdf>.

capacity is expected to be added to the market by the end of 2015. LNG spot prices have slipped back into territory not seen since prior to the 2011 Fukushima disaster, which led to Japan shuttering 47.5 GW of nuclear generation capacity. *The recent dip in global LNG prices may be just the beginning of a longer-term trend of well supplied LNG markets, which could leave many LNG export terminals in the US underutilized and global gas markets wading through a protracted period of depressed prices.*⁸⁶

The Platts/Bentek Energy report concludes: “Despite hopes that global demand will arrive as the savior of US gas markets starting in 2016, it appears that the US LNG exporters may be entering the market just as the party seems to be dying down.”⁸⁷

Leading market analysts concur with the Platts/Bentek Energy report.⁸⁸ In an August 24, 2015, report to clients, Bank of America states: “Spare U.S. liquefaction capacity could aggravate the ongoing spot LNG market glut Longer-term, the critical question for LNG global prices is whether there will be enough demand to meet incremental supply from Australia and the U.S.”⁸⁹ In April 2015, Moody’s Investor Service (Moody’s) issued a similar market forecast for LNG exports. According to Moody’s, export projects already under construction will continue as planned, which will lead to excess liquefaction capacity over the rest of the decade. “Notably, through 2017, Australia will see new capacity come online from roughly \$180 billion in investments, which will result in a 25% increase in global liquefaction capacity. Likewise, the U.S. is poised to become a net LNG exporter after the [Cheniere] Sabine Pass Liquefaction LLC . . . project goes into service in the fourth quarter of 2015.”⁹⁰ Moody’s states: “Lower oil prices are causing LNG suppliers to curtail their capital budgets. This will result in the cancellation of a majority of the almost 30 proposals [to export LNG] in the U.S., 18 in western Canada and four in eastern Canada.” The DEIS fails to address the current market forecast for LNG exports, which demonstrate there is no need for a new LNG export terminal in the Columbia River estuary.

EPA’s comments on the Oregon LNG’s CWA 404 application also undermine the DEIS’s assumption that, if FERC does not authorize Oregon LNG’s project, other companies will fill a market demand for LNG. In its January 16, 2015, letter to the Corps, EPA states:

⁸⁶ Exhibit 73 at 1 (Platts and Bentek Energy, *LNG Exports: Oasis or Mirage?* (Aug. 2015)).

⁸⁷ *Id.* at 4.

⁸⁸ Exhibit 74, Moody’s Investor Service, *Moody’s: Liquefied natural gas projects nixed amid lower oil prices* (Apr. 7, 2015).

⁸⁹ Exhibit 72, Bloomberg Business, *BofA Says Collapsing Oil Drags U.S. LNG Exports Down With It* (Aug. 24, 2015).

⁹⁰ Exhibit 74.

Oregon LNG states that the primary purpose of the Oregon LNG Project is to facilitate the re-export of Canadian-sourced natural gas (and to a lesser extent, the export of U.S.-sourced gas from the Rocky Mountain region) to foreign markets as well as facilitate the availability of such gas supplies for delivery to Pacific Northwest markets, including the Portland metropolitan. However, we note that the energy supply and demand landscape seems to be in a state of flux within the US. With one other LNG proposal pursuing FERC licensing for a site in Oregon and its associated natural gas pipeline within the same service area that could provide new supplies of natural gas to the Pacific Northwest from either Canada or the Rocky Mountains; there are still many uncertainties associated with the current natural gas market that puts the long-term commitment to any particular site that would warrant permanent and temporary impacts to natural resources proposed with construction of the Oregon LNG facility and associated Washington Expansion Pipeline proposal at considerable risk.⁹¹

EPA's letter and leading market analysis on LNG import and export markets demonstrate that FERC is incorrect in concluding that the No Action Alternative could result in other LNG terminal construction or existing terminal expansion. This significant flaw undermines FERC's No Action Alternative analysis and renders the analysis arbitrary.

In addition, in one paragraph, the DEIS dismisses renewable energy as an alternative to meeting the objectives of Oregon LNG's project. The DEIS states:

Commenters have suggested that the Oregon LNG Project could be replaced by renewable energy alternatives. Renewable energy resources include, but are not limited to, wind power, solar power, tidal power, and hydropower. All of these alternatives represent alternative means of producing electrical power. Because the project's primary purpose is to prepare natural gas for export to foreign and domestic markets, the development or use of renewable energy technology would not be a reasonable alternative to the proposed action.⁹²

FERC's analysis is inconsistent with NEPA's implementing regulations. Under 40 C.F.R. § 1502.14, FERC must "[r]igorously explore and objectively evaluate all reasonable alternatives," 40 C.F.R. § 1502.14(a), and analyze "reasonable alternatives not within the jurisdiction of the lead agency," 40 C.F.R. § 1502.14(c). FERC violates these requirement by defining the project purpose and need so narrowly as to preclude alternatives other than the preferred project.

The DEIS must give serious consideration to the impact of increasing reliance on renewable energy on the future of natural gas-fired electricity. In comments on the proposed

⁹¹ Exhibit 64 at 2 (Letter from EPA to Corps (Jan. 16, 2015)).

⁹² DEIS at 3-2-3-3.

Bradwood LNG import terminal, the Oregon Department of Environmental Quality (DEQ) questioned whether Bradwood LNG's impacts were necessary and without alternatives in renewable energy and conservation: "Decades of maintaining LNG facilities in Oregon to supply natural gas to California might not be justified, especially given Oregon's policy to reduce reliance on non-renewable energy sources and the West Coast Governors' goal to explore new renewable energy options on the coasts."⁹³ The Oregon Department of Land, Conservation and Development (DLCD) agreed, stating: "There should be a rigorous analysis of alternatives and more consideration of conservation and renewable energy."⁹⁴ The Oregon Department of Energy expressed skepticism about the real need for the Bradwood LNG import terminal, citing new renewable portfolio standards in the State of Oregon as a factor that could reduce demand for fossil fuel-powered electricity.

Finally, FERC fails to address energy conservation and efficiency as an alternative to the Oregon LNG project. FERC's unexplained decision to ignore energy conservation and efficiency in the DEIS is arbitrary. Specifically, the DEIS does not mention, let alone analyze, energy conservation and efficiency as preferable, practicable alternatives to the project. To the extent Oregon LNG's project proposes LNG import, the DEIS fails to assess accurately non-LNG alternatives, such as conservation, efficiency, and renewable energy. In fact, DEIS fails to acknowledge renewable energy and greenhouse gas emission laws passed in Oregon, Washington, and California. These laws require a greater percentage of electricity generation to come from renewable sources. In sum, FERC must revise the DEIS to address energy conservation and efficiency as alternatives to the Oregon LNG project.

9.3 Alternative Terminal Locations.

By defining the project need and purpose narrowly, the DEIS precludes the existence of any alternative sites. Notably, Oregon LNG's decision to propose an LNG terminal on the East Skipanon Peninsula ignores every siting criteria NOAA recommended in its NEPA scoping comments on the project. In section 9.3.1, the Coalition discusses NOAA's criteria and the DEIS's failure to account for the criteria. In sections 9.3.2 and 9.3.3, the Coalition explains why the DEIS fails to evaluate adequately alternative terminal locations.

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⁹³ Exhibit 19 at 9 (Preliminary Comments of DEQ, Oregon State Agencies on Bradwood LNG DEIS at 9 (Nov. 2007)).

⁹⁴ *Id.* at 21.

9.3.1 The DEIS Ignores NOAA's Recommended Siting Criteria.

In December 20, 2012, NOAA filed with FERC NEPA scoping comments on the Oregon LNG project.⁹⁵ NOAA's scoping comments include a subsection, titled "Siting of LNG Terminals," which describes NOAA's recommendations on siting LNG terminals.⁹⁶ NOAA's letter states:

The location of LNG terminals, and associated infrastructure, will influence the type and magnitude of impacts on aquatic resources. The Commission should follow these recommendations with regard to import terminal siting to mitigate for project effects on marine and anadromous resources.

As the following section demonstrates, Oregon LNG's proposed Terminal location ignores or rejects every NOAA recommendation.

*NOAA Recommendation No. 1: "Site LNG new terminals as far offshore as feasible, in locations of lower biological productivity, and away from sensitive habitats and migration routes of marine mammals or protected migratory species."*⁹⁷

Oregon LNG's Terminal location ignores NOAA's recommendation. Oregon LNG proposes locating the Terminal onshore, within the Columbia River estuary in Youngs Bay. The East Skipanon Peninsula and the mouth of Youngs Bay are an area of high biological productivity that federal agencies designated as critical habitat for multiple ESA-listed species.⁹⁸ Oregon LNG proposes locating the Terminal's dock and LNG tanker turning basin within the migration routes for marine mammals and protected migratory species, including listed salmonids.

*NOAA Recommendation No. 2: "Site LNG terminals and associated pipeline networks to avoid or minimize construction and operation impacts on marine mammals, marine and anadromous fish, ESA-listed species, ESA-designated critical habitats, EFH [Essential Fish Habitat], estuaries, wetlands and shallow water habitats, and fishing areas."*⁹⁹

⁹⁵ Exhibit 5 (Letter from NOAA to FERC, Oregon LNG NEPA Scoping Comments (Dec. 20, 2012)).

⁹⁶ *Id.* at 4.

⁹⁷ *Id.*

⁹⁸ Exhibit 1 (Williams Expert Report).

⁹⁹ Exhibit 5 at 4–5 (Letter from NOAA to FERC, Oregon LNG NEPA Scoping Comments (Dec. 20, 2012)).

The Terminal location conflicts with NOAA’s recommendation. First, Oregon LNG proposes locating the Terminal within the Columbia River estuary. Second, Oregon LNG proposes filling 33.78 acres of palustrine and estuarine wetlands and building an industrial dock within shallow water habitat.¹⁰⁰ Third, Oregon LNG proposes building and operating the Terminal within the most popular non-tribal sport and commercial fishing area in the Columbia River estuary. Fourth, siting the Terminal at the mouth of Youngs Bay fails to avoid or minimize construction and operation impacts on marine mammals, marine and anadromous fish, ESA-listed species, ESA-designated critical habitats, and Essential Fish Habitat (EFH). For example, Oregon LNG’s proposed Terminal location covers critical habitat for ESA-listed species, including Lower Columbia River Chinook Salmon, Snake River Fall-Run Chinook Salmon, Upper Willamette River Chinook Salmon, Upper Columbia River Spring-run Chinook Salmon, Snake River Sockeye Salmon, Lower Columbia River Steelhead, Middle Columbia River Steelhead, Upper Columbia River Steelhead, Upper Willamette River Steelhead, Snake River Basin Steelhead, Columbia River Chum Salmon, Lower Columbia River Coho Salmon, North American Green Sturgeon (Southern DPS), and Eulachon. Oregon LNG’s disregard for NOAA’s second recommendation on terminal siting is discussed in detail in below.

NOAA Recommendation No. 3: “Site LNG terminals to maximize the use of existing viable infrastructure such as existing pipeline networks, and deep draft berthing areas.”¹⁰¹

Oregon LNG’s Terminal location conflicts with NOAA’s recommendation. Oregon LNG proposes developing over 88.7 acres of an undeveloped site on the East Skipanon Peninsula. There is no existing infrastructure on the site, including gas or water pipeline networks. The East Skipanon Peninsula lacks deep draft berthing areas. Oregon LNG proposes dredging 135.2-acres to create a turning basin and 17.1 acres to create an LNG vessel berthing area.¹⁰² This requires dredging 1.2 million cubic yards in Youngs Bay.¹⁰³ To maintain the turning basin, Oregon LNG would dredge 300,000 cubic yards every three years.¹⁰⁴ Oregon LNG’s selected Terminal location ignores, in its entirety, NOAA’s third siting recommendation.

¹⁰⁰ JPA Public Notice at 2.

¹⁰¹ Exhibit 5 at 5 (Letter from NOAA to FERC, Oregon LNG NEPA Scoping Comments (Dec. 20, 2012)).

¹⁰² JPA Public Notice at 3.

¹⁰³ OLANG BA at 2-25.

¹⁰⁴ *Id.* at 2-27.

*NOAA Recommendation No. 4: “Site LNG terminals to minimize conflicts with current activities such as recognized spawning or nursery areas, areas where fishing gear is deployed, navigation channels, and research use areas.”*¹⁰⁵

Oregon LNG’s proposed Terminal location conflicts with NOAA’s recommendation. The Terminal site is adjacent to the most productive SAFE program site within the entire Columbia River estuary. In January 2014, the Oregon Department of Fish and Wildlife (ODFW) adopted fishing regulations that endeavor to concentrate commercial fishing within Youngs Bay.¹⁰⁶ Fishing gear is deployed routinely by commercial fishing vessels within Youngs Bay. Even with the ODFW “control zone” in place, sport fishing continues in Youngs Bay. For these reasons, Oregon LNG’s proposed Terminal location disregards NOAA’s fourth siting recommendation.

*NOAA Recommendation No. 5: “Minimize vessel use of confined waterways. Vessel passage in confined waterways can cause erosion of shoal water areas, resuspend sediment from the channel bottom, strand juvenile salmonids, and contribute to shoreline erosion.”*¹⁰⁷

The Terminal location conflicts with NOAA’s recommendation. Oregon LNG proposes building the Terminal within Youngs Bay, a “confined waterway.” Oregon LNG predicts that approximately 127 LNG tankers will frequent the Terminal on an annual basis. Oregon LNG therefore fails to “[m]inimize vessel use of confined waterways.”

*NOAA Recommendation No. 6: “Minimize the area of dredging and amount of resulting depth change. Dredging and the disposal of dredged material can cause substantial impacts on many aquatic organisms and their habitats. The permanent removal of material from the aquatic environment may interfere with sediment routing and habitat forming processes, and contribute to shoreline erosion.”*¹⁰⁸

The Terminal location conflicts with NOAA’s recommendation. As noted above, Oregon LNG proposes unprecedented dredging in Youngs Bay. This includes dredging 135.2-acres of

¹⁰⁵ Exhibit 5 at 5 (Letter from NOAA to FERC, Oregon LNG NEPA Scoping Comments (Dec. 20, 2012)).

¹⁰⁶ ODFW Press Release, Commission Adopts Youngs Bay Closure (Feb. 7, 2014), <http://www.dfw.state.or.us/news/2014/february/020714.asp>.

¹⁰⁷ Exhibit 5 at 5 (Letter from NOAA to FERC, Oregon LNG NEPA Scoping Comments (Dec. 20, 2012)).

¹⁰⁸ Exhibit 5 at 5 (Letter from NOAA to FERC, Oregon LNG NEPA Scoping Comments (Dec. 20, 2012)).

river bottom to create a turning basin and 17.1 acres to create an LNG vessel berthing area.¹⁰⁹ Together, Oregon LNG's proposal calls for dredging 1.2 million cubic yards in Youngs Bay.¹¹⁰ To maintain the turning basin, Oregon LNG would dredge 300,000 cubic yards every three years.¹¹¹ The Columbia River estuary is well-documented as being "sediment-starved." Yet Oregon LNG proposes removing over 1.2 million cubic yards of sediment from the estuary. The size and scale of Oregon LNG's proposed dredging in Youngs Bay disregards NOAA's sixth siting recommendation.

*NOAA Recommendation No. 7: "Resource evaluation surveys of the proposed site should include information comparing and contrasting the relative aquatic resource impacts of alternate LNG sites and associated infrastructure. The effort should consider and include information and analysis regarding: Marine mammals, marine, estuarine, and anadromous fish, endangered/threatened species, ESA critical habitat, EFH and HAPCs, impacts to the function and value of these habitats; local fishing activity; the type of federally-managed fish species that may be impacted; potential cumulative impacts; a consideration of how climate change may affect those impacts; and the possibilities of interconnecting with existing facilities (e.g., location of existing pipelines, heat sources, and other viable infrastructure) that the applicant could potentially utilize. The analysis should also consider the duration of identified species and habitat impacts."*¹¹²

FERC's alternative analysis disregards NOAA's recommendation. The alternatives analysis includes a section evaluating alternative terminal locations. The section is notably devoid of the analysis NOAA recommends. Specifically, FERC's alternatives analysis does not include any specific information comparing and contrasting the relative aquatic resource impacts of alternate LNG sites and associated infrastructure. Instead, Oregon LNG's analysis includes cursory statements on relative habitat impacts, to the extent the issue is addressed at all. FERC's analysis of the Jordan Cove Energy Project, proposed in Coos Bay, Oregon, illustrates FERC's disregard for NOAA's seventh recommendation. As stated above, the Coalition opposes all proposals for LNG export, including the proposed Jordan Cove project. The Coalition discusses the Jordan Cove alternative in detail below. The DEIS wholly disregards NOAA's seventh recommendation.

NOAA Recommendation No. 8: "Provide a reasonable range of alternative locations for the siting of the LNG terminal as part of the alternatives analyzed pursuant to NEPA. The analyses of these alternative sites should be comprehensive to allow for meaningful

¹⁰⁹ JPA Public Notice at 3.

¹¹⁰ OLNG BA at 2-25.

¹¹¹ *Id.* at 2-27.

¹¹² Exhibit 5 at 5((Letter from NOAA to FERC, Oregon LNG NEPA Scoping Comments (Dec. 20, 2012)).

comparison among the sites. The alternatives analysis should consider all potential sites within the expected service area (e.g., west coast of North America) regardless of whether a project proponent has filed with FERC for authorization to construct a facility on that site."¹¹³

For the reasons described herein, the DEIS alternatives analysis falls far short of providing the information recommended by NOAA. FERC restricts its analysis of terminal locations in Canada to pending or proposed LNG terminal locations. FERC's analysis lacks information that would facilitate a "meaningful comparison," and "comprehensive" review as NOAA recommends.

9.3.2 Alternative Terminal Locations in Canada.

The DEIS fails to analyze adequately alternative terminal locations in Canada. FERC concludes that Oregon LNG must restrict the Terminal's geographic location based on the project's partial purpose of importing natural gas to the Portland metro area.¹¹⁴ FERC's conclusion is arbitrary. As noted above, Oregon LNG's application is clear: the fundamental purpose of Oregon LNG's project is export of Canadian-sourced gas. At most the project will only utilize two LNG import vessels per year, as opposed to 125 export vessels.¹¹⁵ Oregon LNG's land use application to the City of Warrenton, Oregon, states: "Import LNGC [LNG carrier] traffic will be infrequent, up to two a year, most likely in the wintertime, and only occurring in the event of a major natural gas supply emergency on the Pacific Northwest pipeline grid during periods of peak heating demand."¹¹⁶ Yet, the DEIS alternatives analysis rejects any terminal location that does not serve the questionable, market contingent project purpose of importing LNG to serve the Portland metro market. FERC should reject Oregon LNG's decision to reject every prospective terminal location in Canada based on the "LNG import to the Portland metro market" project purpose.

FERC must evaluate alternative terminal locations based on the project's fundamental, overriding purpose: The of export Canadian-sourced natural gas. Oregon LNG's federal permit applications include inconsistent statements on the project's purpose and need, which skews the DEIS alternatives analysis. For example, statements in the Oregon LNG Joint Permit Application (JPA) to the Corps, "Project-specific Criteria and Alternatives Analysis,"¹¹⁷ are inconsistent with Oregon LNG's statements in the "Purpose and Need" section.¹¹⁸ Oregon

¹¹³ *Id.*

¹¹⁴ DEIS at 3-12; *see also* Oregon LNG Supp. JPA at 5-1.

¹¹⁵ OLNG Draft BA at 2-2-2-3; .

¹¹⁶ Oregon LNG Terminal Land Use Application at 2-3 (June 2014, revised Nov. 2014).

¹¹⁷ Supp. JPA at 5-1.

¹¹⁸ *Id.* at at 3-1.

LNG’s alternatives analysis states: “The primary objective of for the Terminal location is to import and supply up to 1.5Bscf/d of natural gas to the Pacific Northwest region and the Portland metro area, and to export up to 1.25 Bscf/d to the global market, assuming a heating factor of 1,000Btu.” However, Oregon LNG’s “Purpose and Need” section states that “[t]he primary purpose of the project is to export North American natural gas to foreign markets.” Oregon LNG’s claim that “[t]he primary objective of for the Terminal location is to import and supply up to 1.5Bscf/d of natural gas to the Pacific Northwest region and the Portland metro area, and to export up to 1.25 Bscf/d to the global market, assuming a heating factor of 1,000Btu[.]” does not square with the number of LNG import and export vessels. FERC must reconcile the project’s true purpose and, in turn, use the accurate project purpose to guide the alternatives analysis.

The history of Oregon LNG’s project provides context for the skewed alternatives analysis. Oregon LNG invested millions of dollars in siting an LNG *import* terminal on the East Skipanon Peninsula before market conditions changed and the project’s primary purpose flipped to an LNG export terminal. This fact—not Oregon LNG’s claims that the project must be sited near the Portland metro market—underlies the applicant’s decision to propose an LNG export terminal on the East Skipanon Peninsula. FERC, however, cannot restrict its alternatives analysis to suit Oregon LNG’s bad gamble on LNG markets.

As the “Purpose and Need” section, *supra*, explains, there is no proven “need” for the project in the Pacific Northwest. The DEIS alternatives analysis rests, in part, on the assumption that LNG export is a vital resource for the future of the Pacific Northwest. Yet, the analysis contains no factual support for a need in the Pacific Northwest that matches the enormous scale of the Oregon LNG proposal. This overarching problem renders the alternatives analysis inadequate.

FERC must revise the DEIS and include a rigorous analysis of potential LNG terminal locations in Canada. The DEIS includes a description of proposed LNG terminals on the West Coast of Canada, including: (1) Kitmat LNG, (2) Douglas Channel LNG, (3) LNG Canada Export Project, (4) Pacific Northwest LNG Project, (5) Prince Rupert LNG Project, (6) Alta Gas Offshore LNG Project, and (7) Shell Canada LNG Project. The analysis of these pending proposals is a far cry from “rigorous.” As noted above, FERC rejected every proposal based on the “LNG import to Portland metro area” criterion. In addition, FERC restricts its analysis of potential LNG terminals in Canada to pending proposals. The alternatives analysis must consider potential *alternative terminal locations*, not simply where other companies are proposing LNG export terminals.

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9.3.3 Alternative Terminal Locations in the U.S.

For the reasons described below, FERC's decision to adopt the applicant's restrictive and unsubstantiated screening criteria is arbitrary. Oregon LNG adopted restrictive siting criteria to render only one site feasible to meet its project purpose and need: the East Skipanon Peninsula. FERC, in turn, adopts the identical criteria in evaluating alternative terminal locations in the U.S. In addition, the alternatives analysis contains a number of claims about why certain sites were eliminated from consideration, yet fails to substantiate the claims with source citations. In the following section, the Coalition highlights examples of FERC's inadequate analysis of alternative terminal locations in the U.S. The Coalition again reiterates opposition to all LNG projects.

Jordan Cove Energy Project (Coos Bay, Oregon). The DEIS analysis of the Jordan Cove Energy Project is a prime example of FERC's failure to provide meaningful and substantiated reasons for rejecting potential alternative terminal locations. Like Oregon LNG, Jordan Cove proposes exporting North American natural gas. Both projects are proposed in the State of Oregon and both projects are at approximately the same regulatory review stage. Yet the DEIS examines and rejects the Jordan Cove project based on an analysis focused on *adding* Oregon LNG's proposed export capacity to the export capacity proposed at Oregon LNG. The DEIS fails to analyze Jordan Cove an *alternative* to building the Oregon LNG project.

Puget Sound. The DEIS dismisses every port in Puget Sound with a summary statement. The DEIS Puget Sound ports analysis states in full: "The Puget Sound area was eliminated from consideration because of the legal challenges associated with attempting to add new supertanker traffic to the sound per the 1977 Magnuson Amendment to the MMPA [Marine Mammal Protection Act], which effectively bans additional supertanker from Puget Sound."¹¹⁹ FERC fails to cite any language from the MMPA or case law to substantiate its summary claim. 33 U.S.C. § 476(b), commonly referred to as the 1977 Magnuson Amendment to the Marine Mammal Protection Act, states:

Notwithstanding any other provision of law, on and after October 18, 1977, no officer, employee, or other official of the Federal Government shall, or shall have authority to, issue, renew, grant, or otherwise approve any permit, license, or other authority for constructing, renovating, modifying, or otherwise altering a terminal, dock, or other facility in, on, or immediately adjacent to, or affecting the navigable waters of Puget Sound, or any other navigable waters in the State of Washington east of Port Angeles, which will or may result in any increase in the volume of crude oil capable of being handled at any such facility (measured as of

¹¹⁹ DEIS at 3-13.

October 18, 1977), other than oil to be refined for consumption in the State of Washington.

FERC must explain why the 33 U.S.C. § 476(b) “effectively bans additional supertanker from Puget Sound” in light of Oregon LNG’s project purpose of transporting LNG.

Grays Harbor. The DEIS eliminated all potential site locations in Grays Harbor without adequate justification. The DEIS analysis of Grays Harbor states in its entirety: “Sites in Coos Bay, Oregon, and Grays Harbor, Washington, were also eliminated from consideration based on depth of the existing shipping channels and distance from Portland.”¹²⁰ FERC arbitrarily rejected Grays Harbor from consideration. Three oil companies deemed Grays Harbor an ideal location for deep draft shipping terminals.¹²¹ The DEIS alternatives analysis fails to discuss this fact, let alone endeavor to distinguish its proposal from similar energy projects. Oregon LNG’s alternatives analysis, submitted the Corps as part of the CWA 404 Supplemental Joint Permit Application, states:

The main reason for dismissing Grays Harbor is due to concerns with the existing depth and width of the north shipping channel within Grays Harbor. The existing channel within Grays Harbor is 300 feet wide dredged to a depth of 36 feet at MLLW (Grays Harbor Economic Development Council, 2007). Access and reasonable turning basin for LNG ships would be difficult with these existing channel dimensions.¹²²

Oregon LNG fails to provide any technical analysis, let alone supporting facts regarding shipping requirements, to justify its sweeping dismissal of Grays Harbor. Oregon LNG’s cursory conclusion is questionable in light of three major proposals to significantly increase Panamax vessel traffic to facilitate oil-by-rail terminals at the Port of Grays Harbor. For example, Oregon LNG fails to explain: (1) why smaller LNG vessels are not feasible, (2) if there are any proposals to expand the depth or width of the Grays Harbor channel, and (3) why access and reasonable turning basin for LNG ships would be difficult. Oregon LNG’s conclusions on the suitability of Grays Harbor lacks critical information to evaluate whether the company’s claims for eliminating potential sites are justified. Importantly, the DEIS fails to address Oregon LNG’s rationale for eliminating Grays Harbor from consideration.

¹²⁰ *Id.* at 3-13.

¹²¹ Exhibit 20 (Grays Harbor Crude-by-Rail Fact Sheet (Aug. 2013), <http://www.portofgraysharbor.com/about/CBR-Project.php>).

¹²² Oregon LNG Supplemental Joint Permit Application to the Corps (hereafter Supp. JPA), Appendix K at 10-23.

Terminal Locations in the State of California. The DEIS does not contain any analysis of alternative site locations in California. This decision contradicts NOAA's recommendation to consider alternative terminal locations on the West Coast.

Lower Columbia River Terminal Locations. The DEIS considers eight sites on the lower Columbia River: (1) Tansey Point (RM 10); (2) East Bank Skipanon Peninsula (RM 11.5); (3) Tongue Point (RM 18); (4) Bradwood Landing (RM 38); (5) Wauna (RM 41); (6) Port Westward (RM 53); (7) Barlow Point (RM 63); and (8) Kalama (RM 68).¹²³ FERC eliminates every site for similar reasons, namely safety due to longer vessel transits and increased air pollution emissions. Initially, FERC eliminates Barlow Point and Kalama based on proximity to population centers and a longer trip upriver requiring tankers to pass under bridges. FERC's analysis lacks any analysis of potential industrial sites at the ports of Longview, Vancouver, and Woodland, and private port properties such as the former Reynolds Metals property in Cowlitz County, Washington.

The Columbia River alternative sites analyses contain common flaws. First, FERC fails to address the relative differences in tsunami and earthquake risks at the alternative locations in comparison to the East Skipanon Peninsula. Second, FERC fails to acknowledge the Corps' dredge spoil disposal easement at the East Skipanon Peninsula. Third, FERC fails to discuss the relative benefits of a shorter pipeline route serving an upriver terminal site. Fourth, FERC fails to address and comment on other industrial terminals proposed at the same sites, and distinguish the Oregon LNG project from those projects. The Coalition identifies specific flaws in FERC's Columbia River alternatives analyses below.

Tansy Point. FERC concludes that Tansy Point has a higher environmental score than the proposed project location. However, FERC rejects this site on the grounds that the safety and constructability evaluation show that it provides limited separation of the berth from the deep draft shipping channel and would place the berth and onshore Terminal facilities in proximity to existing residences and a public park. The DEIS fails to compare the distance between the berth and the deep draft shipping channel for Tansy Point to the East Skipanon Peninsula berth and shipping channel distance. The DEIS also fails to describe the number of residences and the size of the park, and then compare the safety factor to the relative Sandia Zones of Concern impacts from the East Skipanon Peninsula location.

Tongue Point. Aside from vessel safety, the DEIS fails to discuss public safety. The DEIS also fails to address the relative impact to commercial and sport fishing between the East Skipanon Peninsula location and Tongue Point.

¹²³ *Id.* at 10-24.

Wauna. The Wauna site is located in a significantly more remote location than the East Skipanon Peninsula. Despite this fact, the DEIS fails to address the relative public safety differences between the proposed project location and Wauna. The DEIS also fails to address the relative differences in tsunami and earthquake risks at the Wauna site, an upriver location, compared to the East Skipanon Peninsula. The DEIS also lacks any discussion of the relative benefits of a shorter pipeline route serving an upriver terminal site.

Port Westward. FERC fails to address any potential properties at the existing Port Westward industrial site. Instead, the DEIS considers property zoned PA-38, Primary Agriculture. Since Oregon LNG filed its FERC application, a crude oil-by-rail terminal began operating at Port Westward, the Global Partners terminal. In 2014, a Chinese company announced plans to site a large methanol terminal at Port Westward.¹²⁴ The crude oil and methanol terminals demonstrate a significant weakness in the DEIS terminal alternatives analysis: If similar companies deem Port Westward a viable terminal location, why is FERC's alternatives analysis limited to sites that are zoned for agriculture? Oregon LNG also fails to address the relative amount of dredging required at Port Westward, located in a relatively deep area of the Columbia River.

Kalama. Oregon LNG rejects potential terminal locations in Kalama, Washington. In 2014, Northwest Innovation Works announced plans to site a large methanol terminal at the Port of Kalama.¹²⁵ This proposal alone captures the inadequacy of Oregon LNG's alternatives analysis: If a methanol company is proposing a terminal and pipeline in Kalama, why is FERC's consideration of Kalama a mere three sentences?¹²⁶

East Skipanon Peninsula. FERC's analysis of the East Skipanon Peninsula, the proposed project site, disregards the ecological and biological value of the site, as well as the substantial amount of dredging required to accommodate LNG tankers in Youngs Bay. Expert reports submitted by the Coalition demonstrate the fundamental errors in Oregon LNG and FERC's opinion on the quality of wetlands on the East Skipanon Peninsula and ESA-species presence in

¹²⁴ Exhibit 21 (Associated Press, *China, BP plan two Columbia River chemical plants* (Jan. 1, 2014), <http://www.columbian.com/news/2014/jan/22/china-bp-plan-two-columbia-river-chemical-plants/>).

¹²⁵ *Id.*

¹²⁶ Supp. JPA, Appendix K at 10-24 (stating "Oregon LNG looked as far east along the Columbia River as Kalama and found a site ideally located with respect to the main natural gas pipeline. However, this site is located at river mile 68, requiring a long trip upriver and under two existing bridges. In addition, existing residences in Prescott, Washington, would be within 2,000 feet of the docked LNG ships.").

the project action area.¹²⁷ The DEIS alternatives analysis fails to disclose and discuss: (1) tsunami and earthquake risk at the site; (2) the Youngs Bay SAFE program site; (3) the substantial use of Youngs Bay for commercial and sport fishing; (4) Oregon LNG's impact on an existing public access right-of-way; (5) Oregon LNG's impact on traditional waterfowl hunting along the East Skipanon Peninsula shoreline. In addition, FERC fails to acknowledge—let alone analyze—the Corps' dredge spoil disposal easement on the East Skipanon Peninsula. For example, the alternatives analysis fails to analyze: (1) the impacts to the Corps, taxpayers, and the general public of losing an upland dredge spoil disposal site, and (2) the value of the Corps' disposal site and the relative availability of other upland disposal sites in the Columbia River estuary. FERC's flawed analysis of the East Skipanon Peninsula alternative renders the comparative analysis to other sites defective.

9.3.4 Terminal Design Alternatives.

The DEIS fails to include sufficient reasoning or detail to justify its dismissal of many design and project alternatives that could have less adverse environmental impacts. In particular, the DEIS provides little consideration of the relative costs, technologies, and logistics in rejected alternatives. For example, FERC must evaluate a terminal for a smaller design footprints for the terminal and smaller LNG vessels. FERC fails to address the possibility of building a smaller terminal; in turn, the analysis does not provide adequate data to justify why a smaller site design is not practicable. Likewise, FERC does not thoroughly evaluate the potential for using smaller vessels to access the East Skipanon Peninsula, potentially reducing the size of the terminal overall, and limiting the depth and area of the turning basin. There are a range of sizes of LNG vessels (from under 100,000 cubic meters to greater than 200,000 cubic meters). The DEIS fails to discuss adequately these practicable alternatives. The DEIS also fails to discuss alternatives to a 35-acre turning basin requiring 1.2 million cubic yards of dredging.¹²⁸

Finally, Oregon LNG ignores NOAA's input on terminal design. NOAA's 2012 NEPA scoping comments state:

Reduce environmental effects by preferentially placing infrastructure in previously disturbed upland areas with low restoration value, minimizing the facility footprint, and siting and designing the vessel wharf and turning basin to minimize the need for dredging, including maintenance dredging.¹²⁹

¹²⁷ See generally Exhibits 1–3 (Williams, Bierly, and Rhodes Expert Reports).

¹²⁸ DEIS at 3-35.

¹²⁹ Exhibit 5 at 6 (Letter from NOAA to FERC, Oregon LNG NEPA Scoping Comments (Dec. 20, 2012)).

NOAA’s input on terminal design also includes “[a]void[ing] illuminating aquatic areas that may cause changes in behavior or increase risk to living resources, or modify value or function of their habitat.”¹³⁰ Oregon LNG’s proposal for lighting the LNG terminal fails to account sufficiently for NOAA’s input.

9.4 Alternative Pipeline Routes.

FERC eliminates consideration of practicable pipeline alternative routes based on Oregon LNG’s secondary, and uncertain, project purpose of serving the Portland metro area with imported LNG. For the reasons stated above, FERC must reject Oregon LNG’s decision to restrict consideration of alternatives based on the alleged project purpose of serving the Portland metro area. Assuming *arguendo* that there is a need for LNG import to the Portland metro area, Oregon LNG fails to demonstrate why the relative proportion of the project need for LNG import warrants the Pipelines’ impacts to hundreds of waterbodies and the Columbia River estuary.

Like the alternative Terminal site locations, FERC’s alternative Pipeline route locations ignore expert agency input on the pipeline route. NOAA’s 2012 NEPA scoping comments recommend “design[ing] pipeline alignments to use previously disturbed upland areas, avoid or minimize disturbance in riparian areas, and co-locate or combine with other existing or proposed pipelines where possible.”¹³¹ The Pipeline route ignores NOAA’s input. Similarly, the Oregon Department of Forestry’s 2012 NEPA scoping comments express concern regarding the proposed Pipeline route, stating

Realizing the project must be in compliance with the Clean Water Act and Endangered Species Act among others, the ODF has concerns regarding the pipeline route across perennial and fish-bearing streams on State Forest lands. Where possible it would be beneficial to minimize the removal of forest cover when constructing segments of the pipeline beneath and in close proximity to a water course. In the EIS, a plan for revegetation and rehabilitation of the construction corridor should include reforestation with native tree species.¹³²

FERC’s alternatives analysis fails to incorporate input from NOAA and the Oregon Department of Forestry. An expert report prepared by Jonathan Rhodes (hereafter the Rhodes Expert Report), Exhibit 2, analyzes the pipeline’s impacts on waterbodies.¹³³ The Rhodes Expert Report

¹³⁰ *Id.*

¹³¹ Exhibit 5 at 6 (Letter from NOAA to FERC, Oregon LNG NEPA Scoping (Dec. 20, 2012)).

¹³² Exhibit 16 at 3 (Letter from Oregon Department of Forestry to FERC, NEPA Scoping Comments for the Oregon LNG Project (Dec. 13, 2012)).

¹³³ Exhibit 3 (Rhodes Expert Report)

further demonstrates FERC's failure to incorporate input from expert agencies. Commenters hereby incorporate the Rhodes Expert Report by this reference.

9.5 Conclusion for Alternatives Analysis.

The DEIS fails to consider practicable alternatives to the Oregon LNG project, to the design of the Terminal and the turning basin, and to the Pipeline route. To the extent FERC attempts to address alternatives to LNG export, the DEIS analysis is wholly inadequate. The DEIS likewise fails to address alternatives to LNG import. FERC dismisses non-LNG alternatives, while assuming that electricity generation from LNG-sourced gas will be a major driver for the project. Finally, the DEIS fails to assess practicable alternatives in the Pacific Northwest and to the project design that would significantly reduce the project's negative impacts on the aquatic environment.

10.0 ENVIRONMENTAL ANALYSIS FOR OREGON LNG AND THE WEP PIPELINE.

In the following section, the Coalition addresses DEIS section 4.1, FERC's environmental analysis of the Oregon LNG Terminal and Pipeline. The Coalition also provides comments on DEIS section 4.2, which analyzes the WEP Pipeline.

