APPENDIX R

Comments on the Draft EIS and Responses

(continued)

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July 4, 2019

Kimberly D. Bose
Secretary Federal Energy Regulatory Commission
888 First Street N.E. Washington, D.C. 20426

Re: OEP/DG2E/Gas Branch 3, Jordan Cove Energy Project, L.P. Docket No. CP17-495-000
Pacific Connector Gas Pipeline, LP Docket No. CP17-494-000 FERC/EIS-0292D

Dear Ms. Bose:

We write representing the League of Women Voters of Coos County (LWVCC), LWV of Umpqua Valley (LWVUV), LWV of Rogue Valley (LWVRV), and LWV of Klamath County (LWVKC). We are grassroots nonpartisan, political organizations operating in the four counties in Oregon that would be directly affected by the construction and operations of the proposed Jordan Cove Liquefied Natural Gas (JCLNG) and Pacific Connector Gas Pipeline (PCGP), commonly referred to collectively as the Jordan Cove Energy Project (JCEP). Our detailed review of the Draft Environmental Impact Statement (DEIS) for this project shows that **the projects are in direct conflict with many of the state and national League of Women Voters positions**. These positions are based on study documents and consensus evaluations regarding natural resources, water quality and air quantity, climate change, offshore and coastal management, land use, public health and safety, energy conservation, and seismic risks.

Since the 1950s, the League has been in the forefront of efforts to protect air, land, and water resources. The League of Women Voters of the United States (LWVUS) "believes that natural resources should be managed as interrelated parts of life-supporting ecosystems. Resources should be conserved and protected to assure their future availability. Pollution of these resources should be controlled in order to preserve the physical, chemical and biological integrity of ecosystems and to protect public health." The League of Women Voters of Oregon (LWVOR) " . . . opposes degradation of all of Oregon's surface and ground water. . . ." and declares that climate change is the greatest environmental challenge of our generation. The following resolution passed almost unanimously at the 2018 National LWV Convention: "The League of Women Voters supports a set of climate assessment criteria that ensures that energy policies align with current climate science. *These criteria require that the latest climate science be used to evaluate proposed energy policies and major projects* [emphasis added] in light of the globally-agreed-upon goal of limiting global warming to 1.5 degrees C, informed by the successful spirit of global cooperation as affirmed in the UN COP 21 Paris agreement." Finally, at the 2019 LWVOR Convention, a resolution declaring a "climate emergency" passed unanimously. We, as local Leagues, are part of the national and state LWV. Based on these positions and our understanding of the likely impacts of the proposed JCEP on critical environmental resources and communities in our areas, the LWVCC, LWVUV, LWVRV, and LWVKC submit jointly this comment on the DEIS for the JCEP project.

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On the basis of LWV positions and for reasons we provide in this comment, we respectfully but strenuously urge the FERC to deny *with prejudice* any and all permits and approvals sought by the JCEP within your jurisdiction.

Our comments are organized as follows:

Chapter 1: Permitting Consideration Criteria
- I. Section 7 Authorization—Pacific Connector Gas Pipeline
- II. Section 3 Authorization—Jordan Cove LNG Terminal and Facilities

Chapter 2: Alternatives Analysis
Chapter 3: Concerns Related to National Environmental Policy Act (NEPA) Process/Council on Environmental Quality (CEQ) Guidance
Chapter 4: DEIS Section 4 Issues
Chapter 5: Conclusion

CHAPTER 1. PERMITTING CONSIDERATION CRITERIA

We understand the following about the authorizations sought by the Applicant.

> In FERC Docket No. CP17-495-000, Jordan Cove seeks an NGA [National Gas Act] Section 3 Authorization (Authorization) to construct and operate an LNG export terminal in Coos County, Oregon. The terminal would be capable of receiving, processing, and liquefying natural gas into LNG, then storing and loading the LNG onto LNG carriers. The Jordan Cove facilities could receive a maximum of 1.2 billion cubic feet per day (Bcf/d) of natural gas from the Pacific Connector pipeline and produce a maximum of 7.8 million metric tons per annum (MMTPA) of LNG.
>
> In FERC Docket No. CP17-494-000, Pacific Connector seeks a Certificate of Public Convenience and Necessity (Certificate), under NGA Section 7, to construct and operate an approximately 229-mile-long, 36-inch-diameter natural gas transmission pipeline, crossing through Klamath, Jackson, Douglas, and Coos Counties, Oregon. The pipeline would transport about 1.2 Bcf/d of natural gas from interconnections with the existing Ruby Pipeline LLC (Ruby) and Gas Transmission Northwest LLC (GTN) systems near Malin, Oregon to the Jordan Cove terminal.[1]

We understand that the NGA prescribes that the Commission make decisions about applications under these two sections of the Act by two distinct criteria. The DEIS provides this summary statement,

> Specifically, regarding whether to authorize the siting of an LNG terminal under NGA Section 3, the Commission would approve the proposal *unless it finds the proposed facilities would not be consistent with the public interest* [emphasis added]. In considering whether or not to issue a Certificate to a natural gas pipeline under NGA Section 7, the Commission would *balance public benefits against potential adverse consequences*, as documented in the Order. The Commission bases its decision on technical competence, financing, rates, market demand, gas supply, environmental

[1] DEIS, p. 1-1.

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> effects, long-term feasibility, and other issues concerning a proposed project [emphasis added].[2]

In 2016, the Commission denied PCGP's application for a Section 7 Certificate of Public Convenience and Necessity for the pipeline because the Applicant had failed to demonstrate adequate *purpose and need* for the project when weighed against the adverse consequences on private landowners. The denial of the Certificate for the pipeline resulted in denial of the Section 3 authorization to site the proposed LNG terminal since there would be no purpose for that facility without a pipeline to transport gas to it.

We discuss below our reasons for calling on the Commission to deny applications for this current project in relatively like manner. It is essentially the same project with similarly inadequate demonstration of need and limited public benefits in the face of still significant harm to landowners and communities. The numerous significant negative environmental impacts, including many not addressed appropriately in the DEIS, provide further cause for denial.

I. Section 7 Authorization of Certificate of Public Convenience and Necessity Sought for the Pacific Connector Gas Pipeline

A. The current application by PCGP for a Certificate of Public Convenience and Necessity should be denied because the Applicant has once again failed to demonstrate that there is adequate "need" for the Pacific Connector Gas Pipeline.

Regarding the adequacy of the Applicant's demonstration of need for the previous PCGP, the Commission explained in its 2016 Denial Order,

> Here, Pacific Connector has presented little or no evidence of need for the Pacific Connector Pipeline. Pacific Connector has neither entered into any precedent agreements for its project, not conducted an open season, which might (or might not) have resulted in "expressions of interest" the company could have claimed as indicia of demand. . . .[3]

The Certificate Policy Statement indicates flexibility in the way in which the Commission determines "need" for a pipeline.

> Rather than relying only on one test for need, the Commission will consider all relevant factors reflecting on the need for the project. These might include, but would not be limited to, precedent agreements, demand projections, potential cost savings to consumers, or a comparison of projected demand with the amount of capacity currently serving the market."[4]

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[2] DEIS, p. 1-7, citing "Certificate Policy Statement" (see *Certification of New Interstate Natural Gas Pipeline Facilities*, 88 FERC ¶ 61,227 (1999), clarified in 90 FERC ¶ 61,128, and further clarified in 92 ¶ 61,094 (2000)), that established criteria for determining whether there is a need for a proposed [pipeline] project.
[3] FERC, "Order Denying Applications for Certificate and Section 3 Authorization, Jordan Cove Energy Project, L.P., Docket No CP13-483-000, Pacific Connector Gas Pipeline, L.P., Docket No. CP13-492-000," (hereinafter cited as FERC Denial Order), March 11, 2016, pp. 16-17.
[4] "Certificate Policy Statement," p. 23.

We base our assertion that the Commission should deny the current application for a Certificate in part because relatively little of substance has changed since the 2016 denial.

1. Agreements. The Applicant reports several differences from the situation in 2016, but it does not appear to us whether these subsequent activities move the needle appreciably towards demonstrating "need."

- JCEP now claims to have executed "precedent agreements" for 96% of the proposed Pacific Connector Gas Pipeline's capacity, but we understand that these are not with actual outside buyers or shippers, rather they are aggregate bookings.[5] If this is true, does this demonstrate need?
- JCEP finally conducted an open season in July of 2017, but we understand that it resulted in "no qualifying bids." Does the Commission find this to be meaningful "indicia of demand?"[6]
- In its application to FERC of September 21, 2017, JCEP was only able to report that they, ". . . *continue to negotiate* definitive liquefaction tolling agreements with two large LNG purchasers" and are "*involved in active discussions* with other potential tolling customers." With regard to JERA Co., Inc., the company indicates that it has "*finalized the key commercial terms* . . . for the sale of at least 1.5 mtpa [million tonnes per annum] of natural gas liquefaction capacity for an initial term of 20 years, *subject to customary conditions including the execution of a detailed liquefaction tolling agreement.* Similarly, "JCEP has reached *preliminary agreement* with ITOCHU Corporation ('ITOCHU') *with respect to certain key commercial terms* for the purchase by ITOCHU of an additional 1.5 mtpa of natural gas liquefaction capacity for an initial term of 20 years [emphasis added]."[7] It appears that more discussions with potential customers have been held since the 2016 Denial Order than before, but still nothing binding has been accomplished.
- In December of 2018, Pembina revealed a timeline for concluding binding off-take agreements:

  > In addition, the Company has executed non-binding off-take agreements, which include the substantive commercial terms for a total of 11 million tonnes per annum ("Mtpa") which exceeds the planned design capacity of 7.5 Mtpa. These non-binding agreements include 20-year, 100 percent take-or-pay tolling commitments with investment grade counterparties. The Company is working diligently to conclude binding off-take agreements in the first quarter of 2019, including the nominated capacity of Rockies basin producers.[8]

  That has not occurred. In fact, in May, halfway through the second quarter of 2019, Pembina disclosed this:

CO32-1

[5] JCEP, PCGP, "Response to Removal-Fill Comments," Oregon DSL No.: 60697-RF, May 9, 2019, p. 11.
[6] JCEP, PCGP, "Response to Removal-Fill Comments," DSL No. 60697-RF, May 9, 2019, p. 11.
[7] Application to FERC, p. 15, citing *Veresen and ITOCHU Agree Key Terms for Jordan Cove Liquefaction Capacity*, Veresen Inc., dated Apr. 8, 2016 (no longer available online).
[8] Pembina News Release—December 10, 2018 - http://www.pembina.com/media-centre/news-releases/news-details/?nid=135415.

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CO32-1 The draft EIS does not make any claim about public benefit or lack thereof. The EIS analyses environmental impacts from the Project. The Commission would determine whether the Project would have a public benefit or "need" in its Public Order.

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> Commercialization efforts have continued and as previously disclosed the Company has executed non-binding off-take agreements with customers in excess of the planned design capacity of 7.5 Mtpa. *Commercial discussions with prospective customers are continuing* as regulatory permitting is progressed and under the new timeline *the Company will work to conclude binding off-take agreements by early 2020* [emphasis added].[9]
>
> As part of the same press release, they announced that they were cutting their 2019 investment in the project in half, pulling back "non-regulatory" expenditures and setting their projected operational date a year later at 2025.
>
> It will be up to the Commission to decide whether the current scenario demonstrates "need" under the "agreement test" appreciably better than in 2016 or whether this project is still essentially a speculative venture in search of a clear demonstration of market demand.

CO32-1 cont.