10.1 Geological Resources.

10.1.1 Seismic-related Hazards.

The Cascadia Subduction Zone, where the eastward-moving Juan de Fuca tectonic plate plunges beneath the westward-moving North American plate close to the Oregon coast,¹³⁴ creates a severe hazard for earthquakes of magnitude 9.0 or even higher.¹³⁵ Experts estimate the recurrence time for earthquakes in the southern region of the Cascadia Subduction Zone, comprising Northern California and the Oregon coast, at 240 years over a period of 10,000

¹³⁴ Oregon Department of Land Conservation and Development, *Oregon Coastal Zone Management Program Tsunami Guide*, <http://www.oregon.gov/LCD/OCMP/docs/Publications/TsunamiGuide20140108.pdf> (April 2014).

¹³⁵ Goldfinger, Christopher *et al.*, *Turbidite Event History—Methods and Implications for Holocene Paleoseismicity of the Cascadia Subduction Zone*, U.S. Geological Survey Professional Paper 1661-F, <http://pubs.usgs.gov/pp/pp1661f/>, (2014)

years.¹³⁶ Because the last event occurred in 1700, experts estimate the likelihood of a severe seismic event within the expected 50 year lifetime of the facility at up to 42%.¹³⁷

Additionally, since the subduction zone is located offshore, a tsunami of devastating proportions would follow. Experts predict a tsunami similar to the tsunami that inundated Japan's coast immediately following the 2011 Tohoku magnitude 9.0 megathrust earthquake.¹³⁸ The tsunami wave height at Fukushima crested at 49 feet,¹³⁹ consistent with early modeling studies showing that offshore mega-earthquakes in the Pacific U.S. region can trigger tsunamis with wave heights of 30 to 70 feet.¹⁴⁰ In Tohoku, the wave surged inland to a distance equivalent to 128 feet above sea level—well above the elevation of the proposed LNG terminal—traveled up to 6 miles inland, and killed over 15,000 people.¹⁴¹ This is the context in which Oregon LNG proposes to construct the Terminal and Pipeline.¹⁴²

The risk of a devastating 9.0 magnitude earthquake and subsequent tsunami on the lower Columbia River estuary and Oregon Coast is well-documented.¹⁴³ Despite this risk, Oregon LNG proposes building the Terminal on land created from sand deposits. Sandy soils are highly susceptible to liquefaction. Liquefaction is a soil behavior phenomenon in which saturated sand softens and loses strength during strong earthquake ground shaking.¹⁴⁴ Even FERC's staff

¹³⁶ *Id.* at 3.

¹³⁷ *Id.* By the year 2060, within the lifetime of the proposed facility, the southern portion of the Cascade Subduction Zone will have exceeded 85% of recurrence intervals if no major earthquake has yet occurred.

¹³⁸ Oregon Department of Land Conservation and Development, *Oregon Coastal Zone Management Program Tsunami Guide* at 5-6.

¹³⁹ Charles B. Miller, Notes on Potential Effects of a Subduction Earthquake and Tsunami Sequence on a Jordan Cove LNG Terminal at 9. http://350corvallis.org/wp-content/uploads/2013/01/LNG-in-Tsunami-Zone_all.pdf.

¹⁴⁰ Dr. Hal Mofjeld, NOAA Center for Tsunami Research. Pacific Marine Environmental Laboratory, http://nctr.pmel.noaa.gov/faq_display.php?kw=1998%20Interview%20with%20Dr.%20Hal%20Mofjeld#9

¹⁴¹ Becky Oskin, Japan Earthquake and Tsunami of 2011: Facts and Information, <http://www.livescience.com/39110-japan-2011-earthquake-tsunami-facts.html>.

¹⁴² Conditions expected at the Terminal in the event of an earthquake/tsunami are very similar to those anticipated at the LNG export terminal in Coos Bay proposed by Jordan Cove Energy Project.

¹⁴³ Exhibit 37 (Oregon Department of Land Conservation and Development, *Preparing for a Cascadia Subduction Zone Tsunami: A Land Use Guide for Oregon Coastal Communities* (Jan. 2014), <http://www.oregon.gov/lcd/ocmp/docs/publications/tsunamiguide20140108.pdf>).

¹⁴⁴ Exhibit 32 (*Earthquake Risk Study for Oregon's Critical Energy Infrastructure Hub*, Oregon Department of Geology and Mineral Industries, Open File Report 0-13-19 at 7 (2013)). In 2013,

questioned Oregon LNG’s “unprecedented” engineering plans and the company’s attempt to mitigate for seismic and tsunami risks.¹⁴⁵

Oregon LNG concedes that liquefaction at the Terminal site is likely in the event of an earthquake. In addition, the Oregon Department of Energy and Oregon Department of Geology and Mineral Industries (DOGAMI) recognize the risks of siting energy infrastructure on soils susceptible to liquefaction.¹⁴⁶ In Oregon LNG’s October 2008 Resource Report 6, the company acknowledged that it had drilled 350 feet deep at the proposed terminal site without reaching bedrock.

Oregon LNG proposes “deep soil mixing” to improve the foundation of its project, but this strategy is unproven and may not provide a stable foundation given the very severe geologic risks that could impact the Oregon LNG site. For example, in comments on the scope of the Oregon LNG EIS, DOGAMI states:

[T]he Applicant should provide a thorough geological characterization of the proposed project area and surrounding area as well as a comprehensive site-specific geologic hazard and geotechnical assessment (including seismic, tsunami, lateral spreading, subsistence, surface fault rupture, landslide, flood and channel migration hazards) at the proposed facility and along the pipeline.¹⁴⁷

DOGAMI goes on to state:

These assessments should include supporting evidence to explain how the facility can be appropriately constructed and operated. *This is particularly relevant due to the generally high seismic and seismically-induced hazards at the facility and the generally high landslide hazards along the pipeline route.*¹⁴⁸

the DOGAMI released a study on earthquake risk and Oregon’s critical energy infrastructure, which focused on the Portland metro area. In that report, DOGAMI states: “Liquefaction and lateral spreading hazards are the *primary concern* to the oil terminals that handle Oregon’s fuel supply.” *Id.* at 7 (emphasis added).

¹⁴⁵ Exhibit 33 (Letter from FERC to Oregon LNG (Environmental Data Request) (Aug. 1, 2013)).

¹⁴⁶ Exhibit 32.

¹⁴⁷ Exhibit 12 at 17 (Letter from State of Oregon to FERC, Comments on NEPA Scoping for Oregon LNG Bidirectional Project (Dec. 19, 2012)).

¹⁴⁸ *Id.* (emphasis added).

Although Oregon LNG filed Resource Reports on seismic and tsunami risks, DOGAMI requested additional analysis of the most current science on these risks. DOGAMI's letter to FERC states:

We also recommend that a comprehensive review of new science relevant to geology and geological hazards be incorporated into the proposed EIS. New science should include, but not limited to, recent publications about the seismic hazard in Oregon (e.g., Goldfinger and others, 2012; Witter and others, 2011) and new landslide hazard maps in Oregon (e.g., DOGAMI publications). The performance of natural gas and petroleum facilities during the March 11, 2011 Tohoku Japan earthquake and tsunami should be evaluated and considered in siting and design of the proposed export terminal and pipeline.¹⁴⁹

The DEIS fails to address adequately input from DOGAMI.

Oregon LNG fails to demonstrate that the berm system would protect LNG tanks, pipeline infrastructure, gas flare facilities, and other infrastructure at the Terminal. FERC raised significant concerns about the efficacy of Oregon LNG's seismic engineering plans. In its August 1, 2013, letter to Oregon LNG, FERC raised questions about Oregon LNG's proposed system of berms. FERC's letter to Oregon LNG states:

The project foundations are designed for liquefaction settlements of up to 28 inches extending to depths of 169 feet (elevation -148 feet) and downdrag from this settlement. *The design provides unprecedented pile lengths of up to 280 feet for the tanks and 200 to 220 feet for other equipment.* While the design is apparently conservative considering liquefaction to unprecedented depths of 169 feet, the berms protecting the tanks are sitting on the same materials and are subject to 1-foot lateral and up to 3-foot vertical displacement *and have a high likelihood of failure when subjected to the design Tsunami event . . . The designer need to clearly demonstrate that the LNG tanks and the process areas would not be flood due to the Design Tsunami. The present report falls significantly short of this important consideration.*¹⁵⁰

The DEIS fails to demonstrate that Oregon LNG has resolved FERC's critique of the Terminal design.

Oregon LNG has not, and cannot, provide adequate assurance that the Terminal protects public safety. In its geotechnical analysis, Oregon LNG presents the results of computer models

¹⁴⁹ *Id.*

¹⁵⁰ Exhibit 33 at 17 (Letter from FERC to Oregon LNG (Environmental Data Request) (Aug. 1, 2013)) (emphasis added).

in which tsunami wave heights are estimated at just 8 to 16 feet at the Terminal site—well below the 49 foot crest height at Fukushima in the 2011 Tohoku earthquake. Together with estimates of land subsidence and soil liquefaction caused by the earthquake, the 8 to 16 foot wave height prediction is the basis for Oregon LNG’s proposal to construct a protective earthen berm 22 to 27 feet high surrounding the terminal site. However, as Oregon LNG acknowledges, the earthquake that precedes the tsunami will cause soil liquefaction and likely compromise the integrity of this berm. This may well cause severe flooding at the site. After the tsunami hits the coast, its destructive power inland will increase with debris it picks up in its path. This includes large broken pieces of the proposed LNG facility, which may cause increased loss of life and damage to property. Further, fires in the already-devastated region are a common aftermath of tsunamis. The DEIS fails to address the potential for flooding at the site.

Finally, the DEIS fails to address a major fault, the Columbia River Fault, located directly beneath the proposed Terminal.¹⁵¹

10.1.2 Flooding and Coastal Storms.

Oregon LNG proposes building the Terminal within the 100-year floodplain.¹⁵² The EIS concludes, without supporting analysis, that “[b]ecause the terminal would be dependent on having an LNG marine carrier berth with access to the Columbia River navigation channel, there would not be a practicable alternative to siting the terminal within the river’s floodplain.”¹⁵³ First, FERC fails to analyze practicable alternatives to siting the LNG terminal within the floodplain. Second, FERC fails to explain why the Terminal must be located adjacent to the LNG marine carrier berth given other LNG terminals pipe LNG from upland terminals to marine berths. For example, Oregon LNG could locate the Terminal in an upland area and connect to shipping facilities via a longer tank filling pipeline or some other means. For example, at the Dominion Cove Point LNG terminal in Maryland, Dominion located the liquefaction equipment approximately a mile away from the actual vessels. FERC’s rationale for siting the Terminal within the 100-year floodplain is arbitrary.

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¹⁵¹ Exhibit 91 (Horning Geosciences, submittal 1 of 2 to City of Warrenton, Oregon (Sept. 16, 2015)); Exhibit 92 (Horning Geosciences, submittal 1 of 2 to City of Warrenton, Oregon (Sept. 16, 2015)).

¹⁵² DEIS at 4-15.

¹⁵³ *Id.*

10.1.3 Soils.

The DEIS fails to disclose the significant impact to farmlands crossed by the Pipeline. The DEIS states:

Approximately 25.1 miles (29 percent) of the pipeline would cross Important Farmland soils, mainly within Clatsop, Columbia, and Cowlitz Counties. The compressor station and the Woodland meter station would be in and would permanently impact 3.6 acres of Important Farmland soils. The contractor and pipe storage yards would comprise about 13.9 acres of Important Farmland soils; however, they have been previously disturbed.¹⁵⁴

The DEIS fails to disclose the Pipeline's relative impacts on different crops. The DEIS acknowledges that Oregon LNG would prohibit farmers from planting deep-rooted crops, such as trees, in the Pipeline right-of-way. However, the DEIS fails to disclose the overall loss of productive cropland, particularly impacts to tree farms.

10.2 Water Resources.

10.2.1 Surface Water Impacts and Mitigation.

10.2.1.1 Dredging of the Shipping Berth and Turning Basin.

The DEIS fails to analyze the significant impacts to water quality from Oregon LNG's proposed shipping berth and turning basin dredging.¹⁵⁵ Oregon LNG's shipping berth and turning basin require an unprecedented level of aquatic impacts in Youngs Bay, specifically, and the Columbia River estuary, in general. Oregon LNG proposes dredging 1.2 million cubic yards of river bottom to create a turning basin that can accommodate LNG tankers ranging in size from 70,000 to 266,000 cubic meters. The turning basin would extend from the edge of the Columbia River Federal Navigation Channel to the berthing line to facilitate LNG tanker turning, docking, and undocking. The bottom elevation is currently 20 to 30 feet below mean lower low water (MLLW). Oregon LNG proposes dredging to -43 feet Columbia River Datum (CRD), with two additional feet allowed for overdredging to -45 feet CRD.¹⁵⁶ The marine facilities (*i.e.*, the shipping berth and turning basin) would encompass approximately 148 acres of aquatic area.¹⁵⁷ For the reasons explained below, the DEIS ignores or underestimates the impacts of Oregon LNG's dredging.

¹⁵⁴ DEIS at 4-38.

¹⁵⁵ The DEIS discusses the Terminal's impacts on surface water and proposed mitigation from pages 4-45 to 4-51.

¹⁵⁶ Supp. JPA, Appendix N at ES-2.

¹⁵⁷ DEIS at ES-1.

First, the DEIS fails to address the physical and chemical impacts of dredging. Oregon LNG has not yet determined what method(s) of dredging it would employ. Specifically, Oregon LNG's Dredge Material Management Plan describes various dredging methods. However, Oregon LNG fails to disclose which method its contractors would use. Oregon LNG states:

The method of dredging has not yet been determined, and some methods may result in direct mortality to sturgeon. Oregon LNG will prevent dredge-related mortality by selecting a dredging method that does not result in direct mortality and/or by coordinating with resource agencies on the timing of dredging.

Oregon LNG's decision to postpone specifying a dredging method undermines public comments on the project's impacts. As the public comments on the Bradwood LNG terminal demonstrate, the dredging method is highly relevant to the physical, chemical, and biological impacts of dredging.¹⁵⁸

Notwithstanding Oregon LNG's failure to disclose the method for dredging, the Coalition endeavors to address physical and chemical impacts of dredging 1.2 million cubic yards at the mouth of Youngs Bay. The geomorphic modifications due to dredging affect the normal water fluctuations, as discussed in 40 C.F.R. § 230.24. The impacts include changes in salinity gradient, nutrient balance, and dissolved oxygen balances. Oregon LNG's dredging would adversely affect communities of aquatic life, induce populations of nuisance organisms, modify habitat, reduce food supply, restrict movement of aquatic fauna, and change the adjacent upstream and downstream areas.

The proposed turning basin would double the width and cross-section of the channel at a key location where the navigation channel changes from a west-southwest direction to a northwest direction. Under historic conditions both the north and south channels split the flow; now the south channel directs the bulk of the flow. At the Terminal location, strong tidal and river currents mix throughout the year. This raises the potential for Oregon LNG's turning basin to create a large scale eddy on incoming or outgoing tides. The project may exacerbate sedimentation or erosion in the area.

FERC must assess independently the veracity of the models used by Oregon LNG to predict dredging's impacts on hydrology. A study that measures impacts on a dynamic system like the Columbia River estuary must include an analysis of impact over a long enough period to be representative of the impact in a highly variable system; Oregon LNG's hydrodynamic modeling lacks this in-depth analysis. Oregon LNG also opts for 2-dimensional modeling in a number of scenarios, foregoing the more probative 3-dimensional modeling. This was a critical

¹⁵⁸ Exhibit 25 (Columbia Riverkeeper *et al.* Clean Water Act Section 404 Comments for the Bradwood LNG Project (Dec. 18, 2007)).

flaw in the Bradwood LNG hydrodynamic modeling.¹⁵⁹ Oregon LNG repeats this significant flaw to the determinant of government agencies reviewing the project, as well as the public.

The Oregon Department of Environmental Quality's (DEQ) decision denying the Clean Water Act Section 401 certification for the Bradwood LNG terminal and pipeline is highly relevant to FERC's analysis of Oregon LNG's project. NorthernStar Natural Gas proposed building an LNG import terminal 22 miles upriver from Astoria at Bradwood, Oregon. On May 5, 2010, NorthernStar filed for bankruptcy.¹⁶⁰ After NorthernStar filed for bankruptcy, DEQ released a detailed report denying Bradwood's 401 water quality certification. DEQ stated:

Based on evaluation of the best available information, adverse impacts to multiple water quality parameters may be significant and this will adversely impact existing and potential designated beneficial uses. Because the subject waterways are already Water Quality Limited, reversal of the impacts of the geomorphic alternations would not be possible, and mitigation has not been demonstrated to be adequate or achievable, DEQ concludes that application for 401 WQC for this proposed project should be denied.¹⁶¹

Prior to the project's demise, NorthernStar submitted a Biological Assessment to FERC. Although NOAA National Marine Fisheries Service and the U.S. Fish and Wildlife Service (collectively the Services) never released a Biological Opinion disclosing the project's impacts on ESA-listed species, the Bradwood Biological Assessment provides useful information to compare the Bradwood and Oregon LNG terminal proposals. Table 1 summarizes this information.

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¹⁵⁹ Exhibit 22 (DEQ, *Evaluation Report and Findings on Clean Water Act 401 Water Quality Certification Application for Bradwood Landing* (March 10, 2011)).

¹⁶⁰ *Id.*

¹⁶¹ *Id.* at 25.

Table 1. Comparison of Bradwood LNG and Oregon LNG Proposals.

	Bradwood LNG	Oregon LNG
Terminal Location	Lower Columbia River, Clifton Channel, River Mile (RM) 38-39	Lower Columbia River, Youngs Bay, RM 11.5
Size of Dredge Area	46 acres within a 58 acre area ¹⁶²	109 acres in 135 acre area ¹⁶³
Amount of Dredging	700,000 cubic yards ¹⁶⁴	1.2 million cubic yards ¹⁶⁵
Natural Water Depth	-20 feet Columbia River Datum (CRD)	20 to 30 feet Mean Lower Low Water (MLLW) ¹⁶⁶
Depth of Dredging	-42 feet CRD	-50 feet MLLW at berthing area; -45 MLLW at turning basin ¹⁶⁷
Maintenance Dredging	80,000 every two – four years	300,000 cubic yards every three years ¹⁶⁸
Dredge Spoil Disposal Location	Portion for dredge spoils as fill for construction of the terminal, with the balance moved to the Wahkiakum County Sand Pit ¹⁶⁹	Proposes in-water dredge spoil disposal at designated Pacific Ocean site outside of the mouth of the Columbia River ¹⁷⁰
Vessel Traffic	<ul style="list-style-type: none"> · 125 vessels would arrive at the terminal each year¹⁷¹ · 250 inbound and outbound vessel trips · ~ 2.4 LNG vessel trips per week 	<ul style="list-style-type: none"> · 127 vessels would arrive at the terminal each year¹⁷² · 254 inbound and outbound vessel trips · average of 2.4 LNG vessel trips per week¹⁷³
ESA-Listed Species Impacted by Project According to Applicant-drafted BA	<ul style="list-style-type: none"> · 38 listed endangered or threatened species or proposed · applicant concluded project may affect, and is likely to adversely affect 16 ESA-listed species¹⁷⁴ 	<ul style="list-style-type: none"> · 52 listed endangered or threatened species or proposed for listing · applicant concluded project may affect, and is likely to adversely affect, 22 ESA-listed species

¹⁶² Bradwood BA at ES-1.

¹⁶³ OLNG BA at 2-25; 3-33.

¹⁶⁴ Bradwood BA at 2-5.

¹⁶⁵ OLNG BA at 3-33.

¹⁶⁶ *Id.* at 2-25.

¹⁶⁷ *Id.* at 3-33.

¹⁶⁸ *Id.* at 2-25.

¹⁶⁹ Bradwood BA at 2-16 – 2-17.

¹⁷⁰ OLNG BA at 2-21.

¹⁷¹ Bradwood BA at 2-129.

¹⁷² OLNG BA at 3-70.

¹⁷³ *Id.* at 3-2.

¹⁷⁴ Bradwood BA at ES-3.

Ballast Water Intake Impacts	· 125 LNG import vessels per year would take on ballast water	· 2 LNG import vessels per year would intake ballast water ¹⁷⁵ ; LNG export vessels do not require ballast water intake ¹⁷⁶
Cooling Water Impacts	· 125 LNG import vessels per year would discharge cooling water ¹⁷⁷	· 125 LNG export vessels per year would withdraw cooling water ¹⁷⁸ · All LNG vessels would discharge cooling water ¹⁷⁹

For the Bradwood LNG project, NOAA, DEQ, and the Columbia River Inter-Tribal Fish Commission contracted with an independent third party for review of the hydrodynamic modeling and analysis submitted by the applicant. For a project that proposes significantly more dredging, a similar independent review is warranted for the Oregon LNG project. The Coalition urges FERC to analyze hydrodynamic modeling information on Oregon LNG’s project prepared by third-parties.

The chemical and physical impacts of Oregon LNG’s dredging are discussed in detail in the Williams Expert Report, Exhibit 1. Commenters incorporate by this reference the Williams Expert Report.

Second, the DEIS fails to address the impacts of dredging on turbidity, temperature, and dissolved oxygen. The Columbia River is classified as water quality limited under the CWA, Section 303(d) for temperature. EPA and/or the State of Oregon and Washington have yet to complete a total maximum daily load (TMDL) for temperature. Elevated temperature has a number of well-documented, negative impacts on species including ESA-listed salmonids. Similarly, turbidity has a number of adverse effects on water quality, including reducing light for photosynthesis by algae and plants, increasing temperature, and decreasing dissolved oxygen levels. Increases in temperature as a result of turbidity are caused by the suspended particles absorbing more heat from sunlight and, therefore, increasing the temperature of the water around the particles.

The DEIS fails to analyze how dredging would alter water temperature due to increases in turbidity, and how any changes in water temperature resulting from increased turbidity due to dredging will exacerbate the 303(d) water quality-limited status of these waters. Also, as a result of turbidity and increased water temperatures, dissolved oxygen levels and light will decrease, harming aquatic biota including federally protected fish species.

¹⁷⁵ O LNG BA at 2-35.

¹⁷⁶ *Id.* at 2-35.

¹⁷⁷ Bradwood LNG BA at 2-100.

¹⁷⁸ O LNG BA at 2-4.

¹⁷⁹ *Id.* at 2-100.

The Williams Expert Report describes the literature on the impacts of dredging on turbidity and sediment, stating:

Dredging will also increase turbidity and suspended sediment for at least as long as dredging occurs – the O LNG project construction phase and subsequent periodic maintenance dredgings of turning basin. These impacts degrade water quality and have negative effects on salmonids. Elevated turbidity can violate water quality standards and increase treatment costs for downstream water uses (Reid, 1999). Elevated turbidity and suspended sediment levels can also impair the ability of salmonids to feed and cause gill damage (Rhodes et al., 1994). Elevated turbidity and sediment delivery can also adversely affect benthic macroinvertebrates that are an essential part of aquatic foodweb for salmonids and other aquatic fauna.¹⁸⁰

The DEIS must analyze the impacts of dredging 1.2 million cubic yards of sediment on temperature, turbidity, dissolved oxygen and other water quality parameters.

Oregon LNG’s maintenance dredging would also increase water temperature in the Columbia River near the dredging site. Dredging increases temperature because the suspended particles absorb more heat from sunlight. In response to channel deepening dredging on the Columbia River, DEQ stated, “this project is expected to result in an increase in surface water temperatures during the low flow time of year both during dredging and flowlane disposal as a result of increased turbidity. . . . Temperature contributions are particularly problematic given the water quality limited listing for temperature in the lower Columbia River.”¹⁸¹ The DEIS fails to address the impacts of maintenance dredging on temperature, turbidity, dissolved oxygen, and other water quality parameters.

The potential turbidity increases and the impact to aquatic life are great due to the large size and long duration of the dredging. DEQ described the significant impacts from dredging in the Columbia River estuary in its decision denying the Bradwood LNG 401 certification, stating, “Physical observations of USACE dredging in the Columbia River, reveals that some erosion occurs even when modeling doesn’t predict it (Castro 2010).”¹⁸² DEQ’s 401 Certification also describes the adverse impacts of turbidity on ESA-listed species, stating:

Direct and indirect impacts of excessive turbidity to salmonids and other fish species is well documented in the literature (Rosetta, 2005). Impacts to endangered salmonids, other migratory species and resident fish may reach lethality at time or cause behavioral impacts (Rosetta, 2005), such as avoidance of

¹⁸⁰ Exhibit 1 at 22 (Williams Expert Report).

¹⁸¹ Letter from DEQ to Colonel Butler, Corps at 2 (Sept. 29, 2000).

¹⁸² Exhibit 22 at 62 (DEQ 401 Certification Denial for Bradwood LNG).

Clifton Channel [the section of the Columbia River where Bradwood proposed dredging].¹⁸³

Dredging will also decrease dissolved oxygen near the site because dredging increases the oxygen demand by disturbing sediments. DEQ's 401 certification for the Bradwood LNG project, which proposed *less* dredging than Oregon LNG's proposal, is highly relevant to FERC's analysis of Oregon LNG's impact on the Columbia River estuary.

FERC must also consider findings from the Williams Expert Report, which concludes that dredging will increase turbidity. The Williams Expert Report concludes that dredging would result in negative effects on salmonids by impairing their ability to feed and by causing gill damage.¹⁸⁴ Elevated turbidity can also adversely affect benthic macroinvertebrates, which salmon and other organisms rely on for food. The long-term and constant nature of this dredging is particularly troubling and distinguishes Oregon LNG's project from smaller dredging operations that the Corps has approved in the project area vicinity.

All of the physical and chemical changes discussed above are exacerbated by the Columbia River Federal Navigation Channel Deepening in the lower Columbia River. The channel deepening alone has detrimental impacts on the physical and chemical characteristics of the lower Columbia River. FERC must analyze the cumulative effects of the Oregon LNG's proposed dredging, taking into account the channel deepening, increased ship traffic from both the channel deepening and LNG tankers, the increase erosion from both projects, increased wave action, and geomorphic and hydraulic changes.

Third, the DEIS fails to analyze the impacts of dredging on resuspension of contaminated sediments into the water column. Sediments in rivers are often implicated for their tendency to store large amount of contaminants, which may turn into a significant source of contamination to aquatic and terrestrial organisms if disturbed. This is a particularly serious problem in the Columbia River estuary. Oregon LNG provides outdated sampling data from 2007 and 2008. The DEIS includes a condition requiring that Oregon LNG prepare a plan for reevaluating the sediments within the dredge prism, in consultation with the Portland Sediment Evaluation Team, prior to the close of the DEIS comment period.¹⁸⁵ FERC undermines state, federal, and tribal agency review, as well as public engagement, by allowing Oregon LNG to file a plan during the comment period. This decision eliminates the public's ability to comment on the plan as part of the DEIS comments. FERC cannot proceed with finalizing the DEIS until the public and

¹⁸³ *Id.*

¹⁸⁴ Exhibit 1 at 24 (Williams Expert Report).

¹⁸⁵ DEIS at 4-46.

agencies have the opportunity to review and comment on Oregon LNG's sediment data as part of a revised DEIS.

10.2.1.2 Dredging Impacts on the Columbia River Navigation Channel.

The DEIS fails to address the impacts of dredging the shipping berth and turning basin on the Columbia River Navigation Channel. Oregon LNG proposes dredging adjacent to the Columbia River Navigation Channel. The applicant-generated Turning Basin Hydrodynamic Modeling Report concludes that the project will not result in increased sedimentation in the navigation channel. FERC must verify independently the applicant's conclusion. Notably, Oregon LNG relies on a two-dimensional model. As noted above, DEQ raised significant concerns about the use of a two-dimensional model for predicting sedimentation in the dynamic estuary system. Oregon LNG proposes dredging in an area that is relatively more dynamic than the upstream Clifton Channel, the proposed location of the Bradwood LNG terminal. FERC cannot rely on Oregon LNG's conclusions about the project's impact on the Federal Navigation Channel without more in-depth analysis. Moreover, FERC must, at a minimum, disclose the direct, indirect, and cumulative impacts of Oregon LNG's dredging on the Columbia River Navigation Channel.

10.2.2 Dredged Material Disposal.

The DEIS fails to analyze and disclose the significant impacts of dredged material disposal on the Columbia River and Pacific Ocean. The DEIS contains an incomplete and contradictory discussion of alternatives for disposing 1.2 million cubic yards of dredge spoils. FERC acknowledges and describes the well-documented benefits of in-river dredge spoil disposal. Oregon LNG proposes dredge spoil disposal at an EPA ocean disposal site. FERC's analysis falls far short of explaining why the applicant is foregoing in-river disposal given the applicant's admission that in-river disposal is highly preferred by resources agencies.

Both Oregon LNG's Supplemental JPA Alternatives Analysis, Appendix K, and Dredge Material Management Plan, Appendix N, acknowledge and describe the benefits of in-river dredge spoil disposal. Oregon LNG states:

In general, the LCR [Lower Columbia River] is regarded as sediment-deficient because extensive upstream portions of the river have been dammed, which may severely limit downstream migration of sediment. It is therefore generally preferred to retain the dredged material within the riverine system, which confers a number of benefits to the watershed including creation of habitat and reducing erosion, especially if the material to be dredged is clean and would not degrade

the new receiving environment. However, a number of dredge placement options are still being analyzed at this time.¹⁸⁶

Oregon LNG also acknowledges the benefits of in-river dredge spoil disposal in the Dredge Management Plan, stating:

The LCR has been subjected to extensive damming practices during past decades and, consequently, has become sediment-deprived and subject to extensive ocean scouring at its mouth. Much of the sediment scoured from the river mouth is transported upriver during powerful incoming tides, which has resulted in shoaling of LCR channels and embayments, including Youngs Bay, Baker Bay, Steamboat Bay, and other side channels of the LCR. Therefore, when clean material is dredged from LCR embayments, it is highly desirable to keep the material within the riverine system rather than removing it to deeper ocean waters to upland disposal sites.¹⁸⁷

Oregon LNG reviewed current dredge material placement practices for portions of the lower Columbia River, in particular the Corps' Channel Improvement Program and the Port of Astoria's ongoing maintenance dredging. Oregon LNG states, "In general, both programs place high priority on in-water placement, where possible, to maintain the sediments in the system unless contamination becomes a factor, when near-shore or upland placement practices may become preferable."¹⁸⁸ Oregon LNG, however, proposes dredge spoil disposal at an EPA Deepwater Site.¹⁸⁹ The DEIS lacks any meaningful, let alone probative, discussion of alternatives to deepwater disposal.

10.2.3 Stormwater Runoff.

The DEIS understates the impacts of stormwater pollution by relying on Oregon LNG's stormwater pollution prevention and spill control plan. Stormwater pollution is a leading cause of water quality degradation in the United States. According to the National Research Council, "[s]tormwater runoff from the built environment remains one of the great challenges of water pollution control, as this source of contamination is a *principal contributor* to water quality impairment of waterbodies nationwide."¹⁹⁰ Stormwater from construction sites can lead to discharges of sediment, turbidity, nitrogen, phosphorus, metals, trash and debris, nutrients, organic matter, pesticides, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs),

¹⁸⁶ Supp. JPA, Appendix K at 10-49.

¹⁸⁷ Supp. JPA, Appendix N at ES-2.

¹⁸⁸ *Id.* at ES-3.

¹⁸⁹ JPA Public Notice (Nov. 18, 2014) ("The applicant is proposing to transport dredged material for the purpose of disposal in the Pacific Ocean.").

¹⁹⁰ *Urban Stormwater Management in the United States*, National Research Council (Oct. 15, 2008), http://www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf (emphasis added).

other toxic organics, substances that can modify pH, and pathogens.¹⁹¹ EPA acknowledges that the cumulative effects of these pollutants are significant.¹⁹²

FERC must analyze the detrimental impacts of polluted stormwater from Terminal construction. No impervious surfaces currently exist at the Terminal site.¹⁹³ The Terminal would result in approximately 28 acres of impervious surfaces.¹⁹⁴ The Terminal access road would create 2.5 acres of impervious surface.¹⁹⁵ Stormwater pollution caused by construction of the Terminal will contribute to degraded water quality in the Columbia River estuary, generally, and Youngs Bay, specifically. FERC must afford careful consideration to the degraded state of the Columbia River estuary and 303(d) listings.

10.2.4 Water Use and Water Pollution Discharges.

The DEIS discusses the Terminal's water demands and discharges, but contains no analysis of the environmental impacts of water use and discharge.¹⁹⁶ In the following section, the Coalition identifies significant impacts from Oregon LNG's water usage and discharges that FERC must address in the EIS.

10.2.4.1 Water Consumption.

According to Oregon LNG's FERC filings, constructing and testing the Pipeline and Terminal will initially consume 182,900,000 gallons of water.¹⁹⁷ Oregon LNG intends to purchase the water to hydrostatically test the Pipeline from the City of Woodland, Washington.¹⁹⁸ Water to hydrostatically test the infrastructure at the Terminal would likely come directly from the Columbia near Warrenton.¹⁹⁹ FERC must analyze the environmental impacts of Oregon LNG's proposal to use of millions of gallons of water to build the Terminal and Pipeline.

¹⁹¹ See EPA's *Environmental Impact and Benefits Assessment for Proposed Effluent Guidelines and Standards for the Construction and Development Category*, 3–6 (Nov. 2009), <http://www.epa.gov/guide/construction/>; see also 74 Fed. Reg. 62996, 63010 – 011 (December 1, 2009).

¹⁹² *Id.*

¹⁹³ JPA at 6-3.

¹⁹⁴ *Id.*

¹⁹⁵ *Id.*

¹⁹⁶ DEIS at 4-47–4-48.

¹⁹⁷ Oregon LNG, Prefiling Review Draft Resource Report 1—General Project Description, 1-21, 1-22.

¹⁹⁸ *Id.* at 2-15.

¹⁹⁹ *Id.*

Once operational, the Terminal alone would use over four billion gallons of water per year. FERC must evaluate the public interest in using the State of Oregon’s limited water resources for LNG export. The Terminal requires water on a continuous basis for cooling, ballast water, irrigation, fire suppression, and domestic purposes.²⁰⁰ Oregon LNG proposes withdrawing water from the Columbia and the Skipanon rivers and/or buying water from the City of Warrenton to meet these water needs.²⁰¹ During operation, the Terminal will use over 11 million gallons of water per day.²⁰² By comparison, water users in the entire city of Astoria use an average of 2.5 million gallons of water per day.²⁰³

Given the well-documented scarcity of water in the Columbia River Basin, FERC must undertake a robust analysis of the direct, indirect, and cumulative impacts of taking more water out of the Columbia River and its tributaries to support LNG export. This includes evaluating how Oregon LNG’s water withdrawals impact water availability, particularly in light of climate change modeling, impacts to Columbia River water quality, impacts to ESA-listed species and other aquatic life and wildlife, and the cumulative impacts of water withdrawals in the estuary, specifically, and Columbia River Basin, in general. In recent comments to FERC, the National Park Service states:

The Applicant states that the project would use ‘surplus water from the City [of Warrenton], meaning the City would not need to obtain additional water rights.’ However, as stated in their response, this definition of surplus is based on the current diversion infrastructure of the City of Warrenton. The current infrastructure does not fully maximize the city’s water rights to the Lewis and Clark River (Bischoff et al, 2000). If the City of Warrenton expands their infrastructure within their water rights during the life of the proposed project, it would be able to provide more water to the project beyond what is currently withdrawn.

Analysis from 2000 has shown that a full exercise of the City of Warrenton’s rights could lead to the river running dry. Specifically, it would generate a dewatering potential of 14.8% annually with a peak of 24.8% in August at the mouth of the Lewis and Clark River; and, 106.4% annually with a peak of 181.9% in August at the Lewis and Clark River above Heckard Creek (Bischoff et al, 2000). ODFW

²⁰⁰ Oregon LNG, Prefiling Review Draft Resource Report 2 — Water Use and Quality, 1-21.

²⁰¹ *Id.*

²⁰² Oregon LNG’s filings state that it will discharge, at most, 3.5 million gallons of water per day to the City of Warrenton POTW. Oregon LNG Export Project Prefiling Resource Report 1 at 1-25. Consequently, Oregon LNG’s consumptive use of water exceeds 7.5 million gallons of water per day.

²⁰³ Daily Astorian, *Where does Astoria’s water come from?*, http://www.dailyastorian.com/free/where-does-astoria-s-water-come-from/article_8ccacabedfcb-11e0-a440-001cc4c03286.html

found that this dewatering potential would affect the abundance, productivity, diversity, and spatial structure of the Lower Columbia River Coho ESU in the Youngs Bay Watershed because of its impacts on all life stages of the population (ODFW 2005).²⁰⁴

The National Park Service comments raise significant questions about whether the City's unused water right is available given impacts to ESA-listed species.

10.2.4.2 Water Pollution Discharges.

The DEIS contains no discussion on the impacts of water pollution discharges from the Terminal to the Columbia River.²⁰⁵ Instead, the DEIS devotes a section on "Water Use and Discharge" to describing the quantity of water discharged to the Columbia River. FERC therefore fails to analyze the direct, indirect, and cumulative impacts of water pollution discharges by the Terminal and Pipeline.

The Columbia River, and the communities that depend on it, face serious threats from toxic pollution and elevated water temperature. Every day thousands of pipes buried under and along the Columbia River discharge toxic and other pollution from cities, industry, stormwater, and other sources. Pesticides and heavy metals also enter the river from non-point source pollution, such as runoff from agricultural lands and air deposition. Oregon LNG proposes increasing toxic and temperature pollution to an already overburdened river system.

During operation, the Terminal would discharge polluted process wastewater via the City of Warrenton Publicly Owned Treat Works (POTW). The City of Warrenton POTW has a history of violating National Pollutant Discharge Elimination System (NPDES) permit limits.²⁰⁶ Oregon LNG grossly underestimates the water quality impacts to the estuary by concluding, in summary fashion, that the POTW will comply with applicable federal and state standards. FERC must analyze the direct, indirect, and cumulative impacts of discharging more pollution to the heavily degraded Columbia River, including the City of Warrenton's capacity to treat Oregon LNG's wastewater and the City's ability to comply with Oregon's human health criteria for toxics and other water quality standards.

The Coalition hereby incorporates by this reference Exhibit 28, Columbia Riverkeeper's comments on Oregon LNG's draft NPDES permit (hereafter Riverkeeper NPDES Permit Comments). As the Riverkeeper NPDES Permit Comments demonstrate, Oregon LNG's

²⁰⁴ *Id.*

²⁰⁵ See DEIS at 4-47-4-48 (section of DEIS on "Water Use and Discharge.")

²⁰⁶ Oregon Department of Environmental Quality Fact Sheet, City of Warrenton POTW at 2, http://www.deq.state.or.us/wqpr/372_2009120800021CS01.PDF.

polluted wastewater discharges fail to comply with the CWA and state water quality standards. For example, Oregon LNG's application states that it would use the City of Warrenton's regulatory mixing zone. Oregon LNG's NPDES permit application ignores a practical reality. Oregon LNG is not "using" the City's mixing zone; it is creating a second, overlapping mixing zone on top of the City's existing mixing zone. Oregon LNG cannot demonstrate compliance with OAR 340-041-0053(2)(c)(A)–(B), which require that mixing zones be as small as possible and not overlap.

Oregon LNG also fails to demonstrate compliance with water quality standards for temperature. The Columbia River is water quality limited for temperature at the City of Warrenton outfall. Oregon LNG proposes to use a regulatory mixing zone for temperature. Absent a mixing zone, Oregon LNG proposes to discharge wastewater in exceedance of Oregon's numeric temperature criteria. To date, neither EPA nor the states of Oregon and Washington have issued a temperature TMDL for the Columbia River. Oregon LNG's NPDES permit application assumes incorrectly that there is assimilative capacity for temperature in the Columbia River. Oregon LNG's proposal to utilize a mixing zone for temperature fails to comply with the CWA given the Ninth Circuit's ruling in *Friends of Pinto Creek v. EPA*, 504 F.3d 1007 (9th Cir. 2007).

Furthermore, Oregon LNG's plans to mix wastewater with other permitted facilities is highly questionable. Oregon LNG's NPDES permit application states that it would use effluent from the City of Warrenton POTW and discharge wastewater via the existing City of Warrenton outfall. In NEPA scoping comments to FERC, the City of Warrenton states:

While domestic water use at the [Oregon LNG] facility is likely to be nominal, processing water demands and subsequent discharges will likely strain the city's systems. The EIS should analyze the projected demand of both domestic and process water and the city's capacity to provide such volumes to the plant and any improvements necessary to the city's system to meet the demand. Similar analyses should address the disposal of process water from the plant.²⁰⁷

The DEIS fails to include the analyses recommended by the City of Warrenton. Furthermore, there is no evidence that Oregon LNG has reached an agreement with the City of Warrenton to use its effluent and outfall.

In addition, Oregon LNG proposes using a large proportion of the City of Warrenton POTW's wastewater as process water. The balance of wastewater effluent and intake from the Terminal is confusing, and the information in Oregon LNG's NPDES permit application contradicts the assertion that Oregon LNG will use more POTW water than it discharges into the

²⁰⁷ Exhibit 14 (Letter from City of Warrenton to FERC, Oregon LNG NEPA Scoping Comment (Dec. 21, 2012)).

system. For instance, Oregon LNG's application demonstrates in a block flow diagram that the Terminal will discharge more water to Warrenton's POTW than it receives.²⁰⁸ According to the figure, as well as the discussion on Oregon LNG NPDES permit application page 2-2, Oregon LNG will generally discharge more wastewater than it receives from the POTW system. In addition, Oregon LNG's application fails to address how the devastating fire at Pacific Seafood in June 2013 would impact its plans and associated reasonable potential analyses.²⁰⁹ For the reasons stated above and described in the Riverkeeper NPDES Permit Comment, Oregon LNG's wastewater disposal plans remain dubious.

Overall, FERC's decision to exclude the impacts of Terminal water pollution discharges from the DEIS fails to satisfy the minimum requirements for NEPA review.

10.3 Wetlands.

10.3.1 Terminal Wetland Impacts.

The Terminal would permanently impact approximately 36 acres of freshwater marsh and emergent wetlands (palustrine and estuarine wetlands).²¹⁰ The DEIS concludes that adverse impacts on wetland resources at the Terminal would be significant and recommends compensatory mitigation.²¹¹ The DEIS, however, fails to discuss the wetland impacts, devoting less than two pages to the Terminal's temporary and permanent wetland impacts. FERC's discussion of wetland impacts is incomplete and undermines the DEIS's mitigation analysis, discussed *supra*. The Coalition addresses the Terminal's wetland impacts in the following section.

The DEIS fails to address the direct, indirect, and cumulative impacts of Oregon LNG's wetland fill. The loss of additional estuarine wetlands only compounds the significant loss of wetlands in the lower Columbia River. According to a recent study by the Lower Columbia River Estuary Partnership, 68 to 70 percent of vegetated tidal wetlands, which are critical habitats for juvenile salmonids, were lost since 1870.²¹² An expert report on the impacts of

²⁰⁸ See Oregon LNG NPDES Permit Application, Figure 2-1, "Cooling Water Makeup Supply and Treatment – Block Flow Diagram."

²⁰⁹ OPB, *Pacific Seafood finds temporary facilities after processing plant fire* (June 14, 2013), <http://www.opb.org/news/article/pacific-seafood-finds-temporary-facilities-after-processing-plant-fire/>.

²¹⁰ Oregon LNG City of Warrenton Development Applications–Written Evidentiary Submittal at 61 (Sept. 18, 2015). The DEIS states that Oregon LNG's Terminal would permanently impact 33.9 acres of wetlands. DEIS at 4-64.

²¹¹ DEIS at 4-65.

²¹² Exhibit 27 (Lower Columbia River Estuary Partnership, *Habitat change in the Lower Columbia River and Estuary, 1870-2011* (2013)).

Oregon LNG's fill at the Terminal further describes the historic loss of wetlands in lower Columbia River estuary. Wetland ecologist Kenneth F. Bierly, former Wetlands Program Manager for the Oregon Department of State Lands and former Deputy Director for the Oregon Watershed Enhancement Board, prepared a report, *Oregon LNG Terminal Wetland Impact and Proposed Mitigation Review: Analysis of Available Information* (hereafter Bierly Expert Report).²¹³ The report describes the historic loss of wetland habitat near the proposed Terminal site, stating:

There have been significant losses of emergent wetlands from the Youngs Bay reach of the lower Columbia River.

* * *

The most recent analysis of habitat change in the Lower Columbia River for the lower river hydrogeomorphic unit that includes the Skipanon and Youngs Bay shows a historic loss of more than 6,000 acres of emergent marsh. The report (Marco and Pilson, 2012) describes the area as 'Reach A was historically dominated by herbaceous tidal wetlands, and thus this class exhibited the sharpest overall areal decline, while the wooded wetlands classes showed significant declines as well relative to their initial extents.' While the proponent of the project emphasize the loss of forested wetlands, the area of the terminal was historically emergent wetlands of the preponderance of losses of the lower river reach has been emergent wetlands. The loss of an additional 35 acres of marsh compounds the historic loss of more than 6,000 acres of tidal wetlands.²¹⁴

The Bierly Expert Report also notes that "[t]he Youngs Bay area has had significant losses of emergent tidal wetlands near the river[]" and "the tidal regime change has reduced salinity intrusion and affected the estuarine habitats."²¹⁵ Wetland losses around the Skipanon River eliminated nearly all the fringing marsh area of the south bank of the lower reach of the Columbia River adjacent to the main channel. In this degraded state, every remaining acre of wetland is important.

The Bierly Expert Report describes the habitat value of the East Skipanon Peninsula wetlands, and why the applicant's conclusions about the wetland quality are not based on the best available science. The Bierly Expert Report states:

Previous studies for facility development at the east bank Skipanon site have characterized the wetlands and flats along the site as 'productive tidelands' based

²¹³ Exhibit 2, the Bierly Expert Report, is incorporated by reference into these comments.

²¹⁴ Exhibit 2 at 2-5 (Bierly Expert Report).

²¹⁵ *Id.* at 5.

on benthic invertebrate sampling and tidal marsh detritus production availability to the estuary (Montagne & Associates, Inc., 1976).²¹⁶

In addition, the Bierly Expert Report notes that “[t]he most recent evaluation of ‘priority habitats’ for the Columbia River Estuary (LCREP, 2013, Figure 32) clearly shows the wetlands fringing the Skipanon peninsula as ‘existing priority habitat.’”²¹⁷

Oregon LNG’s opinion on the quality and value of the East Skipanon Peninsula wetlands, which the DEIS adopts, is not supported by the best available science. According to Oregon LNG, the tidal wetlands are considered “Priority 5” habitats using ODFW’s ranking scheme.²¹⁸ Oregon LNG’s categorization makes the judgment that the marshes are “not essential habitat for fish and wildlife” and that the marshes are “not readily accessible because of lack of developed channels.”²¹⁹ After reviewing Oregon LNG’s filings, the Bierly Expert Report concludes that “this is a judgment based on limited or no information.” In contrast, the Bierly Expert Report concludes that, based on the best available science, the low and high marsh on the East Skipanon Peninsula are at least Priority 2 using ODFW’s rankings scheme. The Bierly Expert Report describes the evidence for drawing this conclusion, stating:

Studies of the use of tidal marshes in the Salmon River Estuary has documented juvenile salmon use of the marsh plain outside tidal channels and limitations of access by limited access to a breached dike site (Gray et al., 2002; Gray, 2005). In a recent review of juvenile salmon use in Columbia River Estuary Bottom et al. (2011) concluded: ‘Extensive wetland diking and filling in the lower estuary has eliminated habitat for fry and fingerling migrants and has likely reduced the expression of some estuary-resident life histories. Substantial losses of historical wetlands in the lower estuary have reduced rearing opportunities for fry and fingerling migrants that tend to remain in the estuary for the longest periods.’²²⁰

The Bierly Expert Report demonstrates that Oregon LNG, and in turn FERC, failed to rely on the best available science in reaching its conclusion that the East Skipanon Peninsula wetlands are low quality habitat.

Research in the Columbia River estuary demonstrates that the Skipanon Peninsula wetlands are priority habitat. Recent studies of juvenile salmonid use of the Columbia River estuary (Roegner *et al.* 2004) shows the Skipanon shoreland as having high habitat utilization potential for juvenile salmonids.²²¹ For example, recent research on juvenile salmonid use of the

²¹⁶ *Id.* at 6.

²¹⁷ *Id.*

²¹⁸ Oregon LNG Resource Report, Appendix 3B at 9 – 12.

²¹⁹ Exhibit 2 at 6 (Bierly Expert Report).

²²⁰ *Id.* at 6-7.

Columbia River estuary (Johnson et al. 2013) show use of marshes established on the periphery of disposal sites similar in origin and structure to the East Skipanon Peninsula wetlands.²²² Simenstad *et al.* (2000) describe marsh habitats immediately adjacent to low tide reaches as particularly important for juvenile salmon production and survival. As the Bierly Expert Report explains, “With the limited knowledge of the behavior of juvenile salmon in the Columbia River estuary, yet a growing awareness of the estuary in salmon survival, eliminating more fringing tidal marsh in the lowest portion of the estuary has significant long-term risk.”²²³ The public interest in protecting special aquatic sites and habitat that supports ESA-listed species weighs in favor of denying Oregon LNG’s permits.

Finally, the DEIS fails to address ODFW’s NEPA scoping comments on wetland impacts. ODFW’s NEPA scoping comments state:

The ODFW is concerned about impacts to the high quality wetland surrounding the terminal resulting from improvements or alteration of the existing access road to the facility. An alternatives analysis in the EIS that contains other options than improvement or alternation of that existing road will help the ODFW understand the measures taken by the Applicant to avoid and minimize impact to habitat and species. The ODFW recommends the EIS contain analysis and discussion pertaining to the road location, design, and alternatives considered as well as analysis of those options eliminated from further consideration. Ideally, the existing access road to the proposed export terminal facility would be abandoned habitat restored, and a new access road would be proposed at a location that does not fragment habitat patch size and reduce quality habitat.²²⁴

The DEIS lacks any analysis and discussion pertaining to road design and wetland impacts.

10.3.2 Pipelines’ Wetland Impacts.

Like the Terminal wetland impacts, the DEIS contains an incomplete analysis of the Pipelines’ wetland impacts. Construction of the Oregon LNG Pipeline would cause short-term impact to approximately 84.1 acres of wetlands and permanent impacts to 22.8 acres of wetlands in Oregon and Washington.²²⁵ Construction of the WEP Pipeline would temporarily impact approximately 176.6 acres of wetlands and permanently impact approximately 30.6 acres of wetlands.²²⁶ For the Oregon LNG Pipeline, the DEIS contains a summary of wetland impacts, but lacks probative information disclosing the types of wetland impacts and associated water quality and species-specific impacts. For example, the DEIS states: “In general, Oregon LNG

²²² *Id.* at 7.

²²³ *Id.* at 8.

²²⁴ Exhibit 62 at 25 (State of Oregon, ODFW, NEPA Scoping Comments).

²²⁵ DEIS at 4-66.

²²⁶ *Id.* at ES-5.

would minimize wetland impacts by avoidance, mitigation of impacts, and compensation in accordance with federal, state, and local regulations. Oregon LNG intends to restore wetlands with construction and operation of the project as described in its Procedures.”²²⁷ FERC fails to identify what “Procedures” the DEIS references. In addition, the DEIS relies on mitigation measures, discussed below, without analyzing mitigation performance in other similar wetland sites.

10.3.3 Terminal Wetland Mitigation.

FERC fails to satisfy NEPA’s minimum requirements for analyzing mitigation in an EIS. The DEIS concludes that “the adverse impacts on wetland resources at the terminal would be significant.”²²⁸ DEIS section 4.1.4.3 addresses compensatory mitigation for the Terminal. While NEPA does not require that agencies mitigate environmental harms, the statute does require that EISs discuss mitigation measures with “sufficient detail to ensure that environmental consequences have been fairly evaluated.” *Robertson v. Methow Valley Citizens*, 490 U.S. 332, 352, 109 S.Ct. 1835 (1989). An essential component of a reasonably complete mitigation discussion is an assessment of whether the proposed mitigation measures can be effective. *Compare Neighbors of Cuddy Mountain v. U.S. Forest Service*, 137 F.3d 1372, 1381 (9th Cir.1998) (disapproving an EIS that lacked such an assessment) *with Okanogan Highlands Alliance v. Williams*, 236 F.3d 468, 477 (9th Cir. 2000) (upholding an EIS where “[e]ach mitigating process was evaluated separately and given an effectiveness rating”). The Supreme Court has required a mitigation discussion precisely for the purpose of evaluating whether anticipated environmental impacts can be avoided. *Methow Valley*, 490 U.S. at 351–52 (citing 42 U.S.C. § 4332(C)(ii)). The DEIS fails to satisfy NEPA’s minimum requirements to evaluate mitigation.²²⁹

Oregon LNG proposes purchasing and restoring 120 acres of wetlands located at the mouth of the Youngs River in Clatsop County. Specifically, Oregon LNG proposes breaching dikes along the Youngs River, at approximately River Mile 5–6, in two or three locations. The dike breaching would allow flooding of 120 acres of pasture that was historically tidal marsh.²³⁰

Oregon LNG’s wetland mitigation proposal fails to satisfy the Corps and EPA’s mitigation sequencing requirements. First, the mitigation violates the fundamental tenant of the Corps’ mitigation sequencing by failing to avoid adverse impacts. As described above, there are

²²⁷ *Id.* at 4-69.

²²⁸ *Id.* at 4-65.

²²⁹ DEIS at 4-72–4-73.

²³⁰ The DEIS contains conflicting descriptions of the size of Oregon LNG’s wetland mitigation site. *Compare* DEIS at 2-17 (describing wetland mitigation site as 120 acres) *to* DEIS at 4-110 (describing wetland mitigation site as 140 acres).

practicable alternatives to LNG export and the Terminal location. EPA describes the mitigation sequencing as follows:

In 1990, the Environmental Protection Agency (EPA) and the Department of Army entered into a Memorandum of Agreement (MOA) to clarify the type and level of mitigation required under Section 404 regulations. The agencies established a three-part process, known as mitigation sequencing to help guide mitigation decisions:

1. Avoid - Adverse impacts are to be avoided and no discharge shall be permitted if there is a practicable alternative with less adverse impact.
2. Minimize - If impacts cannot be avoided, appropriate and practicable steps to minimize adverse impacts must be taken.
3. Compensate - Appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts which remain.²³¹

The MOA describes the requirement of the law:

Avoidance. Section 230.10(a) allows permit issuance for only the least environmentally damaging practicable alternative. The thrust of this section on alternatives is avoidance of impacts. Section 230.10(a) requires that *no discharge shall be permitted if there is a practicable alternative* to the proposed discharge which would have less adverse impact to the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences. In addition, Section 230.10(a)(3) sets forth rebuttable presumptions that 1) alternatives for non-water dependent activities that do not involve special aquatic sites are available and 2) alternatives that do not involve special aquatic sites have less adverse impact on the aquatic environment. *Compensatory mitigation may not be used as a method to reduce environmental impacts* in the evaluation of the least environmentally damaging practicable alternatives for the purposes of requirements under Section 230.10(a).²³²

Oregon LNG flips this sequence on its head. As the MOA states, compensatory mitigation may not be used as a method to reduce environmental impacts. The DEIS fails to recognize that Oregon LNG's proposed compensatory mitigation violates the mitigation sequencing requirements.

²³¹ EPA, *Wetland Compensatory Mitigation*, <http://www.epa.gov/owow/wetlands/pdf/CMitigation.pdf>.

²³² Memorandum of Agreement between the U.S. Department of the Army and EPA (1990) (emphasis added).

Second, even if Oregon LNG had properly avoided adverse impacts, the mitigation does not adequately compensate for the damage. The destruction of nearly 35 acres of wetland and over 100 acres of prime estuarine salmon habitat is irreplaceable. In addition, adequate mitigation must replace habitat values with “in-kind” and “in-place” habitat. The MOA states:

Generally, in-kind compensatory mitigation is preferable to out-of-kind. There is continued uncertainty regarding the success of wetland creation or other habitat development. Therefore, in determining the nature and extent of habitat development of this type, careful consideration should be given to its likelihood of success.²³³

Here, much of the proposed mitigation is not “in-kind” or “in-place.” The construction and operation of the Terminal will cause immediate, severe, deleterious impacts to salmon, critical habitat. Specifically, ODFW concludes that Oregon LNG’s proposed mitigation fails to satisfy the requirements for compensatory mitigation. In a September 21, 2015, letter to the City of Warrenton, ODFW states:

ODFW has concerns that the proposed Young’s Bay Mitigation site will not adequately mitigate for impacts to estuarine wetland habitat at the proposed OLNK terminal and marine facility site. Specifically, we do not believe that the proposal is consistent with ODFW’s Habitat Mitigation policy (OAR 635-415-0000 through 0025) which governs the Department’s provision of biological advice and recommendations concerning mitigation for losses of fish and wildlife habitat caused by the development actions.

ODFW concludes that Oregon LNG’s proposed mitigation is out-of-kind mitigation, as opposed to in-kind mitigation, which is inconsistent with the Habitat Mitigation Policy. ODFW states:

ODFW considers the estuarine wetland habitat at the terminal site to be Category 3 Habitat per the Habitat Mitigation Policy. For this habitat category, ODFW recommends (1) no net loss of either habitat quantity or quality; (2) avoidance of impacts through alternatives to the proposed development action; or (3) mitigation of impacts, if unavoidable, through reliable in-kind, in-proximity habitat mitigation to achieve no net loss in either pre-development habitat quantity or quality. The primary issue with the Applicant’s proposal is that: (1) mitigating loss of tidal saltmarsh habitat with restoration of freshwater marsh habitat would be considered by ODFW to be out-of-kind habitat mitigation; and (2) assemblage species impacts at the terminal site would not be the same as those benefitting from the restoration of the Young’s River site and therefore be considered out-of-proximity mitigation. If the mitigation standard is not met, per OAR 635-415-

²³³ *Id.*

0025(3)(c) the ‘Department shall recommend against or shall not authorize the proposed development action.’²³⁴

ODFW’s analysis of Oregon LNG’s project demonstrates that FERC’s conclusions on wetland mitigation are arbitrary.

Third, Oregon LNG’s mitigation proposal also hinges on the applicant’s unsupported conclusion that salmon habitat would receive a net benefit from the mitigation project. As the Williams, Rhodes, and Bierly Expert Reports demonstrate, Oregon LNG understates significantly the extent and severity of impacts that the applicant must mitigate; in turn, the applicant’s analysis of how mitigation would offset these problems is inherently flawed. Most importantly, Oregon LNG’s proposed mitigation measures do not necessarily offset the types of habitat the project would destroy.

FERC’s DEIS fails to analyze the degree and characteristics of Oregon LNG’s wetland impacts and, similarly, how the proposed mitigation would off-set the Terminal’s impact on over 35-acres of wetlands. Instead, the DEIS states summarily:

Oregon LNG would follow the USACE and EPA compensatory mitigation rule (33 CFR Parts 325 and 332 and 40 CFR Part 230), ODSL guidance emphasizing a watershed-level approach to compensation (OAR 141-085-0680 to 141-085-0765), and WA Ecology’s compensatory mitigation policies (Chapter 90.84 RCW). Mitigation amounts would be determined as part of the wetland permitting process. The wetland mitigation banks [*i.e.*, for Pipeline wetland mitigation] identified have sufficient credits available to provide mitigation at ratios outlined by USACE, ODSL, and WA Ecology.²³⁵

FERC concludes, stating:

At this time the Oregon LNG’s proposed compensatory wetland mitigation is conceptual; therefore, **we recommend that:**

- **Prior to construction of the Oregon LNG Project, Oregon LNG should file with the Secretary its final Wetland Mitigation Plan, along with documentation of consultation and approval by the USACE, ODSL, and WA Ecology.**²³⁶

The very purpose of public issuance of an environmental impact statement is to “provid[e] a springboard for public comment.” *U.S. Dep’t of Transportation v. Public Citizen*, 541 U.S. 752, 768, 124 S.Ct. 2204 (2004) (alteration in original). FERC’s failure to analyze Oregon LNG’s

²³⁴ *Id.* at 2–3 (emphasis in original).

²³⁵ DEIS at 4-73.

²³⁶ *Id.* (emphasis in original).

proposed compensatory mitigation in the DEIS undermines public participation and violates NEPA. *See* 40 C.F.R. §§ 1502.14(f), 1502.16(e)–(g); *see also* 40 C.F.R. §§ 1505.3; 1508.25 (defining “Scope”); 1508.20 (defining “Mitigation”).

Notably, FERC’s characterization of Oregon LNG’s mitigation plans as “conceptual” is inaccurate. In 2014, Oregon LNG filed detailed wetland mitigation plans with the Corps and DEQ as part its CWA Section 404 permit application and Section 401 water quality certification application.²³⁷ Oregon LNG also filed wetland mitigation plans with the City of Warrenton in 2014 and 2015 as part of the land use permit process for the Terminal. FERC cannot avoid analysis of Oregon LNG’s mitigation based on Oregon LNG’s failure to obtain federal and state permits approving the applicant’s wetland mitigation proposal. For example, the Corps cannot issue any permits until the agency adopts a final EIS (FEIS). FERC, however, can rely on the applicant’s compensatory mitigation plans to disclose and analyze the mitigation in the DEIS and, in turn, allow federal, state, and tribal agencies, as well as the general public, the opportunity to comment on the adequacy of the mitigation.

10.3.4 Pipeline Wetland Mitigation.

The DEIS’s discussion of wetland mitigation for the Pipelines suffers the same deficiencies identified above for the Terminal wetland mitigation. *See supra* at section 10.3.3. The Rhodes Expert Report, Exhibit 3, describes deficiencies in Oregon LNG’s proposed Pipeline mitigation.²³⁸ Because Oregon LNG and WEP propose similar mitigation, the Rhodes critique applies equally to the WEP Pipeline. The Coalition incorporates by reference the Rhodes Expert Report. FERC’s analysis, or lack thereof, of wetland mitigation for the Pipelines violates NEPA’s requirements. *See* 40 C.F.R. §§ 1502.14(f), 1502.16(e)–(g); *see also* 40 C.F.R. §§ 1505.3; 1508.25 (defining “Scope”); 1508.20 (defining “Mitigation”).

10.4 Aquatic Resources.

The DEIS includes an incomplete and inadequate discussion of aquatic resources impacted by the project. DEIS section 4.1.5 addresses aquatic resources, including “the lower Columbia River estuary near the proposed terminal, dredged material disposal area, and the numerous waterbodies and wetlands crossed by the proposed pipeline[,]” and “impacts

²³⁷ Exhibit 95 (Oregon LNG Joint Permit Application to Corps, Appendix T – Wetland Mitigation Plan (Oct. 2014))

²³⁸ Exhibit 3 (Rhodes, Jonathan, J. *Summary of likely impacts of construction and maintenance of pipeline for the proposed Oregon LNG Terminal and Oregon Pipeline Project (Project) on watersheds and aquatic resources and adequacy and veracity of the discussion and assessment of these impacts in the Project’s Biological Assessment (BA), Joint Permit Application (JPA), and supplements thereto* (Jan. 12, 2015)).

associated with the nonjurisdictional LNG marine transit route.”²³⁹ The following section describes deficiencies in FERC’s analysis of the project’s direct, indirect, and cumulative impacts on aquatic resources, including ESA-listed species.

10.4.1 Terminal

10.4.1.1 Dredging.

Oregon LNG proposes an unprecedented level of habitat impact in Youngs Bay, specifically, and the Columbia River estuary, in general, for a single-use private industrial berth and single-use turning basin. Specifically, dredging associated with the Terminal (turning basin, pier, and berth) would impact approximately 152 acres during construction and approximately 148 acres during routine operations. The DEIS states that the spatial footprint for the proposed dredge area (berthing area and turning basin; Figure 2.1.1-2) is about 83 acres and the dredging activity—approximately 300 barge trips—would remove about 1.2 million cubic yards of subtidal sediment. Dredging of the vessel berth will occur to a depth of -48 ft MLLW, the turning basin will be dredged to a depth of -43 ft MLLW, and Oregon LNG proposes two additional feet for over-dredging. To maintain the turning basin, Oregon LNG would conduct maintenance dredging every three years, excavating approximately 300,000 cubic yards of subtidal sediment per dredging event.

In the following section, the Coalition describes significant deficiencies in the DEIS’s discussion of dredging impacts on aquatic resources. These include:

- The DEIS fails to identify Oregon LNG’s dredging method, a critical fact needed to analyze the dredging impacts. Instead, the DEIS states that Oregon LNG would likely use a hydraulic hopper dredge.²⁴⁰
- The DEIS fails to analyze the direct, indirect, and cumulative impacts of Oregon LNG’s proposal to dredge well outside of the in-water work window recommended by ODFW and the Washington Department of Fish and Wildlife (WDFW) for the Columbia River.²⁴¹ The request for a variance to allow for safe vessel operation and navigation is not supported by analysis of data or technical information about the

²³⁹ DEIS at 4-73.

²⁴⁰ DEIS at 4-79.

²⁴¹ *Id.* (stating “Oregon LNG proposes to dredge the turning basin and berth during the period between June 1 and September 30, depending on the availability of dredge vessels. Oregon LNG’s proposed dredging time period is outside the standard in-water work window recommended by ODFW and WDFW for the Columbia River (November 1 through February 28); therefore Oregon LNG would request a timing modification from NMFS, WDFW, and ODFW.”).

frequency of bar restrictions or wind/swell/discharge conditions at the Columbia River Bar that pose a risk to safe operations of the dredge vessel. The in-water work windows are specifically designed to consider the life-history characteristics and presence (or lack thereof) for species of fish and wildlife that inhabit estuaries, bays, streams, and waterbodies that are considered as critical for production. The DEIS fails to provide a compelling rationale regarding safety concerns for conducting the dredging work outside the ODFW In-water Work Window.

- The DEIS concludes, without citing any scientific literature or including a scientific analysis, that the “[t]he effects of dredging the berth and turning basin are likely to be similar in type to the effects of the annual federal navigation channel maintenance dredging, but on a smaller scale.”²⁴² The DEIS fails to distinguish between Oregon LNG’s proposed dredging, located in deep subtidal/open water habitat, where the shallowest predredging depths are approximately 20 feet below MLLW, and the navigation channel dredging, located farther offshore.
- The DEIS concludes that impacts to benthic and epibenthic invertebrates from the initial dredging would be significant, but temporary and limited to the dredge area and close proximity. The DEIS: (1) ignores comments from federal and state agencies identifying long-term effects to benthic and epibenthic invertebrates, and (2) fails to cite any scientific literature to support its conclusion on the long-term impacts of dredging and maintenance dredging.²⁴³
- The DEIS relies on Oregon LNG’s hydrodynamic modeling analysis, which contains significant flaws. FERC must assess independently the veracity of the models used by Oregon LNG to predict the impacts of dredging on hydrology. A study that measures impacts on a dynamic system like the Columbia River estuary must include an analysis of impact over a long enough period to represent the impact in a highly variable system; Oregon LNG’s hydrodynamic modeling lacks this in-depth analysis. Oregon LNG also opts for 2-dimensional modeling in a number of scenarios, foregoing the more probative 3-dimensional modeling. This was a critical flaw in the Bradwood LNG hydrodynamic modeling.²⁴⁴ Oregon LNG repeats this significant flaw to the determinant of government agencies reviewing the project, as well as the public. For the Bradwood LNG project, NOAA, DEQ, and the Columbia River Inter-Tribal Fish Commission contracted with an independent third party for review of the hydrodynamic modeling and analysis submitted by the applicant. Oregon LNG’s

²⁴² *Id.* at 4-80.

²⁴³ See Exhibit 63 at 4–5 (Letter from ODFW to Corps (Jan. 16, 2015)); Exhibit 64 at 2 (Letter from EPA to Corps (Jan. 16, 2015)).

²⁴⁴ Exhibit 22 (DEQ, *Evaluation Report and Findings on Clean Water Act 401 Water Quality Certification Application for Bradwood Landing* (March 10, 2011)).

project, which proposes significantly more dredging, warrants a similar, independent review.

- The DEIS acknowledges that diverse communities of benthic and epibenthic invertebrates are found in the shallow soft-sediment habitats in the proposed Terminal area and in the adjacent sub-tidal habitats in the Columbia River navigation channel.²⁴⁵ However, the DEIS does not include any discussion of impacts to the benthic detritus-based food webs that are expected to result from dredging the berth area and turning basin.
- The DEIS states: “Dredging would convert estuarine slope habitat to deepwater channel, bottom-type habitat with little or no slope. The greatest changes would occur nearest the shoreline, where existing depths around 20 feet below MLLW would be deepened to 45 to 50 feet below MLLW.”²⁴⁶ DEIS concludes that “the changes in bathymetry could cause minor localized changes in distribution and number of epibenthic and benthic invertebrates but the fundamental processes that support the existing food web would not be affected. In particular, we expect that the dredged area would be rapidly recolonized by Dungeness crab from surrounding habitat.” This broad conclusion is not supported by any technical information or scientific analysis regarding similarities or differences in the functioning of benthic food webs in shallow (*i.e.*, -20 ft MLLW) and deeper water habitats (*i.e.*, - 45 ft MLLW) in the lower Columbia River estuary. Similarly, FERC’s conclusion is not supported by any specific technical information about rates of recolonization by Dungeness crab in the estuary.
- The DEIS fails to address the Youngs Bay Select Area Fisheries Enhancement (SAFE) Project and Youngs Bay tributary hatcheries. *See supra* at section 2.0 (describing the SAFE project, an RPA under the FCRPS BiOp). Specifically, the DEIS fails to address the impacts of dredging on salmonid smolt releases from the Youngs Bay SAFE net pens and tributary hatcheries (approximately 5.9 million smolts annually).

Overall, the DEIS is deficient because it fails to provide an adequate description of the current use of subtidal habitats, as well as actions designed to offset the significant impacts from Oregon LNG’s dredging. Dr. Richard N. Williams, Ph.D., prepared a report titled *Review of the draft Biological Assessment and Essential Fish Habitat for Proposed Oregon LNG Terminal Project* (hereafter Williams Expert Report), which analyzes impacts from the berth and dredging. The Williams Expert Report describes how Oregon LNG’s Biological Assessment (BA) and other application materials fail to acknowledge, let alone analyze, recent studies on the lower

²⁴⁵ DEIS at 4-76.

²⁴⁶ *Id.* at 5-10.

Columbia River estuary, including sampling results collected at locations at and near the project area. The Williams Expert Report states:

In spite of presenting a large amount of information on ESA-listed salmon and steelhead populations (Section 3 of the OLNG draft Biological Assessment; CH2MHill 2013), significant recent and highly relevant research on juvenile salmonids in the lower Columbia River estuary (LCRE) and its implications were not included in the OLNG BA. That information is reviewed in this report (pp. 10-18) and includes specific studies on juvenile salmon use of estuarine habitats in the LCRE by researchers from NOAA-NMFS and ODFW (Bottom et al. 2005a, 2005b, 2008, 2011; Roegner et al. 2008, 2012; Weitkamp et al. 2012), and OSU's Oregon Cooperative Fisheries and Wildlife Research Unit (Anderson et al. 2005; Schreck et al. 2005; Roby et al. 2005; Evans et al. 2012).

This body of research is a surprising and significant omission from the OLNG BA as it sheds substantial light on how juvenile salmonids utilize the shallow water habitats and deeper water migratory pathways in the immediate proximity of the Oregon LNG site.

The studies by Bottom, Schreck, Roegner, Weitkamp, and Thompson revealed important habitat associations, juvenile salmonid migratory patterns, and life history diversity patterns that were not previously well understood. Many of them have direct implications on the likely impacts to shallow water habitats and deeper water pathways in the immediate proximity of the Oregon LNG site. *The Oregon LNG draft Biological Assessment is deficient in not considering the work of these researchers and their studies more thoroughly with respect to the potential impacts of construction and operation on the proposed Oregon LNG project.*²⁴⁷

The Williams Expert Report concludes:

Based on these results, it is clear that construction and operation of the proposed Oregon LNG project would negatively impact ESA-listed salmonids of a variety of species and life stages throughout the entire year. The habitats surrounding the proposed Oregon LNG site, both shallow water and deeper water, are used extensively by salmonids including fry for rearing, by juvenile salmonids for rearing and outmigration, and by returning adult salmon. Impacts would likely be greatest for fry-stage juvenile subyearling Chinook and chum salmon, which use the shallow water habitats of the Lower Columbia River estuary extensively for rearing and growth prior to outmigration.²⁴⁸

²⁴⁷ Exhibit 1 at 25 (Williams, Richard N., *Review of the draft Biological Assessment and Essential Fish Habitat for Proposed Oregon LNG Terminal Project* (Jan. 8, 2015)) (emphasis added).

²⁴⁸ *Id.*

The Williams Expert Report also describes recent sampling results not addressed in Oregon LNG's filings. For example, ODFW fish sampling in 2013-14 show adult Chinook salmon (both spring and fall runs), coho salmon, sockeye salmon, and steelhead trout use the project area. ODFW captured adult salmon in the two outer test zones, both of which abut the proposed Oregon LNG site at their northwest edges. Based on the ODFW sampling results, the Williams Expert Report concludes that "it is likely that construction and operation of the proposed Oregon LNG project would negatively impact in-river migrating adult ESA-listed salmonids that transit the Oregon shoreline migration route that includes the project site and the outer portions of Youngs Bay."²⁴⁹

The DEIS fails to address the impacts of dredging on increased salmonid predation. Many of the outmigrating juvenile ocean-type (subyearling) salmonids move along the southern shore (Roegner et al. 2012). The Williams Expert Report explains the significance of this fact, stating: "Because there is not alternative migration pathway for them [the subyearling salmonids], they are forced into deeper water if the area is dredged and pilings and overhead structures are built."²⁵⁰ The Williams Expert Report concludes that "[t]his will likely result in more predation on this specific suite of juveniles by fish and birds."²⁵¹

In addition to the comments above, the Coalition incorporates by reference Exhibit 70, the Coalition's comments to the Corps on Oregon LNG's Clean Water Section 404 application, which describe the significant impacts of Oregon LNG's dredging.

10.4.1.2 Dredge Spoil Disposal.

The DEIS fails to take a hard look at the significant impacts of Oregon LNG's proposal to deposit over 1.2 million cubic yards of dredge spoils at EPA's Deep Water Disposal Site, located in the Pacific Ocean. *See supra* at section 10.2.1. The DEIS fails to address the impacts of deep water disposal, particularly the lost benefits of in-river, nearshore disposal. For example, the DEIS fails to consider concerns raised by EPA in the agency's comments on Oregon LNG's CWA 404 permit application. EPA states:

EPA supports nearshore disposal of dredged material because of the numerous social, economic, and ecological benefits to keeping the material within the active littoral zone. When dredge material is dumped at the Deep Water Site, these benefits to private and public coastal property protection, coastal hazard

²⁴⁹ *Id.* at 26.

²⁵⁰ *Id.*

²⁵¹ *Id.*

mitigation, and nearshore habitat for fish and invertebrates are not realized. Use of the Deep Water Site should only occur after all other options are exhausted.²⁵²

The DEIS fails to address the lost ecological, social, and economic benefits associated with deep water disposal.

10.4.1.3 Construction of Onshore Facilities.

The DEIS contains an inaccurate description of the Terminal's impact on intertidal mudflat habitat and marsh habitations.²⁵³ The proposed wetland impacts at the Terminal and ancillary facilities consist of 3.15 acres of temporary impacts and approximately 34.92 acres of permanent impacts. The proposed wetland impacts at the Terminal occur primarily in estuarine intertidal emergent marsh habitat (29.35 ac.), which ODFW considers Category 3 Habitat.²⁵⁴ According to ODFW, this shallow-water habitat is critical rearing habitat for several ESA-listed salmonids and is also used by a variety of other estuarine-dependent species. The DEIS states, incorrectly, that “[m]ost of the terminal would be within Category 4 and 5 habitats, which are low quality habitat in the ODFW rating system.”²⁵⁵ ODFW identified wetlands at the Terminal site as Category 3 in public comments to the Corps on Oregon LNG's CWA 404 application.²⁵⁶ Nonetheless, FERC's DEIS relies on the applicant's incorrect assessment that the wetlands are low quality (*i.e.*, Category 4 and 5). Based on the failure to categorize correctly wetland habitat quality, the DEIS reaches arbitrary and unsupported conclusions regarding the impact of wetland fill on aquatic resources.