2. Demand projections. In a recent document provided to the Oregon Department of State Lands (DSL), JCEP predicted U.S. LNG export growth of four percent to five percent per year between 2015 and 2030 (without citing a source).[10] Various countries are named as potential buyers, but the discussion is based on 2016 information. Perhaps the Applicant wasn't able to find any more recent projections, but between the geopolitical upheaval and global economic turmoil in the past three years and currently, it seems patently unwise to rely on information and predictions from what is, in effect, already a bygone era. We can mention, for example, the current trade war with China that includes a 15% tariff hike by that country on U.S. LNG, bringing the total tariff to 25% before as of June 1. The LNG market does not operate in isolation. Alliances have shifted or weakened or both, treaties have dissolved, sanctions have been put in place, internal disruption is occurring in various parts of the world, there is talk of war in the Middle East, and relations are again strained with North Korea. At this writing, the Trump Administration has left the door open to blanket tariffs on all imports from Mexico. The overall LNG market is flux. Things change daily. Predicting market demand under the circumstances can be expected to be challenging but using 2016 or older trendlines to read even the near-term future isn't compelling.

3. Cost savings to customers. There are no domestic customers claimed or even suggested by the Applicant for the current project, but to the extent that U.S. gas were to be exported, domestic consumers of natural gas would pay more, not less, as a result.

4. Comparison of demand with capacity. This is the final gauge of "need" mentioned in the Certificate Policy Statement. Since JCEP switched from an import project to an export one, four LNG export terminals have come online; seven are approved and under construction; six are approved and not yet begun; and 19 projects are, like JCEP, proposed and somewhere in the regulatory permitting process.[11] In Canada, 18 LNG export facilities are proposed; 13 of them are on the west coast in British Columbia, much closer to the Montney Basin-sourced gas that Pembina plans to export if the Jordan Cove Terminal is constructed. Twenty-four Canadian LNG

[9] Pembina News Release – Pembina Pipeline Corporation Reports First Quarter Results. May 2, 2019. http://www.pembina.com/media-centre/news-releases/news-details/?nid=135432.
[10] The statement is simply asserted in JCEP, PCGP, "Response to Removal-Fill Comments," Oregon DSL No.: 60697-RF, May 9, 2019, p. 12.
[11] FERC, "LNG," https://www.ferc.gov/industries/gas/indus-act/lng.asp.

projects have been issued export licenses.[12] Mexico is a competitor, as well, with a project proposed in Sonora.[13] Venture Global LNG recently obtained an infusion of financing for three facilities on the Gulf Coast, one of which has received all necessary permits and has reliable global customers.[14] U.S. LNG export capacity from approved facilities is said to be on track to double by the end of 2020, from five billion cubic feet per day to ten Bcf/d.[15] It would appear that the Commission's commitment to avoid "overbuilding" may suggest that, by the time PCGP expects to come online—most recently set for 2025—the field will already be crowded, including on the west coast of North America both in Canada and Alaska.

In light of the above, we believe the Commission should find that PCGP is a project for which adequate need or public benefit still has not been established. The company has booked their own pipeline capacity, their discussions with potential Japanese customers are stale and non-binding, the project has been on the drawing board for well over a decade while several other LNG terminals that were begun more recently are already up and running and 13 more have been approved. JCEP sees so many regulatory challenges and even reversals that they have announced a 50% decrease in spending and a 12- month delay in projected start-date. The rosy picture painted in the DEIS in terms of global market demand is founded on national and international circumstances that are outdated and vastly different from today's realities, and those too are changing daily. Industry market analysts are paying increasing attention to public pressure to reduce fossil fuel emissions and refocus on non-polluting, renewable energy sources due to climate change. The myth of natural gas as "clean" is being exposed and replaced with understanding that methane is an even more harmful greenhouse gas than carbon. This may result in political conditions with a powerful market impact within a few years. CO32-2

B. The current application by PCGP for a Certificate of Public Convenience and Necessity should be denied because, in addition to failing to demonstrate need for the project, they have once again failed to demonstrate that there are adequate public benefits associated with the Pacific Connector Gas Pipeline to outweigh adverse effects on landowners.

The Commission in the 2016 Denial Order documented the public benefits claimed by the Applicants for the entire project: ". . . construction of the pipeline and LNG terminal will create temporary construction jobs and full-time operation jobs and millions of dollars in property, sales, and use taxes to state and local governments.[16] The Commission's conclusion was as follows:

> Because the record does not support a finding that the public benefits of the Pacific Connector Pipeline outweigh the adverse effects on landowners, we deny Pacific Connector's request for certificate authority to construct and operate its project, as well as the related blanket construction and transportation certificate applications.[17]

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[12] Natural Resources Canada, "Canadian LNG Projects," https://www.nrcan.gc.ca/energy/natural-gas/5683.
[13] https://www.chron.com/business/energy/article/KBR-lands-design-contract-for-planned-LNG-export-13652389.php.
[14] "New $1.3 Billion Equity Investment in Calcasieu Pass LNG Facility," *The Maritime Executive*, May 28, 2019, https://www.maritime-executive.com/article/new-1-3-billion-equity-investment-in-calcasieu-pass-lng-facility.
[15] "Additional LNG Exports Authorized from Freeport LNG," *The Maritime Executive*, May 29, 2019, https://maritime-executive.com/article/additional-lng-exports-authorized-from-freeport-lng.
[16] FERC Denial Order, pp. 16-17.
[17] FERC Denial Order, p. 18.

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CO32-2 Comment noted.

As with the proposal denied in 2016, the Applicants indicate that their desire is to facilitate the export of primarily Canadian natural gas to primarily Asian markets, but they again place their main focus in terms of public benefits for the PCGP on temporary job creation during the construction phase and increased tax revenue.

1. The number of jobs that would be created during pipeline construction—all temporary—does not offer enough of a public benefit to outweigh adverse impacts on landowners, communities, and the environment. The estimate of 885 jobs per month related to the pipeline project is not accompanied by enough detail to understand who would benefit and how much. But beyond that, the DEIS supports the Applicant in wrongly asking the Commission to find that jobs created by construction or operation of the *Jordan Cove LNG project* and revenue slated for Coos County and other municipal entities from the export facility are legitimate public benefits to weigh against adverse effects on landowners, communities, and the extensive additional human and natural environmental impacts of the *Pacific Connector Pipeline Project area*.

CO32-3

The Commission, following guidance in the Certificate Policy Statement, stated in 2016 that it balanced adverse impacts on landowners against public benefits claimed for the pipeline and found the latter lacking. The situation has not changed. We discuss below our reasons for concluding that the LNG project is in conflict with the public interest and therefore, authorization under NGA Section 3 should be denied. But whatever benefits are claimed for the JCLNG project are irrelevant to the Commission's consideration of the PCGP's Section 7 application. The 2016 Denial Order appears to underscore that conclusion. Therein, the Commission first considered the Section 7 application for the pipeline and determined that denial was warranted—and that, after performing only the first step in balancing benefits against adverse impacts. The foreclosure of a gas supply led the Commission to the separate denial of the Section 3 application for the JCLNG project.

2. The Policy Statement is not specific about what the Commission may elect to consider as public benefits, but applying the factors cited in the DEIS to the current PCGP proposal does not support a finding of public benefits outweighing adverse effects on landowners and communities.

The DEIS offers this explanation:

> "The Commission bases its decision on technical competence, financing, rates, market demand, gas supply, environmental effects, long-term feasibility, and other issues concerning a proposed project.[18]

We find the following to be pertinent:

- In terms of gas supply, new information shows that claimed public benefits are actually less significant than were expected during the previous iteration. As in the project version that FERC denied, JCEP cites as evidence of need the desire of Rocky Mountain and Canadian natural gas producers to find new markets for their product. In 2016 and until recently, the percentage of Canadian to U.S. gas the Applicant had in mind transporting has not been known. However, Pembina has now revealed that it

[18] DEIS, p. 1-7.

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CO32-3 The EIS does not ask the Commission to find that the estimated jobs and tax revenues that would be supported and generated as a result of Project construction and operation are public benefits or necessarily identify these anticipated impacts as public benefits. The Commission would determine whether or not to authorize the Project in its Public Order, as described in section 1.3.1.1 of the EIS:

"Specifically, regarding whether to authorize the siting of an LNG terminal under NGA Section 3, the Commission would approve the proposal unless it finds the proposed facilities would not be consistent with the public interest. In considering whether or not to issue a Certificate to a natural gas pipeline under NGA Section 7, the Commission would balance public benefits against potential adverse consequences,13 as documented in the Order. The Commission bases its decision on technical competence, financing, rates, market demand, gas supply, environmental effects, long-term feasibility, and other issues concerning a proposed project."

actually intends for relatively little benefit in terms of getting product to market—just 6-12 percent of pipeline capacity—to be realized by U.S. producers. At a meeting last fall in Grand Junction, CO, Stuart Taylor, a Pembina Senior Vice President, indicated that,

> Jordan Cove plans to specifically hold space in the project for Rockies producers. That space currently may amount to about 75 million to 150 million cubic feet a day, which Taylor acknowledged doesn't sound like a lot in the context of a project that could initially ship 1.3 billion cubic feet a day.[19]

While the DEIS is silent on this important matter related to need and public benefits, the above quotation indicates that the JCEP, "a market-driven response to the burgeoning and abundant natural gas supply in the US Rocky Mountain and Western Canada markets, and the growth of international demand, particularly in Asia,"[20] really is asking FERC to grant a Certificate of Public Convenience and Necessity to benefit almost entirely Canadian gas producers. As noted above, even before the company had disclosed how little of the pipeline capacity would be reserved for Rocky Mountain producers, public opposition to the project was founded heavily on the burden that would be placed on Oregon landowners, as well as harm to communities, and the environment (as we will demonstrate below) to build a 229-mile pipeline and liquefaction, storage, and export facilities to benefit a foreign corporation supplying gas to foreign markets. Our understanding of how handsomely the Canadian economy is to be rewarded at the expense of Oregon and U.S. has only grown and intensity of opposition along with it.

CO32-4

- The DEIS verifies that JCEP in the current application has dropped the previous suggestion that some of the gas may benefit the domestic market, resulting in accurate disclosure that the project would provide no energy on this continent in exchange for the eminent domain takings sought by JCEP.[21] While this corrects the record in terms of the company's intent, we raise it here to underscore the fact that, not only would the project provide little in terms of a new Asian market for U.S. gas producers, it would, in fact, offer no benefit whatsoever in terms of meeting future U.S. energy needs. We again contend that the power Congress has given to the Commission to convey, in turn, eminent domain authority on pipeline companies must stay within the bounds of the Fifth Amendment requirement for public use. Eminent domain power would be misapplied in this case where the Pacific Connector Gas Pipeline would be little more than a conduit from the Montney gas fields of western Canada to Asian markets.

- While the Commission did not comment in the 2016 Denial Order on "long term feasibility" of the project, that is another factor they may consider pursuant to the Certificate Policy Statement and if they do, there is reason for concern with regard to the PCGP and, indeed, the entire JCEP. Evidence of climate change is intensifying and with it, increasing demands from various sectors and the public for a more rapid conversion to renewable, non-polluting energy sources suggest that any new fossil fuel infrastructure projects may face higher costs or mandates to reduce emissions or both. Oregon's Governor and legislative majority has committed to passing a "cap and trade"

CO32-5

[19] Dennis Webb, "Geopolitical case for Jordan Cove," *Grand Junction Sentinel*, September 12, 2019, https://www.gjsentinel.com/news/western_colorado/geopolitical-case-for-jordan-cove/article_cd728716-b64a-11e8-9ed7-10604b9f7c7c.html.
[20] JCEP, FERC Application, Resource Report 1, September 2017, pp. 1-2.
[21] DEIS, 4-745.

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CO32-4 The draft EIS does not make any claim about public benefit or lack thereof. The EIS analyses environmental impacts from the Project. The Commission would determine whether the Project would have a public benefit or "need" in its Public Order.

CO32-5 It is outside the role of the Commission or this EIS to determine if the export or utilization of natural gas is appropriate.

bill similar to one already passed and operating in California and Washington state is taking a similar stand. Public outcry over clear evidence of health and other risks posed by hydraulic fracturing is resulting in local and state governmental efforts to ban or place moratoriums on fracking. The state of Oregon passed such a law during the 2019 legislative session. Within the lifetime of this project, gas supply could potentially be limited. The myth that natural gas is a clean or bridge fuel is being replaced by understanding that pipelines and facilities leak, and methane is, in fact, a powerful greenhouse gas. Some have suggested that projects like this, and JCEP in particular, may be forced to close down long before they have run their expected useful lives.[22] Fossil fuel assets may be on their way to being stranded.

CO32-5 cont.

- The technical competence of the JCLNG (and of the PCGP) appears to be something the Commission should take a close look at; unfortunately, the DEIS falls short of performing that task and arguably should be pulled back and the deficiency rectified. We offer two of what we believe to be many examples of this concern. 1) While we have not yet had an opportunity to review subsequent analyses and comments of the Oregon Department of Geology and Mining Industries (DOGAMI), Brad Avy, chief geologist and executive director of the agency has raised numerous serious concerns about the design of the proposed Jordan Cove LNG terminal, especially with regard to its likely ability to withstand a major earthquake and associated tsunami.[23] 2) As we will discuss below, the Federal Aviation Administration (FAA) has issued 13 Notices of Presumed Hazard, each indicating design features of the proposed LNG terminal and operations that pose significant safety hazards due to the proximity of the Southwest Oregon Regional Airport. While these issues surfaced long before Pembina purchased the project—they were acknowledged in the 2015 FEIS—they too have not been able to resolve them and instead have convinced FERC staff to kick the problems to a later phase—a proposal that we find totally irresponsible and unacceptable. 3) Many of the 98 recommendations FERC staff found it necessary to make to correct deficiencies of various types in the DEIS Section 4.13 Reliability and Safety appear to point to technical incompetence. 4) We question why, after fourteen years of planning to build the Pacific Connector Gas Pipeline on largely the same route, Pembina's application to the Oregon Department of Environmental Quality (DEQ) was still so deficient in fulfilling the requirements to obtain the Section 401 Water Quality Permit that DEQ issued over 200 pages of information gaps and design inadequacies to accompany its Denial.[24]

CO32-6

- The DEIS, following the Applicant's lead, fails to acknowledge the science that shows methane is quite the opposite of a less significant source of greenhouse gas emissions. Throughout the DEIS, "methane" is used several times, including in a list of substances considered to be "greenhouse gases." However, we could find no acknowledgment of the now well accepted fact that methane, though different in behavior from carbon-based fuels, is a powerful GHG and contributes mightily to global warming and climate change.

CO32-7

[22] Oil Change International, "Jordan Cove LNG and Pacific Connector Pipeline Greenhouse Gas Emissions Briefing," January 2018, p. 8.
[23] Oregon Department of Justice to FERC, December 1, 2017 conveying "DOGAMI Comments Related to Geologic Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Gas Connection Pipeline," November 17, 2017.
[24] Oregon DEQ, "Evaluation and Findings Report, Section 401 Water Quality Certification for the Jordan Cove Energy Project," May 2019.

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CO32-6 The EIS complies with the requirements of the NEPA. The project's compliance requirements related to FAA regulations as well as earthquake safety standards are addressed in section 4.13 of the EIS.

CO32-7 Section 4.12.1.2 of the draft EIS states that "the term "greenhouse gases" (GHG) refers to the gases and aerosols that occur in the atmosphere both naturally and as a result of human activities, such as the burning of fossil fuels. The primary GHGs are CO2, methane, and nitrous oxide." Methane emissions are quantified as CO_2e in all construction and operation emissions tables in section 4.12.

C. The Commission should deny the PCGP's Section 7 certification because, as in 2016, the harm to landowners that would be perpetrated to construct and operate the pipeline outweighs whatever public benefits that can be attributed to the PCGP. CO32-8

Indeed, the Commission based the 2016 Denial Order in significant part on the likely substantial use of eminent domain to construct the pipeline:

> In this case, the Pacific Connector Pipeline will impact 157.3 miles of privately-owned lands, held by approximately 630 landowners (54 of which have intervened). As stated above, the landowners contend that the pipeline will have negative economic impacts, such as land devaluation, loss of tax revenue, and economic harm to business operations (e.g., oyster and timber harvesting and farming). While we cannot predict the outcome of the eventual negotiations, *it currently appears that at least some portion of the necessary property rights will need to be obtained through the exercise of eminent domain* [emphasis added]. The Certificate Policy Statement makes clear that holdout landowners cannot veto a project that the Commission finds is required by the public convenience and necessity after balancing all relevant factors and considerations. However, "*the strength of the benefit showing will need to be proportional to the Applicant's proposed exercise of eminent domain procedures* [emphasis added]."[25]

The Commission in its Denial Order did not indicate the impact of eminent domain on their decision in terms of any specific number of easement agreements, rather that they would balance the Applicant's demonstration of public benefit against that particular adverse impact. As of 2016, JCEP had failed to negotiate easement agreements with around 90 percent of private landowners. According to our best information, almost midway through 2019, 40 percent have still refused to sign.[26] Over 100 landowners would be subjected to eminent domain takings. There is no question that JCEP under Pembina has made obtaining easements a higher priority than the previous owner did. There is also no question that opposition to the project is growing, a large measure of it due to rejection of the prospect of eminent domain for a 100 percent export project that offers almost nothing to the state of Oregon and carries substantial cost, risk, and harm. A "public use" for the pipeline is totally lacking. The last sentence of the quoted portion of the FERC Denial Order above will be still be key in the Commission's decision on the current application. Where are the benefits to justify this degree of eminent domain?

D. The Commission should be even more mindful of adverse impacts to landowners in light of uncertainty about the Applicants' long-term business intentions or viability. Landowner property rights issues are different in character from other environmental issues considered under the National Environmental Policy Act of 1969 (NEPA).[27] The Certificate Policy Statement calls on the Commission to pay special heed to this, as well. Of growing concern to landowners is understanding that construction, including tree cutting, can begin as CO32-9

[25] FERC Denial Order, p. 16.
[26] The specific number of landowners the Commission cited in the Denial Order included adjacent landowners, rather than just those owning property on the pipeline route. The public is not privy to proprietary information including about landowner negotiations, so the numbers we report here are based on landowner research of filed easement agreements in county recorders offices in the four counties affected by the project as of April 26, 2019. Alignment modifications, including those recommended by FERC staff in the DEIS, create some changes, including an increase in the number of affected private landowners.
[27] Certificate Policy Statement (1999), p. 24.

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CO32-8 The draft EIS does not make any claim about public benefit or lack thereof. The EIS analyses environmental impacts from the Project. The Commission would determine whether the Project would have a public benefit or "need" in its Public Order.

CO32-9 Section 7(h) of the Natural Gas Act grants Certificate holders the ability to utilize eminent domain to acquire a right-of-way across private lands. If the Commission issues Pacific Connector a Certificate, it would convey eminent domain authority. The proposed Jordan Cove LNG terminal, which has sought authorization under Section 3 of the NGA, would not have eminent domain authority.

soon as a pipeline company obtains a Certificate of Public Convenience and Necessity, but before it is clear that the Applicant's project is viable. After over a decade of false starts, despite grand hopes JCEP is still operating without assurance of a market and like Veresen before it, Pembina may have taken on more than it can afford. The project has no buyers and its parent company is showing signs that it lacks necessary financing.[28] The company's CEO shared at their May 3, 2019 Annual General Meeting that they are still looking for up to 60% equity partners:

> . . . And we also, we just are not ready for $10 billion-dollar projects. We are a $35 billion-dollar company. $10 billion is just too big for us. It's the same reason insurance companies re-insure. We are re-insuring this risk because it's just a bit too big for us.[29]

CO32-9 cont.

The cumulative message from these recent communications to shareholders and investors recall this from the Certificate Policy Statement: "Landowners should not be subject to eminent domain for projects that are not financially viable and therefore may not be viable in the marketplace."[30] Elsewhere we raise concerns that this project may be beyond the technical grasp of the new owners. The Certificate of Public Convenience and Necessity would allow the immediate exercise of eminent domain taking, even though the application materials are so incomplete that the DEIS includes well over a hundred recommendations that FERC staff believe are critical to just project safety, many of which are not required until well into project construction. The possibility exists that landowners' property would be seized and damage done, and then the company would walk away. We urge the Commission to heed the many signs we and other commenters are reporting that this project is wrong for the site selected and with age, the serious flaws in the recycled design and application materials are only becoming more obvious. Landowners should not have to suffer the added grief of having their land damaged for nothing.

E. The Commission should deny the application for the Certificate because the limited need or public benefits the Applicant demonstrates are still outweighed by adverse impacts on landowners and communities.

The Certificate Policy Statement explains how this next step in the Commission's decision-making process works:

> Landowners whose land would be condemned for the new pipeline right-of-way, under eminent domain rights conveyed by the Commission's certificate, have an interest as does the community surrounding the right-of-way. The interest of these groups is to avoid unnecessary construction, and any adverse effects on their property associated with a permanent right-of-way. In some cases, the interests of the surrounding community may be represented by state or local agencies. Traditionally, the interests of the landowners and the surrounding community have been considered synonymous with the environmental impacts of a project; however, these interests can be distinct.[31]

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[28] Evans and Schaaf to Rosenblum, "Letter of Concern Regarding Jordan Cove/Pacific Connector State Permit Processes," May 15, 2019.
[29] Pembina May 3rd, 2019 Annual General Membership Webcast. Minute 54:40 to 55:06. http://www.pembina.com/investor-centre/presentations-and-events/
[30] Certificate Policy Statement, 1999, p. 20.
[31] Certificate Policy Statement, 1999, p. 24.

The DEIS has erred egregiously in acknowledging, but then dismissing with inadequate data or reasoning, numerous adverse effects that cannot realistically be mitigated to an acceptable level because they stem from natural forces and other pertinent factors that are outside of the control of the Applicants. (The issues raised below are discussed in more detail under "III. Section 4 Issues.")

1. Landowners and communities would suffer residual adverse effects due to increased risk of wildfire during construction. The substantial increase in human and equipment activity in heavily timbered areas during pipeline construction can by itself be expected to increase the risk of fire; 62 percent of the pipeline route is forested. Pipeline construction would take place primarily during "fire season," keeping a dawn to dusk, 60-hour work-week schedule. That means construction involving the use of feller-bunchers, chainsaws, bulldozers, track-hoes, rock saws, and other heavy equipment, as well as blasting would take place across four southern Oregon counties under high to extreme wildfire risk conditions. PCGP would seek waivers of restrictions. In current drought conditions with longer, more intense fire seasons this activity constitutes an unacceptable adverse effect on landowners and communities.