The DEIS also concludes, without supporting rationale, that Oregon LNG's proposed wetland mitigation “would compensate for the unavoidable losses of marsh habitat, and comply with compensatory mitigation requirements of the USACE and the Oregon Department of State Lands.”²⁵⁷ As the Coalition explains in section 10.3.3, *supra*, FERC fails to analyze Oregon LNG's proposed compensatory mitigation.

²⁵² Exhibit 64 at 3 (Letter from EPA to Corps (Jan. 16, 2015)).

²⁵³ DEIS at 4-90 (stating “The proposed [Terminal] footprint would maintain existing intertidal mudflat habitat and minimize the loss of marsh habitat.”).

²⁵⁴ Exhibit 94 (Letter from Oregon Department of Fish and Wildlife to City of Warrenton (Sept. 21, 2015)); *see also* Exhibit 2 (Bierly, Kenneth, *Oregon LNG Terminal Wetland Impacts and Proposed Mitigation Review: Analysis of Available Information* (Jan. 8, 2015)) (describing wetlands impacted by Oregon LNG's project.”).

²⁵⁵ DEIS at 4-132.

²⁵⁶ Exhibit 63 at 15 (Letter from ODFW to Corps (Jan. 16, 2015)).

²⁵⁷ DEIS at 4-132.

Moreover, FERC fails to satisfy NEPA’s minimum requirements for environmental analysis by presuming compliance with federal and state environmental laws and foregoing a discussion of environmental impacts in an EIS. In particular, the DEIS concludes, “Because this mitigation is designed to be in compliance with the CWA, we conclude the long-term detrimental effects on fishery resources from loss of estuarine marsh habitat would be adequately mitigated.”²⁵⁸ An agency may not rely on the imposition of future mitigation measures to avoid analyzing the impacts of an activity in an EIS. *See S. Fork Band Council of W. Shoshone v. U.S. Dep’t of Interior*, 588 F.3d 718, 726 (9th Cir. 2009) (holding EIS violated NEPA because it failed to analyze a project’s air quality impacts in reliance on separate Clean Air Act permitting process). In sum, FERC violates NEPA requirement to take a hard look at the project’s impacts on aquatic resources by presuming compliance with the CWA.

10.4.1.4 LNG Vessels.

The DEIS contains an incomplete and inaccurate assessment of LNG vessel impacts on aquatic resources.²⁵⁹ At the outset, the DEIS acknowledges that “[t]he movement and operation of the LNG marine carriers at the marine terminal would have the potential to affect aquatic resources in the lower Columbia River,” and describes seven categories of impacts: (1) bank erosion and increased suspended sediment levels; (2) fish stranding; (3) entrainment and impingement of aquatic species; (4) cooling water discharges; (5) exotic species introduction; (6) vessel strikes; and (7) potential fuel spills.²⁶⁰ The Coalition describes specific deficiencies in the DEIS below.

- The DEIS concludes that fish stranding would be unlikely as a result of LNG vessel traffic.²⁶¹ However, the DEIS fails to analyze the cumulative effects of Oregon LNG’s vessel traffic and existing and reasonably foreseeable future vessel traffic in the lower Columbia River estuary.
- The DEIS fails to analyze aquatic species entrainment/impingement for LNG import vessels. The DEIS acknowledge that export LNG vessel would take on cooling water while docked at the berth, and import LNG vessels would require both cooling and ballast water. The DEIS acknowledges that sea chest openings used for ballast water are “much larger than the screening criterion of 0.07 inch[es] recommended by NMFS [the National Marine Fisheries Service, also referred to as NOAA] and ODFW for intakes where small fish are present.”²⁶² Further, the DEIS states that NMFS and

²⁵⁸ *Id.* at 4-90.

²⁵⁹ The DEIS refers to LNG vessels as “LNG marine carriers.” *Id.* at 4-91.

²⁶⁰ *Id.* at 4-91.

²⁶¹ *Id.* at 4-92.

²⁶² *Id.*

ODFW have requested screening of the ballast and cooling water taken on by the LNG vessels. Because Oregon LNG seeks authorization for a bidirectional terminal, the DEIS must analyze entrainment/impingement under an LNG import scenario beyond the applicant's near-term predication of two import vessels per year. While the DEIS acknowledges that "[t]he potential for entrainment would be greater with ballast water withdrawal because of the larger volumes required," the DEIS fails to analyze the environmental effects of entrainment in an LNG import scenario.²⁶³

- The DEIS contains an incomplete discussion of the impacts of aquatic species entrainment/impingement and relies on unspecified mitigation measures to address aquatic species impacts. While the DEIS acknowledges the conflicting views of NMFS/ODFW and the Coast Guard, the DEIS fails to reconcile the conflict and address best and worst case species impact scenarios depending on the outcome of the agencies' disagreement.²⁶⁴
- The DEIS fails to address the impact of vessel cooling and ballast water on the Youngs Bay SAFE project and Youngs Bay tributary hatchery salmonid smolts.
- The DEIS relies on the Youngs Bay Mitigation Site to mitigate for impacts to ESA-listed species take from ballast and cooling water. FERC fails to demonstrate that Oregon LNG is offering mitigation acres in excess of what is need to offset habitat-only impacts. FERC also fails to describe how the Youngs Bay Mitigation Site offsets impacts from vessel entrainment/impingement.
- According to the DEIS, vessel cooling water temperature would range from 11 to 16°F warmer than intake water. The DEIS concludes that "the localized temperature increases caused by the proposed cooling water discharge would not negatively affect migrating or rearing salmonids and migration would not be blocked."²⁶⁵ The DEIS fails to acknowledge and address that the Columbia River is impaired (*i.e.*, on the CWA 303(d) list) for temperature.
- The DEIS reaches an unsupported conclusion on the impacts of an LNG spill on aquatic resources. The DEIS states summarily:

In the highly unlikely event that LNG is spilled into the water from an accidental or intentional breach of an LNG marine carrier during transit, the cryogenic liquid would vaporize rapidly upon contact with the warm air and water. Being less dense than water, LNG would float on the surface before vaporizing. Impact on fish and fishery resources would be minor, localized, and short term.

²⁶³ *Id.*

²⁶⁴ *Id.* at 4-94.

²⁶⁵ *Id.* at 4-95.

The DEIS fails to cite any support for its conclusions.

- The DEIS discusses spill risk from LNG vessel fuel in passing and fails to reach a conclusion. The DEIS analyzes vessel fuel spills in three sentences, stating:

Fuel (e.g., diesel) used for vessel propulsion or auxiliary/emergency generators on an LNG marine carrier could potentially spill or leak. However, fuel on each carrier is protected by the vessel's double hull. Furthermore, each LNG marine carrier would maintain a SOPEP and would also be required to comply with state spill prevention and contingency plans, including the applicable requirements in Chapter 317-40 of the WAC – Bunkering Operations.²⁶⁶

The DEIS fails to support its assumption that a vessel's double hull removes spill risk. Similarly, the DEIS cannot rely on oil spill plans as a substitute for analyzing spill risk and consequences.

10.4.1.5 Maintenance Dredging.

FERC fails to disclose the direct, indirect, and cumulative impacts of Oregon LNG's plans to conduct 300,000 cubic yards of maintenance dredging every three years to maintain the turning basin. Instead, the DEIS addresses maintenance dredging in one paragraph, stating:

Oregon LNG would conduct maintenance dredging every 3 years during the period from June 1 to September 30. Dredged materials would be disposed of at the same location identified for initial dredging. Like initial dredging, maintenance dredging would remove immobile benthic organisms from the 109-acre dredge area. The effects of maintenance dredging would be similar to those for the initial dredging but smaller in scale because only one-fourth of the volume of material (about 300,000 cy) would need to be removed.²⁶⁷

FERC's analysis fails to disclose the significant impacts to aquatic resources from dredging 300,000 cubic yards over the lifetime of the project.

For example, FERC cannot rely on the relative size of the maintenance dredging compared to Oregon LNG's unprecedented proposal to dredge 1.2 million cubic yards of river bottom for a single-user turning basin. In the context of Oregon LNG's City of Warrenton land use application, the Coalition addressed the unprecedented amount of dredging Oregon LNG proposes for a single-user dock and turning basin in the Columbia River estuary. Oregon LNG failed to identify any other single-user or multi-user dock project that even approaches the

²⁶⁶ DEIS at 4-96.

²⁶⁷ *Id.*

amount of dredging proposed for Oregon LNG's project. In fact, the only project Oregon LNG cited as a comparable example was the Port of Astoria dredging project, which required 364,000 cubic yards of dredging over a 31 acre area. The Port of Astoria project also called for 204,000 cubic yards of annual maintenance dredging each year for five years. Oregon LNG's maintenance dredging alone warrants a meaningful analysis in the EIS.

In addition, the DEIS must analyze the impacts of Oregon LNG's proposal to conduct maintenance dredging outside of the in-water work window. The DEIS fails to disclose any rationale for maintenance dredging outside of the in-water work window.

10.4.2 Pipelines.

The DEIS contains a flawed and incomplete analysis of the Pipelines' impacts on aquatic resources during construction and operation. The Pipeline would cross 184 waterbodies in both Oregon and Washington, including crossing of the same waterbody at multiple locations.²⁶⁸ The WEP Pipeline would cross 271 waterbodies in Washington.²⁶⁹ For the reasons described below, FERC must revise the DEIS to analyze completely the direct, indirect, and cumulative impacts of the Pipelines' construction and operation.

10.4.2.1 Road Construction to Build and Maintain the Pipelines.

The DEIS fails to address adequately the aquatic impacts from road use, road modifications, temporary extra work area construction and temporary and permanent access roads. Roads contribute to the disruption of hydrologic function and increase sediment delivery to streams. Roads also provide access to otherwise isolated habitat, and the activities that accompany access magnify their negative effects on aquatic habitats. The DEIS fails to provide complete and accurate maps of roads (existing, proposed, and expanded), specific characterizations of impacts to waterways that the Pipeline would impact, details regarding types of roads, or specific details on long-term maintenance proposed for roads in steep terrain areas.

Road construction has the potential to produce a multiple impacts to aquatic resources, including:

- Soil erosion, compaction, loss of forest productivity;
- Pollution: sedimentation, thermal loading;
- Rapid water runoff: peak flows;

²⁶⁸ DEIS at ES-4.

²⁶⁹ *Id.* at ES-5.

- Impaired floodplain function;
- Barrier to movement of wood and spawning gravel;
- Fragmentation: wildlife dispersal barrier;
- Human disturbance: weed vector, hunting pressure, loss of snags, litter, marbled murrelet nest predation, human fire ignition, etc.

Roads have a particularly negative influence on aquatic and riparian ecosystems and organisms. Roads interfere with movement of materials and organisms in three dimensions: upstream/downstream, channel/upland, and surface/subsurface.²⁷⁰ Roads are deliver chronic sediment discharges to streams.²⁷¹

In recent decades, studies in a variety of terrestrial and aquatic ecosystems have demonstrated that roads aggravate many of the most pervasive threats to biological diversity, including habitat destruction and fragmentation, edge effects, exotic species invasions, pollution, and overhunting. Roads have been implicated as mortality sinks for animals ranging from snakes to wolves; as displacement factors affecting animal distribution and movement patterns; as population fragmenting factors; as sources of sediments that clog streams and destroy fisheries; as sources of deleterious edge effects; and as access corridors that encourage development, logging and poaching of rare plants and animals. EPA describes the impacts of roads as follows:

Stormwater discharges from logging roads, especially improperly constructed or maintained roads, may introduce significant amounts of sediment and other pollutants into surface waters and, consequently, cause a variety of water quality impacts. ... [S]ilviculture sources contributed to impairment of 19,444 miles of rivers and streams [nationwide]. ... forest roads can degrade aquatic ecosystems by increasing levels of fine sediment input to streams and by altering natural streamflow patterns. Forest road runoff from improperly designed or maintained forest roads can detrimentally affect stream health and aquatic habitat by increasing sediment delivery and stream turbidity. This can adversely affect the survival of dozens of sensitive aquatic biota (salmon, trout, other native fishes, amphibians and macroinvertebrates) where these species are located. Increased fine sediment deposition in streams and altered streamflows and channel morphology can result in increased adult and juvenile salmonid mortality where present (e.g., in the Northwest and parts of the East), a decrease in aquatic

²⁷⁰ Doyle, Jim. *Where the Water Meets the Road*,
http://web.archive.org/web/20070325061623/http://www.fsl.orst.edu/geowater/RRR/jim/aquaha_b/index.html.

²⁷¹ Derrig, Michael. *Road Improvements for Watershed Restoration*,
<http://www.fsl.orst.edu/geowater/PEP/calfed/derrig/index.html>.

amphibian and invertebrate abundance or diversity, and decreased habitat complexity.

The physical impacts of forest roads on streams, rivers, downstream water bodies and watershed integrity have been well documented but vary depending on site-specific factors. Improperly designed or maintained forest roads can affect watershed integrity through three primary mechanisms: they can intercept, concentrate, and divert water (Williams, 1999).²⁷²

Temporary roads present most of the same risks posed by permanent roads.²⁷³

The DEIS fails to disclose the full extent of the road network for the Pipelines' construction or explain how these impacts are adequately mitigated. To use heavy equipment on many of the existing roads, significant road modifications are necessary, including blading/grading, widening, drainage improvements, and the construction of turnouts and roadside temporary extra work areas. The DEIS does not include detailed descriptions of what activities will occur that could impact wetlands, streams, and other waters. Rather, the DEIS relies on blanket statements about the application of best management practices (BMPs) to avoid impacts to streams. By not specifying the location and nature of construction activities associated with all access roads, the DEIS provides an inadequate description of the project and impacts to aquatic resources.

FERC must evaluate the impacts of all construction activities, including culvert replacements, arising from construction of the Pipelines. The DEIS lacks site-specific information on impacts to resources for both existing and new roads, instead relying on broad statements regarding use of BMPs.

Not only is road construction inadequately described in the DEIS, but the measures to prevent significant sedimentation and turbidity in streams are neither site-specific nor reliable. On steep slopes, particularly in rainy winter months, similar BMPs failed to prevent impacts to streams, creeks and ditches. For example, during construction of the 12-inch Coos County pipeline in 2003, covering terrain similar to the proposed Pipeline, erosion and sedimentation control measures repeatedly failed. The DEIS provides little specific information to justify the

²⁷² EPA 2012. Notice of Intent to Revise Stormwater Regulations Federal Register (May 23, 2012), <http://www.gpo.gov/fdsys/pkg/FR-2012-05-23/pdf/2012-12524.pdf>.

²⁷³ Roadless Area Conservation FEIS — Specialist Report for Terrestrial and Aquatic Habitats and Species prepared by Seona Brown and Ron Archuleta, EIS Team Biologists, Available at http://web.archive.org/web/20040515020554/http://roadless.fs.fed.us/documents/feis/specprep/xbi_o_spec_rpt.pdf.

assumption that, particularly in steep areas, BMPs will be adequate to prevent impacts to streams.

10.4.2.2 Pipeline Construction.

The DEIS fails to analyze adequately the direct, indirect, and cumulative impacts of Pipelines' construction on aquatic resources. This includes the potential for hydraulic fracturing, or a "frac-out." A frac-out occurs when an HDD fails, fractures a streambed or riverbed, and releases drilling lubricants into the stream.

The DEIS underestimates the impacts of HDD crossings on aquatic resources. HDD crossings, when successful, impact areas adjacent to rivers where staging and construction activities occur. HDDs also require the disposal of materials extracted from the drill hole. HDD attempts frequently fail, causing drastic impacts to water quality and fish habitat. For example, many HDD attempts along the 12-inch Coos County pipeline failed, resulting in "frac-outs," situations in which large amounts of sediment and bentonite clay (used as a drilling lubricant) were released into streams. Bentonite clay and sediment released through frac-outs can disrupt fish spawning habitat, increase turbidity, and potentially introduce other contaminants to impacted waterways. The DEIS fails to adequately address the risk and potential impacts of frac-outs.



The photograph above documents a frac-out that led to sedimentation and a huge release of bentonite clay into the Coquille River during construction of the 12-inch Coos County pipeline. A similar HDD failure on Nehalem River, Lewis and Clark River, or other waterbody crossings would severely impact water quality and salmon habitat. Even where HDD succeeds without a frac-out, this method of pipeline installation can lead to large, unanticipated sediment discharge.

Construction in riparian areas and along steep slopes also increases the risk of erosion and sedimentation in important Columbia River tributaries, some of which are listed as water quality limited (*i.e.*, already in violation of state water quality standards). These issues are

addressed at length in the Rhodes Expert Report, which is incorporated in its entirety by reference and attached hereto as Exhibit 3. The DEIS, which fails to address many of the environmental impacts identified in the Rhodes Expert Report, contains an incomplete analysis of Pipelines' the construction impacts.

The DEIS also fails to address the impact of the Pipelines' construction and operation on potential habitat restoration sites. For example, ODFW identified the Lewis and Clark River and its tributaries as important habitat for Coho salmon, Fall Chinook, and Winters Steelhead. ODFW recommended that third-parties target the Lewis and Clark River for easement acquisition to protect functioning riparian areas, as well as restoration of degraded riparian areas, in order to ensure the survival and recovery of these species.²⁷⁴ The Pipelines directly threaten efforts to stabilize and restore fish and fish habitat. The possibility of HDD frac-out and failure, which the DEIS largely dismisses, conflicts with ODFW's identified goal of reducing the sediment load into the Lewis and Clark River and its tributaries.

Finally, the DEIS contains a flawed and incomplete analysis of cumulative impacts. For example, the DEIS assumes that Oregon LNG and WEP avoid imposing a cumulative impact on waterbodies with multiple stream crossings, such as the Lewis and Clark River, because Oregon LNG proposes HDD crossing. The DEIS, however, fails to analyze the risks of a frac-out. The DEIS also concludes, without citing any supporting technical analysis, that 164 crossings, located within 64 waterbodies, are "sufficiently far apart as to have little to no potential additive effects."²⁷⁵ FERC cannot leap to this conclusion without any supporting analysis.

10.5 Pipelines' Impacts on Vegetation and Habitat Fragmentation.

The DEIS fails to address adequately the direct, indirect, and cumulative impacts of the Pipelines' on vegetation and associated impacts on terrestrial species. According to the DEIS, the Oregon LNG Pipeline and compressor station construction would disturb approximately 985 acres of forest and agricultural upland vegetation.²⁷⁶ Approximately 423 acres of forest habitat would be permanently converted to an herbaceous community. The DEIS acknowledges the Pipeline's long-term impacts on forest habitat, stating:

Long-term impacts on forested habitats (i.e., coniferous, deciduous, and riparian forest and corresponding scrub-shrub) would occur because of the time required to restore the woody vegetation to its preconstruction condition. Permanent

²⁷⁴ Lower Columbia River Conservation and Recovery Plan For Oregon Populations of Salmon and Steelhead, (Aug. 6, 2010), http://www.dfw.state.or.us/fish/CRP/docs/lower-columbia/OR_LCR_Plan%20-%20Aug_6_2010_Final.pdf .

²⁷⁵ DEIS at 4-108.

²⁷⁶ *Id.* at 4-122.

impacts on woody species would occur where vegetation is maintained within the permanent right-of-way because the species would not be allowed to regenerate the woody canopy present before construction due to periodic right-of-way maintenance activities.²⁷⁷

The DEIS contains and similar analysis of the WEP Pipeline. For the reasons described below, the DEIS fails to address adequately the Pipelines' direct, indirect, and cumulative impacts on habitat fragmentation.

Habitat fragmentation is one of the most pervasive and difficult-to-control threats to native ecosystems in the United States. It occurs when land uses break up contiguous blocks of habitat into smaller patches or when roads, transmission lines, pipelines, or other corridors penetrate blocks of habitat. The Pipelines would contribute to and create new habitat fragmentation, compromising the integrity of habitat interior in wetlands, forests, and other ecosystems. For example, habitat fragmentation can have negative effects on wildlife and ecosystems through direct habitat loss or indirectly through changes that occur as a result of the adjacent habitat type and the particular land use associated with it.

The DEIS contains an inadequate analysis of construction and right-of-way impacts on habitat disturbance, including increased exotic and invasive species. Impacts include, but are not limited to: providing access for plants and animals that thrive in disturbed environments and the associated detriment to species that require contiguous habitat; opening access to previously remote areas via the new roads and pipelines and the impact of increased human access on fish and wildlife; the spread of invasive plant species; disturbance of sensitive habitats and species of conservation concern, including threatened and endangered species; the increase in car, truck, and heavy machinery traffic; and the impact of pipelines and roads as acting as barriers to movement for many amphibian species and some small mammals.

In addition, the DEIS fails to assess the cumulative impacts of the Pipelines and existing and reasonably foreseeable future transmission, road, and pipeline right-of-ways that threaten habitat quality and wildlife. Clearing forestland along the Pipeline right-of-way directly removes habitat, provides a conduit for the spread of wildfires, and provides increased access to off-road vehicle users. FERC must assess these impacts in the DEIS.

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²⁷⁷ *Id.* at 4-123.

10.6 The Project's Impacts on Migratory Birds.

The DEIS fails to address adequately the project's impacts on migratory and other birds.²⁷⁸ The purpose of Oregon LNG's project is to distribute natural gas feedstock from Canada. Consequently, construction and operation of this project would facilitate ongoing and additional natural gas production in Canada. FERC must therefore consider the transboundary impacts on migratory birds, including the impacts of gas drilling in Canada.

Migratory birds are fully protected under the Migratory Bird Protection Act (MBTA), which prohibits the "take" of migratory birds and their nests or eggs, except as permitted by regulation.²⁷⁹ "Take" is defined by the MBTA as "pursue, hunt, shoot, capture, collect, [or] kill."²⁸⁰ The prohibition applies broadly to all taking done "at any time, by any means or in any manner."²⁸¹ FERC must ensure that the Oregon LNG's construction, operation, and the drilling that supports the natural gas feedstock for the project does not cause the unlawful take of migratory birds.

The Terminal poses significant threats to migratory birds that the DEIS fails to disclose. In September 2013, an LNG terminal in Saint John, New Brunswick, Canada, killed approximately 7,500 songbirds, including some endangered species.²⁸² The migrating birds flew into the gas flare at Canaport LNG. At the time, weather conditions were foggy and overcast, which may have contributed to the incident. According to the head of zoology for the New Brunswick Museum, not much is known about how such birds navigate at night, but officials believe they are attracted to light, particularly red or flashing lights. In October 2014, government regulators filed charges against Canaport LNG stemming from the massive bird kill.²⁸³ The DEIS fails to disclose and analyze the known risks of LNG terminals to migratory birds. In light of these well-documented risks, the DEIS must analyze the Terminal's direct, indirect, and cumulative impacts on migratory birds.

FERC must also evaluate the impacts of natural gas production on migratory birds. For example, the U.S. Fish and Wildlife Service has documented that oil and gas waste pits present significant risks to wildlife. Pits can "entrap and kill migratory birds and other wildlife" as birds mistake waste pits for bodies of water and become covered with substances that may cause

²⁷⁸ See DEIS at 4-146–4-150 (analyzing impacts on migratory birds).

²⁷⁹ 16 U.S.C. § 703(a).

²⁸⁰ *Id.* § 715(n).

²⁸¹ *Id.* § 703(a).

²⁸² Exhibit 29 (The Globe and Mail, *7,500 songbirds killed at Canaport gas plant in Saint John* (Sept. 18, 2013)).

²⁸³ Exhibit 30 (CBC News, *Canaport LNG faces charges for bird kill* (Oct. 20, 2014)).

exposure and exhaustion.²⁸⁴ In addition, the New Mexico Department of Game and Fish has expressed concern about the hazards of hydrocarbon toxicity to wildlife including “acute and chronic ingestion or absorption toxicity, loss of thermal stability from oiling of fur or feathers, and reproductive failure due to absorption of chemicals from the maternal bird body through the shell of eggs.”²⁸⁵ FERC must account for migratory bird impacts in both Canada, as well as the Rocky Mountains, since Oregon LNG acknowledges that some feedstock may come from that region.

Finally, the DEIS reaches an unsupported conclusion that a to-be-prepared-at-a-future-date Migratory Bird Conservation Plan will render the project’s impacts on migratory birds “minor.”²⁸⁶ FERC’s conclusion is arbitrary. FERC fails to cite any support for its conclusion that a Migratory Bird Conservation Plan will render the project’s impacts “minor.” FERC also stymies NEPA’s public engagement objectives by issuing a DEIS prior to requiring the applicant prepare a Migratory Bird Conservation Plan. In particular, FERC’s decision cuts off potential public and agency comments on the Migratory Bird Conservation Plan’s adequacy.

10.7 Threatened, Endangered, and Other Special Status Species.

The DEIS ignores and underestimates the project’s significant impacts to ESA-listed species. At least 38 ESA-listed or candidate species occur within the project area. Oregon LNG proposes building the Terminal in the Columbia River estuary, an area at the center of a regional and national effort to restore endangered and threatened salmonids and other species. The Columbia River estuary provides vital habitat for salmon throughout the Columbia River basin, and is of particular importance from a threatened and endangered species recovery perspective.²⁸⁷ The estuary is designated as critical habitat for 17 species of ESA-listed fish and

²⁸⁴ U.S. Fish & Wildlife Service, Region 6 Env’tl. Contaminants Program, Reserve Pit Mgmt.: Risks to Migratory Birds (2009).

²⁸⁵ Letter from Lisa Kirkpatrick, Conservation Services Division Dept. of Fish and Game, to New Mexico Oil and Conservation Division, Environmental Bureau re OCD Rule “Pits and Below-Grade Tanks” NMAC 19.15.2.40; NMGF Project No. 11251 (Feb. 2, 2007).

²⁸⁶ DEIS at 4-150 (stating “Oregon LNG would implement mitigation measures to reduce impacts on migratory birds during construction and operation and has also proposed compensatory mitigation for habitat that supports migratory birds. We are recommending that Oregon LNG consult with FWS to prepare a Migratory Bird Conservation Plan. Therefore we conclude that the overall impact of the project on migratory birds would be minor.”).

²⁸⁷ See generally Exhibit 1, Williams, Richard N., *Review of the draft Biological Assessment and Essential Fish Habitat for Proposed Oregon LNG Terminal Project* (Jan. 8, 2015) (hereafter Williams Expert Report), Exhibit 2, Bierly, Kenneth, *Oregon LNG Terminal Wetland Impacts and Proposed Mitigation Review: Analysis of Available Information* (Jan. 8, 2015) (hereafter Bierly Expert Report), and Exhibit 3, Rhodes, Jonathan, J. *Summary of likely impacts of construction and maintenance of pipeline for the proposed Oregon LNG Terminal and Oregon*

Essential Fish Habitat for Pacific salmon.²⁸⁸ The federal government, public, and private entities have invested, and continue to spend, billions of dollars in efforts to restore endangered and threatened salmon in the Columbia River Basin.²⁸⁹ This includes the federal agencies' obligations under the Federal Columbia River Power System Biological Opinion (FCRPS BiOp). For the reasons explained below, the DEIS fails to analyze adequately the project's significant direct, indirect, and cumulative impacts on ESA-listed species.

As an initial matter, FERC's process for coordinating ESA and NEPA review undermines the quality and content of the DEIS. The DEIS notes that FERC staff are preparing a Biological Assessment and Essential Fish Habitat assessment for submittal to the Services "prior to the issuance of the final EIS."²⁹⁰ FERC, however, plans to issue the FEIS prior to obtaining, reviewing, and incorporating the findings of the Services' Biological Opinions. This decision undermines the quality and content of the DEIS. Moreover, FERC fails to state whether the agency intends to end its illegal practice of issuing conditional licenses prior to completing Section 7 consultation.²⁹¹ For the reasons described in section 5.0, FERC must cease this unlawful practice.

10.7.1 Marine Mammals.

The DEIS adopts the applicant's inadequate analysis and conclusions on the project's impacts to marine mammals. The Coalition incorporates by this reference Exhibit 4, the Center for Biological Diversity's (CBD) comments on Oregon LNG's CWA 404 application, which describes why Oregon LNG's analysis of marine mammal impacts underestimates the project's significant impacts on marine mammals. The DEIS fails to consider literature cited and account for the direct, indirect, and cumulative impacts cited in the CBD comments.

The DEIS is also deficient because it only analyzes marine mammal impacts under an LNG export scenario. Oregon LNG proposes a bidirectional terminal to allow the applicant to adjust LNG import and export shipments depending on market demands. In turn, FERC cannot

Pipeline Project (Project) on watersheds and aquatic resources and adequacy and veracity of the discussion and assessment of these impacts in the Project's Biological Assessment (BA), Joint Permit Application (JPA), and supplements thereto (Jan. 12, 2015) (hereafter Rhodes Expert Report).

²⁸⁸ Exhibit 5, Letter from National Marine Fisheries Service to FERC, Oregon LNG NEPA Scoping (Dec. 20, 2012).

²⁸⁹ See Thom, R. *et al.*, Columbia River Estuary Ecosystem Restoration Program, 2012 Synthesis Memorandum, PNNL-21477 FINAL (Jan. 2013).

²⁹⁰ DEIS at 4-153.

²⁹¹ See Exhibit 97 (NOAA National Marine Fisheries Service Request for Rehearing to FERC, Bradwood LNG (Oct. 17, 2008)).

assume that Oregon LNG would handle two LNG import vessels per year. The DEIS must analyze the marine mammal impacts under both an LNG import and export scenario.

10.7.2 Marbled Murrelets and Northern Spotted Owls.

The DEIS adopts Oregon LNG’s conclusions regarding the project’s impacts on marbled murrelets and northern spotted owls. For the reasons detailed in the CBD comments on Oregon LNG’s CWA 404 application, Exhibit 4, hereby incorporated by reference, FERC’s analysis contains incomplete and inadequate information on the project’s impacts to marbled murrelets and northern spotted owls. In addition, FERC relies on speculative and undefined mitigation plans, including habitat acquisition, to conclude that Oregon LNG can “offset the project’s impacts.”²⁹² FERC cannot rely on Oregon LNG’s vague mitigation plans to conclude mitigation would offset the project’s impacts.

10.7.3 Fish Species.

The Coalition describes significant flaws in the DEIS’s evaluation of the project’s impacts on ESA-listed species in section 10.4, *supra*.

10.8 Land Use, Recreation, and Visual Resources.

10.8.1 Land Use.

10.8.1.1 Terminal.

The DEIS contains an inaccurate description of land use at the proposed Terminal site. The DEIS states that “[c]urrently the property is used as an informal recreation area for motor bike riding, walking, and running.”²⁹³ The DEIS fails to disclose that the East Skipanon Peninsula and its shoreline are used for birdwatching, fishing, and waterfowl hunting.²⁹⁴ The DEIS also fails to disclose that Oregon LNG’s project would cut off public access to the East

²⁹² DEIS 4-176.

²⁹³ DEIS at 4-229.

²⁹⁴ Exhibit 93 (Letter from Oregon Department of Fish and Wildlife to City of Warrenton (Aug. 29, 2015)); Exhibit 94 (Letter from Oregon Department of Fish and Wildlife to City of Warrenton (Sept. 21, 2015)); Exhibit 95 (City of Warrenton Waterfowl Hunting Map (undated)).

Skipanon Peninsula.²⁹⁵ The Coalition incorporates by this reference Exhibits 98 through 100, which address Oregon LNG's impact on public access on the East Skipanon Peninsula. FERC cannot ignore the project's significant direct and indirect impacts on public access to the East Skipanon Peninsula and Columbia River estuary.

10.8.1.2 Oregon LNG Pipeline.

To demonstrate consistency with the Coastal Zone Management Act, Oregon LNG must obtain local land use approvals under the Oregon Coastal Management Program. The DEIS contains a factually incorrect summary of Oregon LNG's compliance with Clatsop County's land use requirements and the Pipeline's consistency with local land use laws.²⁹⁶ In 2013, Clatsop County issued a unanimous decision denying on dozens of grounds Oregon LNG's application for a 41-mile segment of the Pipeline. On April 29, 2015, the Oregon Land Use Board of Appeals upheld Clatsop County's decision. Oregon LNG did not appeal LUBA's order. Accordingly, Clatsop County's decision denying local land use approval for the pipeline is final. The DEIS fails to address Oregon LNG's failure to obtain local land use permits. This includes failing to address Clatsop County's findings and conclusions on the project's environmental impacts on the Columbia River estuary.

10.8.2 Recreation and Public Interest Areas.

The DEIS contains an inaccurate and incomplete discussion of the project's impacts on recreation and public interest areas. The Coalition details FERC's errors and omissions below.

10.8.2.1 National Park Impacts.

The DEIS concludes, without explanation, that the Terminal and associated marine vessel traffic would not affect national parks or forests.²⁹⁷ FERC's conclusion conflicts with the National Park Service's 2012 scoping comments and subsequent letters.²⁹⁸

²⁹⁵ See Exhibit 98 at 68–72 (Columbia Riverkeeper *et al.* Testimony to the City of Warrenton on Oregon LNG's Bidirectional Terminal and Pipeline Land Use Applications (Sept. 2, 2015) (discussing public access)); Exhibit 99 at 15–18 (Columbia Riverkeeper *et al.* Supplemental Public Testimony to the City of Warrenton on Oregon LNG's Bidirectional Terminal and Pipeline Land Use Applications (Sept. 17, 2015) (discussing public access)); Exhibit 100 at 7–8 (Columbia Riverkeeper *et al.* Closing Testimony to the City of Warrenton on Oregon LNG's Bidirectional Terminal and Pipeline Land Use Applications (Sept. 25, 2015) (discussing public access)).

²⁹⁶ DEIS at 4-264–4-265.

²⁹⁷ DEIS at 4-234.

²⁹⁸ Exhibit 10 (Letter from National Park Service to FERC, Comments on NEPA Scoping for Oregon LNG Bidirectional Project (Nov. 7, 2012)); Exhibit 69 (Letter from the National Park

10.8.2.2 Waterfowl Production and Hunting Impacts.

The DEIS concludes that the Terminal and associated marine vessel traffic would not impact waterfowl production areas.²⁹⁹ This statement is factually incorrect. ODFW's public comments to the Corps and testimony to the City of Warrenton, as well as published City of Warrenton waterfowl hunting map, demonstrate that the East Skipanon Peninsula shoreline is an important waterfowl production and hunting area.³⁰⁰

10.8.2.3 West Tiger Mountain Natural Resources Conservation Area.

The DEIS contains an incomplete and inadequate assessment of the WEP Pipeline's impacts on the West Tiger Mountain Natural Resources Conservation Area (West Tiger Mountain). The WEP Pipeline crosses the West Tiger Mountain, impacting approximately 22.2 acres. The Washington Department of Natural Resources (WDNR) owns and manages West Tiger Mountain and raised substantial concerns about the WEP Pipeline's impacts on state-owned land.³⁰¹ The DEIS fails to acknowledge and account for these concerns in the DEIS.³⁰² Instead, the DEIS concludes summarily,

Following construction, Northwest would restore disturbed areas to preconstruction conditions and recreational activities would continue as before construction. Northwest would continue to consult with land management agencies regarding impacts, restoration, and right-of-way agreements within the NRCA Areas.³⁰³

The DEIS fails to analyze the WEP Pipeline's direct, indirect, and cumulative impacts on West Tiger Mountain.

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Service to the Corps (July 9, 2015)); Exhibit 71 (Letter from National Park Service to FERC (Apr. 29, 2015)).

²⁹⁹ DEIS at 4-234.

³⁰⁰ Exhibit 63 (Letter from ODFW to Corps (Jan. 16, 2015)); Exhibit 93 (Letter from ODFW to City of Warrenton (Aug. 29, 2015)); Exhibit 94 (Letter from ODFW to City of Warrenton (Sept. 21, 2015)); Exhibit 103 (City of Warrenton Waterfowl Hunting Map (undated)).

³⁰¹ Exhibit 15 at 2 (Letter from Washington Department of Natural Resources to FERC, Comments on NEPA Scoping for Oregon LNG Bidirectional Project (Dec. 21, 2012)).

³⁰² DEIS at 4-581-82.

³⁰³ *Id.* at 4-582.

10.8.2.4 Recreational and Commercial Fishing and Other Recreational Impacts.

The DEIS reaches an arbitrary and unsupported conclusion on the Terminal's impacts on recreational fishing and other recreational river use impacts. The DEIS concludes:

Recreational vessels would be restricted from the construction area during construction and from security zones at the terminal during operation. However, the restrictions during construction would be temporary and the security zones [in place during Terminal operation] would present a minor inconvenience relative to the size of the river at this location.³⁰⁴

The DEIS likewise concludes that the project would not harm commercial fishing. The DEIS's conclusions conflict with scoping comments received from the State of Oregon and numerous members of the public, discussed in detail below.

Since early statehood, Oregon courts and the legislature have recognized that water is a publicly owned resource. Public rights in state waters include not only navigation, fishing, hunting, and recreation, but also boating, swimming, and other uses. Public trust rights also include rights to wildlife. A leading scholar on the Oregon Public Trust Doctrine explains:

The Oregon PTD [Public Trust Doctrine] is more robust than generally recognized to date. The doctrine is a background principle of state property law, reflecting the pre-statehood principle that as sovereign trustee, the state must manage public water and wildlife resources for the benefit of present and future generations. The PTD is actually shorthand for a collection of Oregon doctrines protecting public usufructuary rights in natural resources, including public rights to navigate on public highways like beaches and waterways, public ownership of water, and sovereign ownership of wildlife. The PTD unifies common law doctrines that recognize public rights to use trust resources, including customary rights to use Oregon beaches recognized in *Hay*. Although the origins of Oregon's PTD lie in longstanding public ownership of waters and wildlife, and the public highways language from the Northwest Ordinance in the Statehood Act, the PTD is quite vibrant, reflected in both historic and modern statutes, as well as modern case law concerning state ownership of wildlife and public rights to use waters and ocean beaches.³⁰⁵

The DEIS ignores and mischaracterizes the project's significant and unreasonable impacts on public trust rights, including fishing and boating.

³⁰⁴ DEIS at 4-239.

³⁰⁵ Exhibit 78 (Michael C. Blumm & Erika Doot, *Oregon's Public Trust Doctrine: Public Rights in Waters, Wildlife, and Beaches*, 42 *Env't'l Law* 375 (2012)).

First, the DEIS reaches unsupported conclusions on the impacts of security and exclusion zones associated with the LNG Terminal, dock, and vessels. Due to the safety and security risks associated with LNG, the Coast Guard imposes safety/security exclusion zones around LNG vessels and docks, as well as fixed security exclusion zones around LNG terminals (hereafter referred to as safety/security zones).³⁰⁶ FERC confirmed the applicability of the Coast Guard's safety/security zones in the DEIS.³⁰⁷ For the Oregon LNG project, the Coast Guard determined that project would require:

1. A moving safety/security zone around LNG vessels extending 500-yards from the vessel and ending at the shoreline.
2. A 200-yard safety/security zone around the vessel when moored at the facility.
3. A 50-yard fixed safety/security zone around the LNG Terminal when there is not a vessel at the dock.³⁰⁸

No vessel may enter the safety/security zone without first obtaining permission from the Coast Guard Captain of the Port.³⁰⁹

Over 46,000 commercial and recreational fishing boats use the Columbia River estuary each year for fishing and transit to the ocean. These boats would have to avoid the 500 yard safety zone around LNG tankers. The LNG tanker exclusion zones would create delays in the extremely short and regulated commercial fishing season. Due to heavily regulated fishing seasons, missing just one drift could cost thousands of dollars. Further, LNG tankers and fishing boats would both need to cross the notoriously dangerous Columbia River bar at favorable tides. Because the LNG tankers would have priority, fishing boats would experience more risky crossings. Significantly, LNG tankers are unannounced for security reasons. As a result, private and commercial boats will not have the opportunity adjust river use habits. Oregon LNG's project would also restrict and disrupt local marine traffic, particularly at a nearby public marina

³⁰⁶ See Exhibit 41, Coast Guard Letter of Recommendation for Oregon LNG Project at 1 (Apr. 24, 2009).

³⁰⁷ DEIS at 4-426.

³⁰⁸ Exhibit 42, Coast Guard Letter of Recommendation Analysis at 1-2 (Apr. 24, 2009).

³⁰⁹ *Id.*; see also Oregon LNG DEIS at 4-426 (stating "No vessel may enter the safety/security zone without first obtaining permission from the Coast Guard COTP. The expectation is that the COTP's Representative will work with the Pilots and patrol assets to control traffic, and will allow vessels to transit the Safety/Security zone on a case-by-case assessment conducted on the scene."); *id.* at 4-429 (describing Coast Guard facility safety measures for LNG facilities outlined in 33 CR 105, including a required Facility Security Plan).

on the Skipanon River. Exclusion zones restrict access to the Skipanon River while LNG tankers are approaching and docking at the facility.

In public comments to the Corps, the ODFW raised substantial concerns about Oregon LNG's impacts on public trust rights, stating:

The Skipanon Marina and Warrenton Deep Sea facilities are an important harbor and marina complex for recreational and commercial vessels. As a result many commercial and recreational vehicles transit through the area identified for the proposed marine terminal berthing area during their exit and return to the Skipanon Marina. The application recognizes that 'the Pacific Ocean, Columbia River, and other rivers crossed by the pipeline support diverse commercial and recreational fishing industries whose harvests include sturgeon, salmon, steelhead, bottomfish, and crabs' (Section 4-40 / Commercial and Recreational Fishing). *However, the application does not do a sufficient job of characterizing the local importance of the commercial and recreational fisheries or how they will be affected during construction and operation of the OLNG terminal, berthing dock, and other facilities.*³¹⁰

ODFW also concludes that Oregon LNG's characterization of impacts to the Buoy 10 fishery, which are repeated in the DEIS, are inadequate, stating:

The applicant does acknowledge the extremely popular recreational fishery for Chinook and coho salmon that occurs near the mouth of the Skipanon River (Buoy 10 Fishery), and that the proposed OLNG terminal is located in the mid-region of this popular fishing salmon area. *However, the application does not adequately characterize the potential for substantial disruption of this socially and economically important fishery during construction and operation of the marine terminal complex.* For instance, this fishery experienced 107,700 angler trips in 2014 and a combined catch of nearly 84,500 salmon.³¹¹

Similarly, ODFW notes that Oregon LNG does not explain how the project would affect recreational crabbing in the Terminal vicinity.³¹² The DEIS likewise fails to address the project's impacts on recreational crabbing.

Second, the DEIS ignores the impacts of dredging and dock building on fishing and other river recreation uses. Dredging would degrade vital fish habitat, which impacts the fisheries' health. The commercial salmon fishery is already severely limited due to dwindling populations. Dredging activities also have the potential to disrupt recreational and commercial fishing, as well as shipping on the Columbia River. Dredging activities have the potential to disrupt recreational

³¹⁰ Exhibit 63 at 17, Letter from ODFW to Corps (Jan. 16, 2015) (emphasis added).

³¹¹ *Id.* (emphasis added).

³¹² *Id.* at 17-18.

and commercial access near the Skipanon Peninsula, where Oregon LNG proposes dredging. In addition, the 24-hour per day dredging will completely block access to the traditional fishing grounds at the mouth of Youngs Bay. This would seriously degrade sport and commercial fishing and violate the public trust. Even after dredging is complete, routine operation of the Terminal requires maintenance dredging and, in turn, harms river commerce. Oregon LNG's permanent destruction of key salmon habitat will further degrade the fishery, and, in turn, degrade the opportunities for commercial and recreational fishing, as well as tribal fishing rights throughout the Columbia River Basin.

Third, the DEIS fails to address the project's impacts on reduction in catch. Specifically, the DEIS fails to address the Select Area Fisheries Enhancement (SAFE) mitigation site and hatcheries that release fish to tributaries of Youngs Bay. Youngs Bay is the most productive Chinook salmon mitigation site (*i.e.*, to mitigate for lethal impacts of the Columbia River hydroelectric dams) in the entire Columbia River estuary. The DEIS fails to acknowledge this fact, let alone analyze the impacts of the project on the Select Area Fisheries Enhancement (SAFE) site, and in turn impacts on anglers. As discussed above, Youngs Bay is one of four sites in the lower Columbia River that comprise the SAFE project. The SAFE project is a two-decade long salmon stocking program funded primarily by the Bonneville Power Administration to off-set harm to endangered salmon from Columbia and Snake River hydroelectric dams. The primary purpose is to reduce fishing impacts on wild and weak upriver salmon stocks by increasing the availability of hatchery fish in off-channel areas of the lower Columbia. The FCRPS BiOp identifies funding for the Youngs Bay Select Areas Fisheries as a "Reasonable and Prudent Alternative" (*i.e.*, a mitigation measure to off-set endangered salmon and steelhead harm from the dams). The BiOp states that fisheries agencies established the program "to mitigate fisheries by providing the opportunity to harvest locally-produce salmon stocks in off-channel areas of the Columbia River." Of the four terminal fisheries sites in the Columbia River Estuary, the Youngs Bay site has the highest five-year average for Chinook salmon harvest. Biologists believe that stocking salmon at Youngs Bay may result in a *10-fold increase* in survival and catch rates because the fish are released closer to the ocean at a size and time of year that is more conducive to spring Chinook out-migration.³¹³

Fourth, the DEIS fails to address sport and commercial fishing regulations in Youngs Bay. In February 2014, the Oregon Fish and Wildlife Commission adopted a sport fishing closure in the section of Youngs Bay near the proposed Terminal site.³¹⁴ The closure restricts sport fishing from August 1 to September 15. The purpose of the closure is to reduce the impact

³¹³ ODFW News Release, <http://www.dfw.state.or.us/news/2009/november/110609b.asp> (Nov. 6, 2009).

³¹⁴ ODFW News Release, <http://www.dfw.state.or.us/news/2014/february/020714.asp> (Feb. 7, 2014).

of sport fishing on hatchery fish returning to Youngs Bay so that these fish will be available for commercial fishing in Youngs Bay. “The closure, along with several other changes to fisheries management, emerged during the 2012 process to restructure sport and commercial fisheries on the Columbia River. Senate Bill 830, passed by 2013 Oregon Legislature, directed the [Oregon Fish and Wildlife] Commission to create a closure area.”³¹⁵ The Northwest Sportfishing Industry Association is fighting to reverse the season sport fishing closure.³¹⁶ This demonstrates the importance of Youngs Bay to the efforts to restore and maintain a healthy fishery in the Columbia River. The Terminal’s impacts would undermine these efforts, and harm sport and commercial fishing in the region.

Similarly, the DEIS fails to acknowledge and discuss ODFW’s proposal to expand the Youngs Bay commercial fishery.³¹⁷ According to ODFW’s written testimony on Oregon LNG’s land use application, “[t]he expected east boundary for the expanded fishery area would be adjacent to the proposed OLN terminal, and therefore, commercial fishing activity in this area could be impacted by security zones around docked and marine carriers in transit and maneuvering in the turning basin.”³¹⁸ The DEIS fails to acknowledge—let alone analyze the project’s impacts on—ODFW’s proposal to expand commercial fishing in Youngs Bay.

Finally, the DEIS fails to analyze and disclose recreational and commercial fishing impacts imposed by Oregon LNG’s fixed safety/security zone. As noted above, the Coast Guard requires a 50-yard, permanent safety/security zone extending from the Terminal shoreline into the Skipanon River and Youngs Bay. Coast Guard regulations detail the impact of a security zone. 33 CFR § 165.30 states:

(a) A security zone is an area of land, water, or land and water which is so designated by the Captain of the Port or District Commander for such time as is necessary to prevent damage or injury to any vessel or waterfront facility, to safeguard ports, harbors, territories, or waters of the United States or to secure the observance of the rights and obligations of the United States.

(b) The purpose of a security zone is to safeguard from destruction, loss, or injury from sabotage or other subversive acts, accidents, or other causes of a similar

³¹⁵ *Id.*

³¹⁶ Exhibit 38 (Northwest Sportfishing Industry Association, *NSIA committed to fighting today’s ODFW Commission Youngs Bay ruling* (Feb. 7, 2014), <http://www.nsiafishing.org/general/nsia-committed-to-fighting-todays-odfw-commission-youngs-bay-ruling/>); Exhibit 59 (The Columbia Basin Bulletin, *Sportfishing interests seek reversal on ‘Control Zone’ closure at Youngs Bay* (Feb. 21, 2014)).

³¹⁷ Exhibit 94 (Letter from Oregon Department of Fish and Wildlife to City of Warrenton (Sept. 21, 2015)).

³¹⁸ *Id.* at 2.

nature:(1) Vessels, (2) Harbors,(3) Ports, and(4) Waterfront facilities in the United States and all territory and water, continental or insular, that is subject to the jurisdiction of the United States.

33 CFR § 165.33, “General regulations,” also describes the implications of a security zone, stating:

Unless otherwise provided in the special regulations in Subpart F of this part:(a) No person or vessel may enter or remain in a security zone without the permission of the Captain of the Port;(b) Each person and vessel in a security zone shall obey any direction or order of the Captain of the Port;(c) The Captain of the Port may take possession and control of any vessel in the security zone;(d) The Captain of the Port may remove any person, vessel, article, or thing from a security zone;(e) No person may board, or take or place any article or thing on board, any vessel in a security zone without the permission of the Captain of the Port; and (f) No person may take or place any article or thing upon any waterfront facility in a security zone without the permission of the Captain of the Port.

Public access to the 50-yard aquatic area, extending from the Terminal upland to the Skipanon River and Youngs Bay, requires contacting and obtaining approval from the Coast Guard Captain of the Port.³¹⁹ It is unclear if and under what circumstances the Coast Guard would grant approval. The DEIS fails to examine impacts to recreational and commercial fishing associated with Oregon LNG’s fixed security zone.

In sum, the project’s direct, indirect, and cumulative impacts on recreational and commercial fishing, as well as other river recreation uses, are not fully accounted for or accurately disclosed in the DEIS. Oregon LNG’s project—from construction through operation—imposes unprecedented, harmful impacts on fishing, hunting, boating, and other public trust rights in Youngs Bay and the Columbia River estuary.

10.9 Socioeconomics.

The DEIS fails to address the broad range of local, regional, and national socioeconomic impacts from the project. Without explanation, the DEIS only examines the project’s impacts on job growth, failing to address substantial concerns raised by elected officials and local communities on the negative impacts of the project job losses. FERC must examine the project’s potential impacts on existing businesses and industries in Clatsop County, the State of Oregon, and the Pacific Northwest. Overall, Oregon LNG presents a tremendous risk and negative impacts to multiple local businesses, industries, and municipalities that the DEIS fails to disclose.

³¹⁹ Oregon LNG DEIS at 4-426.

The DEIS identifies potential socioeconomic effects, including impacts on: (1) local population, (2) employment, (3) housing, (4) traffic, (5) the economy, (6) public services, (7) local tax revenues, (8) property values, and (9) environmental justice.³²⁰ In the following section, the Coalition describes areas where FERC fails to take a hard look at the project's direct, indirect, and cumulative impacts on socioeconomics.

10.9.1 Fishing and Shipping Industries.

The Terminal would result in significant, adverse economic impacts on commerce, including impacts to the fishing and shipping industries. Oregon LNG proposes dredging a massive hole that spans 135 acres of the Columbia River in Youngs Bay—roughly the size of 102 football fields. This is the heart of what historically has been the most popular non-tribal sport and commercial salmon fishing area on the Columbia River.³²¹ Furthermore, Youngs Bay is the most productive Chinook salmon mitigation site (*i.e.*, to mitigate for lethal impacts of the Columbia River hydroelectric dams) in the entire Columbia River estuary. The DEIS fails to take a hard look at economic impacts of siting an LNG terminal in the heart of this productive fishery.

The DEIS contain an incomplete analysis of the project's impacts on local marine traffic. The Oregon LNG project has the potential to disrupt local marine traffic, particularly a nearby public marina on the Skipanon River. Exclusion zones restrict access to the Skipanon River while LNG tankers are approaching and docking at the facility. The DEIS must disclose the project's significant, negative impacts on local marine traffic.

10.9.2 Tourism, Property Values, and Other Local Impacts.

The Terminal, including associated LNG tanker traffic, and the Pipeline would cause economic harm inhibiting the flow of boat traffic, diminishing the tourism appeal of the area, negatively impacting the housing market, and diminishing property values.

First, the DEIS fails to examine the project's impacts on the North Coast's booming tourism industry. The project would diminish tourism in the area in general, a \$352 million industry for Clatsop County. LNG tankers are perceived as being unsafe. In an industry where perception is reality, tourism as an economic generator depends on a positive perception of the area." In turn, militarizing the mouth of the Columbia to protect LNG shipping from terrorists would change tourists' perception of the area for the worse, thereby leading to decreased

³²⁰ DEIS at 4-284.

³²¹ Exhibit 39 (Martin, Irene, *A Social Snapshot of the Columbia River Gillnet Fishery* (Sept. 2005)); *see also* U.S. Coast Guard, Buoy 10 Taskforce, <http://www.uscg.mil/d13/sectcolrvr/ops/buoy10.asp>.

tourism, decreased jobs, and a decreased taxable base for Clatsop County. The DEIS fails to analyze these potential socioeconomic impacts.

Second, the DEIS fails to examine the project's impacts on property values. Public comments on the DEIS demonstrate significant and well-founded concerns from local community members about the impact of the Terminal and Pipeline on property values. The DEIS addresses property value impacts in one paragraph, citing a study Oregon LNG commissioned in 2006.³²² The 2006 analysis examined local county assessment records for neighborhoods surrounding existing LNG "peak storage" facilities in Newport and Portland, Oregon. FERC fails to demonstrate how an LNG "peak storage" facility compares to an LNG production and export shipping terminal that would produce up to 9 million metric tons of LNG annually. In addition to property value impacts, the DEIS fails to examine potential impacts on insurance costs for nearby homeowners and businesses.

Third, the DEIS fails to disclose the Terminal and Pipeline's impacts on emergency response and other public services expenses in local communities, including Clatsop County and the cities of Warrenton and Astoria. The Terminal would require significant investments by local communities, including costs related to emergency response costs and the increasing the capabilities of emergency responders. Oregon LNG would place additional burdens on coastal communities related to emergency response costs and measures.

Fourth, the DEIS fails to account for the Pipeline's negative impacts on economic development and property values. The Pipeline would degrade property values, including farms and forestlands, by preventing customary uses of land, causing erosion and environmental damage, harming drainage systems, and creating a safety risk. FERC must account for the direct and indirect impacts of the Pipeline on economic development and decreased property values. This analysis should include an assessment of the attendant impact on state and federal sales and property taxes.

Finally, Oregon LNG has not provided any financial assurances for site abandonment, the consequences of which would fall to taxpayers. For example, Oregon LNG has yet to demonstrate how the company would protect taxpayers in the event the company declares bankruptcy or abandons the site. FERC must revise the DEIS to address these significant shortcomings.

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³²² DEIS at 4-289.

10.9.3 Economic Impacts to Tribes and Other Environmental Justice Communities.

From air pollution to impacts on subsistence fishing, Oregon LNG's project raises significant environmental justice issues. On February 11, 1994, President Clinton issued Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." The Executive Order makes it the responsibility of each Federal agency to "make achieving environmental justice part of its mission in identify and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." Accompanying this order was a Presidential Memorandum stating that "each Federal agency shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by the [National Environmental Policy Act]." The DEIS fails to address adequately the project's significant impacts on environmental justice communities.

The DEIS contains an incomplete analysis of how project construction and operation would impact cultural resources. This includes impacts to Native American cultural resources, impacts to cultural resources at the Lewis and Clark National Historical Park and along the Lewis and Clark National Historical Trail, and other cultural sites near the Terminal, along the LNG tanker route and Pipeline route. FERC's public interest review would benefit substantially from government-to-government consultation with Columbia River tribes and other tribes impacted by the Oregon LNG project.

FERC's actions to date, including refusing to extend the comment period, undercut efforts to inform and engage environmental justice communities. Moving forward, the Coalition urges FERC to engage tribes and environmental justice communities in a meaningful way. FERC has treaty and constitutional duties to consider the project's impacts on Columbia River treaty tribes. The Coalition leaves comments on these duties and obligations to the sovereign tribal nations.

10.9.4 Flood Control Structure Impacts.

Under the Rivers and Harbors Act, private parties such as Oregon LNG cannot alter federal flood control structures without permission from the Corps. 33 U.S.C. § 408 (Section 408). Most of the dikes and flood control structures along the Pipeline route were built, or are owned by, the Corps. Accordingly, Oregon LNG must secure permission under Section 408 from the Corps to build the Pipeline. Section 408 permits can require significant data collection

and risk analysis by the Corps and the applicant. FERC must consider this information in a revised DEIS and, in turn, provide the opportunity for public comments.

The DEIS fails to consider the impacts of Pipeline construction, operation, and maintenance on flood control structures and the lives and property they protect. For example, the proposed Pipeline segment beginning in Woodland, Washington, would cross under a dike along the Washington shore of the Columbia River which protects lowland farms around Woodland. The Pipeline would also run for several hundred feet along a dike protecting Deer Island, Oregon. As the Pipeline approaches the Terminal site, it would intersect various dikes and flood control structures along the lower Lewis and Clark River and around the City of Warrenton, Oregon. Overall, the Pipeline would cross eleven dikes.³²³ The public comment letter filed by the Consolidated Diking Improvement District No. 2 of Cowlitz County (CDID No. 2) highlights the DEIS's failure to disclose the Pipeline's direct, indirect, and cumulative impacts on flood control structures.³²⁴ FERC must revise the DEIS to account to disclose the Pipeline's impacts on flood control structures.

10.10 Air Quality.

The DEIS contains an inadequate analysis of the project's direct, indirect, and cumulative impacts on air quality. Oregon LNG acknowledges the proposed Terminal is a "major source" and must obtain a preconstruction major source permit, an Air Contaminant Discharge Permit, and an operating permit, a Title V major source permit. This is a significant change from the LNG import proposal. According to Oregon LNG's FERC filing, the facility exceeds the greenhouse gas PSD threshold. The facility's emissions would also exceed the Significant Emissions Rate (SER) thresholds for NO_x, CO, SO₂, and PM_{2.5}. Operation of the proposed Terminal, Pipeline, and other facilities will emit harmful carbon monoxide (CO), nitrogen oxides (NO_x), volatile organic chemicals (VOC), greenhouse gases (GHGs), sulfur dioxides (SO_x), particulate matter (PM₁₀ and PM_{2.5}), and hydrogen sulfide (H₂S) pollution. The following section describes air pollution from the project and FERC's failure to analyze the impacts of this pollution in the DEIS.

The project would cause significant emissions of VOCs and NO_x, emitted directly from project facilities and indirectly from tanker and other ship traffic and operations. In total, Oregon LNG estimates emissions of 736.1 tons per year (tpy) of NO_x emissions and 60.47 tpy of

³²³ DEIS at 4-53 (Table 4.1.3-6, Flood Control Dikes Crossed by the Oregon LNG Pipeline).

³²⁴ Exhibit 96 (Letter from Consolidated Diking Improvement District No. 2 of Cowlitz County to FERC (Sept. 17, 2015)).

VOC.³²⁵ The WEP Pipeline includes installing an additional 90,000 horsepower of compression.³²⁶ The DEIS fails to specify whether these compressors will be powered by electricity from the grid, natural gas, or some other power source. Because natural gas fired compressors have significant NO_x and VOC emissions, total emissions resulting from the project could much higher than the above.³²⁷ Where electrical compressors are used, FERC must consider the power source and power line route that would service the compressors.

VOCs and NO_x

These emissions would harm the environment by increasing the formation of ground level ozone. VOCs and NO_x contribute to the formation of ground-level ozone, also referred to as smog. Smog pollution harms the respiratory system and has been linked to premature death, heart failure, chronic respiratory damage, and premature aging of the lungs.³²⁸ 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.³²⁹

Significant ozone pollution also damages plants and ecosystems.³³⁰ Ozone also contributes substantially to global climate change over the short term. According to a recent study by the United Nations Environment Programme, behind carbon dioxide and methane, ozone is now the third most significant contributor to human-caused climate change.³³¹

³²⁵ The 736.1 tpy of NO_x includes 76.1 tpy from terminal operations, 53.9 tpy from ship and dredging activity near the terminal site, 304 tpy from induced tanker transits Oregon exclusive economic zone (EEZ), and 306.1 tpy in the Alaska EEZ. *See* FERC Dkt. PF12-18, Resource Report (RR) 9-16 to 9-19. For VOC, 35.8 tpy are emitted from terminal facilities.

³²⁶ FERC Dkt. PF12-20 RR 1-1, 1-42 (Aug. 16, 2012).

³²⁷ The proposal for the Oregon Pipeline proposes electrically driven compression, the environmentally preferable option with few direct NO_x or VOC emissions. RR 1-18, 9-13.

³²⁸ EPA, *Proposed New Source Performance Standards and Amendments to the National Emissions Standards for Hazardous Air Pollutants for the Oil and Natural Gas Industry: Regulatory Impact Analysis*, 4-25 (July 2011), <http://www.epa.gov/ttnecas1/regdata/RIAs/oilnaturalgasfinalria.pdf>. (hereinafter O&G NSPS RIA) Jerrett *et al.*, *Long-Term Ozone Exposure and Mortality*, *New England Journal of Medicine* (Mar. 12, 2009), <http://www.nejm.org/doi/full/10.1056/NEJMoa0803894#t=articleTop>.

³²⁹ *See* EPA, *Ground-Level Ozone, Health Effects*, <http://www.epa.gov/glo/health.html>. EPA, Nitrogen Dioxide, Health, available at <http://www.epa.gov/air/nitrogenoxides/health.html>.

³³⁰ O&G NSPS RIA at 4-26.

³³¹ *Id.* *See also* United Nations Environment Programme and World Meteorological Organization, (2011): *Integrated Assessment of Black Carbon and Tropospheric Ozone*:

Carbon Dioxide

Operation of the Terminal would directly emit 150.5 tpy of carbon dioxide (CO), with an additional 197.18 tpy of marine vessel emissions.³³² As with NOx and VOC, additional compressors installed as part of the WEP may raise this total. CO can cause harmful health effects by reducing oxygen delivery to the body's organs and tissues.³³³ CO can be particularly harmful to persons with various types of heart disease, who already have a reduced capacity for pumping oxygenated blood to the heart. "For these people, short-term CO exposure further affects their body's already compromised ability to respond to the increased oxygen demands of exercise or exertion."³³⁴

Greenhouse Gases

Oregon LNG estimates that the Terminal, Pipeline, and associated facilities will directly emit over 2.6 million tpy of carbon dioxide equivalent in greenhouse gases (CO₂e), with an additional 118,544.6 tpy emitted by marine vessel traffic.³³⁵ These greenhouse gas emissions would contribute to climate change, harming both the local and global environments.

The impacts of climate change caused by 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."³³⁶ 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.³³⁷ 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 increased incidence of respiratory and infectious disease, greater air and water pollution, increased malnutrition, and greater casualties

Summary for Decision Makers (hereinafter "UNEP Report," http://www.unep.org/dewa/Portals/67/pdf/Black_Carbon.pdf), at 7.

³³² Oregon LNG Resource Report 9, Air and Noise Quality at 9-16 to 9-18.

³³³ EPA, *Carbon Monoxide*, <http://www.epa.gov/air/carbonmonoxide/health.html>.

³³⁴ *Id.*

³³⁵ Oregon LNG Resource Report 9, Air and Noise Quality at 9-16 to 9-19.

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

³³⁷ *Id.* at 66, 532-33.

from fire, storms, and floods.³³⁸ Vulnerable populations—such as children, the elderly, and those with existing health problems—are the most at risk from these threats.

Oregon LNG's project and climate change impacts are discussed in greater detail section 10.12 below.

Sulfur Dioxide

The Terminal and compressor stations will directly emit an estimated 72 tpy of SO₂, with an additional 80.88 tpy emitted by marine vessel traffic.³³⁹ 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.³⁴⁰ PM is discussed separately below.

Particulate Matter

The proposed Terminal and Pipeline compressor stations will directly emit an estimated 14.9 tpy of particulate matter, with an additional 51.2 tpy emitted by marine vessel traffic.³⁴¹ PM consists of tiny particles of a range of sizes suspended in air. Small particles pose the greatest health risk. These small particles include “inhalable coarse particles,” which are smaller than 10 micrometers in diameter (PM₁₀), and “fine particles” which are less than 2.5 micrometers in diameter (PM_{2.5}). PM₁₀ is primarily formed from crushing, grinding or abrasion of surfaces. PM_{2.5} is primarily formed by incomplete combustion of fuels or through secondary formation in the atmosphere.³⁴²

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

³³⁸ EPA, *Climate Change, Health and Environmental Effects*, <http://epa.gov/climatechange/effects/health.html>.

³³⁹ Oregon LNG Resource Report 9, Air and Noise Quality at 9-16 to 9-19.

³⁴⁰ EPA, Sulfur Dioxide, Health, <http://www.epa.gov/air/sulfurdioxide/health.html>.

³⁴¹ Oregon LNG Resource Report 9, Air and Noise Quality at 9-16 to 9-19.

³⁴² See EPA, Particulate Matter, Health, <http://www.epa.gov/pm/health.html>; BLM, *West Tavaputs Plateau Natural Gas Full Field Development Plan Final Environmental Impact Statement* (West Tavaputs FEIS), at 3-19 (July 2010), http://www.blm.gov/ut/st/en/fo/price/energy/Oil_Gas/wtp_final_eis.html.

problems, are most at risk from PM pollution. PM also reduces visibility,³⁴³ and may damage important cultural resources.³⁴⁴ Black carbon, a component of PM emitted by combustion sources such as flares and older diesel engines, also warms the climate and thus contributes to climate change.³⁴⁵

FERC's conclusions on the project's air quality impacts fail to satisfy NEPA's requirement that agency's take a hard look at projects' environmental impacts. First, FERC concludes that the project would not result in significant regional air quality impacts.³⁴⁶ FERC concludes that "Oregon LNG would be required to meet all federal and state air quality permitting requirements as a condition of operation." FERC cannot rely on future compliance with federal and state laws to evade disclosing the environmental impacts of air pollution from the project. Second, FERC fails to address whether the project would result in significant local air quality impacts. FERC's failure to address local air quality impacts and reliance on future permitting processes is arbitrary.

10.11 Reliability and Safety.

FERC must account for significant public safety risks introduced by the Terminal, Pipeline, and WEP Pipeline. Unfortunately, the DEIS does not adequately address safety and reliability concerns for the project, deferring key studies and plans until after FERC completes the DEIS. As a result, FERC relies on incomplete information to draw conclusions about the project. For the reasons described below, FERC must revise its analysis of safety and reliability issues for the Terminal, its associated LNG tankers, and the Pipelines.

10.11.1 LNG Terminal and Tankers.

FERC unreasonably diminishes both the extent and severity of potential hazards near the Terminal and along the tanker route. The DEIS concludes, "As a result of our technical review of the preliminary engineering design, we conclude that the facility design proposed by Oregon LNG plus our recommended mitigation would provide acceptable layers of protection or safeguards which would reduce the risk of a potentially hazardous scenario from developing into an event that could impact the off-site public."³⁴⁷ FERC's conclusion is undermined by incomplete and contradictory evidence presented in the DEIS.

³⁴³ EPA, *Visibility – Basic Information*, <http://www.epa.gov/visibility/what.html>.

³⁴⁴ See EPA, Particulate Matter, Health West Tavaputs EIS, at 3-19; O&G NSPS RIA at 4-24.

³⁴⁵ UNEP Report at 6; IPCC (2007) at Section 2.4.4.3.

³⁴⁶ DEIS at 4-349.

³⁴⁷ *Id.* at 5-29.

The Terminal and LNG tankers pose extraordinary hazards to the surrounding area including, but not limited to: toxic vapor clouds, flammable vapor clouds, intense thermal radiation, unconfined vapor cloud explosions, boiling liquid expanding vapor explosions, asphyxiation hazards, and cryogenic hazards. Additionally, because of the enormous scale of the proposed Terminal and its associated tankers, some the risks associated with the Terminal span a huge area, particularly the potential flammable vapor clouds. The DEIS acknowledges that data from the Sandia National Labs points to a number of potential impacts, stating:

The areas located within the Zones of Concern for this project are portions of Clatsop County, Oregon, and Pacific County, Washington. Communities located within the Zones of Concern include portions of the communities of Hammond, Warrenton, and Astoria. Waterfront areas of Hammond and Warrenton are overlapped by Zone 1. Other portions of Hammond and Warrenton are overlapped by Zones 2 and 3. Portions of Astoria are also overlapped by Zone 3.³⁴⁸

The DEIS depicts the hazard in Figure 4.1.13-13. The Sandia Labs “Zones of Concern” refer to areas at risk of a drifting, ignitable vapor cloud of methane. The DEIS notes that the distance can exceed 2 miles.

First, FERC failed to adequately analyze the risk to people and structures due to LNG tankers passing within close proximity to the shoreline. Although the DEIS indicates that LNG vapor hazards from large LNG tankers could impact Astoria, Warrenton, Hammond, and portions of Washington State, the DEIS fails to take a hard look at the consequences to those areas in the case of a large intentional or accidental LNG release. The DEIS relies on Coast Guard-imposed safety and security measures to conclude that Oregon LNG can mitigate the risk from an LNG vessel. Although the Coast Guard recommends a 500 yard moving safety/security zone to ensure the safety of shoreside people and structures, the DEIS acknowledges that LNG tankers will be closer to the shore than 500 yards at several places, including near the Hammond Marina and the mouth of the Skipanon River. It is therefore impossible to ensure that the requisite safety/security zone is maintained while the LNG tanker is passing populated shorelines. Moreover, FERC cannot compare the Terminal’s risk to human safety to other proposed LNG sites where the safety/security zone would not be rendered meaningless as a result of an encroaching shoreline. Oregon LNG’s Terminal location brings LNG vessels and storage tanks into very close proximity to the communities of Warrenton, Hammond, and Astoria.

³⁴⁸ DEIS at 4-421.

Second, the DEIS fails to account for hazards posed by maneuvering very large, high-seaboard loaded LNG tankers during inclement weather. Oregon LNG's own analysis points to potential hazards for LNG tankers transiting the Columbia River Bar. According to the DEIS,

The PMI study also found that for inbound carriers, the simulator hydrodynamic models used became difficult to handle going over the bar, with winds in excess of 25 knots and waves up to 16 feet. This indicated the upper operational range for inbound carriers. For outbound carriers, the upper operational limits were winds in excess of 2 knots and seas up to 2 feet. In addition, the general consensus among the pilots who participated in the study was that they should not meet other vessels while transiting between Buoy 8 and the terminal. This is because during river transits with winds of 2 knots, the swept path of these carriers took up much of the available channel.³⁴⁹

Because LNG tankers are exceptionally large and potentially difficult to maneuver in the Columbia River, the DEIS should acknowledge the increased potential for accidents and risks to other vessels in the Columbia River. In this case, the DEIS makes the recommendation that no vessels (not only deep-draft vessels) meet an LNG tanker between the Terminal and Buoy 8—a restriction that could disrupt Columbia River traffic. Neither the Coast Guard's Letter of Recommendation (LOR) nor the underlying LOR analysis expressly restrict river traffic as the DEIS suggests. In fact, the analysis the Waterway Suitability Analysis states:

Meeting situations of commercial vessels will be closely controlled. All meetings to be pre-arranged via Channel 13 VHF Bridge-to-Bridge and would be limited to the following areas: Commercial piloted vessels avoid meeting in all turns (excluding fishing vessels under 200 feet); Weather and bar conditions permitting, vessels may arrange for meetings to occur between the CR buoy and buoy 12, and between buoy 25 and buoy 27.³⁵⁰

It is unclear whether the DEIS's assumption that no vessel meetings will be allowed between Buoy 8 and the Terminal is, in fact, reflected in the Coast Guard's LOR, which appears to allow for some vessel meetings. In short, the DEIS presents an analysis that relies on mitigation measures that may not occur in order to conclude that LNG tankers can safely transit the Columbia River.

Third, the DEIS falls short of taking a hard look at the actual consequences of a large LNG release on the communities of Hammond, Warrenton, Astoria, and Pacific County,

³⁴⁹ DEIS at 4-416 (referencing the navigational study conducted for Oregon LNG by Pacific Maritime Institute).

³⁵⁰ Exhibit 42 at 2 (U.S. Coast Guard Letter of Recommendation Analysis for Oregon LNG Project (Apr. 24, 2009)).

Washington. The DEIS does little more than provide maps of the potentially impacted communities in Figures 4.1.13-12 and 4.1.13-13. The DEIS summarizes the impacts to these communities, stating:

If the flammable portion of a vapor cloud encounters an ignition source, a flame would propagate through the flammable portions of the cloud. In most circumstances, the flame would be driven by the heat it generates. This process is known as a deflagration, or a flash fire because of its relatively short duration. However, exposure to a deflagration, or flash fire, can cause severe burns and death, and can ignite combustible materials within the cloud. Flammable vapor dispersion is evaluated in section 4.1.13.6.³⁵¹

Aside from outlining the potential impacts of a vapor cloud fire, the DEIS does not investigate the impact on homes, businesses, schools, and other structures close to the LNG tankers' route. FERC also fails to analyze an LNG tanker breach and the extent of the human casualties. FERC must analyze the consequences of an LNG tanker breach at different locations along the shipping route (*e.g.*, near Fort Stevens State Park, near the Hammond Marina, at berth). Particularly troublesome is FERC's failure to analyze the consequences of a large volume of natural gas being released in close proximity to homes and businesses near the Skipanon River in Warrenton. Moreover, the analysis in DEIS section 4.1.13.6 uses unreasonably small design spill scenarios, discussed below.

Fourth, FERC fails to analyze the risk and consequences of a cascading failure of an entire LNG tanker due to a large breach. LNG's principle hazards result from its cryogenic temperature (-260° F), flammability, and vapor dispersion characteristics, all of which factor into the potential for an LNG accident. Because of LNG's cryogenic temperature, it will quickly cool materials in contacts, causing extreme thermal stress in materials not specifically designed for ultracold conditions. Such thermal stresses could subsequently subject the material to brittleness, fracture, or other loss of tensile strength.³⁵² An LNG spill could therefore result in cascading failures, turning a "basic" spill into an even more catastrophic event. In addition, FERC fails to analyze the potential of cascading failures due to melting of polystyrene foam that is used as insulation on LNG tankers. A recent peer-reviewed paper analyzed the response of a liquid-full LNG tank insulated with polystyrene foam to an engulfing LNG fire. The study concluded that the current regulatory requirements for pressure relief capacity sufficient to prevent tank rupture are inadequate.³⁵³

³⁵¹ DEIS at 4-375.

³⁵² *Id.* at 4-372.

³⁵³ Exhibit 104 (Jerry Havens and James Venart, *Fire performance of LNG carriers insulated with polystyrene foam*, Journal of Hazardous Materials (Jan. 2008)).

Finally, without additional analysis, the extent and consequences of a fire threat due to a catastrophic event is unknown. Depending on the location of the LNG tanker breach, the associated fire could devastate parks, utility infrastructure, residential and commercial buildings, and even entire municipalities (most of Warrenton is within Sandia Zone of Concern 3).³⁵⁴ The Government Accountability Office, concerned about the lack of research and need to clarify uncertainty surrounding cascading failures, called for additional study of the threat and Congress directed the DOE to undertake further analysis in 2012.³⁵⁵ In their 2015 paper, Havens and Venart summarize the Sandia Lab's discussion:

The six unclassified studies we reviewed all examined the heat impact of an LNG pool fire but produced varying results; some studies also examined other potential hazards of a large LNG spill and reached consistent conclusions on explosions. Specifically, the studies' conclusions about the distance at which 30 seconds of exposure to the heat could burn people ranged from about three quarters of a mile to 2,000 meters (about 1-1/4 miles). The Sandia National laboratories' study concluded that the most likely distance for a burn is about 1,600 meters (1 mile). These variations occurred because researchers had to make numerous modeling assumptions to scale-up the existing experimental data for large LNG spills since there are no large spill data from actual events. These assumptions involved the size of the hole in the tanker, the number of tanks that fail, the volume of LNG spilled, key LNG fire properties, and environmental conditions, such as wind and waves. Three of the studies also examined other potential hazard of an LNG spill, including LNG vapor explosions, asphyxiation, and cascading failure. All three studies considered LNG vapor explosions unlikely unless the LNG vapors were in a confined space. Only the Sandia National Laboratories' study examined the potential for cascading failure of LNG tanks and concluded that only three of the five tanks would be involved in such an event and this number of tanks would increase the duration of the LNG fire.