2. Landowners and communities would suffer residual adverse effects due to increased risk of wildfire and consequences due to landslide, seismic activity, or other natural phenomena during operation. The DEIS largely dismisses the risk of pipeline rupture and explosion, despite the extensive seismic characteristics present particularly in the Coos Bay and Klamath County portions of the pipeline alignment, evidence of numerous areas at risk of soil liquefaction and lateral spreading, and extensive landslide-prone conditions all across the 229-mile route. This nonchalance is inappropriate when the PHMSA has acknowledged an increasing number of ruptures and explosions nationwide due to particularly weather-related landslides and consequently has seen fit to issue two sets of protocols calling for renewed efforts to site, engineer, build, and monitor gas pipelines.[32] What we see of Applicant plans do not measure up to the additional caution needed. Landowners and communities are right to be concerned. CO32-10

3. Landowners and communities would suffer residual adverse effects due to increased risk of landslide during construction. The Oregon Department of Land Conservation and Development (DLCD) lists as landslide triggers undercutting of a slope of cliff by erosion or excavation; shocks or vibrations from earthquakes or construction; vegetation removal by fires, timber harvesting, or land clearing; and placing fill (weight) on steep slopes.[33] A map set, prepared by the Applicant at the request of DOGAMI to allow assessment of pipeline rupture risk, shows numerous landslide-prone areas.[34] The maps are nonetheless referenced in several tables developed by the Applicant that report that the risk of landslide along the pipeline route is "low" or "none."[35] We believe this should have attracted the investigative attention of FERC staff while preparing the DEIS. CO32-11

4. Landowners and communities would suffer residual adverse effects due to disruptions of services and road closure due to landslides. Mapping included in application materials appear to suggest some risk of landslides near at least Highway 140 and the Butte Falls Highway in

[32] Pipeline and Hazardous Materials Safety Administration (PHMSA), "Pipeline Safety: Potential for Damage to Pipeline Facilities Caused by Earth Movement and Other Geologic Hazards," *Federal Register*, 5/2/2019.
[33] DLCD, "Oregon's Natural Hazards," https://www.oregon.gov/lcd/NH/Pages/Natural-Hazards.aspx
[34] PCGP, Resource Report 6, Appendix F, Geologic Hazards Maps (2), Figures 24-35.
[35] PCGP, Resource Report 6, Appendix A.6 "Geologic Hazards and Mineral Resources Report;" compare with maps, Resource Report 6, Appendix F, Geologic Hazards Maps, Figures 26-33, 35.

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CO32-10 Earthquakes and fire are addressed in sections 4.1, 4.4, and 4.13. As indicated in section 4.13, the risk of accidents (e.g., ruptures) is very low.

CO32-11 The risk of landslides is addressed in section 4.1 of the EIS. The EIS describes and documents the detailed iterative evaluation of landslides along the pipeline route; and provides data for the landslide risk determinations.

Jackson County, as well as some areas in Coos and Douglas Counties. Landslide risk is very real in Oregon across the pipeline route, but the investigation and planning processes are generally dismissed. Respect for natural processes and the fact that laws of nature are paramount is lacking. Mitigation is only marginally possible. The project is poorly developed—there is repeated evidence that plans are boilerplate and not designed for the specific conditions on the ground.

5. Landowners and communities would suffer residual effects due to the risk of pipeline explosion or other hazard in the event of a wildfire caused by other means. The DEIS reveals that JCEP has yet to prepare an Emergency Response Plan designed to minimize risk in case of wildfire. A draft plan is said to be included in the Plan of Development POD), Appendix H.[36] What is actually there is only a concept paper, outlining an "Emergency Plan and Preparedness Manual" and a "Public Safety Response Manual." Attachments that would describe various kinds of safety procedures are all "forthcoming."[37] We cannot find any evidence of awareness that the presence of a buried pipeline may restrict fire-fighting activities. The DEIS does not discuss whether above-ground pipeline facilities would be vulnerable to over-heating and explosion and if so, how they plan to prevent an explosion and gas fire from endangering residents or fire-fighters or making an existing wildfire much worse.[38]

CO32-12

CO32-13

6. Landowners and communities would suffer residual effects due to the risk of pipeline accidents from other causes. Between 2010 and 2017, pipeline incidents resulted in almost 100 deaths, injured 500, and forced the evacuation of thousands of people.[39] The fact that almost the entire 229-mile PCGP would be built to Class I standards in terms of pipe gauge and weld standards increases the risk of leaks, explosions, and gas fires which may also spread to structures and ignite wildfires. The U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) reported in a letter to Congress in 2013 on a variety of scenarios that raise the likelihood of pipeline incidents, several of which match the Applicant's pipeline construction and routing plans.[40]

7. Landowners and communities would suffer residual effects in the event of groundwater disruption, contamination, or loss due to construction, blasting, or hydraulic directional drilling (HDD). The application does not identify the location of all wells, springs, and seeps near the construction right-of-way for the pipeline and construction. Trenching and blasting could substantially alter surface and subsurface flow patterns. Water wells could be disrupted or ruined.[41] Additionally, the pipeline would cross six wellhead protection areas (WHPA), vulnerable areas where contaminants can be introduced into groundwater and harm drinking water supply.[42] There are numerous sites with the potential to encounter contaminated soils within 0.25 mile of the pipeline route, posing another threat to groundwater.[43] This is a

[36] DEIS, p. 4-775.
[37] DEIS, Appendix F.10 PCGP POD-Part 3-22.PDF, Appendix H, "Emergency Plan and Preparedness Manual," and "Public Safety Response Manual."
[38] DEIS, p. 4-775.
[39] Jonathan Thompson, "A map of $1.1 billion in natural gas pipeline leaks," *High Country News*, November 29, 2017.
[40] U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration to U.S. Congress, August 27, 2013.
[41] DEIS, p. 4-81
[42] DEIS, p. 4-79.
[43] DEIS, p. 4-80.

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CO32-12 As soil is a very effective insulator, the pipeline is not vulnerable to heating and explosion from fires that may occur on the surface.

CO32-13 The risks of fire, and how the project would be designed to withstand these risks, are addressed in section 4.13 of the EIS.

significant and serious concern for impacted landowners along the pipeline route who rely on springs on their property for drinking water and domestic uses. Municipal sources for 160,000 are also at risk.[44]

8. Landowners and communities would suffer residual adverse effects due to multiple impacts on water quality, including in violation of Oregon's Water Quality Standards. Below in 4.3. we will raise a number of concerns with harm to water resources that would stem from both construction and operation of the PCGP, but for purposes of the discussion here, materials accompanying the Oregon Department of Environmental Quality's denial of the Applicants' Section 401 Water Quality Permit attests to the high level of harm that would be brought by the PCGP.[45]

9. Landowners and communities in some areas along the pipeline would suffer residual adverse effects, including possibly long-term health problems due to the release of Naturally Occurring Asbestos (NOA) into the air from blasting and other soil and rock disturbance activities. A minimum of 6.5 miles of pipeline alignment would require disturbance of this highly carcinogenic material in Ultramafic rocks and serpentinite. OSHA regulations designed to safeguard personnel and other individuals from this airborne hazard do not apply in this situation. This clear and dangerous adverse effect on landowners and communities is not mentioned in the DEIS.

CO32-14

10. Landowners and communities in the vicinity of project facilities such as the Malin Compressor Station would suffer multiple, ongoing adverse effects of that facility. Natural gas compressor stations are associated with serious health hazards. Harmful emissions include volatile organic compounds (VOCs) that are linked to cancers, respiratory and cardiovascular illness, and birth defects. Other impacts include throat irritation headaches, burning eyes, skin irritation, as well as respiratory, nervous, and cardiovascular effects. Chemicals present can include benzene, dimethyl disulfide, methyl ethyl disulphide, ethyl-methylethyl disulfide, trimethyl benzene, diethyl benzene, methyl-methylethyl benzene, tetramethyl benzene, naphthalene 1,2,4-trimethyl benzene, m-&p- xylenes, carbonyl sulfide, carbon disulfide, methyl pyridine, dimethyl pyridine. [46] In addition to emissions-related problems, many people living in the vicinity of compressors suffer from the impacts of noise. These concerns—related to both physical and mental health—are associated with construction, ongoing operation, and compressor blowdown activities.

11. Indigenous communities in the entire project area would face cultural resource destruction and loss, clearly an adverse impact that cannot be adequately mitigated. The project has sparked broad concern by Tribal Nations as it is planned to cross the traditional lands of 14 groups. Five Tribes have declared their opposition and six Tribes have filed as intervenors.

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[44] Research to compile the extent of potential impact was performed by Physicians for Social Responsibility and reported in Rogue Riverkeeper, et. al. to Bob Lobdell, Public Comment on DSL APP0060697 (Jordan Cove Energy Project and Pacific Connector Gas Pipeline) Application for Removal-Fill Permit, January 30, 2019, p. 29.
[45] Oregon DEQ, "Evaluation and Findings Report, Section 401 Water Quality Certification for the Jordan Cove Energy Project," May 2019.
[46] Southwest Pennsylvania Environmental Health Project, "Summary on Compressor Stations and Health Impacts," February 24, 2015, https://www.docdroid.net/rJdRls2/summary-on-compressor-stations-and-health-impacts-22415.pdf#page=15

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CO32-14 Pacific Connector would employ the specific mitigation measures identified in its Fugitive Dust Control Plan for areas where naturally occurring asbestos may be present. A summary of these specific measures has been added to section 4.12.1.4 of the EIS.

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Impacts to cultural resources are certain to occur and many groups have complained that harm to water and traditional fishing sources would have long-term or permanent effects on their way of life.

II. Jordan Cove LNG Terminal Application for NGA Section 3 authorization

The Commission in 2016 denied Jordan Cove's application for Section 3 authorization to site, construct, and operate an LNG liquefaction, storage, and export facility without applying project-specific criteria. The Denial Order states,

> We find that without a pipeline connecting it to a source of gas to be liquefied and exported, the proposed Jordan Cove LNG Terminal can provide no benefit to the public to counterbalance any of the impacts which would be associated with its construction.[47]

We have provided reasons we believe call for denial of PCGP's application to construct the pipeline, thereby leading to denial of the current Jordan Cove LNG project on the same basis as in 2016, but our analysis of the latter project application and the DEIS causes us to conclude that it should be denied in its own right because it is not consistent with the public interest.

The DEIS states two criteria the Commission would use in considering a Section 3 application. Both center on the public interest.

> 1) "Note that the Commission will consider as part of its decision whether or not to authorize natural gas facilities, all factors bearing on the public interest, including the project's purpose and need."[48]
> 2) " . . . the Commission would approve the proposal *unless it finds the proposed facilities would not be consistent with the public interest.*"[49]

The Jordan Cove LNG Export Terminal project would be a highly complex undertaking under any circumstances, but the fact that first one company and now another one has remained committed to achieving it for over a decade, despite clear evidence of unsafe and inappropriate siting, raises serious concerns. First, this project has changed direction, beginning over a decade ago as an import scheme and then shifting to liquefaction, storage, and export purposes, as well as changed ownership and gone through myriad modifications resulting from extensive communications with regulators in attempts to obtain required permits and approvals. Across time, multiple consultants have prepared numerous reports and other documents regarding the various aspects of the design. The current application includes many of these materials, even though some are years old and were prepared for earlier iterations of the project.

Because the operation, begun by Veresen and then subsumed by Pembina, has been locked to the Malin to Coos Bay siting and began with a highly vested conclusion that the proposed location best meets the criteria, the current Applicant has inadequately assessed positive potential to meet the project purpose offered by other current-day alternatives. They have also

[47] FERC Denial Order, p. 19.
[48] DEIS, p. 1-6, fn. 12.
[49] DEIS, p. 1-7, citing Certificate Policy Statement.

paid little attention to serious deficiencies that have emerged with regard to the time-worn proposed location and design.