Our panel of 19 experts generally agreed on the public safety impact of an LNG spill, disagreed with a few conclusions reached by the Sandia National Laboratories' study, and suggested priorities for research to clarify the impact of heat and cascading tank failures. Experts agreed that (1) the most likely public safety impact of an LNG spill is the heat impact of a fire; (2) explosions are not likely to occur in the wake of an LNG spill, unless the LNG vapors are in confined spaces, and (3) some hazards, such as freeze burns and asphyxiation, do not pose a hazard to the public. Experts disagreed with the heat impact and cascading tank failure conclusions reached by the Sandia National Laboratories' study, which the Coast Guard uses to prepare WSAs. Specifically, all experts did not agree with the heat impact distance of 1,600 meters. Seven of 15 experts thought Sandia's distance was "about right," and the remaining eight experts were

³⁵⁴ DEIS at 4-423.

³⁵⁵ *Id.* at 4-419.

evenly split as to whether the distance was “too conservative” or “not conservative enough” (the other 4 experts did not answer this question).³⁵⁶

As a result of the GAO report, Congress directed further research to be conducted by the Sandia National Laboratory. The DEIS explains,

In order to more robustly analyze the potential for cascading failure of LNG marine carrier cargo tanks, Sandia use detailed vessel structural and thermal damage models to simulate the effects to an LNG marine carrier from a spill. For the large breaches considered, Sandia predicts that as much as 40 percent of the LNG released from the cargo tank would remain within the ship’s structure. Due to both the cold temperature of the LNG and the heat from a pool fire, the LNG marine carrier’s structural steel would be degraded. The effects could be significant enough to cause the ship to be disabled, severely damaged, and at risk of sinking.

Although LNG ship design and construction practices render simultaneous, multiple tank failures as extremely unlikely, Sandia concluded that sequential multi-tank spills may be possible.³⁵⁷

Although the DEIS acknowledges the possibility of a cascading event, the document fails to take a hard look at the actual consequences of such an event – up to and including the total loss of an LNG tanker - on nearby communities and the Columbia River. The study re-affirms that potential for LNG hazards, however, unlikely, to dramatically impact nearby communities in an intentional LNG release.

From an LNG vessel damage viewpoint, the analyses conducted and presented in this report suggest that significant damage is likely to LNG vessels from medium and large breach events and spills. Therefore, a large breach and spill could have both short-term and long-term impacts on public safety, energy security and reliability, and harbor and waterway commerce at some sites. For this reason, significantly more attention and proactive measures should be considered for preventing the possibility of larger breach and spill events or for mitigating the cryogenic and fire impacts of larger spills on LNG vessels.³⁵⁸

Without the benefit of additional analysis of how homes, businesses, schools, and other public areas would be impacted by a large LNG release and cascading failure, and without evaluating

³⁵⁶ Exhibit 75 at 26–27.

³⁵⁷ DEIS at 4-420.

³⁵⁸ Exhibit 109 at 23 (DOE, Liquefied Natural Gas (LNG) Safety Research, Report to Congress (May 2012)).

impacts of an LNG release at multiple locations along the path of an LNG tanker, FERC has little basis to conclude that the Terminal poses a minimal hazard to human safety.

10.11.1.1 LNG Spills, Vapor Dispersion Models, and Thermal Exclusion Zones.

The DEIS relies on design spills that are too small. The vapor dispersion modeling contained in the DEIS was based on a design spills listed in Table 4.1.13-3, rather than modeling a spill from the 32-inch-diameter transfer line which would actually carry the LNG from the tanker to the onshore tanks, or a loss of containment of an LNG tank or tanker. FERC should consider as a design spill a full guillotine rupture of the line that could release more LNG—thereby creating a larger vapor dispersion zone—than FERC has evaluated in its current design spill scenarios. FERC should also model potential spills resulting from the full loss of primary and secondary containment of an LNG tank, which is already alluded to in the DEIS, but not fully assessed for its potential to create thermal and vapor cloud dispersion risks.³⁵⁹ By only looking at smaller design spills, and by considering each individually without the potential for simultaneous (such as during a large earthquake) or cascading events, FERC fails to take the requisite hard look at the risks and consequences of a larger spill and larger vapor and thermal hazards.

The largest design spill discussed in DEIS section 4.1.13 would release 4,457,330 pounds of LNG per hour. The design spill was estimated to last for 10 minutes.³⁶⁰ The total volume of LNG released in the design spill is 212,253 gallons of LNG – far less than the potential amount of LNG that could be released from a guillotine rupture of a 32-inch transfer line, which FERC considered credible enough to include for the sizing of the largest impoundment basin in the terminal.³⁶¹ FERC estimated that a transfer line spill could release 530,280 gallons of LNG, which itself may be an underestimate, as we discuss further below. According to Dr. Jerry Havens’ testimony on the Bradwood LNG terminal, FERC made the same type of error in its analysis of the Jordan Cove LNG and Bradwood LNG terminals.³⁶² For Bradwood, FERC allowed Bradwood to use a design spill that was based on the rupture of a 6-inch LNG line.

³⁵⁹ DEIS at 4-390.

³⁶⁰ Assume 10 minute spill of LNG at rate of 4,457,330 lbs LNG/hour:
(4,457,330 lbs LNG spilled/hour) x (1/6 hours) = 742,888.333 lbs of LNG spilled in 10 minutes.
1 gallon of LNG weighs 3.5 lbs (http://www.prometheuseenergy.com/_pdf/LNGQuickFacts.pdf)
(742,888.333 lbs LNG) x (1 gallon LNG/3.5 lbs LNG) = 212,253.81 gallons of LNG spilled in the largest design spill.

³⁶¹ DEIS at 4-392.

³⁶² Exhibit 104 (Jerry Havens and James Venart, *Fire performance of LNG carriers insulated with polystyrene foam*, Journal of Hazardous Materials (Jan. 2008)).

For example, the DEIS states that “[d]esign spills are used in the determination of the hazard distances required to be calculated by Part 193,” and states repeatedly that DOT has approved Oregon LNG’s selection of design spill criteria. Yet the DEIS also states,

DOT’s conclusions on the candidate design spills used in the siting calculations required by Part 193 were based on preliminary design information which may be revised as the engineering design progresses. If Oregon LNG’s design or operation of the proposed facilities differs from the details provided in the documents on which DOT based its review, then the facilities may not comply with the siting requirements of Part 193.³⁶³

FERC then recommends future collaboration between DOT and Oregon LNG to address how DOT criteria may be met with future design changes. Therefore, FERC both under-sizes its design spill criteria and acknowledges that Terminal design information will potentially change the risks associated with potential LNG leaks. FERC must consider a broader range of spills, and provide a public safety analysis that is robust enough to withstand minor changes to the Terminal design.

Even accepting FERC’s argument that the design spills may meet DOT’s requirements, DOT’s regulations do not absolve FERC of its responsibility under NEPA to take a hard look at spills that may exceed the design spills described in section 4.1.13 of the DEIS. Indeed, the DEIS cites the potential for larger spills to occur by pondering a “common cause” failure of an LNG tank’s primary and secondary containment³⁶⁴ and acknowledging the Sandia Zones of Concern for large LNG releases involving vessels that may hold less LNG than the onshore tanks at the Terminal. Additionally, FERC considers the breach of the 32-inch-diameter transfer line as reasonably foreseeable under NEPA because it uses this scenario for sizing the largest spill impoundment at the Terminal. Lastly, FERC’s fails to take a hard look at LNG or other leaks that last for longer than 10 minutes. FERC must consider spills that last much longer, particularly when workers may have to evacuate the Terminal for their own protection. This occurred in the recent Plymouth LNG leak in Washington, causing a release of LNG vapors lasting for many hours (not a few minutes).³⁶⁵

For all of the above reasons, FERC fails to assess thermal risks and vapor cloud hazards from a spill and fire of LNG or other hazardous substances at the Terminal that could extend well beyond the property boundary. FERC does not provide a “worst case” scenario, wherein

³⁶³ DEIS at 4-394.

³⁶⁴ *Id.* at 4-390.

³⁶⁵ It took over 8 hours for safety specialists to re-enter the Plymouth LNG site after a March 31, 2014, leak caused workers to evacuate.

proposed mitigation measures fail, or a full LNG tank loses containment beyond the design spills described in the DEIS. By failing to do so, FERC truncates its assessment of the impacts of an LNG vapor cloud originating at the terminal, and does not assess how a toxic or flammable vapor cloud could impact nearby residences, such as the condominium complex within 0.5 miles of the proposed Terminal site.³⁶⁶

In addition, the DEIS fails to consider a spill into an impoundment area that overwhelms the impoundment. For example, the DEIS describes the largest design spill into an impoundment area:

A Transfer Area Spill Containment Basin would serve the LNG marine transfer and LNG storage tank areas. This impoundment would be 80 feet long by 80 feet wide and 11.1 feet deep below the bottom of the trench that directs liquid into it. These dimensions result in a volumetric capacity of about 531,420 gallons. Oregon LNG designed the LNG Transfer Area Spill Containment Basin to contain a *10-minute spill from a full rupture of the 32-inch-diameter LNG ship transfer line*, which would produce 530,280 gallons, including the potential increased flow due to loss of back pressure on the pumps. Therefore, this proposed impoundment system would be sized to contain the largest volume of LNG that could be discharged into the impoundment from the full rupture of a single transfer pipe for a 10-minute spill.³⁶⁷

In contrast to the data presented in the Oregon LNG DEIS, estimates of spill volumes are significantly larger for the Jordan Cove LNG terminal in Coos Bay, according to the Jordan Cove DEIS. According to the Jordan Cove LNG DEIS, “the largest spill to the process area impoundment basin would be a 10-minute spill volume of 827,740 gallons.”³⁶⁸ Yet, the DEIS for Oregon LNG models a maximum spill of 530,280 gallons—a difference of 56 percent. In both cases, the design spills are estimates for a 32-inch transfer line over a 10-minute period of time. FERC should explain the discrepancy and the wide range of design spills used in FERC analyses over the past decade.³⁶⁹ Using Jordan Cove’s design spill estimate, the largest spill impoundment at the Oregon LNG facility would be undersized, causing damage to Terminal equipment and exacerbating the formation of a flammable vapor cloud. A larger-than-design spill such as the one considered credible in the Jordan Cove LNG DEIS could result in a significantly altered public safety analysis for the Terminal. As a result, FERC has not disclosed

³⁶⁶ DEIS at 4-353.

³⁶⁷ *Id.* at 4-391 (emphasis added).

³⁶⁸ Jordan Cove DEIS at 4-945. FERC Docket CP13-483 (November 2014).

³⁶⁹ Havens, J. August 2009. Consequence Analyses for Credible LNG Hazards, Second Annual AICHE/CSCHE Topical Conference, Montreal, Quebec.

the full potential range of impacts on nearby areas, such as the condominiums within 0.5 miles of the Terminal.

The DEIS' analysis of how spill impoundments will mitigate LNG releases is also flawed because FERC's modeling improperly assumes no air/methane mixture in any spill impoundment in the event of a breach of onshore LNG tanks or inlet or outlet lines thereto. FERC's assumption is inconsistent with relevant field studies of the issue, such as the Gas Research Institute's Falcon Series Data Report on the 1987 LNG Vapor Barrier Verification Field Trials.³⁷⁰ It is also inconsistent with FERC's own acknowledgments in other environmental reviews. This flawed assumption is discussed in greater detail in the paper by Dr. Jerry Havens and Dr. Spicer, "Error in FERC environmental impact statement determinations of LNG vapor cloud exclusion zones: failure to account for air mixing in vapor impoundments."³⁷¹

Setting aside the inadequacies of FERC's analysis of the spill impoundments and design spills, FERC fails to consider other greater-than-design spill scenarios that may overwhelm the impoundment systems. For example, each LNG storage tank can contain over 45 million gallons of LNG. FERC acknowledges the possibility of a case of a "common cause failure of the existing full containment storage tank primary and secondary containers," but its safety analysis focuses more narrowly on smaller "design" spills that can be contained within the impoundment system.³⁷² Rather than undertaking an independent review of a worst-case event, FERC accepts Oregon LNG's assertion that potential Terminal hazards will not impact the surrounding area. FERC writes,

Based on the hazardous area calculations we reviewed, we conclude that potential hazards from the siting of the facility at this location would not have a significant impact on public safety. The areas impacted by these design spills also appear to meet the DOT's exclusion zone requirements by either being within the facility property boundary, within land controlled by Oregon LNG, or over a navigable body of water.³⁷³

To accept the hazardous area calculations provided by Oregon LNG as the basis for its safety analysis, FERC must ignore a reasonable range of LNG spills that might occur at the Terminal. Accordingly, FERC fails to take a hard look at scenarios in which the volume of LNG or other

³⁷⁰ See Exhibit 105 (U.S. Department of Energy, Report of the Investigation Board for the Unplanned Fire at the Liquefied Gaseous Fuels Spill Test Facility on August 29, 1987 (1987)).

³⁷¹ See Exhibit 106 (Jerry Havens and Tom Spicer, Error in FERC Environmental Impact Statement Determinations of LNG Vapor Cloud Exclusion Zones: Failure to Account for Air Mixing in Vapor Impoundments (2005)).

³⁷² DEIS at 4-390

³⁷³ *Id.* at 5-29

hazardous material exceeded the design spills presented in Oregon LNG's analysis. As a result, the DEIS unreasonably minimizes the potential off-site impacts of an LNG leak, spill, vapor cloud, fire, BLEVE,³⁷⁴ and unconfined vapor cloud explosion. The Coalition urges FERC to revise the DEIS to consider other greater-than-design spill scenarios that may overwhelm the impoundment systems.

10.11.1.2 Expert Review on Public Safety.

In a detailed letter submitted on January 14, 2015, Dr. Jerry Havens and Dr. James Venart (hereafter Havens and Venart) provide critical insights into flaws in FERC's method of analysis that lead the agency to understate safety hazards of LNG terminals.³⁷⁵ While the letter is specific to the Jordan Cove LNG terminal, there are many common elements between the projects and FERC's treatment of public safety concerns for LNG terminals. Havens and Venart point out these flaws and others in their January 2015 letter:

- *Proposed mitigation measures (such as vapor fences) may actually worsen safety risks.* To conclude that vapor dispersion risks are adequately mitigated, FERC accepts Oregon LNG's reliance on unsure mitigation strategies (shrouds and vapor fences) whose design may be incomplete and may exacerbate other hazards. In comments to FERC regarding the Jordan Cove LNG proposal (CP13-483), Havens and Venart explain how vapor fences and other mitigation measures can enhance, rather than ameliorate, some risks at LNG facilities. Havens and Venart write:

The simple fact is that while the vapor clouds considered in this DEIS are prevented by physical barriers (vapor fences) from posing a vapor cloud hazard extending much beyond the property line, the holdup of very large quantities of flammable hydrocarbons by the vapor fences causes the gases to accumulate, with spreading largely driven by gravity spreading, so as to completely fill the affected areas to depths of a few meters, with large portions of those gas clouds having concentrations between the flammable limits. With these hazard-worsening conditions and the presence of densely packed processing equipment and the vapor fences which become enveloped in the cloud, *one could hardly design the releases to better maximize the potential for catastrophic explosion hazard.*³⁷⁶

³⁷⁴ Boiling liquid expanding vapor explosion (BLEVE)

³⁷⁵ See Exhibit 75.

³⁷⁶ Exhibit 75 at 18 (emphasis added) (Dr. Jerry Havens and Dr. James Venart, *United States LNG Terminal Safe-Siting Policy is Faulty*, submittal to FERC (Jan. 14, 2015)).

While Havens and Venart's letter deals specifically with the Jordan Cove LNG terminal, the same fundamental error applies to FERC's handling of the Oregon LNG Terminal. FERC allows Oregon LNG to "solve" one problem (mitigating dangerous vapors leaving property that Oregon LNG claims to control³⁷⁷) by an increased risk of unconfined vapor cloud explosions.³⁷⁸ Oregon LNG's array of vapor fences is a critical mitigating factor that leads FERC to conclude that thermal hazards and vapor dispersion hazards will remain within the property boundary as required by CFR 193, but FERC does not address how Oregon LNG's proposed Terminal design may compound other explosion risks that could property damage, environmental harm, and personal injury or death in Warrenton.

- *FERC's analysis relies on proprietary vapor dispersion models.* Havens and Venart explain how the use of proprietary, non-public models limits the public's ability to review and understand the conclusions that FERC reaches in its DEIS for Jordan Cove. Havens and Venart write,

At least two new vapor dispersion models have been approved, for a total of four; DEGADIS, FEM3A, and two new ones, PHAST and FLACS. In contrast to DEGADIS and FEM3A, the development of which were paid for with public funds and which were (and still are) freely available for use and independent evaluation, the new models are privately held (proprietary), prohibitively expensive to the public, and they are not freely available for evaluation of applicability and accuracy. To our knowledge PHAST and FLACS are the only models which have been used since they were approved, and they are the only (vapor dispersion) models used for the preparation of the JCE Terminal DEIS.³⁷⁹

According to the Oregon LNG DEIS, Oregon LNG also used FLACS and PHAST exclusively to model vapor dispersion distances. As a result, the methods underlying the DEIS' conclusions are obscured from the public view, preventing reviewers from engaging in a meaningful, expert review of the assumptions that underlie FERC's safety analysis. In the past, Riverkeeper and others have specifically addressed the technical

³⁷⁷ The Corps has a valid dredged material disposal easement on the proposed site of the Oregon LNG terminal. Hence, Oregon LNG does not actually control the property.

³⁷⁸ Exhibit 75 at 6.

³⁷⁹ *Id.*

aspects of how FERC applies its models, particularly the use of the DEGADIS model for assessing vapor dispersion at the Terminal.³⁸⁰

- *FERC underestimates the potential for and consequences of a cascading failure.* Havens and Venart wrote,

We believe the hazards attending the proposed operations at the Jordan Cove export facility could have the potential to rise, as a result of cascading events, to catastrophic levels that could cause the near-total and possibly total loss of the facility, including any LNG ship berthed there. Such an event could present serious hazards to the public well beyond the facility boundaries.³⁸¹

FERC does not fully assess how cascading events and a near-total loss of the facility could impact nearby homes, schools, businesses, and boats on the Columbia River.

FERC briefly addresses Sandia National Labs' acknowledgment of the potential for cascading events to impact LNG tankers in Section 4.1.13.7 of the DEIS. FERC draws the incorrect conclusion that the Sandia Labs report argues for disregarding cascading failures because a cascading event would prolong an LNG pool fire but not significantly increase its intensity. On the contrary, Havens and Venart argue that the Sandia report correctly acknowledges the potential for cascading events, particularly when there are heavier hydrocarbons present. Indeed, Havens and Venart explain that the potential for cascading failures has led GAO and Sandia to take on additional research:

As a result of the GAO report, Congress directed further research to be conducted by the Sandia National Laboratory. That research (thus far) concludes that the radiant heat fluxes from large LNG fires on water, which burn without much smoke, can exceed 300 kW/m², and that there are potential failure modes regarding LNG carriers that could lead to a ship being at risk of sinking.³⁸²

Unfortunately, FERC's analysis falls far short of actually assessing the consequences of the type of cascading event that Sandia suggests could be possible. FERC's analysis of cascading events at the Terminal boils down to Section 4.1.13.2 of the DEIS, which

³⁸⁰ Riverkeeper addressed FERC's use of the DEGADIS model in our 2008 Petition for Rehearing for the Bradwood LNG Terminal (CP05-365). It is unclear to what degree FERC has again relied on this model for reaching major conclusions. It is clear, however, that Oregon LNG did rely on two non-public models to support its analysis.

³⁸¹ *Id.* at 1.

³⁸² Exhibit 75 at 27.

states: “Fires and overpressures may also cause failures of nearby storage vessels, piping, and equipment if not properly mitigated. These failures are often termed cascading events or domino effects and can exceed the consequences of the initial hazard.”³⁸³ Yet, FERC fails to provide any meaningful analysis of how cascading failures of LNG tanks (either on vessels or at the Terminal) would actually impact surrounding areas. Even if a cascading event only prolongs an LNG fire (and does not increase its intensity), it could alter the impact felt by communities facing evacuation or destruction in the event of a large LNG spill associated with the Terminal or an LNG vessel.

- *FERC relies on design spills that do not capture the full range of possible risks.* Havens and Venart detail how FERC has allowed applicants to present a limited range of design spills, and how these smaller design spills (both in spill rate and duration) are “resulting from pressures on the applicants to seek approval of smaller and smaller required exclusion distance determinations.” Further, they write, “The calculations supporting the exclusion zone distance for the LNG ‘tanktop’ fire chosen by the applicant as the controlling ‘design spill’ fire do not consider potential cascading failure hazards to the public that could follow such a fire. We believe such failures have the potential to lead to structural failures of the LNG tank(s) which could lead to catastrophe.”³⁸⁴ Havens and Venart sum up their argument by stating, “when the calculated distances required to separate the public from the hazard became ‘unmanageable’ the release magnitudes (the so called “SOURCE” terms) were decreased.”³⁸⁵

In the case of the Oregon LNG Terminal, FERC fails to assess the impacts of potential catastrophic incidents at the facility with consequences that would extend beyond the property boundaries. It appears that FERC allows Oregon LNG to make unreasonable assumptions that allow modeling results to paint an unrealistically favorable picture of the hazards posed by an LNG terminal, as Havens and Venart suggest. In contrast, NEPA requires that FERC take a hard look at potential environmental impacts of the project, including events that may be more severe than the design spills presented by Oregon LNG.

Because FERC has replicated in the Oregon LNG DEIS many of the errors in the Jordan Cove DEIS that were pointed out by Havens and Venart, the DEIS presents an incomplete and inaccurate picture of the public safety hazards associated with the project.

³⁸³ DEIS at 4-375.

³⁸⁴ Exhibit 75 at 5.

³⁸⁵ *Id.* at 25

10.11.1.3 Impermissible Reliance on Conditions.

The DEIS acknowledges the incompleteness of its analysis when it requests key studies and analyses that should already exist and underpin the conclusions FERC reaches in the DEIS. For example, FERC's analysis assumes that impingement shrouds will "mitigate the high momentum jetting and flashing releases" associated with a large LNG release. Yet, FERC also writes, "Prior to the end of the comment period on the draft EIS, Oregon should file with the Secretary a computational fluid dynamic analysis of the mechanical fragmentation of the liquid into droplets, heat transfer effects and vaporization, liquid and vapor fractions, trajectories, velocities, and turbulence within and exiting the shroud."³⁸⁶

By its own admission, FERC's DEIS relies on mitigation measures that require further study. Specifically, FERC lists recommendations for Oregon LNG to provide critical technical information for evaluating the safety risks with the Oregon LNG terminal.³⁸⁷ FERC requests:

44. Prior to the end of the comment period on the draft EIS, Oregon shall file with the Secretary technical substantiation for the use of 10 minute exposure times for the toxic releases. If any exposure times would exceed 10 minutes, the AEGL durations shall be at least the exposure duration. (EIS section 4.1.13)

45. Prior to the end of the comment period on the draft EIS, Oregon shall file with the Secretary a toxic dispersion analysis for the NGL design spills that accounts for hexane and mercaptans, in addition to the benzene, toluene and xylene content. (EIS section 4.1.13)

46. Prior to the end of the comment period on the draft EIS, Oregon shall file with the Secretary a computational fluid dynamic analysis of the mechanical fragmentation of the liquid into droplets, heat transfer effects and vaporization, liquid and vapor fractions, trajectories, velocities, and turbulence within and exiting the shroud. (EIS section 4.1.13)

47. Prior to the end of the comment period on the draft EIS, Oregon shall file with the Secretary adequate validation for the revised model that was used to analyze overpressures. Alternatively, Oregon LNG shall provide acceptable mitigation to prevent public impacts due to 1 psig overpressures that are modeled to the ½ psig to account for uncertainty in the model. (EIS section 4.1.13)

³⁸⁶ DEIS at 4-393.

³⁸⁷ *Id.* at 5-43.

The exclusion of the above-referenced technical reports and studies undermines the public's ability to verify the conclusions put forward in the DEIS, which generally concludes that hazards from the Oregon LNG site can be mitigated to acceptable levels. FERC should not have released the DEIS without these studies. Furthermore, FERC presumes that the contents of these documents will support the conclusions FERC reaches in the DEIS.

FERC does not provide any detailed information on how hazards will impact surrounding areas if the proposed mitigation does not operate as anticipated, which is particularly troubling because of the close proximity of homes to the Terminal. For example, if "jetting and flashing releases" exceed expected levels, could they impact the condominium complex 0.5 miles from the Terminal, or fishing boats on the Columbia River? In this case, FERC's analysis fails to reach reliable conclusions because the DEIS relies on incomplete technical information.

As indicated by the missing studies above, the DEIS fails to address accurately the hazards from vapor dispersion zones around the proposed Terminal resulting from an NGL spill releasing hydrogen sulfide,³⁸⁸ benzene,³⁸⁹ and other toxic substances. Toxic vapors produced at the terminal site could impact homes, businesses, and boaters near the LNG terminal site. The DEIS admits that it has failed to produce an analysis of the vapor dispersion of hexane and mercaptans.³⁹⁰ Further, the DEIS acknowledges that the DEIS' assumed 10-minute exposure time lacks "technical substantiation," rendering it an arbitrary basis for determining the impacts of the Oregon LNG project.³⁹¹ Because of the close proximity of homes and public areas (such as the Columbia River and Skipanon River) where people may linger longer than 10 minutes and where toxic vapors may be released, FERC must take a hard look at how dangerous vapor releases could impact the public. FERC should do this analysis with the benefit of key information requested as conditions of the DEIS.

Unfortunately, FERC couples its incomplete analysis with unreasonable assumptions about potential public exposure scenarios. The DEIS' incomplete vapor dispersion modeling shows that toxic vapors could reach areas used by recreational boaters, hunters, birder, hikers, and workers at the mill. Yet FERC writes, "Oregon LNG indicated that all of the toxic dispersion distances remained outside of areas containing residences, parks, hospitals, churches or other sensitive areas...this release scenario would not be considered a significant impact on public receptors." In contrast to FERC's conclusion, Figure 4.1.13-10 shows toxic benzene levels encompassing the entire Skipanon River, reaching the mill across the River, and impacting areas that are incorporated into the network of trails on the Skipanon Peninsula. Clearly, the

³⁸⁸ DEIS at 4-407.

³⁸⁹ *Id.* at 4-408.

³⁹⁰ *Id.* at 4-409.

³⁹¹ *Id.* at 4-407

Draft EIS demonstrates that an accidental release of NGL and a related release of toxic vapors from the Oregon LNG facility will pose a threat and safety concern for vessels that transit through the Skipanon River.³⁹² FERC’s analysis dismisses arbitrarily the potential impacts on boaters that transit the mouth of the Skipanon River during their exit and return to the Skipanon and Warrenton marinas. As a result, not only is FERC’s technical analysis incomplete, but FERC also dismisses the obvious conclusions of Oregon LNG’s modeling – that toxic vapors could impact members of the public in the case of an NGL spill and other toxic releases.

Similarly, FERC draws conclusions about the risks of overpressure events (explosions), but admits that it lacks a full technical understanding of the potential risks. FERC writes that the models used to assess overpressures have not been adequately validated.³⁹³ Additionally, FERC notes that the final design of the Terminal may contribute to an increase in explosion risks, stating, “Piping and equipment arrangements may differ in final design, potentially resulting in increased congestion or confinement in the liquefaction area and an increase in the overpressure distance.”³⁹⁴ Despite these caveats and two suggested conditions that require revised analysis of potential overpressure risks, FERC concludes, “the siting of the project facilities with the proposed recommendations would not have a significant impact on public safety.”³⁹⁵ FERC’s own general description of the consequences of an overpressure event contradict the idea that public safety hazards are insignificant:

The failure of a pressurized vessel could cause fragments of material to fly through the air at high velocities, posing damage to surrounding structures and a hazard for operating staff, emergency personnel, or other individuals in proximity to the event. In addition, failure of a pressurized vessel when the liquid is at a temperature significantly above its normal boiling point could result in a boiling liquid expanding-vapor explosion (BLEVE). BLEVEs can produce overpressures when the superheated liquid rapidly changes from a liquid to a vapor upon the release from the vessel. BLEVEs of flammable fluids may also ignite upon release and cause a subsequent fireball.³⁹⁶

FERC must have a complete, accurate assessment of explosion and “fireball” risks at the Terminal. There are homes, businesses, and public areas well within a range of the hazards described above, although the DEIS does not provide a details assessment of how an explosion at the Terminal could harm Warrenton residents or people using the Columbia or Skipanon Rivers.

³⁹² DEIS at 4-408. Figure 4.1.13-9 (hydrogen sulfide vapor dispersion resulting from an acid gas spill) and DEIS 4-409, Figure 4.1.13-10 (dispersal of benzene vapor resulting from an NGL spil)

³⁹³ *Id.* at 4-405

³⁹⁴ *Id.* at 4-406

³⁹⁵ *Id.*

³⁹⁶ *Id.* at 4-375.

By relying on incomplete information, FERC fails to address how explosions at the Terminal could impact the surrounding community.

In a related issue, Havens and Venart dispute FERC's methodology regarding explosion risks, and they specifically note that FERC "must surely be aware of the serious potential for an unconfined vapor cloud explosion to extend well beyond the limits of the flammable cloud boundary," and criticize FERC for omitting "the potential for LNG clouds that contain small amounts of heavier-than-methane hydrocarbons to develop damaging overpressures."³⁹⁷ The Oregon Department of Energy also questioned FERC's public safety analysis and its focus on modeling for methane-only risks, to which FERC responded, "The presence heavier hydrocarbons such as ethane and propane and imported LNG with concentrations from 86 to 96 percent methane are discussed in section 4.1.13.6 of the EIS."³⁹⁸ Unfortunately, although FERC notes the presence of heavier hydrocarbons, the agency does not adequately integrate the risks posed by these heavier hydrocarbons in its still-incomplete assessment of explosion risks. This error compounds many others described by Havens and Venart. It demonstrates that, without an in-depth and independent review of Oregon LNG's proposal, FERC cannot reasonably conclude that the proposed Terminal will have an insignificant impact on public safety.

10.11.1.4 Recent LNG Terminal Safety Breaches.

FERC ignores LNG safety breaches that demonstrate the potential public safety risks associated with LNG terminals and their related infrastructure. FERC's DEIS concludes that the Terminal will have negligible public safety impacts and characterizes LNG-related incidents as "very unlikely." FERC's conclusion is arbitrary. Specifically, FERC must consider international and domestic LNG accidents, including the following examples.

- *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 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.

³⁹⁷ Exhibit 75 at 13.

³⁹⁸ DEIS Volume II, Appendix C1 at C-4.

- *Cove Point, Maryland, 1979.* LNG leak from a high-pressure pump found its way into an electrical conduit.
- *Nevada Test Site, Mercury, Nevada, 1987.* An accidental ignition of an LNG vapor cloud occurred at the U.S. Department of Energy Nevada Test Site in August 1987.
- *Savannah, Georgia, March 14, 2006.* A potentially disastrous spill was averted 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, Cape Cod, Massachusetts, 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 corralled by four tugboats about 25 miles east of Provincetown.

In addition, FERC must consider the recent LNG leak and evacuation at an LNG peak-shaving and storage facility in Plymouth, Washington. FERC mentions the March 31, 2014 Plymouth incident briefly on page 4-376 of the DEIS, stating:

On March 31, 2014, an explosion and fire occurred at Northwest Pipeline Corporation's LNG peak-shaving facility in Plymouth, Washington. The facility was immediately shut down, and emergency procedures were activated, which included notifying local authorities and evacuating all plant personnel. No members of the public were injured. The accident investigation is still in progress. Once developed, measures to address any causal factors which led to this incident will be applied to all facilities under Commission jurisdiction.³⁹⁹

FERC's description overlooks key details of the Plymouth event that could inform FERC's analysis of how the Terminal would potentially impact the City of Warrenton and boat traffic on the Columbia River. First, local first responders evacuated a 2-mile radius around the Plymouth LNG facility.⁴⁰⁰ According to one local news report,

³⁹⁹ DEIS at 4-376

⁴⁰⁰ Exhibit 88 (Tri-City Herald, Update: Evacuation radius near Plymouth plant to be reduced (Mar. 31, 2014)); *See also* Exhibit 89 (Tri-City Herald, Update: 5 injured in natural gas explosion, fire near Plymouth (Mar. 31, 2014)).

Up to 1,000 residents and agricultural workers were evacuated from a two-mile radius around Northwest Pipeline in south Benton County after the explosion, which caused slow leaks from a massive storage tank and injured five people.

Hazardous materials experts entered the liquefied natural gas facility Monday afternoon for the first time nearly eight hours after the initial explosion and fire inside a building at Northwest Pipeline, a subsidiary of Williams Partners.

The 8:22 a.m. explosion sent shrapnel into a 14.6-million-gallon storage tank, rupturing it and starting the gradual leak of super-cold liquefied natural gas. Williams Partners officials say the tank was only one-third full.

A Washington State Patrol robot and a Williams Partners helicopter were sent in Monday afternoon. Joe Lusignan, Benton County Sheriff's Office spokesman, said the hazardous material experts assessed damage after reviewing information gathered by the robot and helicopter.

The evacuation remained in place Monday night and Highway 14 between Interstate 82 and Paterson was closed, he said. Officials encouraged citizens to stay out of the area.

Traffic also was shut down on the Columbia River and the rail lines near the plant.⁴⁰¹

As noted in the news report, the Plymouth evacuation involved more than just “plant personnel,” in contrast to the description of the incident in FERC’s DEIS. Moreover, the evacuation and nearby closures were severely disruptive to regional river and highway traffic, closing both for hours. Lastly, experts were unable to re-enter the facility for almost eight hours after the initial incident and leak began. A similar evacuation radius, if applied to the Warrenton/Astoria area, would involve a closure of the Columbia River shipping channel, closure of Highway 101, evacuation of most of Warrenton, and evacuation of part of Astoria for a prolonged time period. Additionally, the Astoria Regional Airport is within 2 miles of the LNG storage tanks proposed in Warrenton and may have to be evacuated in a Plymouth-style incident. FERC’s DEIS draws no meaningful lessons from the 2014 incident at Plymouth, WA, choosing instead to minimize the significance of the event.

The Plymouth incident is important because it demonstrates that FERC has failed to assess how regional first-responders would realistically react to an LNG terminal. The City of Astoria raises this issue in its recent comments to FERC.⁴⁰² FERC states in its DEIS, “No major

⁴⁰¹ *Id.*

⁴⁰² Exhibit 87 (City of Astoria Letter to FERC and Resolution on Oregon LNG (Sept. 10, 2015)).

or critical infrastructure is within the vapor dispersion or thermal exclusion zones surrounding the LNG terminal.”⁴⁰³ Notwithstanding FERC’s failure to accurately develop an analysis of the vapor dispersion and thermal exclusion zones (discussed above) under CFR 193, there is major and critical infrastructure that would fall within the evacuation zone if a large LNG release occurred similar to the incident in Plymouth. FERC must consider how a Plymouth-like incident at the proposed Terminal would impact the Astoria-Warrenton area.

10.11.1.5 Air Traffic Safety Impacts.

The DEIS does not address whether LNG tankers may cross the flight path of planes heading to and from the Astoria Regional Airport in Warrenton. The Astoria Regional Airport is within two miles of the proposed Terminal and the LNG storage tanks will be in the flight path of the airport. The DEIS states:

Oregon LNG would place navigation lights on the LNG storage tanks and minimize the overall height of the tanks by mounting any ladders, walkways, valves, and vent lines on the side of the storage tanks. In addition, Oregon LNG would upgrade the radio navigational system at the Astoria Regional Airport. These measures would allow for the intrusion of the LNG storage tanks into the navigation airspace without disrupting visual or instrument flight paths.⁴⁰⁴

The DEIS does not address the potential for LNG tankers to enter into the protected airspace of the Astoria Regional Airport, nor does it address the risks posed by incoming and outgoing flights to the safety of LNG vessels. Additionally, according to the DEIS, the “FAA reviewed the location of the LNG storage tanks on the East Skipanon Peninsula in relation to flight operations at the Astoria Regional Airport and determined the storage tanks pose no hazard *to* air navigation (FAA, 2011).” However, the FAA did not undertake a detailed review of the risk posed to the Terminal *from* air navigation. The FAA did not account for the unique and spectacular risks posed by LNG storage tanks (which are different than other, more inert potential flight path obstructions) in the path of the Astoria Regional Airport. Instead, the FAA was focused on taking a narrow review of the terminal’s potential impact on air traffic, not the reverse impact of errant air traffic on the Terminal.

The DEIS must take a hard look at the risks that the FAA did not consider—namely, the potential for an errant plane to crash, either accidentally or intentionally, into the LNG terminal or an LNG tanker. FERC does not address the consequences of an aircraft colliding with the

⁴⁰³ DEIS at 4-289.

⁴⁰⁴ *Id.* at 5-19.

Terminal or an LNG tanker other than to agree with the FAA that the Terminal should pose no threat to the aircraft.

10.11.1.6 Emergency Response Plan.

FERC relies on the efficacy of emergency response procedures to conclude that the public safety risks of the Terminal can be mitigated. FERC requires, as a suggested condition, that a final emergency response plan (ERP) be developed prior to the commencement of project construction, which occurs well after the closure of the public comment process and issuance of a FERC license. The DEIS states:

In accordance with the EPAct, Oregon LNG's emergency response plan (ERP) must offer a Cost-sharing Plan, and outline how Oregon LNG would fill resource gaps and supplement the first-responder capabilities of the local jurisdictions. Oregon LNG would be required to file a final ERP including a Cost-sharing Plan for review and approval by the Director of OEP prior to the beginning of project construction activities. The Cost-sharing Plan included in the ERP would address comments that the emergency response for the project would not place an undue burden on local resources. Other than the services of local first responders, construction and operation of the LNG terminal would not have any other adverse impacts on local infrastructure and public services.⁴⁰⁵

As demonstrated above, FERC relies on yet undeveloped plans to reach conclusions about the adequacy of Oregon LNG's emergency response planning. NEPA requires, to the greatest extent possible, disclosure of mitigation measures that will be relied upon to address public safety hazards. In this case, because of the extraordinary public safety hazards involved in the development of an LNG terminal, NEPA requires that FERC provide more detail about the type of equipment, procedures, and personnel that would be involved in mitigating safety risks.