As a result of this long history, the project application includes a confusing set of often outdated, disjointed, and conflicting information. We believe that these iterations and ownership changes have resulted in a plan that does not fit well into the existing site at the same time as the Applicants seek to move forward tenaciously despite clear evidence of serious problems. The DEIS takes the entirely inappropriate approach of allowing known deficiencies to slide by without resolution, consistently indicating that they will be handled at a later time.

What the DEIS should have done is directly confronted the flaws in this project, rather than put forward the contention of the Applicant that they can and will eventually be overcome. The public is put at serious risk by the majority of the following matters of safety, thereby putting this project in conflict with the public interest. The remaining issues highlighted below describe ways in which the project promises to seriously disrupt the economic underpinnings of the communities that would be impacted. Those, too, constitute a conflict with the public interest. The Commission should find that this project has always been a bad idea for this location and there is ample evidence that it still is. CO32-15

A. The FAA has determined that the project LNG storage tanks are one of many flight hazards for the Southwest Oregon Regional Airport. The FAA determined that both LNG storage tanks constitute a "Determined Hazard to Air Navigation" at the Southwest Oregon Regional Airport due to excessive height. JCEP has stated that they cannot reduce tank height. The DEIS acknowledges the apparent impasse between the needs of the Applicant and the agency charged with protecting the public, but simply dismisses it as a significant problem and recommends that it be resolved at a later time.[50] A project that puts the lives of the flying public, flight crews, and the surrounding community in jeopardy is not in the public interest. (See also Chapter 4: DEIS Section 4 Issues, Subsection 4.13.)

B. The FAA has determined that excessive carrier vessel stack heights are a flight hazard that threatens the community. The FAA issued nine "Notices of Presumed Hazards" pertinent to the excessive height of LNG Carrier Vessel Stack Height (above 136' AMSL). The DEIS did not address this issue—a clear deficiency—but more importantly, an unresolvable public safety hazard is not in the public interest. (See also Chapter 4: DEIS Section 4 Issues, Subsection 4.13.)

C. The Applicant failed to disclose to the FAA that temporary construction equipment, such as cranes, derricks, etc., exceed allowable heights and would therefore pose flight hazards—this oversight is serious, whether deliberate or accidental. The DEIS correctly notes that JCEP did not notify the FAA of these hazards at all.[51] FERC staff included a recommendation that this be done, but there is no reason to expect that this issue would be resolved in a way that would make the public safe and such a serious oversight indicates poor judgment or ineffective planning or both. This conflicts with the public interest. (See also Chapter 4: DEIS Section 4 Issues, Subsection 4.13.)

D. The FAA has determined that a Thermal Plume Hazard exists as a result of an aspect of the project design. The DEIS also dismisses as outdated notice by the FAA of the CO32-16

[50] DEIS, p. 4-751—4-752.
[51] DEIS, p. 4-750.

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CO32-15 The EIS contains a description of the current status of the consultation and determinations from the FAA regarding avian risks (see section 4.13). The Commission defers to the FAA regarding determinations of risk to aviation.

CO32-16 See our updated analysis in section 4.10 and 4.13 of the final EIS related to the FAA assessment, and the Project's potential impacts to the Southwest Regional Airport.
Also, see comment response CO28-62.

thermal plume hazard created by the gas combustion turbines used in the liquefaction process and the risk it poses to airport operations. Thorough study is needed to determine the accuracy of that assertion and until demonstrated to be true or false by factual information, the risk of in-flight hazards for aircraft is not in the public interest. (See also Chapter 4: DEIS Section 4 Issues, Subsection 4.13.)

CO32-16

E. The project poses a heavy hydrocarbon vapor cloud explosion hazard. LNG Export Terminals that handle and store large quantities of heavier-than-methane hydrocarbons pose hazards of Unconfined Vapor Cloud Explosion (UVCE). Expert testimony submitted to PHMSA addresses potential flaws in the Applicant's calculations that allegedly result in an underestimation of the risk of UCVEs by an order of magnitude. Until either the concerns are assuaged through scientific evidence or the Applicant has been mandated to install appropriate safety measures, moving forward with the project is contrary to the public interest. (See also Chapter 4: DEIS Section 4 Issues, Subsection 4.13.)

CO32-17

F. The project poses an LNG leak or spill and explosion hazard. The 2015 FEIS for the previous project acknowledged that around 16,000 residents of the Coos Bay/North Bend area would likely be at least injured if a release of highly flammable LNG were to be coupled with an ignition source. The current DEIS references the same matter and discloses that the US Department of Transportation (USDOT) has not yet evaluated the project for compliance with safety measures. FERC staff indicated that, if USDOT finds this hazardous situation in such a populous area unacceptable, the Commission could deny the project's certification application.[52]We sincerely hope that is the case. (See also Chapter 4: DEIS Section 4 Issues, Subsection 4.13.)

G. The project suffers from numerous hazardous siting and design factors that are contrary to SIGTTO recommendations. The Society of International Gas Tanker and Terminal Operators (SIGTTO) exists to minimize risks, including in the site selection and design for LNG ports and jetties. The proposed JCLNG Terminal conflicts with several of SIGTTO's best practices recommendations, one of which has already been implied in most of the above discussions of specific public safety hazards: avoidance of siting near population centers.[53] (See also Chapter 4: DEIS Section 4 Issues, Subsection 4.13.)

CO32-18

H. The project of this nature sited in a major earthquake and tsunami zone should not even be considered. Both the Oregon Department of Oil and Gas Industries (DOGAMI) and independent seismic experts have raised serious concerns about the prospect of siting an LNG export facility in Coos Bay. The DEIS unacceptably indicates that this is not a problem. (See also Chapter 4: DEIS Section 4 Issues, Subsection 4.13.)

CO32-19

I. The communities of Coos Bay and North Bend face would almost certainly suffer the cascading results of housing shortage and unaffordability throughout the construction period, a short- and long-term situation that is not in the public interest. Even the DEIS, with repeated denials that acknowledged negative impacts of project activities would be significant concluded that the influx of outside workers for the LNG Terminal construction would create "high and adverse impacts." They conclude that, "the combined demand for housing from LNG terminal and pipeline workers would result in a significant impact

[52] DEIS, p. 4-702.
[53] Society for International Gas Tanker and Terminal Operators, *Site Selection and Design for LNG Ports and Jetties*, Information Paper No. 14.

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CO32-17 USDOT PHMSA reviewed the application and has issued a Letter of Determination on the Project's compliance with the siting requirements of 49 CFR 193, Subpart B. This determination also addresses compliance with NFPA 59A, section 2.1.1(d) for overpressure considerations from vapor cloud explosions. While 49 CFR §§ 193.2057 and 193.2059 provide specific parameters and computer models for thermal radiation and flammable vapor dispersion exclusion zones from each LNG container and LNG transfer system, the overpressure hazards from flammable vapor cloud explosions have been considered by Jordan Cove as the applicable factors to the site in accordance with NFPA 59A (2001), section 2.1.1(d). The requirements in NFPA 59A (2001) do not provide specific models or details to calculate the overpressure hazards from flammable vapor cloud explosions. FERC staff recognizes the importance of using suitable hazard models in its supplemental guidance document for Resource Reports 11 for LNG Projects, and application of uncertainty factors to account for potential underpredictions that may occur when compared against experimental data. The two primary models used to evaluate vapor cloud explosions, PHAST and FLACS, have been validated against a number of experimental data that do not indicate the under-predictions being represented. As such, an uncertainty factor of 2 was implemented in FLACS results. In addition, we note that FLACS has been shown to be one of the few models to more closely replicate overpressures in incidents with large flame propagation distances, such as Buncefield. FERC staff also note that many of the cited incidents that resulted in large damaging overpressures had initiating events that the preliminary engineering design and layers of protection proposed or recommended in Jordan Cove would prevent or mitigate. For example, many of the cited incidents include overfill events that did not have adequate or adequately managed overfill protection, had insufficient alarm and shutdowns initiated by hazard detection devices, had insufficient ignition controls that allowed vapors to disperse into buildings in a confined area that ignited and may have contributed to the overpressures. We evaluated the facilities to ensure there would be adequate overfill protections, sufficient alarm and shutdown capabilities, including those initiated by hazard detection, sufficient ignition controls, including alarm and shutdown of HVAC and combustion air intakes to prevent ignition in confined areas, in addition to many other layers of protection. We also recognize that DOT PHMSA and FERC continually seek to improve the evaluation of hazard models and assumptions used as inputs into the models in siting and in evaluation of layers of protection. As described in section 4.13.1.2 of the FEIS, DOT PHMSA regulations incorporate NFPA 59A (2001) for siting requirements. NFPA 59A (2001) requires consideration of factors applicable to the specific site with a bearing on the safety of plant personnel and the surrounding public must be considered, including an evaluation of potential incidents and safety measures incorporated into the design or operation of the facility. USDOT PHMSA has considered potential incidents, such as vapor cloud explosions and toxic releases in its Part 193, Subpart B Letter of Determinations to FERC. FERC staff primarily conducted the evaluation of this modeling prior to the 2018 MOU, and it was described in its NEPA documents. Since the issuance of the 2018 MOU, DOT PHMSA has been responsible for issuing a Letter of Determination indicating whether a project's preliminary design would comply with its siting requirements. In addition, as noted in section 4.13.1.5, FERC evaluates potential hazards and incident history when evaluating the reliability and safety in its engineering reviews, including its assessment of the various layers of protection proposed in the design. FERC staff may also make recommendations on the engineering design and layers of protection to mitigate the potential of a vapor cloud explosion from directly or indirectly through cascading damage, impacting the public.

CO32-18 See response to comment IND556-20

CO32-19 The LNG facility's resiliency against natural hazards, including seismic events, is described in the final EIS. These requirements meet or exceed requirements in the most commonly referenced structural design code and standard used in the United States for the most critical infrastructure and highest consequences.

on housing in Coos County."[54] The results would include displacement of local resident renters due to rent hikes, homelessness and associated health and safety risks, increased pressure on social services from housing stress, increased domestic violence and family dissolution.[55] (See also Chapter 4: DEIS Section 4 Issues, Subsection 4.9.)

J. **The commercial and recreational fishing industries play a significant role in the economy of the bay area and would suffer from various aspects of the project to the detriment of the public interest.** The DEIS fragments the potential negative impacts on fishing that can be expected during both construction and operation across numerous sections and concludes for each that impacts would not be significant. From destruction of species during dredging to exposing smaller vessels to dangerous weather and oceanic conditions, the entire fishing economy is jeopardized and undervalued by this project to the detriment of the entire community. (See also Chapter 4: DEIS Section 4 Issues, Subsection 4.9.)

CO32-20

K. **The negative visual impact of this high-profile industrial facility is in conflict with the public interest in a growing residential community that has been progressively building a viable economy based on tourism and recreation.** This is another one of the rare negative aspects of the project that FERC staff concludes in the DEIS would have "high and adverse impacts." Contrary to the public interest are major effects including reduction in the recreational and residential appeal of the area and likely a reduction in property values and outmigration of current residents. A facility of this size, entertaining enormous ships, changes everything about Coos Bay and environs. As the DEIS says, "the size and location of the proposed LNG terminal and associated facilities would cause visual effects from many viewpoints that cannot be effectively mitigated."[56] (See also Chapter 4: DEIS Section 4 Issues, Subsection 4.8.)

L. **FERC staff correctly raises concerns about the Applicant's handling of interactions with Tribal groups in the LNG Terminal area, but their plan and recommendation that resolution can be put off until after the Commission makes its decision about the Section 3 authorization are unacceptable.** The DEIS reveals that the Applicant has been ineffective in providing a required "Ethnographic Report describing sites of religious and cultural significance to Indian Tribes and other tribal information," and has been recalcitrant about responding to efforts to obtain compliance. It is appropriate for this issue to be raised in the DEIS, but the matter should have been dealt with and the results plainly reported in so that the public and other entities have the information before them. As it is, though, the DEIS indicates that resolution will not be required until "prior to construction of "facilities . . . ."[57] What recourse would the affected Tribal groups have at that point? (See also Chapter 4: DEIS Section 4 Issues, Subsection 4.11.)

CO32-21

[54] DEIS, p. 4-603.
[55] DEIS, p. 4-603.
[56] DEIS, p. 4-565-66
[57] DEIS, p. 4-647.

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CO32-20 Potential impacts to the fishing economy are discussed in section 4.9 of the EIS. Section 4.9.1.7, which addresses the recreation and tourism economic sector, has been expanded to include a discussion of travel-generated spending in Coos County related to shellfishing, fishing, hunting, and wildlife viewing. Additional information has also been added to section 4.9.1.8, which addresses the commercial fishing industry.

CO32-21 The draft EIS acknowledged that the Section 106 process has not yet been completed, and that future cultural resources investigations are outstanding. While some information was still pending at the time of the issuance of the draft EIS, the fact that some cultural resources reports are outstanding does not deprive the public of a meaningful opportunity to comment on the 106 process. The courts have held that final plans are not required at the NEPA stage (see *Robertson v Methow Valley Citizens Council*). The EIS stated that we would produce an MOA, in consultation with the consulting parties, including tribes, to resolve adverse effects at affected historic properties.

CHAPTER 2. ALTERNATIVES ANALYSIS

The alternatives analysis is central to the NEPA process and the project purpose and need statement is to be the basis of it. For that, the DEIS simply restates what the Applicant provided in their application:

> . . . Jordan Cove states the purpose of its project is to export natural gas supplies derived from existing interstate natural gas transmission systems (linked to the Rocky Mountain region and Western Canada) to overseas markets, particularly Asia. According to Jordan Cove, the project is a market-driven response to increasing natural gas supplies in the U.S. Rocky Mountain and Western Canada production areas, and the growth of international demand, particularly in Asia. *In its application, Pacific Connector states that the purpose of its project is to connect the existing interstate natural gas transmission systems of GTN and Ruby with the proposed Jordan Cove LNG terminal* [emphasis added].[58]

CO32-22

A. FERC staff should have recommended the No Action Alternative—thereby recommending denial of the project—because the Applicants' now stated intent to export the vast majority of Canadian natural gas causes the proposed project to defy common sense and reveals that the human and natural environmental costs associated with the entire proposed project are unnecessary to accomplish the true purpose and need of the project as it has evolved.

"A Citizen's Guide to the NEPA" indicates that, "If the agency is considering an application for a permit or other federal approval, the agency must still consider all reasonable alternatives."[59] It also says that, "Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the Applicant."[60]

CO32-23

Guidance provided in "Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements," (AKA "Green Book") for the current circumstance—where a private entity is seeking authorizations to construct and operate a project—instructs as follows:

> In some situations, no action taken by DOE [and we assume FERC, as an entity under the DOE's jurisdiction] may constitute the only alternative to the proposed action. Example: DOE may be involved with a private Applicant and faced with a go/no-go decision (e.g., fund or not fund, *approve or not approve*) [emphasis added]. In such a case, the no action alternative may include several sub-alternatives consisting of those reasonably foreseeable courses of action that would be available to the Applicant if DOE denies its application. DOE should describe such sub-alternatives and analyze their impacts to the extent they are reasonably foreseeable.[61]

[58] DEIS, p. 1-6.
[59] "A Citizen's Guide to the NEPA," p. 16.
[60] "A Citizen's Guide to the NEPA," p. 16.
[61] U.S. Department of Energy, "Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements," Second Edition, December 2004, p. 11.

19

CO32 continued, page 19 of 118

CO32-22 As stated in the EIS, the Commission's alternatives analysis relies on the purpose and need statement identified by the applicant. The Commission cannot simply ignore a project's purpose and substitute a purpose it or a commenter deems more suitable. The Commissioners would have a broader discussion of purpose and need in their Project Order.

CO32-23 Comment noted. Our analysis and explanation of conclusions for the no action and other alternatives is included in section 3.0 of the EIS.

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Per the explicitly narrow purpose and need statement, the objective of the JCEP is to export LNG to Asian markets, but within that, the purpose and need of the integral PCGP (italicized above) is the narrow specification that natural gas pipeline would begin near Malin, OR (the only place where the GTN and Ruby pipelines come together) and end "at the proposed Jordan Cove LNG terminal" which is nowhere else but on the North Spit of the Coos Bay. When this project was first developed for an import purpose, it could have made sense to utilize the site of the Port of Coos Bay as a west coast location due to its proximity to the intersections of the GTN and Ruby pipelines where both Canadian and U.S. markets could be served. But since conversion to an export purpose, the focus becomes gas source. While from Malin there would have been the potential to open new markets for natural gas sources from western U.S. gas fields in the Rocky Mountain states as the JCEP purpose and need statement allows, the Canadian corporate export project owner would also be free to set the percentage mix of the gas supply at will. In the previous iteration of the project, numerous commenters have pointed out that up to 100 percent could be Canadian if the parent company so chose.

CO32-23 cont.

As noted elsewhere in this comment (pp. 7-8), it is now known that the Applicant expects to source as little as six percent of the gas from U.S. producers. Going forward, it could be less or even none at all.

Therefore, FERC should recommend the No Action Alternative and outline sub-alternatives that would connect the preferred Canadian gas fields *directly* to existing or proposed LNG export terminals on the western coast of Canada. The Applicant's objective of exporting (Canadian) gas would be reasonably and feasibly accomplished by connecting those fields directly to an existing or proposed LNG facility on the west coast of Canada, thereby eliminating all human and natural environmental impacts across southern Oregon, from Malin to Coos Bay and in the bay area itself. This course would meet the actual Applicant purpose of exporting LNG from Canadian sources to Asian markets with dramatically lower net negative impacts. The Kitimat facility planned by Canada LNG appears to have adequate capacity to meet export needs, especially now that the Canadian government plans to invest an additional $275 million in the project.[62]

If Pembina, the current owner of the Ruby pipeline, so desired, they could perhaps find a profitable way to preserve some of their investment by connecting to Gulf coast facilities. For example, Cheniere Energy's Sabine Pass LNG terminal is already operational and expanding.[63] LNG plants in Corpus Christi, TX and Freeport, TX are under construction. Other Gulf Coast LNG terminals have been approved.[64] Under any of these scenarios, Pembina would have to develop its own project, rather than recycling the one developed years ago by Veresen.

We will grant that first Veresen and now Pembina combined have invested substantial resources to make this project happen—from editing and recycling thousands of pages of Resource Reports to hiring economic analyses to expensive promotional campaigns to incentive payments to obtain easement agreements with private landowners to paying filing and attorney fees to obtain required permits. But the human and natural environmental costs and public

[62] "Government of Canada Invests in Kitimat LNG Facility," *The Maritime Executive*, June 27, 2019, https://maritime-executive.com/article/government-of-canada-invests-in-kitimat-lng-facility.
[63] Federal Energy Regulatory Commission (FERC), "North American LNG Import/Export Terminals—Existing," https://www.ferc.gov/industries/gas/indus-act/lng/lng-existing.pdf
[64] FERC, "North American LNG Import/Export Terminals—Approved," https://www.ferc.gov/industries/gas/indus-act/lng/lng-approved.pdf

safety hazards of locating this project where it has been envisioned for over a decade are clearly not worth it to facilitate expanding natural gas production in Canada. It is not FERC's purpose to protect a corporation's investments in a project, especially one that has minimal value to this country.

Given the miniscule percentage of natural gas that would be sourced from the U.S. western states, common sense and technical and economic feasibility coupled with substantial adverse human and natural environmental impacts associated with the pipeline and significant hazards and costs to the communities around Coos Bay—contrary to the public interest—FERC needs to take a hard look at letting this time-worn, problematic project go, as is. We strongly urge FERC staff to recommend the "No Action Alternative" and assist the Applicant in recognizing, if they continue to have interest in exporting LNG overseas, that the wiser choice is to connect Canadian gas fields directly with an LNG facility on the west coast of Canada, rather than to continue to pursue a project design that is, in effect, thwarting Pembina from its goal of exporting Canadian gas.

CO32-23 cont.

B. Related to the above, FERC staff erred in its consideration of the no action alternative by simply adopting the approach put forward by the Applicant.

Had FERC staff followed the above stated guidance in the Green Book, we believe they would have taken a different, more considered approach to the no action alternative, rather than simply following the lead of the Applicant. The DEIS says this,

> Given that the Project is market-driven, it is reasonable to expect that if the Jordan Cove LNG Project is not constructed (the No Action Alternative), export of LNG from one or more other LNG export facilities could also be authorized by the DOE and eventually be constructed. Thus, although the environmental impacts associated with constructing and operating the Project would not occur under the No Action Alternative, equal or greater impacts could occur at other location(s) in the region as a result of another LNG export project seeking to meet the demand identified by Jordan Cove.[65]

CO32-24

FERC staff should have recognized that what is stated is not a genuine no action alternative at all, rather it is a self-serving construct by the Applicant that turns on a prediction that, if not this project another similar one that may have greater impacts, is a foregone conclusion. This "deferred action alternative" grossly understates the complexity of both the future natural gas market and even the future national and global approach to the development of fossil fuels at a time when ever more urgency is being urged due to intensifying effects of climate change.

C. The DEIS fails to follow in its execution of the alternatives analysis the criteria therein stated on which the determination of alternatives to be analyzed is to be based.

The DEIS states inaccurately that the following process, based on three criteria, was used to determine what could be considered and analyzed as alternatives as follows:

> The purpose of this evaluation is to determine whether an alternative would be preferable to the proposed action. To determine if an alternative would be preferable to a proposed action, we generally evaluate an alternative using three criteria:

CO32-25

[65] DEIS, p. 3-4.

CO32 continued, page 21 of 118

CO32-24 Comment noted. Text in the final EIS has been revised.

CO32-25 The alternatives analysis followed the process described in section 3.0 and referenced in this comment. However, as stated in the introduction to section 3.0, we also attempted to address some alternatives that were identified in comments filed during the scoping process, and comments and requests made during review by cooperating agencies.

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1. does the alternative meets the stated purpose of the project;
2. is technically and economically feasible and practical; and
3. offers a significant environmental advantage over a proposed action.

> The alternatives were reviewed against the evaluation criteria *in the sequence presented above* [emphasis added]. If the alternative would not meet the Project's purpose, or is not feasible or practical, we did not compare environmental information to determine if the third evaluation criterion was satisfied.[66]

CO32-25 cont.

It is important to pay close attention to amplification given to the first of the three criteria.