10.11.2 Pipelines.

FERC's analysis fails to take a hard look at the environmental and public safety impacts from the Pipelines. While characterizing the risks of a pipeline failure as "very low," FERC provides only a general analysis that fails to specifically address how local communities would be impacted in the event of a pipeline rupture, leak, and fire. FERC states,

The available data show that natural gas transmission pipelines continue to be a safe, reliable means of energy transportation. From 1994 to 2013, there were an average of 62 significant incidents, 10 injuries, and 2 fatalities per year. The

⁴⁰⁵ DEIS at 4-291.

number of significant incidents over the more than 303,000 miles of natural gas transmission lines indicates the risk is low for an incident at any given location. The operation of the Oregon LNG Project would represent a slight increase in risk to the nearby public.⁴⁰⁶

FERC's analysis is inadequate because it sidesteps the key issue: Oregon LNG and WEP are proposed for construction in exceptionally rugged terrain prone to landslides, seismic events, floods and other risks that increase the risk of catastrophic pipeline failures. Elsewhere in the DEIS, FERC acknowledges, "Steep slopes and unstable underlying geologic formations are common in the Coast Range (crossed by the pipeline between MPs 6.0 and 80.0). This area has the greatest potential for landslides and the associated risks that may result from a significant landslide event (*e.g.*, potential pipeline rupture and associated fire risk)," but the DEIS stops short of providing a detailed analysis of how public safety and environmental resources in the Coast Range would be impacted by a pipeline-caused fire.⁴⁰⁷

The DEIS cites regulations on pipeline safety, but fails to conduct a site-specific, in-depth analysis of how rural communities and natural resources would be impacted by a pipeline rupture. Instead, FERC writes, "high pressure gas lines can rupture when subjected to permanent ground deformation due to landslides, and explode if an ignition source is available. A pipeline rupture due to a landslide has potential to cause injury or death and can lead to forest fires. Additional information on pipeline reliability and safety is provided in section 4.1.13.10."⁴⁰⁸ The section FERC cites (4.1.13.10) is entitled "Facility Security and LNG Vessel Safety," *and it does not address pipeline safety whatsoever*. Elsewhere in Section 4.1.13.13, FERC briefly addresses community impacts from the Pipeline and asserts that "DOT pipeline safety regulations described above are designed to ensure minimum requirements for safety of all populations."⁴⁰⁹

The DEIS should identify the consequences of a pipeline rupture and resulting fire at key sensitive locations along the pipeline route, as well as on a section-by-section basis. FERC's analysis should identify impacts to sensitive natural resources, hard-to-access segments of pipeline, and rural communities like Vernonia where residents would be impacted by a pipeline incident. FERC should undertake an analysis of how a natural gas pipeline fire could trigger or worsen a forest fire, and how the presence of a high-pressure, non-odorized gas pipeline could

⁴⁰⁶ DEIS at 4-439.

⁴⁰⁷ *Id.* at 4-22.

⁴⁰⁸ *Id.* at 4-24.

⁴⁰⁹ *Id.* at 4-436.

complicate firefighting activities.⁴¹⁰ Lastly, FERC provides little analysis of how nearby homes would be impacted by a pipeline fire or the evacuation resulting from a fire, and dismisses the issue because only two homes are within 50 feet of the proposed route.⁴¹¹ In contrast, there are 740 homes close to the WEP Pipeline, and FERC does not detail additional safety measures for these residences during operation of the pipeline. During construction, the WEP Pipeline ponders actually relocating some residents during peak construction, an indication that pipeline construction activities will be both disruptive and potentially unhealthy for nearby residents.

10.11.2.1 Oregon LNG Pipeline and Emergency Response.

The DEIS fails to disclose how local first responders would deal with a pipeline incident in small, rural communities near the Pipelines. Critically, FERC fails to address how communities in the Coast Range near the Pipeline route are poorly equipped to handle pipeline fires or the secondary fires they would create. Comments from Oregon Department of Energy, the City of Vernonia, and others have identified the lack of emergency response resources as a critical shortcoming of Oregon LNG's proposed Pipeline. FERC glosses over the issue in the DEIS, stating:

Several comments were received indicating the concern that the project may result in a strain on current fire protection resources in the case of an emergency involving the LNG terminal and associated pipeline. The DOT is mandated to provide pipeline safety, and the DOT pipeline standards are published in 49 CFR Parts 190-199. Part 192 of 49 CFR specifically addresses natural gas pipeline safety issues. Part 192 requires that each operator must establish and maintain liaison with appropriate fire, police, and public officials to learn the resources and responsibilities of each organization that may respond to a natural gas pipeline emergency and to coordinate mutual assistance. The operator must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials.⁴¹²

FERC also writes:

As discussed in section 4.1.13.10, because of current safety regulations governing the construction design, monitoring, and operation of interstate natural gas pipelines, the potential for an accident involving the pipeline is very low. The pipeline would be safely installed and operated according to DOT regulations, and

⁴¹⁰ See Exhibit 16 (Letter from Oregon Department of Forestry to FERC, Comments on NEPA Scoping for Oregon LNG Bidirectional Project (Dec. 13, 2012)).

⁴¹¹ *Id.*

⁴¹² DEIS at 4-306.

would not be a threat to public safety. In addition, Oregon LNG would have an integrity management plan in place to minimize the potential for an accident and an emergency plan that includes procedures to minimize the hazards in a natural gas pipeline emergency (see section 4.1.13.10). Additionally, Oregon LNG would provide the appropriate training to local emergency service personnel before the pipeline is placed in service, establish and maintain liaison with emergency responders and public officials, One-Call Center participation, and a Pipeline Education and Awareness Program. Therefore, the pipeline would not have significant adverse impacts on local police, fire departments, or hospitals.⁴¹³

Finally, and most alarmingly, FERC states, “No additional specialized local fire protection equipment would be required to handle operational pipeline emergencies.”⁴¹⁴ FERC’s analysis does not provide for any additional personnel in small, understaffed rural fire protection districts.

Once again, FERC addresses safety concerns about the pipeline by referencing Section 4.1.13.10 of the DEIS, *which does not discuss the pipeline whatsoever*. Elsewhere in the DEIS, FERC gives a cursory analysis of emergency response planning and cost-sharing. The DEIS makes a recommendation that these issues be resolved “prior to initial site preparation,” but it is unclear if the requirement applies to the pipeline, at all. The bulk of discussion around emergency response planning revolves around the Terminal, despite the State of Oregon⁴¹⁵ and the City of Vernonia⁴¹⁶ specifically raising the issue of emergency response preparedness along the pipeline route. FERC concludes that “because of current safety regulations governing the construction design, monitoring, and operation of interstate natural gas pipelines, the potential for an accident involving the pipeline is very low. The pipeline would be safely installed and operated according to DOT regulations, and would not be a threat to public safety,”⁴¹⁷ but the DEIS does not provide a detailed analysis of how Pipeline or WEP Pipeline will address hazards specific to different areas of the proposed routes.

Without supporting rationale, FERC concludes there is no need for additional equipment or resources in rural communities that would be burdened by pipeline-related hazards. Instead, FERC accepts Oregon LNG’s assertion that additional training and communication will augment current firefighting and other first responder capacities. FERC does not provide adequate information about the specific resources in place to handle a pipeline fire, explosion, or secondary fires that result from a pipeline accident. The DEIS simply lists the local rural fire protection districts without offering an assessment of their relative capacities. The DEIS states,

⁴¹³ *Id.*

⁴¹⁴ *Id.* at 4-436.

⁴¹⁵ DEIS, Volume II, Appendix C at c-4.

⁴¹⁶ *See* Exhibit 107 (City of Vernonia Resolution on Oregon LNG (May 18, 2015)).

⁴¹⁷ DEIS at 4-306.

“There are also 7 fire departments and 260 firefighting and other protective service workers in these areas.”⁴¹⁸ The DEIS appears to be asserting that these rural fire protection districts are adequately staffed to handle a pipeline emergency, but it fails to recognize that most of the rural fire protection districts are already over-stretched and heavily reliant on volunteer support.⁴¹⁹ FERC’s conclusion that “the pipeline would not have significant impacts on local police, fire departments, or hospitals” is arbitrary. FERC’s analysis fails to consider the burdens already placed on remote, rural fire departments that face a bevy of challenges in communicating with one another in areas that lack cell phone coverage in rugged, wildfire-prone coastal forests.

In Appendix C of the DEIS, FERC notes that Oregon Department of Energy specifically requested that emergency response resources be provided for the Pipeline. Oregon Department of Energy wrote, “The FERC should require an applicant to commit to covering 100 percent of the safety and security costs directly associated with the LNG vessel transits, the facility, and the pipeline.”⁴²⁰ FERC responded, “We included a recommendation that the Emergency Response Plan include a Cost-Sharing Plan identifying the mechanisms for funding all project-specific security/emergency management costs that would be imposed on state and local agencies. This is discussed in section 4.1.13.9 of the EIS.” The section of the DEIS referenced in this passage (4.1.13.9) does not meaningfully address preparedness of local communities along the Pipeline route. In fact, language regarding the Emergency Response Plan and Cost-Sharing Plan seem focused on the Terminal, rather than the Pipeline, and place requirements on the Terminal operator, not the Pipeline operator.

To date, rural communities have not been meaningfully engaged in assessing the potential resource gaps in the proposed Pipeline route, and the DEIS provides only a cursory analysis of the public safety issue. Proposed conditions as explained in Section 4.1.13.9 do not address potential pipeline hazards and safety and security costs, but are rather specifically focused on the LNG Terminal and LNG vessels.

10.11.2.2 WEP Pipeline and Emergency Response.

The DEIS contains an inadequate analysis of safety risks and emergency response capacity for the WEP Pipeline. FERC’s public safety analysis revolves around the assumption that, because 94 percent of the WEP pipeline would be constructed in an existing pipeline right-of-way, public safety impacts would not significantly differ than those expected for the existing pipeline. However, the DEIS notes that, “About 740 residences would be within 50 feet of the construction right-of-way and ATWS, and Northwest has prepared site-specific construction

⁴¹⁸ DEIS at 4-305.

⁴¹⁹ See Exhibit 108 (The Daily Astorian, Staff raps LNG firm over pipeline (July 2010)).

⁴²⁰ DEIS Volume II, Appendix C at C-2

plans for these residences. Northwest would reduce or offset the construction right-of-way for short distances to avoid houses and minimize impacts.”⁴²¹ The site-specific construction plans for residences close to the pipeline do not consider the long-term increased public safety risk of homes being located in such close proximity to two high-pressure, non-odorized natural gas pipelines.

FERC should take a hard look at the impacts to homes and communities in the path of the WEP Pipeline. This includes assessing impacts to residences and elder care facilities that would be uninhabitable during construction of the pipeline.

10.11.2.3 Oregon Department of Energy Safety Standard Recommendations.

Oregon Department of Energy suggested to FERC that the Pipeline should be constructed as a Class 3 pipeline (not Class 1, with the lowest standards). The State of Oregon also suggested that the mainline block valve spacing be reduced to limit hazards along the route near populated areas.⁴²² In response to the Oregon Department of Energy, FERC states:

As described under pipeline safety in section 4.1.13.13 of the EIS, under a Memorandum of Understanding on Natural Gas Transportation Facilities dated January 15, 1993 between the DOT and FERC, the DOT has the exclusive authority to promulgate federal safety standards used in the transportation of natural gas. Section 157.14(a)(9)(vi) of FERC’s regulations requires that an applicant certify that it will design, install, inspect, test, construct, operate, replace, and maintain the facility for which a Certificate is requested in accordance with federal safety standards and plans for maintenance and inspection. Alternatively, an applicant must certify that it has been granted a waiver of the requirements of the safety standards by the DOT in accordance with Section 3(e) of the Natural Gas Pipeline Safety Act. The FERC accepts this certification and does not impose additional safety standards for pipeline facilities.⁴²³

Despite the State of Oregon’s suggestion that there are readily available mitigation measures that could help to lessen pipeline hazards, FERC did not conduct a meaningful analysis of the potential benefits of using stricter construction standards. In addition, FERC declined to consider additional mitigation measures for pipeline safety hazards in the landslide-prone

⁴²¹ DEIS at 5-21

⁴²² DEIS Volume II, Appendix C at C-5.

⁴²³ *Id.*

Oregon Coast Range. In doing so, FERC fails to evaluate a reasonable alternative for mitigating the projects' risks.

FERC also ignores the Oregon Department of Energy's recommendations on block valve spacing. FERC allows the Pipeline to propose mainline block valve spacing in excess of 19 miles in rugged Clatsop County. Because of this excessive spacing between block valves, a pipeline rupture would require a much longer time before the gas in the line was fully vented or consumed by a fire. As a result, Oregon Department of Energy asked FERC to consider closer spacing of mainline block valves to reduce the hazard during a pipeline rupture and/or fire. As discussed below, this is the same area where the Pipeline has not yet produced detailed lateral spreading maps. Yet, FERC fails to consider tighter block valve spacing in areas where the DEIS already acknowledges that geologic hazards may be very significant and are not yet fully understood. Not only is Pipeline's proposed mainline valve spacing inadequate for protecting public safety, but FERC's arbitrary dismissal of closer spacing contradicts NEPA's requirement for FERC to consider project alternatives that mitigate potential human health and environmental hazards. FERC should revise the DEIS include a detailed consideration of pipeline construction methods as a reasonable mitigation for the extraordinary landslide, erosion, and fire risks in Oregon's Coast Range.

10.12 Climate Change.

The DEIS fails to take a hard look at the projects' greenhouse gas emissions and contributions to climate change. This project would represent a significant investment in facilities for the production and transportation of natural gas, a fossil fuel the use of which directly contributes to greenhouse gas emissions and climate change. By authorizing such a project FERC would be implicitly supporting a policy of continuing to invest in and expand our infrastructure for using fossil fuels. Such a policy directly undermines recent efforts, supported by state and federal policies, to reduce greenhouse gas emissions. FERC must revise the DEIS to do the following:

- Provide a clear statement of the Projects' total greenhouse gas emissions (including indirect emissions).
- In that statement, reflect best available science regarding the impact of non-carbon-dioxide greenhouse gas emissions (*e.g.*, methane).
- Include, in the indirect effects analysis, emissions associated with producing the electricity consumed by the project and increased production in natural gas caused by the project.
- Include climate in the cumulative effects analysis.
- Discuss the impact, rather than merely the amount, of greenhouse gas emissions, by:

- Estimating the social cost of these emissions, and
- Evaluating the impact of these emissions on Oregon and Washington greenhouse gas emission reduction targets.

10.12.1 Total Greenhouse Gas Emissions.

The DEIS fails to address total greenhouse gas emissions. This includes failing to state the tonnage of greenhouse gases that emitted by the Terminal and Pipelines' operation. Nowhere in the DEIS does FERC provide a comprehensive statement of total emissions. Instead, operational emissions are discussed on at least five separate tables, spread across three hundred pages of the DEIS.⁴²⁴ The DEIS's brief section titled "Climate Change," section 4.3.1.13, states that FERC can do no more than quantify the Projects' greenhouse gas emissions, but this section fails to provide any such quantities.

The DEIS indicates that project operations will lead to nearly four million tons of per year of greenhouse gas emissions. In reaching this total, commenters were forced to start by summing seven different values spread across three tables.⁴²⁵ Commenters were then forced to compute the differences in emissions for each of the five compressor stations along the Pipeline, because the DEIS inexplicably provides baseline and projected future emissions without stating the change.⁴²⁶ Based on the sum of these values, the DEIS acknowledges 3,730,667 tons per year of carbon dioxide equivalent emissions.

While FERC must plainly state the project's total emissions, the actual total is much higher than this amount. FERC must revise the DEIS to reflect current science regarding non-carbon-dioxide greenhouse gases and to incorporate indirect effects of the project.

10.12.2 Outdated Global Warming Potentials.

The DEIS purports to account for impacts of emissions of non-carbon-dioxide greenhouse gases by converting these emissions to their "CO₂-equivalents."⁴²⁷ In so doing, the DEIS fails to account for the Intergovernmental Panel on Climate Change's (IPCC) 2013 revisions to the estimate of these gases' impacts.⁴²⁸ The DEIS recognizes the IPCC as the "leading international, multi-governmental scientific body for the assessment of climate

⁴²⁴ See DEIS Tables 4.1.12-7, 4.1.12-8, 4.2.12-1, 4.2.12-13, 4.2.12-14.

⁴²⁵ DEIS Tables 4.1.12-7, 4.1.12-8, and 4.2.12-1; Table 4.2.12-1 provides five different emission quantities without providing a total.

⁴²⁶ Compare DEIS Table 4.2.12-13 to Table 4.2.12-14

⁴²⁷ DEIS 4-347.

⁴²⁸ Exhibit 110 (IPCC, Climate Change 2013: Physical Science Basis, Annex III: Glossary, 1455).

change.”⁴²⁹ In the IPCC’s most recent assessment, the IPCC stated that the “better estimates” of the impact of methane and other non-CO₂ greenhouse gases should account for “climate-carbon feedback[s].”⁴³⁰ IPCC concluded that better estimate of the 100-year global warming potential of fossil methane was 36,⁴³¹ as opposed to the estimate of 25 FERC used here.⁴³² The IPCC concluded that on a 20-year basis, the global warming potential of methane was 87. DOE has acknowledged that these estimates are the “most appropriate for use today and that climate carbon feedbacks should be captured in the [global warming potential].”⁴³³

The DEIS only identifies greenhouse gas emissions by individual greenhouse gas, rather than by aggregate CO₂ equivalent, in Table 4.2.12-13. The overwhelming majority of emissions in that table are methane emissions; using the correct 100-year global warming potential increases the CO₂e total from 95,988⁴³⁴ to 138,139, a 44% increase. Although methane presumably represents a lower share of greenhouse gas emissions from the remainder of the project, the DEIS provides no information on this issue.

10.12.3 Foreseeable Indirect Emissions of Greenhouse Gases.

The DEIS also fails to account for indirect effects on greenhouse gas emissions. A primary source of indirect emissions will be the additional natural gas production that will be induced by these projects. We discuss those emissions below.

Generating electricity consumed by the Terminal would also be a major source of indirect greenhouse gas emissions. The DEIS is unlawfully and entirely silent as to this foreseeable indirect effect.

The primary component of the Terminal will be “two identical liquefaction trains with capacity of 4.5 MTPA each.”⁴³⁵ Although the DEIS is silent as to the design or manufacturer of these liquefaction trains, the DEIS implicitly acknowledges that operating these electric facilities will require significant upgrades to the electric transmission grid.⁴³⁶ Material submitted by

⁴²⁹ DEIS 4-680.

⁴³⁰ Exhibit 110 at 714.

⁴³¹ *Id.*

⁴³² DEIS 4-347.

⁴³³ Department of Energy, Cameron LNG, LLC, Dkt. 11-162-LNG, DOE/FE Order 3391-B, at 29 (Sept. 24, 2015)

⁴³⁴ 95,988 appears to be a typographical error; combining the listed 3,831 tons of methane, at a global warming potential of 25, with the listed 223 tons of carbon dioxide produces a total of 95,998 (ten additional tons per year).

⁴³⁵ DEIS 2-8.

⁴³⁶ *See, e.g.*, DEIS 2-9, 2-23 to 2-24.

Oregon LNG states that the Terminal will require 400 megawatts of electricity for terminal operation,⁴³⁷ with an additional 40 megawatts for the Columbia County pipeline compressor station.⁴³⁸ This DEIS indicates that this power will be required “24 hours per day, 7 days per week (8,760 hours per year).”⁴³⁹ Thus, the Terminal will apparently require approximately 3,854,400 megawatt hours of electricity per year of operation.

Generation of this electricity would emit significant amounts of air pollution, including but not limited to greenhouse gases. These emissions are a foreseeable (indeed, inevitable) consequence of the project. Accordingly, they cannot be ignored in the EIS.

Moreover, EPA has developed tools that allow FERC to estimate the quantity of these emissions. EPA has created the Emissions & Generation Resource Integrated Database (eGRID),⁴⁴⁰ which can be used to estimate air pollution impacts associated with adding marginal units of electricity demand at the level of subregions, states, or by utility.⁴⁴¹ The eGRID database uses detailed information on historical emissions from electric generating units throughout the United States and associated transmission constraints to define emission rates for each subregion. The database conveniently provides emission rates in units of pounds per megawatt-hour (lb/MWh) for the three main greenhouse gases (CO₂, CH₄, and N₂O) as well as for the two primary air pollutants associated with power production (SO₂ and NO_x, with NO_x given in annual NO_x rates and ozone season NO_x rates). FERC has *already used this tool* in discussing the indirect impacts of generating electricity to supply another export project that will use electrically-driven liquefaction equipment: the Freeport, Texas Project.⁴⁴² FERC provides no explanation for wholesale failure to address these impacts here.

eGRID, when used with the outdated global warming potentials provided in the DEIS and an assumption of 7 percent transmission and distribution losses, estimates that generating a

⁴³⁷ LNG Development Company, LLC’s February 28, 2014 response to FERC August 1, 2013 data request (Ascension No. 20140228-5304).

⁴³⁸ DEIS 1-2.

⁴³⁹ DEIS 4-338.

⁴⁴⁰ See <http://www.epa.gov/cleanenergy/energy-resources/egrid/index.html> (last visited Sept. 25, 2015.). Information for 2010, for example, is provided at http://www.epa.gov/cleanenergy/documents/egridzips/eGRID_9th_edition_V1-0_year_2010.zip (last visited Sept. 25, 2015).

⁴⁴¹ EPA, *How to use eGRID for Carbon Footprinting Electricity Purchases in Greenhouse Gas Emission Inventories* (July 2012), available at

<http://www.epa.gov/ttnchie1/conference/ei20/session3/adiem.pdf> (last visited Sept. 25, 2015).

⁴⁴² FERC, Final Environmental Impact Statement for the Freeport LNG Liquefaction Phase II Modification Project, CP12-509 (June 16, 2014) at F-7.

megawatt-hour of power in this region emits 885 pounds of CO₂e.⁴⁴³ Although this emission rate is likely to decrease in the future as a result of regulation of the electric sector and increased use of renewables, it will remain significant throughout the life of the Projects.⁴⁴⁴ Using this eGRID data indicates that the indirect emissions associated with electricity generation amount to 1.7 million additional tons of CO₂e per year—a **45 percent** increase beyond the emissions acknowledged in the DEIS.

10.12.4 Effect of Emissions.

The DEIS must also discuss the impact, rather than merely amount, of greenhouse gas emissions. The DEIS states that the Terminal and Pipeline’s emissions “would increase the atmospheric concentration of GHGs,” but that “there is no standard methodology to determine how the projects’ relatively small incremental contribution to GHGs would translate into physical effects on the global environment.”⁴⁴⁵ The Coalition does not dispute that no such methodology is currently available for the emissions identified in the DEIS.

However, the DEIS is wrong to conclude that the absence of such a methodology relieves FERC of the obligation to engage in any further discussion of the impact of these emissions.⁴⁴⁶ NEPA requires FERC to meaningfully inform itself and the public of the “ecological . . . , aesthetic, historic, cultural, economic, social, [and] health” effects of its actions.⁴⁴⁷ Where, as here, an agency contends that “the means to obtain” information regarding a project’s foreseeable impacts “are not known,” the agency must nonetheless summarize of existing relevant “credible scientific evidence” and provide “the agency’s evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community.”⁴⁴⁸ These effects must be disclosed in terms that can be understood by the environmental impact statement’s “intended readership: interested members of the public, public servants, and legislators.”⁴⁴⁹

⁴⁴³ This figure was calculated using the “baseload” eGRID2012 emission factor available at <http://www.epa.gov/cleanenergy/energy-resources/egrid/index.html> (last visited Sept. 25, 2015).

⁴⁴⁴ See EPA, Clean Power Plan Final Rule (Aug. 3, 2015) (internet version pending Federal Register publication), <http://www2.epa.gov/cleanpowerplan/clean-power-plan-final-rule>.

⁴⁴⁵ DEIS 4-681.

⁴⁴⁶ *Id.*

⁴⁴⁷ 40 C.F.R. § 1508.8.

⁴⁴⁸ 40 C.F.R. § 1502.22(b).

⁴⁴⁹ *Natural Res. Def. Council, Inc. v. U. S. Nuclear Regulatory Comm’n*, 685 F.2d 459, 487 n.149 (D.C. Cir. 1982) *rev’d on other grounds sub nom. Baltimore Gas & Elec. Co. v. Natural Res. Def. Council, Inc.*, 462 U.S. 87, 106-107 (1983).

One way to provide this necessary additional context by using the tools provided by federal Interagency Working Group on Social Cost of Carbon, which would allow FERC to estimate “the monetized damages associated with [the] incremental increase in carbon emissions” caused by the Projects, including effects on “agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services.”⁴⁵⁰ This tool was specifically developed to address federal “actions that have small, or ‘marginal,’ impacts on cumulative global emissions.”⁴⁵¹ The working group recently updated these values to reflect the most current science.⁴⁵² While the working group’s paper principally addresses carbon dioxide, EPA has published parallel peer-reviewed research estimating the impact of non-CO2 greenhouse gas emissions.⁴⁵³ The EPA and Council on Environmental Quality agree that the Social Cost of Carbon is an appropriate tool for use in NEPA reviews of individual projects, notwithstanding that it was initially developed to evaluate regulations.⁴⁵⁴ The Ninth Circuit has explained that if the available “alternative mode[s] of [NEPA] evaluation [are] insufficiently detailed to aid the decision-makers in deciding whether to proceed, or to provide the information the public needs to evaluate the project effectively,” then FERC cannot refuse to employ available tools to illustrate the monetized impacts of environmental effects. *Columbia Basin Land Prot. Ass’n v. Schlesinger*, 643 F.2d 585, 594 (9th Cir. 1981).

Another way in which FERC must illustrate the impacts of these emissions is by discussing their impact on Oregon and Washington greenhouse gas emission reduction efforts.

⁴⁵⁰ Exhibit 111 (Interagency Working Group on Social Cost of Carbon, *Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis* at 1 (February 2010)), available at <https://www.whitehouse.gov/sites/default/files/omb/inforeg/for-agencies/Social-Cost-of-Carbon-for-RIA.pdf>.

⁴⁵¹ *Id.* at 1-2.

⁴⁵² Exhibit 111 (Interagency Working Group on Social Cost of Carbon, *Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis* (July 2015) <https://www.whitehouse.gov/sites/default/files/omb/inforeg/scc-tds-final-july-2015.pdf>

⁴⁵³ Exhibit 113 (EPA, *The Social Cost of Carbon*, <http://www3.epa.gov/climatechange/EPAactivities/economics/scc.html>); Exhibit 114 (Alex Marten *et al.*, *Corrigendum to: Incremental CH4 and N2O mitigation benefits consistent with the U.S. Government's SC-CO2 estimates*, *Climate Policy* (Jul. 24, 2015), DOI:10.1080/14693062.2015.1070550, <http://www.tandfonline.com/doi/full/10.1080/14693062.2015.1070550>).

⁴⁵⁴ Environmental Protection Agency, *Comment Letter on Keystone XL Project DEIS* (Apr. 22, 2013) at 2, <https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details/downloadCommentLetters?eisId=87900>; *High Country Conservation Advocates*, 52 F. Supp. 3d at 1190 (recognizing EPA’s endorsement); Council on Environmental Quality, *Revised Draft Guidance on Consideration of Greenhouse Gas Emissions in NEPA Reviews*, 79 Fed. Reg. 77,802, 77,827 (Dec. 24, 2014).

NEPA regulations require analysis of “[p]ossible conflicts between the proposed action and the objectives of Federal ... plans, policies and controls,” 40 C.F.R. § 1502.16(c), and identify consistency with “law or requirements imposed for the protection of the environment” as a factor to consider in determining whether impacts are significant. 40 C.F.R. § 1508.27(b)(10). The Council on Environmental Quality agrees that agencies should discuss “whether the [greenhouse gas] emissions being discussed are consistent with” “Federal, state, tribal, or local goals for ... emission reductions.” 79 Fed. Reg. at 77,827.

Oregon has adopted statutory emission reduction targets,⁴⁵⁵ setting the 2020 target for emissions 10 percent below 1990 levels and 15 percent below 2005 levels, or 55 million tons of CO₂e per year.⁴⁵⁶ Oregon reports that its 2012 greenhouse gas emissions were 67 million tons of CO₂e.⁴⁵⁷ Thus, in the next five years, Oregon must *decrease* annual emissions by 12 million tons of CO₂e per year. Emissions identified in the DEIS that will occur in Oregon amount to an *increase* of 3,161,146 tons of CO₂e per year.⁴⁵⁸ As we explain above, the Terminal Project’s consumption of electricity will indirectly cause emissions of 1.7 million additional tons of CO₂e per year, much of which will occur in Oregon. Even if these indirect emissions are excluded from analysis, however, the DEIS indicates that the Terminal Project, itself, will increase Oregon’s annual greenhouse gas emissions by 5%. FERC must address whether Oregon will be able to offset this 3 million ton (or 4.5 million ton, or greater) increase while also finding tools to produce a further 12 million ton decrease. Oregon’s targets for after 2020 are even more ambitious, requiring more extensive (and potentially more difficult to achieve) further reduction.

Washington has a similar statutory emission reduction goal, reducing greenhouse gas emissions to 1990 levels by 2020, with further reductions in following years.⁴⁵⁹ This will require reducing annual emissions by 4%, from 101 million tons (2012 levels) to 97.4 million tons (1990 level).⁴⁶⁰ The DEIS identifies 513,724 tons per year of CO₂e emissions in Washington,⁴⁶¹

⁴⁵⁵ ORS § 468A.205

⁴⁵⁶ Oregon Public Utility Commission Website, <http://www.puc.state.or.us/docs/2014%20Greenhouse%20Gas%20Reduction%20Goal%20Rate%20Impact%20Report%20per%20SB%20101.pdf> (last visited Sept. 29, 2015) (expressing target at 50 million metric tons and providing estimates of potential future emission trajectories).

⁴⁵⁷ Exhibit 115 (<https://www.oregon.gov/deq/AQ/Pages/Greenhouse-Gas-Inventory-Report.aspx>, reporting 2012 emissions as 60.8 million metric tons of CO₂e).

⁴⁵⁸ DEIS Tables 4.1.12-7, 4.1.12-8 (Oregon transit, docking and undocking, hoteling, and maintenance dredging).

⁴⁵⁹ RCW § 70.235.020(1)(A)(i).

⁴⁶⁰ Exhibit 116 (Washington State Total Annual Greenhouse Gas (GHG) Emissions, http://www.ecy.wa.gov/climatechange/docs/2012CO2e_table.pdf (providing totals in millions of metric tons)).

⁴⁶¹ DEIS Tables 4.2.12-1, 4.2.12-13 and 4.2.12-14

although properly accounting for methane and addressing indirect impacts such as electricity generation will mean that the actual total is much higher, as discussed above. In any event, FERC must address the impact of these emissions on Washington’s ability to achieve emission reduction goals.

In sum, FERC must revise the DEIS to account fully for the project’s greenhouse gas emissions and associated climate change impacts.

10.13 Indirect and Cumulative Effects.

The DEIS fails to account for multiple indirect and cumulative effects, including the induced natural gas drilling and fracking, which is one of the primary purposes underlying this proposal, and other proposals to significantly increase fossil fuel terminals and transport on and along the Columbia River. An EIS must describe the direct and indirect effects, and cumulative impacts, of a proposed action.⁴⁶² Direct effects are “caused by the action and occur at the same time and place.”⁴⁶³ Indirect effects are “caused by the action” and occur “later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effect on air and water and other natural systems, including ecosystems.”⁴⁶⁴ 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.”⁴⁶⁵

In the foregoing comments, the Coalition addressed many examples of FERC’s failure to consider the project’s direct, indirect, and cumulative effects. In addition, the Coalition highlights specific examples of the DEIS failure to consider other indirect and cumulative effects in the following section.

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⁴⁶² 40 C.F.R §§ 1502.16, 1508.7, 1508.8, 1508.25, 1508.27(b)(7); *Northern Plains Resource Council v. Surface Transportation Board*, 668 F.3d 1067, 1072-73 (9th Cir. 2011).

⁴⁶³ 40 C.F.R. § 1508.8(a)

⁴⁶⁴ 40 C.F.R. § 1508.8(b).

⁴⁶⁵ 40 C.F.R. § 1508.7.

10.13.1 Increased Gas Production.

The 456 billion cubic feet per year of natural gas exports enabled by, and that will depend upon, the Terminal and Pipelines will inevitably lead to an increase in natural gas production. Indeed, material Oregon LNG submitted to FERC explicitly states that a purpose of the project is to enable and encourage such production.⁴⁶⁶ DOE has conditionally approved the export of 456.25 bcf/yr from the proposed Terminal and Pipelines as consistent with the public interest under the Natural Gas Act.⁴⁶⁷ To justify that finding, the DOE relied heavily upon a two-part study of the impacts of permitting natural gas exports conducted by the U.S. Energy Information Administration (EIA) and NERA Economic Consulting (NERA).⁴⁶⁸ DOE repeatedly cited to one or both studies to reject the arguments of commenters, and expressly found the NERA Study “reflects an accurate understanding of the contractual terms and market environment affecting the fossil fuel industry.”⁴⁶⁹ Responding to comments arguing that approving exports of natural gas is inconsistent with the public interest, the DoE repeatedly relied upon the EIA and NERA studies’ predictions that natural gas exports of up to 23 Bcf/d would induce additional drilling of equivalent scale, rather than cause U.S. prices to appreciably increase.⁴⁷⁰

This increased gas drilling and fracking will have reasonably foreseeable environmental impacts. Here, as in every FERC review of liquefied natural gas export projects, FERC has refused to consider the impacts of this additional gas production.⁴⁷¹ An agency cannot rely on a project-related development to justify a project and yet claim the related development is outside the scope of, or unforeseeable for purposes of, the agency’s environmental review.⁴⁷² As already noted above, the DOE is a cooperating agency for this DEIS and conditioned its approval of the project on FERC preparing an acceptable NEPA analysis. If DOE or FERC wish to author

⁴⁶⁶ See, e.g., Oregon LNG, Resource Report 1, p.1-5 (June 2013) (“The Project presents various benefits to the public, including the much-needed expansion of market scope and access for North American natural gas producers at times when neither U.S. nor Canadian as prices support continued production.”).

⁴⁶⁷ Exhibit 209 at 151–52 (U.S. DOE, Order Conditionally Granting Long-Term Multi-Authorization to Export LNG by Vessel from the Oregon LNG Terminal in Warrenton, Clatsop County, Oregon to Non-Free Trade Agreement Nations (July 31, 2014)).

⁴⁶⁸ *Id. passim*.

⁴⁶⁹ *Id.* at 112.

⁴⁷⁰ *Id.* at 108.

⁴⁷¹ FERC cites several of its prior orders as supporting FERC’s decisions here. We note that several of those other orders are the subject of pending litigation in the D.C. Circuit. See D.C. Circuit Cases 14-1249, 14-1275, 15-1127, and 15-1133.

⁴⁷² *Northern Plains Resource Council v. Surface Transp. Bd.* 668 F.3d 1067, 1081-82 (9th Cir. 2011) (Holding that an agency is arbitrary and capricious if it relies on a project-related development to financially justify a project, but at the same time declines to evaluate impacts of that development as not reasonably foreseeable.)

and/or rely upon an EIS that is not arbitrary and capricious, they must either revisit this relied-upon conclusion that natural gas export expansion will substantially induce additional natural gas extraction in North America, or else they must appropriately consider the impacts from this increased extraction. FERC's refusal in the DEIS to discuss these indirect or cumulative impacts is arbitrary, capricious, and a violation of NEPA.

FERC provides a number of purported justifications for excluding these impacts from analysis that, simply put, have no foundation in the NEPA statute, regulations, or caselaw. In revising the DEIS, FERC must clearly acknowledge that the following factors which were asserted in the DEIS are not valid bases for excluding the effects of natural gas production from the scope of FERC's NEPA review:

- The fact that “FERC does not have any authority over activities related to the exploration, production, and gathering of natural gas.”⁴⁷³ FERC's NEPA obligations extend to all impacts of the FERC-authorized projects, not just to impacts FERC directly regulates.⁴⁷⁴
- The fact that “exploration, production, and gathering of natural gas ... are regulated by state and local governments.”⁴⁷⁵ The fact that another entity has authority over an effect does not remove the effect from the scope of FERC's NEPA obligation to consider indirect effects.⁴⁷⁶
- Any uncertainty regarding the source of the individual gas molecules “which would be transported to the project facilities.”⁴⁷⁷ A foreseeable increase in gas production is an effect of the project regardless of whether, for any particular well that would not have been drilled but-for the project, that well's output is delivered to the project or is instead delivered elsewhere. FERC has never identified any authority to suggest otherwise.

⁴⁷³ DEIS at 1-12.

⁴⁷⁴ *Save Our Sonoran, Inc. v. Flowers*, 408 F.3d 1113, 1122 (9th Cir. 2005) (“Although the Corps' permitting authority is limited to those aspects of a development that directly affect jurisdictional waters, it has responsibility under NEPA to analyze all of the environmental consequences of a project. Put another way, while it is the development's impact on jurisdictional waters that determines the scope of the Corps' permitting authority, it is the impact of the permit on the environment at large that determines the Corps' NEPA responsibility.”)

⁴⁷⁵ DEIS at 1-12.

⁴⁷⁶ *Calvert Cliffs' Coordinating Committee, Inc. v. United States Atomic Energy Comm'n*, 449 F.2d 1109, 1122-23 (D.C. Cir. 1971 (NEPA would “wither away in disuse, [if] applied only to those environmental issues wholly unregulated by any other federal, state or regional body.”).

⁴⁷⁷ DEIS at 1-12.