> The first consideration for including an alternative in our analysis is whether or not it could satisfy the stated purpose of the Project. As described previously, the purpose and need of the Jordan Cove Project is to export natural gas supplies derived from existing interstate natural gas transmission systems to overseas markets; and *the purpose and need of the Pacific Connector Project is to connect the existing interstate natural gas transmission systems of GTN and Ruby with the proposed Jordan Cove LNG terminal. Alternatives that do not achieve these purposes cannot be considered as feasible or reasonable alternatives* to the Project [emphasis added]. Furthermore, the Commission cannot simply ignore a project's purpose and substitute a purpose it or a commenter deems more suitable.[67]

To satisfy the purpose and need statement for the PCGP portion of the project per criterion #1 above and warrant even moving on the criterion #2, it appears to us that an alternative would need to include a pipeline that begins nowhere else but at Malin, OR and ends at "the proposed Jordan Cove LNG terminal" which is nowhere else but on the Coos Bay. With the beginning and end points of the pipeline thus fixed and in accordance with the above process, the only legitimate alternatives could be modifications to the proposed pipeline alignment (as FERC staff has actually done in recommending four minor route changes) or perhaps alternatives considered for other locations in Coos Bay.

However, rather than acknowledging that the extreme narrowness of the purpose and need statement forecloses almost all other alternatives, the DEIS proceeds for over six pages to raise "alternatives" primarily that would involve a different location for an LNG terminal/pipeline terminus other than the North Spit of the Coos Bay and would therefore fail to satisfy criterion #1. For example, the DEIS briefly discusses and then dismisses two proposed LNG facilities in Alaska—because the pipeline from Malin would be too long and therefore pose too many environmental disruptions (criterion #3). The numerous proposed LNG terminals that would be located on the west coast of Canada—which, as we noted, could play a role in a new strategy to export Canadian gas to Pacific Rim countries—were also dismissed for pipeline length from Malin (perhaps criteria #2 and #3) and lack of information.[68] Likewise, Mexican options were deemed unreasonable. FERC staff discuss Humbolt Bay in California as a possible alternative location for the LNG terminal. Humbolt Bay, too, fails to satisfy the purpose and need statement for location of the terminal, but FERC staff engages in some criteria comparisons and dismisses Humbolt Bay as offering no advantage in terms of environmental, etc., impacts over the proposed project.

[66] DEIS. P. 3-2.
[67] DEIS, p. 3-2.
[68] DEIS, p. 3-7.

It is totally unclear to us why all of that useless exercise was performed. The Alternatives Analysis section of the DEIS is thus flawed and almost entirely meaningless. CO32-25 cont.

D. The systematic alternatives analysis DEIS performs regarding LNG terminal locations proceeds to compare the proposed location and four others—ignoring again Criterion #1 that would make the latter irrelevant as alternatives—but the process reveals, in our view, the fact that the proposed location itself fails to meet the conditions the Applicant selected for the analysis alternatives for siting.

The history of the JCEP is provided in the DEIS, but very briefly, begun in 2005 as an import project designed and approved by FERC to supply natural gas to both U.S. and Canadian consumers. The rise of hydraulic fracturing resulted in a market-driven decision by the proponent to flip to an export purpose and another set of required applications was filed. As the project has been subjected to the scrutiny over the ensuing years by experts, state and other federal agencies, and the public, a range of types and degrees of problems have come to light. The most obvious are a conglomerate of serious public safety, environmental, and socioeconomic problems that stem from the siting of the LNG liquefaction, storage, and export terminal in Coos Bay, but public safety was not a central feature of the screening criteria or most certainly, the proposed location would have failed.

A problem is revealed via the project screening criteria. The DEIS reiterates from Resource Report 10 and Table 3.3.2-1 that five locations have been deemed as reasonable alternatives and provides an evaluation of the proposed location on Coos Bay, plus Astoria, Wauna, and Port Westward in Oregon and Grays Harbor in Washington. Each of the sites evaluated is said to meet the following four initial project screening criteria:

> 1. Available Land—a parcel or combination of parcels available for development and large enough to accommodate the proposed LNG terminal facilities and associated safety exclusion zone, about 200 acres.
> 2. Deep Channel Access—a channel with depth of at least 36 feet MLLW in order to accommodate the draft of anticipated LNG carriers.
> 3. Waterfront Access—a site that can safely accommodate the mooring of an LNG carrier and the facilities required to transfer LNG from the terminal to the carrier.
> 4. Comparable Pipeline – a site that could be reached by a comparable natural gas transmission pipeline from the intersection of the GTN and Ruby pipeline systems.[69]

CO32-26

From what is known now, the Coos Bay location fails to satisfy Criterion #1.

> 1. Available Land. The Coos Bay location on the North Spit includes 200 acres; however, the space available is highly compromised in meeting the project's needs due to its proximity to the Southwest Oregon Regional Airport. The FAA has issued numerous Notifications of Presumed Hazard and none have been resolved (see further discussion in Section 4.13 below). For example, one notification stems from the height of storage tanks. The FAA has indicated that JCEP must either reduce tank height or abandon the project. This issue is not a new one. It was acknowledged in the 2015 FEIS for the last iteration of this project. The current DEIS doesn't disclose the fact that the Applicant has been unable to reduce tank height, but other materials do. In the

[69] DEIS, p. 3-10.

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CO32-26 In the context of the alternatives analysis in the EIS, "available land" means that the parcel is owned by or leased to the applicant, agreements are in place that document that the existing owner is in agreement to sell or lease the property to the applicant, or the parcel is available for sale or lease. The proposed site for the Jordan Cove LNG terminal meets this definition of available land. With regard to the general alternatives analysis, we disagree that the EIS ignores current-day alternatives or unresolved deficiencies in the proposed location and design. Other agencies and the public have been provided with the opportunity to evaluate and comment on potential alternatives through the pre-filing process, scoping, and in response to the draft EIS.

alternatives analysis in their removal-fill permit application to the Oregon Department of State Lands (DSL), JCEP indicates that the configuration of the property where the storage tanks are to be located precludes widening the circumference of the tanks to allow their height to be lowered without violating safety regulations. That and another infeasible strategy to lower tank heights have resulted in the persistence of the FAA notification about tank height.[70] It appears that the proposed location does not meet the actual land availability selection criterion in a practical sense.

CO32-26 cont.

E. We are all faced with considering alternatives analyses for a proposed project that appears to constitute little more than justification for a pipeline and site location and design that was decided over a decade ago.

While 40 CFR § 1500.2.e. calls on the agency to "use the NEPA process to identify and assess reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment," the DEIS before us falls short. Because FERC staff began with the Applicant's highly vested conclusion that the proposed location best meets the criteria, the DEIS has both inadequately assessed positive potential to meet at least the central feature of the project purpose offered by other current-day alternatives. Likewise, it essentially ignored serious and persistently unresolved deficiencies that have emerged with regard to the proposed location and design. In the process, other agencies and the public have not been provided with a genuine evaluation of alternatives to this highly impactful project nor adequate informational means to do so.

F. The DEIS evaluation of what FERC staff has identified as reasonable site alternatives includes sites that do not meet the locations required by the purpose and need statement, but beyond that, it rejects at least one site that would involve significantly less serious impacts on the human environment than the prescribed site.

Environmental criteria were examined as summarized in the assessment in Table 3.3.2-1 of the DEIS.[71] They include the freshwater and estuarine wetlands affected at the site, endangered species and existing residences within one mile. With this assessment, Wauna, Oregon along the lower Columbia River appears to have several important factors that would be assets over the proposed location. The Wauna, OR site has low estuarine in-water issues, and very low level of existing residences within a 1-mile area. The Wauna location is also next to the Federal Navigation Channel of the Columbia River that is already 43 feet deep and most is 400 feet wide. A quick view of the land characteristics and development to compare the two sites shows the exceptionally different density of human development and infrastructure nearby, not only in the one-mile, but over the two to four-mile extent.

CO32-27

Moreover, there exist several options within the Pacific Northwest Pipeline infrastructure of existing pipelines within a close distance to the Wauna site on the lower Columbia River, even shown on their Fig. 3.2-1. These sources do not include the Ruby Pipeline. From a regulatory standpoint, we question why the alternative sources are not included in an assessment of the distance to the nearest pipeline as a criterion. But more importantly, the DEIS rejects all four alternatives that were evaluated because,

> When evaluating these potential impacts, we have not identified an alternative site that would result in a significant environmental advantage over the proposed site. Therefore,

[70] DSL Application APP0060697, Section 1 JCEP, Attachment B.1, "Reasonable site alternatives," PDF p. 231.
[71] DEIS, p. 3-11.

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CO32-27 The EIS acknowledges that the Wauna site would have significantly fewer residences located within one mile than the proposed site. However, our conclusion is based on consideration of not just a single factor but all environmental factors. Based on consideration of all environmental factors, we conclude that the Wauna site would not result in a significant environmental advantage over the proposed site in Coos Bay.

CO32 continued, page 25 of 118

we conclude that none of the regional alternative sites would result in a significant environmental advantage over to the proposed site in Coos Bay.[72]

We strenuously disagree with this assessment. FERC staff appears to have forgotten that the *human* environment is an essential consideration required by NEPA. A reasonable alternative that appears to pose an equally negative impact on the *natural* environment as the proposed alternative, but is located in a far less populated area and therefore guaranteed to pose a far less egregious negative impact on the *human* environment, should not be dismissed in favor of a project with the negative impacts on the communities of North Bend, Coos Bay, Empire, and Charleston, OR.

CO32-27 cont.

[72] DEIS, p. 3-11.

CHAPTER 3: CONCERNS RELATED TO NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) PROCESS/COUNCIL ON ENVIRONMENTAL QUALITY (CEQ) GUIDANCE

This DEIS fails to comply with NEPA.

> Agencies must integrate the NEPA process into their planning at the earliest possible time to ensure that planning and decisions reflect environmental values, avoid delays later in the process, and anticipate and attempt to resolve potential issues. NEPA should not become an after-the fact process that justifies decisions that have already been made. The CEQ Regulations emphasize early NEPA planning in the context of an EIS. The scoping process can be used before an agency issues a notice of intent to seek useful information on a proposal from agencies and the public. For example, agencies can commence the process to prepare an EIS during the early stages of development of a proposal, to ensure that the environmental analysis can be completed in time for the agency to consider the final EIS before making a decision on the proposal. Further, an agency shall prepare an EIS so that it can inform the decisionmaking process in a timely manner "and will not be used to rationalize or justify decisions already made."[73]

Throughout this DEIS, the Applicants' information appears to have been accepted without question and, in many cases on that basis alone, FERC staff has concluded that negative impacts on the human and natural environment would not be significant. CO32-28

Moreover, since the current project is largely identical to the version that has been in play since 2012 and that was acquired by the parent company as part of a larger business investment in 2017, the EIS being prepared appears to us to be "an after-the-fact process that justified decisions that have already been made."

The DEIS is also deficient in complying with 40 CFR §1507.2. which states that the agency shall,

> (a) Fulfill the requirements of section §102(2)(A) of the Act to utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision making which may have an impact on the human environment. Agencies shall designate a person to be responsible for overall review of agency NEPA compliance.
> (b) Identify methods and procedures required by section 102(2)(B) to insure that presently unquantified environmental amenities and values may be given appropriate consideration.
> (c) Prepare adequate environmental impact statements pursuant to section 102(2)(C) and comment on statements in the areas where the agency has jurisdiction by law or special expertise or is authorized to develop and enforce environmental standards.
> (d) Study, develop, and describe alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources. This requirement of section 102(2)(E) extends to all such proposals, not just the more limited scope of section 102(2)(C)(iii) where the discussion of alternatives is confined to impact statements.
> (e) Comply with the requirements of section 102(2)(H) that the agency initiate and utilize ecological information in the planning and development of resource-oriented projects.