- The fact that “other factors, unrelated to the project and over which the Commission has no control may *also* influence production[,] such as regional domestic market demands, permitting for new gas wells, or technologies and efficiencies in exploration.”⁴⁷⁸ All available forecasts indicate that, regardless of what else occurs, exports will lead to additional (in economic terms, marginal, but in all practical terms, hugely significant) increases in natural gas production. The fact that authorization or denial of exports will not be the sole determinant of future gas production levels does not change the fact that more gas will be produced if exports occur than would be produced if exports do not. FERC must take a hard look at the impacts of that change in overall production levels.
- The fact that DOE “retains the authority to approve or disprove the import or export of the commodity [of natural gas] itself.”⁴⁷⁹ As noted above, the fact that another agency also has authority to prevent an effect does not remove the effect from the scope of FERC’s NEPA obligations. DOE has acknowledged as much, by labelling DOE and FERC’s environmental review obligations as “overlapping.”⁴⁸⁰ More broadly, DOE has instructed FERC to act as lead agency for coordinated NEPA review of the projects, thereby directing FERC to consider the impacts of DOE’s actions as well as FERC’s actions.⁴⁸¹

FERC’s remaining assertions all boil down to the argument that impacts of additional gas production are unforeseeable.⁴⁸² This argument is legally and factually incorrect.

FERC’s argument reflects a legal error regarding the obligation to engage in reasonable forecasting and the level of certainty required for NEPA review. NEPA requires FERC to engage in “reasonable forecasting and speculation.”⁴⁸³ FERC contends that information regarding the amount, timing, location, etc. of induced gas production cannot be obtained here. However, where an agency contends that “information relevant to reasonably foreseeable significant adverse impacts cannot be obtained,” NEPA requires “a summary of existing credible scientific evidence” and “evaluation of such impacts based upon theoretical approaches or

⁴⁷⁸ *Id.* (emphasis added).

⁴⁷⁹ *Id.* at 1-12.

⁴⁸⁰ *Freeport LNG Expansion, L.P.*, DOE/FE Docket 11-161-LNG, DOE/FE Order 3357 (Nov. 15, 2013) at 164.

⁴⁸¹ U.S. Department of Energy, Import and Export of Natural Gas; New Administrative Procedures; Proposed Rule, 46 Fed. Reg. 44,696, 44,700 (Sept. 4, 1981).

⁴⁸² DEIS 1-12–1-13.

⁴⁸³ *Delaware Riverkeeper Network v. FERC*, 753 F.3d 1304, 1310 (D.C. Cir. 2014) (citing *Scientists’ Inst. for Pub. Info., Inc. v. Atomic Energy Comm’n*, 481 F.2d 1079, 1092 (D.C. Cir. 1973)).

research methods generally accepted in the scientific community.”⁴⁸⁴ Here, FERC has failed to employ any of the “generally accepted” modeling tools, discussed below, that could inform an evaluation of the impacts of induced gas production.

Even if FERC were to conclude that it was impossible to foresee the “extent” of the impacts of induced gas production—a conclusion refuted by the record here—FERC would be required to take a hard look at the “nature” of these impacts.⁴⁸⁵ The DEIS fails to provide such a discussion.

FERC’s argument that it is impossible to foresee the effects of induced gas production is also factually incorrect because it fails to reflect the ability of available tools to predict the impacts of these effects. Numerous models, both federal and private, can predict the amount and region of gas production that will be induced by operation of the Terminal and Pipelines.

Here, Oregon LNG submitted a study by Navigant specifically predicting that the exports at issue here would lead to increased natural gas production.

Similarly, the EIA has repeatedly affirmed that exports will increase gas production, providing quantitative estimates of this impact. The EIA’s first assessment of exports is the January 2012 report titled “Effect of Increased Natural Gas Exports on Domestic Energy Markets” (hereafter the Export Study).⁴⁸⁶ This study was commissioned by DOE specifically to assess the likely impacts of expanded exports.⁴⁸⁷ It concludes, *inter alia*, that: (1) “Increased natural gas exports lead to increased natural gas prices” within the United States; (2) That “[n]atural gas markets in the United States balance in response ... through increased natural gas production”; and (3) “Due to higher prices [of natural gas], the [U.S.] electric power sector primarily shifts to coal-fired generation.”⁴⁸⁸ The modeling EIA performed to produce the Export Study provided region-specific forecasts of where additional production would occur.⁴⁸⁹ EIA

⁴⁸⁴ 40 C.F.R. § 1502.22(b).

⁴⁸⁵ *Mid States Coal. for Progress v. Surface Transp. Bd.*, 345 F.3d 520, 549-50 (8th Cir. 2003); see also *Scientists’ Inst. for Pub. Info.*, 481 F.2d 1096-97 (where there are reasonable estimates of the deployment of nuclear power plants, the amount of waste produced, and the land needed to store waste, NEPA required analysis of the impacts of such storage even though the agency could not predict where such storage would occur).

⁴⁸⁶ Attached as Exhibit 2 to Sierra Club Motion to Intervene filed Aug. 12, 2013, in these dockets.

⁴⁸⁷ *Id.* at Appendix A.

⁴⁸⁸ *Id.* at 6.

⁴⁸⁹ The tabulated data is available at Energy Information Administration, Lower 48 Natural Gas Production and Wellhead Prices by Supply Region, <http://www.eia.gov/oiaf/aeo/tablebrowser/#release=FE2011&subject=16-FE2011&table=72->

affirmed these conclusions in 2014 and again in 2015. In October 2014, the EIA updated the Export Study, again at the DOE's request, affirming its basic conclusions.⁴⁹⁰ This update concluded that if other federal actions limited growth of coal-fired electricity generation (actions which EPA has since undertaken), the connection between exports and production increases would be even stronger, as fewer electric producers would be able to respond to higher gas prices by switching to coal.⁴⁹¹ Most recently, EIA's 2015 Annual Energy Outlook again affirmed that increasing volumes of exports will cause increases in natural gas production (and, to a lesser extent, increases in coal use).⁴⁹²

At least five other forecasts, from three different consultants each using their own distinct models, have agreed with the EIA's conclusion that domestic natural gas markets will respond to exports primarily by increasing natural gas production and, secondarily, by shifting some existing demand from gas to coal. Deloitte Marketpoint, *Made in America: The Economic Impact of LNG Exports from the United States* (2011), at 10; ICF International, *U.S. LNG Exports: State-Level Impacts on Energy Markets and the Economy* (Nov. 2013) at 13, Charles Ebinger et. al., "Liquid Markets: Assessing the case for U.S. Exports of Liquefied Natural Gas," Brookings Institution (May 2012), at 32, (summarizing an earlier study by ICF International and two studies by Navigant).⁴⁹³

As noted above, Navigant has already used its model to predict the impacts of the Terminal and Pipeline projects at issue here; many of the other models used to develop these forecasts encompass all of North America, and can therefore also be used to predict the impacts of exports from the Terminal and Pipeline projects.⁴⁹⁴ FERC must look beyond studies and forecasts that have already been performed: FERC "shall" obtain information that is essential to a reasoned choice among alternatives unless the costs of obtaining it are "exorbitant."⁴⁹⁵ FERC

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⁴⁹⁰ Exhibit 117 (Energy Information Administration, *Effect of Increased Levels of Liquefied Natural Gas Exports on U.S. Energy Markets* (Oct. 29, 2014) ("Updated Export Study"), at 12, <http://www.eia.gov/analysis/requests/fe/pdf/lng.pdf>).

⁴⁹¹ *Id.* Table B2 (but note that EIA predicts that even in this scenario, exports will cause an increase in coal use).

⁴⁹² Exhibit 118 (Energy Information Administration, *Annual Energy Outlook 2015* (Apr. 2015) at 6, 21-22, 24, *available online at* [http://www.eia.gov/forecasts/aeo/pdf/0383\(2015\).pdf](http://www.eia.gov/forecasts/aeo/pdf/0383(2015).pdf) (last visited May 20, 2015)).

⁴⁹³ Sierra Club has filed these materials in this docket under separate cover.

⁴⁹⁴ *See, e.g.*, Exhibit 119 (Deloitte Marketpoint, *Natural Gas Models*, <https://www.deloittemarketpoint.com/industries/natural-gas/world-gas-model>)

⁴⁹⁵ 40 C.F.R. § 1502.22.

has not shown, or even asserted, that the cost of modeling the impacts of exports from the Terminal and Pipeline projects would be exorbitant.⁴⁹⁶

Moreover, some information regarding the source of the gas at issue here is already available. As the DEIS states, “most of the gas is expected to come from Canadian sources.”⁴⁹⁷ Publicly available trade publications more precisely state that the gas for export at the proposed Terminal is expected to be primarily produced the Horn River Basin, the Cordova Embayment, and the Liard Basin shale formations.⁴⁹⁸

FERC cannot avoid examining the impacts of this foreseeable or related induced gas production simply because it will occur in western Canada or the Rocky Mountains region of the U.S. Section 1508.7 of the CEQ regulations defining cumulative impact contains no requirement that actions must “occur in the project area or region of influence of the project being analyzed” for those actions to be included in a cumulative impact analysis. The guidance states that:

For a project-specific analysis, it is often sufficient to analyze effects within the immediate area of the proposed action. When analyzing the contribution of this proposed action to cumulative effects, however, the geographic boundaries of the analysis *almost always should be expanded*. These expanded boundaries can be thought of as differences in hierarchy or scale. Project-specific analyses are usually conducted on the scale of counties, forest management units, or installation boundaries, *whereas cumulative effects analysis should be conducted on the scale of human communities, landscapes, watersheds, or airsheds*.⁴⁹⁹

The DEIS is inconsistent with CEQ guidance. For example, the CEQ guidance recommends looking well beyond the project area in a cumulative effects analysis. This includes agencies evaluating the “ecosystem” level for vegetative resources and resident wildlife, the “total range of affected population units” for migratory wildlife, an entire “state” or “region” for land use, and the “global atmosphere” for air quality.⁵⁰⁰ The analysis in the DEIS falls well short of this.

⁴⁹⁶ See *Mayo Found. v. Surface Transp. Bd.*, 472 F.3d 545, 555 (8th Cir. 2006) (using the EIA’s National Energy Modeling System to predict the impacts of an individual fossil fuel infrastructure project).

⁴⁹⁷ DEIS at 1-12.

⁴⁹⁸ Exhibit 120 (Baker & McKenzie Client Report: U.S. LNG Terminal to be fed by Canadian Shale Gas Applies for Export Approval); see also Exhibit 121 at slide 21 (BMO Capital Markets Presentation: Canadian Shale Gas & LNG In a North American Context) (discussing how “new export markets (LNG) are required for Canadian production”).

⁴⁹⁹ CEQ, Considering Cumulative Effects under the National Environmental Policy Act, at 12 (1997) (emphasis added).

⁵⁰⁰ *Id.* at 15.

This additional gas production will have severe consequences, which FERC must analyze and disclose. These environmental effects include emissions of greenhouse gases, contribution to regional ozone formation, water consumption, groundwater contamination, habitat fragmentation, induced seismicity and others. Analysis of the environmental impacts of induced gas production does not require knowledge of the precise sites where additional production will occur. For example, FERC can evaluate environmental costs, and the economic costs which accompany them, in aggregate. FERC can quantify the net increases in air pollution associated with the number of wells that the project will induce based on EPA's emissions inventories. FERC can also derive the net volumes of waste from industry reports and state discharge figures. At a minimum, FERC can localize these impacts by region. Even for those impacts that are more closely tied to a specific location, such as habitat fragmentation, FERC can and must acknowledge that the impact will occur, including an estimate of the severity of the impact averaged across potential locations.⁵⁰¹ Moreover, NEPA regulations provide that FERC "shall" obtain information that is essential to a reasoned choice among alternatives unless the costs of obtaining it are "exorbitant."⁵⁰²

FERC must, for example, quantify the volume of greenhouse gases that will be emitted by the additional natural gas production induced by the projects. The National Energy Technology Laboratory's report titled "Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas from the United States," DOE/NETL-2014/1649 (May 29, 2014), illustrates one way in which this analysis can be accomplished.⁵⁰³ Commenters have explained that this report understates the emissions associated with natural gas production, and thus that the inputs to this method of analysis should be changed.⁵⁰⁴

FERC must also address the effect of additional gas production on ground-level ozone, or smog.⁵⁰⁵ Ozone impacts are particularly pertinent here, because the Terminal will potentially draw natural gas from, and induce increases in natural gas production in, Rocky Mountain states

⁵⁰¹ See *Scientists' Inst. for Pub. Info.*, 481 F.2d 1096-97 (where there are reasonable estimates of the deployment of nuclear power plants, the amount of waste produced, and the land needed to store waste, NEPA required analysis of the impacts of such storage even though the agency could not predict where such storage would occur).

⁵⁰² 40 C.F.R. § 1502.22.

⁵⁰³ This report is filed in this docket under separate cover by Sierra Club. See also *See Sierra Club, Motion to Intervene, Protest, and Comments*, CP09-6, CP09-7 (Aug. 12, 2013) at 15-17 (providing another method of illustrating the greenhouse gas impacts of natural gas production induced by the Terminal and Pipeline projects).

⁵⁰⁴ *Sierra Club et al.*, Comment on Climate Impacts of LNG Exports (July 21, 2014), lodged in this docket under separate cover.

⁵⁰⁵ See *Sierra Club et al.*, Comment on Gas Production at 16-19 (July 21, 2014), lodged in this docket under separate cover.

where oil and gas production is already causing severe increases in ozone levels. The regional-level forecasts of induced gas production that can be provided by available tools provide a basis for assessing impacts on ozone levels, because ozone is generally assessed at the regional level.⁵⁰⁶

FERC must also address impacts to habitats and landscapes from additional gas production. For example, available tools can estimate the amount of gas that is ultimately produced by different types of wells⁵⁰⁷ and the proportion of induced gas production that will result from different types of production⁵⁰⁸—and, thus, the rough number of individual wells that will be drilled as a result of the Terminal and Pipelines. Available tools further estimate the surface area disturbed by each well pad and associated infrastructure and the spacing of well pads.⁵⁰⁹ This type of information enables FERC to discuss the extent and intensity of habitat fragmentation and landscape disruption that will be caused by the production induced by these projects.

In summary, all available evidence indicates that the Terminal and Pipelines will cause a significant increase in North American natural gas production. This increased production will have significant environmental impacts, including impacts on climate, ozone, and habitat. FERC has an affirmative obligation to investigate and disclose these impacts, which FERC has failed to do in the DEIS.

10.13.2 Indirect Effects of Increased North American Coal Use.

The EIA studies and private models agree that natural gas exports will also increase coal use. EIA concluded that this effect would occur even if regulations were adopted to limit use of coal generally.⁵¹⁰ As with increased natural gas production, increased coal use will emit greenhouse gases, emit ozone-forming pollution, and cause other foreseeable environmental impacts.

⁵⁰⁶ See *Sierra Club v. E.P.A.*, 774 F.3d 383, 385, 397-99 (7th Cir. 2014) (upholding EPA analysis that assesses ozone precursor reductions across a 22-state region as sufficient to demonstrate impacts on three discrete urban areas);

⁵⁰⁷ See, e.g., National Energy Technology Laboratory, *Environmental Impacts of Unconventional Natural Gas Development and Production*, DOE/NETL-2014/1651 at Exhibit 2-9 (May 29, 2014),

⁵⁰⁸ See, e.g., Export Study.

⁵⁰⁹ National Energy Technology Laboratory, *Environmental Impacts of Unconventional Natural Gas Development and Production*, DOE/NETL-2014/1651, at 115-120.

⁵¹⁰ Energy Information Administration, *Effect of Increased Levels of Liquefied Natural Gas Exports on U.S. Energy Markets*, Table B2 (Oct. 29, 2014).

10.13.3 Indirect Effects of Liquefied Natural Gas Use in Importing Markets.

FERC must also consider the environmental effects of transporting liquefied natural gas overseas and combusting it in end-use markets.

FERC contends that it may ignore these impacts entirely because “it is not possible to know who those end users would be, or for FERC to realistically be able to characterize those impacts (especially in foreign countries, where environmental constraints would be different from the U.S. permitting process).”⁵¹¹ Elsewhere in the DEIS, FERC contends that its ability to predict these impacts is limited by uncertainty as to the type and route vessels will use.⁵¹²

As with the other indirect effects discussed above, here, FERC overstates the extent to which uncertainty limits FERC’s ability to provide reasonable forecasts that inform both FERC and the public. Oregon LNG contends that exports are likely to be directed to Asia, an assumption supported by basic geography. Oregon LNG further “anticipates that its terminal would be visited by about 125 LNG marine carriers or less per year with capacities of either 148,000 m³ or 173,000 m³.”⁵¹³ The National Energy Technology Laboratory has concluded that the emissions associated with exports to Asia can be usefully illustrated by considering exports to Shanghai, China, and subsequent combustion in a combined cycle natural gas power plant.⁵¹⁴

In discussing these effects, FERC cannot assume that exported natural gas will be used to displace coal or other fossil fuels. All available reports and studies indicate that increasing natural gas supply globally, and in Asia in particular, will increase overall energy consumption (*i.e.*, some of the exported gas won’t “displace” anything), and that when displacement occurs, some renewables are displaced as well as coal.⁵¹⁵ FERC has not shown that the tools used in

⁵¹¹ DEIS at 4-665

⁵¹² *Id.* at 1-13 (“Oregon LNG has not identified the specific type of vessels that would ship the LNG abroad, the routes of those vessels, or the identities of the customers for the LNG.”)

⁵¹³ DEIS at 2-23.

⁵¹⁴ Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas from the United States, DOE/NETL-2014/1649, at 1 (May 29, 2014). Although this NETL report considered exports originating in New Orleans, LA, NETL’s methodology could be used to estimate the impacts of exports from the Warrenton, Oregon Terminal under consideration here.

⁵¹⁵ Exhibit 122 (International Energy Agency, *Golden Rules for a Golden Age of Gas*, Ch. 2 p. 91 (2012)); *see also* Haewon McJeon *et al.*, Limited impact on decadal-scale climate change from increased use of natural gas, 514 *Nature* 482-485 (Oct. 23, 2014), <http://www.nature.com/nature/journal/vaop/ncurrent/full/nature13837.html>, doi:10.1038/nature13837

these studies cannot also be used to show how likely end-use markets will respond to U.S. LNG exports.⁵¹⁶

Finally, FERC cannot assume that, where the Terminal and Pipeline do cause some end-users to use exported liquefied natural gas instead of coal, this substitution reduces greenhouse gas emissions. As we explain above, the NETL reports drastically underestimated the quantity of methane that is emitted with natural gas production and transmission, as well as the impact of each ton of methane emitted. Thus, NETL underestimates the overall lifecycle emissions of liquefied natural gas exports. Correcting these issues undermines NETL's conclusions that substituting U.S. LNG exports for coal is likely to reduce global greenhouse gas emissions. The need to correct the NETL analysis on this issue, however, is not a basis for FERC to ignore the NETL report entirely.

10.13.4 Other Cumulative Impacts.

The DEIS fails to address degraded air and water quality in the project area caused by multiple sources of industrial air and water pollution on the Columbia River, in general, and in the lower Columbia River estuary, specifically.⁵¹⁷ For example, the DEIS fails to disclose the number of permitted sources of air and water pollution in the project area and, in turn, analyze the cumulative impacts of Oregon LNG's air and water pollution combined with existing, permitted industrial sources of air and water pollution.

The DEIS fails to address water pollution discharges to the Columbia River and its tributaries from multiple municipal sewage treatment plants and stormwater pollution conveyances.⁵¹⁸ Consequently, the DEIS lacks any analysis on the cumulative effects of existing wastewater and stormwater pollution and the project's pollution discharges.

The Columbia River estuary is at the epicenter of a series of high-profile proposals to develop fossil fuel transport projects. Examples of development proposals that would increase large-scale vessel traffic, in-water infrastructure, and dredging in the Columbia River include:

- *Millennium Bulk Coal Export Terminal*. Longview, Washington. Ambre Energy proposes building and operating a 44 million ton per year coal export terminal on the Columbia River. The project requires dredging to accommodate deep draft vessels and

⁵¹⁶ See 40 C.F.R. § 1502.22.

⁵¹⁷ See Exhibit 101 at 7, 17 (discussing sources of industrial pollution in the Columbia River) (EPA, *Columbia River Basin: State of the River Report for Toxics* (Jan. 2009)).

⁵¹⁸ See e.g., Exhibit 102 (U.S. Geological Survey, *Reconnaissance of Contaminants in Selected Wastewater-Treatment-Plant Effluent and Stormwater Runoff Entering the Columbia River, Columbia River Basin, Washington and Oregon, 2008-10*, Scientific Investigations Report 2012-5068 (2012))

new industrial docks, among other things. At two loaded vessels per day, the Millennium project would add 730 outgoing Panamax vessels per year.⁵¹⁹

- *Morrow Pacific Coal Export Project.* Boardman, Oregon. The Morrow Pacific Project would export 8 million tons of coal per year using two Columbia River ports—the Port of Morrow and Port Westward. The project requires building a new dock at the Port of Morrow, barging coal to Port Westward, and transferring coal from barges to Panamax vessels. The project would add 133 outgoing Panamax vessels per year.
- *Tesoro/Savage Oil-by-Rail Terminal.* Vancouver, Washington. Tesoro/Savage proposes the nation’s largest crude oil-by-rail terminal project at the Port of Vancouver. Tesoro/Savage’s application to Washington EFSEC states that the project could require as many as 365 vessels per year to transport 360,000 barrels of crude oil each day.⁵²⁰
- *Global Partners Oil-by-Rail Terminal.* Port Westward, Oregon. Global started operating a crude oil-by-rail terminal in late 2012. Global intends to sharply increase its shipments of crude oil through Port Westward. According to Oregon DEQ, Global could ship as much as 120,000 barrels/day, increasing vessel traffic by 115 vessels per year.⁵²¹
- *Northwest Innovation Works Methanol Export Terminals.* Kalama, Washington, and Port Westward, Oregon. Two methanol export proposals would use large volumes of natural gas to produce and export methanol to China from the Port of Kalama and Port

⁵¹⁹ Millennium Bulk Terminals, Joint Aquatic Resources Permit Application, 10 (2010) (“At maximum throughput, approximately two vessels per day would be loaded.”)

⁵²⁰ Tesoro/Savage, Biological Resources Report, Appendix H.1 to application to the Energy Facility Site Evaluation Council (EFSEC) at 75 (2013) (“It is estimated that the proposed Facility will result in approximately 140 ship transits per year in 2016 (first full year of operations) up to 365 ship transits per year at full buildout.”).

⁵²¹ Oregon Department of Environmental Quality Public Notice (Feb. 28, 2014) (Global “significantly increased crude oil storage and loading and now intends to receive and transload as much as 1,839,600,000 gallons per year.” One barrel of oil is 42 gallons. According to DEQ’s notice, and converting gallons per year to barrels per day, Global intends to ship 120,000 barrels/day – an increase of 115,000 barrels over currently permitted levels. Assuming the same ratio of ships to barrels as the Vancouver Tesoro/Savage project (both hope to use Panamax vessels), the Global oil terminal will require roughly 115 additional ships outgoing per year.).

Westward. Each facility would require two ships per week,⁵²² totaling 208 ships per year.

These DEIS fails to account for the cumulative effects of all of these reasonably foreseeable projects.

10.13.5 Cumulative Impacts and Programmatic Study.

FERC must revise the DEIS to address the cumulative impacts of other authorized and proposed liquefied natural gas export projects on greenhouse gas emissions, natural gas production, coal use, and the other indirect effects identified here.

NEPA requires FERC to consider cumulative effects.⁵²³ The most efficient and informative way for FERC to consider the cumulative effects of natural gas export facilities would be to prepare a programmatic EIS.⁵²⁴

Although FERC has some flexibility in determining whether to prepare a programmatic EIS, here, the reasons FERC has offered for failing to do so are arbitrary and capricious. FERC appears to think that that a programmatic EIS is only appropriate or useful where considering a “coordinated federal program”; FERC contends that its “review and approval of individual projects under the NGA” is not so coordinated, and that a programmatic EIS is therefore inappropriate.⁵²⁵ Last year, CEQ released final guidance on “Effective use of Programmatic NEPA Reviews.”⁵²⁶ This guidance states that a programmatic EIS is appropriate not only where an agency is considering an official policy, formal plan, or program that applies to multiple individual actions.⁵²⁷ Instead, even when there is no such overarching action, a programmatic EIS can still be appropriate where an agency is “approving multiple actions” that are “temporally ... connected.”⁵²⁸ More broadly, this guidance suggests that programmatic review would be

⁵²² St. Helens Chronicle, *Methanol plant could be in the works for Port Westward* (Jan. 21, 2014), http://www.thechronicleonline.com/news/article_b96d4192-82f7-11e3-a2be-001a4bcf887a.html.

⁵²³ 40 C.F.R. § 1508.7.

⁵²⁴ *Id.* at § 1508.17.

⁵²⁵ DEIS at 1-13.

⁵²⁶ Council on Environmental Quality, *Effective Use of Programmatic NEPA Reviews*, at 14 (Dec. 18, 2014)

https://www.whitehouse.gov/sites/default/files/docs/effective_use_of_programmatic_nepa_reviews_final_dec2014_searchable.pdf

⁵²⁷ *Id.* at 13–14.

⁵²⁸ *Id.* at 14.

appropriate and useful here. FERC must review this guidance and revisit the decision of whether to prepare a programmatic EIS.

Even if FERC refuses to do a programmatic EIS, however, that refusal does not relieve FERC of the obligation to consider the cumulative impacts of other LNG export projects.

11.0 CONCLUSION.

For the reasons set forth above, the DEIS fails to take a hard look at the impacts of the proposed project. The DEIS fails to support its conclusions that the project would “result in adverse environmental impacts” and that “most of impacts would be reduced to less-than-significant levels.”⁵²⁹ FERC therefore cannot proceed without revising its analysis. Because of the extent of revisions necessary, FERC must make any revised analysis available for further public comment prior to any FERC decision on the pending applications. More broadly, the Coalition continues to contend that the adverse environmental and other impacts of the project demonstrates that the project is contrary to the public interest and should be denied.

Sincerely,

/s/ Lauren Goldberg

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/s/ Tom Buchele

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Submitted on behalf of Columbia Riverkeeper, the Pacific Coast Federation of Commercial Fishermen’s Associations, the Northwest Guides and Anglers Association, the Association of Northwest Steelheaders, the Institute for Fisheries Research, the Waterkeeper Alliance, the Oregon Shores Conservation Coalition, the Northwest Property Rights Coalition, Columbia Pacific Common Sense, Oregon Physicians for Social Responsibility, Wahkiakum Friends of the River, Sierra Club, the Center for Biological Diversity, Landowners and Citizens for a Safe Community, Forest Grove Oregon Citizens Against the Pipeline, Yamhill County Oregon Citizens Against the Pipeline, Save Our Wild Salmon, Food and Water Watch, the Northwest Environmental Defense Center, Northwest Environmental Advocates, Oregon Wild, and the Willapa Hills Audubon Society

⁵²⁹ DEIS at ES-15.

**TABLE OF EXHIBITS TO COLUMBIA RIVERKEEPER ET AL. PUBLIC
COMMENTS ON OREGON LNG AND WASHINGTON EXPANSION PROJECT
DRAFT ENVIRONMENTAL IMPACT STATEMENT**

Docket Nos. CP09-6-000, CP09-6-001, CP09-7-000, CP09-7-001, CP13-507-000

Exhibit No.	Description
1	Williams, Richard N., <i>Review of the draft Biological Assessment and Essential Fish Habitat for Proposed Oregon LNG Terminal Project</i> (Jan. 8, 2015)
2	Bierly, Kenneth, <i>Oregon LNG Terminal Wetland Impacts and Proposed Mitigation Review: Analysis of Available Information</i> (Jan. 8, 2015)
3	Rhodes, Jonathan, J. <i>Summary of likely impacts of construction and maintenance of pipeline for the proposed Oregon LNG Terminal and Oregon Pipeline Project (Project) on watersheds and aquatic resources and adequacy and veracity of the discussion and assessment of these impacts in the Project's Biological Assessment (BA), Joint Permit Application (JPA), and supplements thereto</i> (Jan. 12, 2015)
4	Letter from Center for Biological Diversity to U.S. Army Corps of Engineers, Comments on Oregon LNG Bidirectional Project Joint Permit Application, NWP-2005-748 (Jan. 2015)
5	Letter from NOAA National Marine Fisheries Service to FERC, Oregon LNG NEPA Scoping (Dec. 20, 2012)
6	Oregon LNG Waterway Suitability Analysis (Mar. 2008)
7	Letter from the U.S. Army Corps of Engineers to FERC (Dec. 14, 2014)
8	Letter from Columbia Riverkeeper <i>et al.</i> to FERC, Comments on NEPA Scoping for Oregon LNG Bidirectional Project (Dec. 21, 2012)
9	Letter from U.S. Environmental Protection Agency to FERC, Comments on NEPA Scoping for Oregon LNG Bidirectional Project (Dec. 26, 2012)
10	Letter from National Park Service to FERC, Comments on NEPA Scoping for Oregon LNG Bidirectional Project (Nov. 7, 2012)
11	Letter from U.S. Fish and Wildlife Service to FERC, Comments on NEPA Scoping for Oregon LNG Bidirectional Project (Jan. 11, 2013)

12	Letter from State of Oregon to FERC, Comments on NEPA Scoping for Oregon LNG Bidirectional Project (Dec. 19, 2012)
13	Letter from Washington Department of Ecology to FERC, Comments on NEPA Scoping for Oregon LNG Bidirectional Project (Dec. 18, 2012)
14	Letter from City of Warrenton to FERC, Comments on NEPA Scoping for Oregon LNG Bidirectional Project (Dec. 21, 2012)
15	Letter from Washington Department of Natural Resources to FERC, Comments on NEPA Scoping for Oregon LNG Bidirectional Project (Dec. 21, 2012)
16	Letter from Oregon Department of Forestry to FERC, Comments on NEPA Scoping for Oregon LNG Bidirectional Project (Dec. 13, 2012)
17	Letter from Columbia River Estuary Study Taskforce to FERC, Comments on NEPA Scoping for Oregon LNG Bidirectional Project (Dec. 19, 2012)
18	Sierra Club and Columbia Riverkeeper, Motion to Intervene, Protest and Comments to the U.S. Department of Energy (Nov. 2013)
19	Letter from State of Oregon to FERC, Preliminary Comments of DEQ on Bradwood LNG DEIS (Nov. 2007)
20	Grays Harbor Crude-by-Rail Fact Sheet (Aug. 2013), http://www.portofgraysharbor.com/about/CBR-Project.php
21	Associated Press, <i>China, BP plan two Columbia River chemical plants</i> (Jan. 1, 2014), http://www.columbian.com/news/2014/jan/22/china-bp-plan-two-columbia-river-chemical-plants/
22	DEQ, <i>Evaluation Report and Findings on Clean Water Act 401 Water Quality Certification Application for Bradwood Landing</i> (Mar. 10, 2011)
23	U.S. Army Corps of Engineers, Defendant's Motion to Dismiss, <i>Oregon Development Company, LLC v. U.S. Army Corps of Eng'rs</i> , Case No. 3:14-cv-01239-AC (Nov. 14, 2014)
24	Oregon Development Company, LLC, Complaint, Exh. B, <i>Oregon Development Company, LLC v. U.S. Army Corps of Eng'rs</i> , Case No. 3:14-cv-01239-AC (Aug. 1, 2014)

25	Columbia Riverkeeper <i>et al.</i> Clean Water Act Section 404 Comments for the Bradwood LNG Project (Dec. 18, 2007)
26	Ecotrust, <i>Economic Risk of the Morrow Pacific Project: Livelihood, Habitat, and Recreation</i> (Mar. 20, 2014)
27	Lower Columbia River Estuary Partnership, <i>Habitat change in the Lower Columbia River and Estuary, 1870-2011</i> (2013)
28	Letter from Columbia Riverkeeper to Oregon Department of Environmental Quality, Comments on Oregon LNG Bidirectional Project NPDES Permit Application (Nov. 21, 2013)
29	CBC News, <i>7,500 songbirds killed at Canaport gas plant in Saint John</i> (Sept. 18, 2013), http://www.cbc.ca/news/canada/new-brunswick/7-500-songbirds-killed-at-canaport-gas-plant-in-saint-john-1.1857615
30	CBC News, <i>Canaport LNG faces charges for bird kill</i> (Oct. 20, 2014), http://www.cbc.ca/news/canada/new-brunswick/canaport-lng-faces-charges-for-bird-kill-1.2805161
31	Goldfinger, C. <i>et al.</i> , <i>Turbidite Event History—Methods and Implications for Holocene Paleoseismicity of the Cascadia Subduction Zone: U.S. Geological Survey Professional Paper 1661-F</i> (2012), http://pubs.usgs.gov/pp/pp1661f/
32	<i>Earthquake Risk Study for Oregon's Critical Energy Infrastructure Hub</i> , Oregon Department of Geology and Mineral Industries, Open File Report 0-13-19 (2013), http://www.oregongeology.org/sub/earthquakes/CEI-Hub-report.pdf
33	Letter from FERC to Oregon LNG (Environmental Data Request) (Aug. 1, 2013)
34	Letter from the Oregon Department of Forestry to Clatsop County (June 25, 2010)
35	Letter from Columbia Riverkeeper <i>et al.</i> to the Oregon Department of Land Conservation and Development, Oregon LNG Coastal Zone Management Act Public Comments (Nov. 2013)
36	Yeh, Harry <i>et al.</i> , <i>Tsunami Hydrodynamics in the Columbia River</i> , Civil Environmental and Engineering Faculty Publication and Presentations. Paper 106 (2012), http://pdxscholar.library.pdx.edu/cengin_fac/106
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	<i>Communities</i> (Jan. 2014), http://www.oregon.gov/lcd/ocmp/docs/publications/tsunamiguide20140108.pdf
38	Northwest Sportfishing Industry Association, <i>NSIA committed to fighting today's ODFW Commission Youngs Bay ruling</i> (Feb. 7, 2014), http://www.nsiafishing.org/general/nsia-committed-to-fighting-todays-odfw-commission-youngs-bay-ruling/
39	Martin, Irene, <i>A Social Snapshot of the Columbia River Gillnet Fishery</i> (Sept. 2005)
40	Washington Department of Fish and Wildlife, 2014 Creel Data for Buoy 10 Fishery (accessed Jan. 13, 2015), http://wdfw.wa.gov/fishing/creel/buoy10/
41	U.S. Coast Guard Letter of Recommendation for Oregon LNG Project (April 24, 2009)
42	U.S. Coast Guard Letter of Recommendation Analysis for Oregon LNG Project (April 24, 2009)
43	Letter from Columbia Riverkeeper to Clatsop County, Testimony on Oregon Pipeline, LLC Consolidated Land Use Application (June 9, 2010)
44	Letter from Columbia Riverkeeper to Clatsop County, Testimony on Oregon Pipeline, LLC Consolidated Land Use Application (June 24, 2010)
45	Letter from Columbia Riverkeeper to Clatsop County, Testimony on Oregon Pipeline, LLC Consolidated Land Use Application (July 16, 2010)
46	Letter from Columbia Riverkeeper to Clatsop County, Testimony on Oregon Pipeline, LLC Consolidated Land Use Application (Oct. 22, 2010)
47	Letter from Columbia Riverkeeper to Clatsop County, Testimony on Oregon Pipeline, LLC Consolidated Land Use Application (Feb. 23, 2011)
48	U.S. Department of Energy: National Energy Technology Laboratory. <i>Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas from the United States</i> , DOE/NETL-2014/1649, Office of Fossil Energy (May 29, 2014), http://energy.gov/sites/prod/files/2014/05/f16/Life%20Cycle%20GHG%20Perspective%20Report.pdf .
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50	Letter from Columbia Riverkeeper to U.S. Army Corps of Engineers (Dec. 8, 2014)

51	Oregonian, <i>Jordan Cove LNG in Coos Bay could quickly become one of the largest greenhouse gas emitters in Oregon</i> (Nov. 18, 2014)
52	Oregonian, <i>Major earthquake in Oregon could be in next 50 years, infrastructure not ready</i> (Aug. 1, 2012)
53	Roegner, C.G. <i>et al.</i> , <i>Density and Condition of Subyearling Chinook Salmon in the Lower Columbia River and Estuary in Relation to Water Temperature and Genetic Stock of Origin</i> , Transactions of the American Fisheries Society (July 1, 2013)
54	Roegner, C.G. <i>et al.</i> , <i>Distribution, Size, and Origin of Juvenile Chinook Salmon in Shallow-Water Habitats of the Lower Columbia River and Estuary, 2002-2007</i> , Marine and Coastal Fisheries: Dynamics, Management and Ecosystem Science (Aug. 13, 2013)
55	Teel, D.J. <i>et al.</i> , <i>Genetic Identification of Chinook Salmon in the Columbia River Estuary: Stock Specific Distributions of Juveniles in Shallow Tidal Freshwater Habitats</i> , North American Journal of Fisheries Management, 34:3, 621-641 (2014)
56	Thom, R. <i>et al.</i> , <i>Columbia River Estuary Ecosystem Restoration Program, 2012 Synthesis Memorandum</i> , PNNL-21477 FINAL (Jan. 2013)
57	Oregon LNG Project, Presentation to California Energy Commission (Dec. 4, 2008)
58	Oregon Department of Fish and Wildlife and Washington Department of Fish and Wildlife, <i>2014 Joint Staff Report: Stock Status and Fisheries for Spring Chinook, Summer Chinook, Sockeye, Steelhead, and Other Species, and Miscellaneous Regulations</i> (Jan. 22, 2014)
59	The Columbia Basin Bulletin, <i>Sportfishing interests seek reversal on 'Control Zone' closure at Youngs Bay</i> (Feb. 21, 2014)
60	Roegner, C. <i>The contribution of tidal fluvial habitats in the Columbia River Estuary to the recovery of diverse salmon ESUs</i> , Prepared for the U.S. Army Corps of Engineers (May 2013)
61	Counihan, T.D., <i>A survey of benthic sediment contaminants in reaches of the Columbia River Estuary based on channel sedimentation characteristics</i> , Science of the Total Environment, 484:331-343 (2014)
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