[73] *Federal Register*, Vol. 77, No. 48, Monday, March 12, 2012, pp. 14476-77.

CO32 continued, page 26 of 118

CO32-28 The document meets the requirements of the CEQ regulations for implementing the NEPA. The commenter is incorrect, in that the EIS does determine that some impacts to the human and natural environment would be significant (see section 5).

CO32 continued, page 27 of 118

(f) Fulfill the requirements of sections 102(2)(F), 102(2)(G), and 102(2)(I), of the Act and of Executive Order 11514, Protection and Enhancement of Environmental Quality, Sec. 2. CO32-28 cont.

This document shows little if any integrated use of natural and social sciences and is unclear in the methods and procedures use to assess impacts.

CHAPTER 4. DEIS SECTION 4 ISSUES

Throughout the DEIS document are reported conclusions regarding the likely significance of adverse human and natural environmental impacts of the JCEP. It appears to us as reviewers that FERC staff relied excessively on Applicant information. Some of that information was provided by their own consultants—some conflicts with other sources. Some is outdated information, apparently recycled from previous iterations of the proposed project. This is concerning to us as reviewers, as is the supposition that so many of the clearly harmful effects can be mitigated with management practices and thereby reduced to insignificance. CO32-28 cont.

The League of Women Voters is often skeptical of the practice of mitigation as a means to adequately reduce negative impacts. A large project such as this calls for comprehensive consideration of where the benefits and losses are occurring and a careful examination of alternative approaches and cumulative effects. Many small impacts add up. With so many individually negotiated mitigation measures, there is a potential likelihood for the needs of the Applicant to become paramount over the needs of the resource the various Acts are designed to protect. Mitigation conditions are difficult to enforce, especially for a project such as this where impacts would occur over many miles and acres, as well as in enormous volumes of water. And finally, this DEIS in particular in many cases bases conclusions of insignificant impact on nothing more than the claim that the Applicants' mitigation plans would be implemented, without actually describing what those plans would include. Often it is revealed that they are still being devised and will not be available until a later time. CO32-29

We are hereby on record for our finding that the DEIS's treatment of mitigation as a panacea for significant negative impacts is highly unacceptable.

4.1 GEOLOGICAL RESOURCES

The DEIS is supposed to reveal the breadth of geologically related factors that have the potential to impact, or be impacted by, the JCEP and then provide an assessment of the human and natural environmental impacts. It fails to do so. The geologic features that potentially impact on the proposed Jordan Cove LNG terminal are deliberately omitted from this section—although without providing a reason. Only the proposed pipeline route is addressed, including geologic characteristics of four mountain ranges; minerals, mining, and mining hazards; seismic hazards including fault rupture, ground-shaking, soil liquefaction and lateral spreading; earthquake-induced landslides; and ground subsidence. Despite this inventory of geologically related challenges and hazards and the vast potential impacts of a major earthquake and tsunami on the human environment in the Coos Bay area (which FERC staff mentions, despite the missing discussion), the DEIS concludes the following: CO32-30

> Much of the Project is located in the CSZ tectonic area (an area of potential earthquake and tsunami activity). Based on the documentation that mineral resources are not present along the Project; Jordan Cove and Pacific Connector's proposed construction and operations procedures, methods, and plans to appropriately design for geologic hazards; and their implementation of minimization and mitigation measures, we conclude that constructing and operating the Project would not significantly affect geology and would not be significantly affected by geologic hazards.[74]

[74] DEIS, p. 4-40.

CO32 continued, page 28 of 118

CO32-29 Not all impacts can be avoided, and the NEPA does not require that all impacts be mitigated.

CO32-30 Impacts of a major earthquake and tsunami on the human environment in the Coos Bay area and for the LNG terminal are addressed in section 4.13. Inclusion in section 4.13 allows a more streamlined discussion that includes both the evaluation of geologic hazards, as well as the engineering safety and reliability issues for the Project.

CO32 continued, page 29 of 118

We disagree with the conclusion.

A. The DEIS must be found to be deficient as it fails entirely to discuss the Cascadia Subduction Zone as it could impact on the proposed JCLNG Terminal in this subsection devoted to geological resources. Had that topic been raised, the above dismissal of significant impact on the project would have been impossible

CO32-30 cont.

It is unclear, but nonetheless disturbing, why FERC staff chose to exclude discussion in this subsection of the most dramatic geologic feature in the region of the proposed LNG terminal. Granted, discussion of the Cascadia Subduction Zone (CSZ) and associated tsunami warrants inclusion in subsection 4.13 "Reliability and Safety" where it does appear. However, it should be dealt with as a geological phenomenon of major importance in this subsection of the DEIS. The purpose of the various subsections is to ensure that all issues with potential impacts on the natural and human environment are explored and presented and that an assessment about impacts is rendered on the basis of that information. If FERC staff sees fit to offer a conclusion about the geological resources and impacts—especially one dismissive of significant impacts—the proposed LNG site and everything of geologic consequence must be included.

The Coos Bay/Pacific Ocean adjacent to the Bay is, in fact, an area of active seismic events. A summary of those that have occurred between 1969 and 2015 is provided in Fig. 1, as detailed in the "Physical Description in the Coos Estuary and the Lower Coos Watershed."[75]

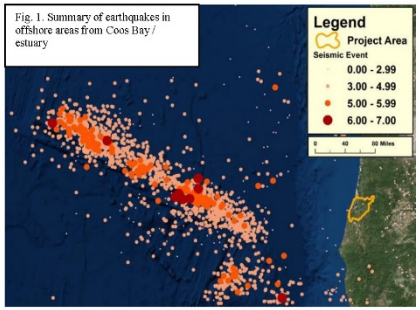


Fig. 1. Summary of earthquakes in offshore areas from Coos Bay / estuary

The bay itself has several faults as shown in the map below. Some have triggered significant earthquakes of 6.0 or more. One fault in particular is located at the proposed location of the LNG facility at Jordan Cove (Fig. 2). The underlying geology of the Coos estuary and surrounding watershed results from the tectonic interactions between the Pacific, Gorda, Juan de Fuca, and North American (i.e., North American continent) tectonic plates, and oceanic spreading from two ridges (Juan de Fuca and Gorda) as detailed by Rumrill (2006)[76]. Along the Oregon coast, pressure from these tectonic movements of the earth's crust have resulted in the folded and warped outer continental shelf margin and cycles of long term, incremental uplift of the coastal lands followed by rapid subsidence events as earthquakes.

[75] http://www.partnershipforcoastalwatersheds.org/
[76] Rumrill, S. 2006. *Ecology of the South Slough Estuary: Site profile of the South Slough National Estuarine Research Reserve*, South Slough National Estuarine Research Reserve, 259 pp.

29

The DEIS provides some discussion of seismic events in areas of the pipeline, particularly the hot zone in the Klamath Falls area; it also mentions the impacts of Tsunami and other associated risks. However, most all the description of the area and risks is provided with heavy citation of reports from Geo Engineers, unpublished documents. Why are there not references to the many peer reviewed and USGS reports associated with earthquake risks and subduction zone issues? The recent models provided by many highly qualified researchers indicate massive failure of infrastructure. Most seismologists predict an overdue Cascadian subduction earthquake event, and data from the Japan Tohoku quake and others have shown that models were not predicting the probability of events of such exceptional magnitude [77]

CO32-31

B. The DEIS is deficient by omitting substantive discussion of the potential for tsunamis associated with the CSZ.

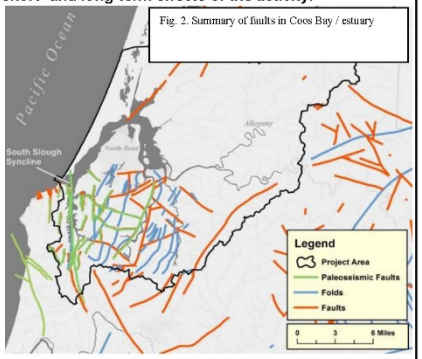
The actions of tsunami following a subduction zone event in an estuary such as Coos Bay will be repeated wave events back and forth, upstream and downstream causing longer and more damaging events. Neither the likelihood of major destruction and resultant risks to the many populations nearby nor their effects on the facility and underlying geology of the entire area are addressed at all.

CO32-32

C. The construction of the facility includes filling, compaction, and dredging of the slip and access channel, all of which would change the hydrology of the site. This has implications for the stability with short- and long-term effects of the activity.

The magnitude of the proposed removal of 5.7 mcy for the slip and access channel are not surficial changes alone, due to the likelihood of subsidence and the complex relationship of the hydrology of the spit, and erosion as a result of dredging and filling and changing of the patterns of recharge and discharge of water table. The use of sheet piles to secure the sides of the excavated slip and access areas does not prevent exchange of water or contain suspended sediments. The proposed changes in the shoreline and subtidal substrates as a result of dredging of the channel for access and the additional proposed removal of 584,300 cy from the four Navigation Reliability Improvements

Fig. 2. Summary of faults in Coos Bay / estuary



CO32-33

[77] Goldfinger C, Ikeda Y, Yeats RS, Ren J (2013a) Superquakes and supercycles. Seismol Res Lett. doi: 10.1785/0220110135; Y. Rong, D. D. Jackson, H. Magistrale, and C. Goldfinger. 2014. Magnitude Limits of Subduction Zone Earthquakes. Bulletin of the Seismological Society of America, Vol. 104, No. 5, pp. 2359–2377; Oregon Department of Justice to FERC, December 1, 2017 conveying "DOGAMI Comments Related to Geologic Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Gas Connection Pipeline," November 17, 2017.

30

CO32 continued, page 30 of 118

CO32-31 The GeoEngineers report, which is included in FERC's public record, includes details of all the references and data used to determine the seismic and other geologic hazards and risks for the Project along the pipeline route. The assessments performed as part of the EIS studies have included recent data from the USGS and DOGAMI. In addition, it is noted that the evaluation of pipeline seismic hazards is based on USGS probabilistic data. Also see comment response CO28-47; Reference to USGS documents and tools are made and many of the codes and standards that form the basis of the design contain maps and input from USGS.

CO32-32 Tsunamis associated with the CSZ are addressed in section 4.13. Modeling for the tsunami predictions includes recent modeling techniques and consideration of the specific characteristics of Coos Bay.

CO32-33 Impacts to the hydrology of the affected area is addressed in sections 4.3 and 4.5 of the EIS.

(NRI) and compaction of filling of the spit area for construction of the terminal and associated structures would have a profound influence on the circulation of water in the area. We provide additional comments regarding this in subsections 4.2 Soils and Sediments and 4.3 Water Resources below.

CO32-33 cont.

Also not addressed are the effects of vibrations from the turbines at the liquefaction facility. These would also affect the sand sediments and sand fill that would occur at the site. The factors of this and the interactions of the ground water in the sand spit are all of concern and should not have been ignored in the DEIS.

CO32-34

D. The DEIS denies that a major earthquake would pose a significant risk to the pipeline.

We reiterate our concern that the DEIS relies on thin research on a topic, often provided by the Applicant in the form of studies and reports performed by their own consultants. The result is often a conclusion based on an overly narrow and potentially biased perspective. With regard to the risk of earthquake damage to the pipeline, the DEIS states this, on the basis of one historic event and a study done for the Applicant by GeoEngineers,

CO32-35

> If a Cascadia-type earthquake of magnitude 8 or greater occurred during the operating life of the pipeline, the ground shaking and possible ground subsidence would be strongest in the Coast Range province and in low-lying areas near Coos Bay. Although ground shaking would likely be felt throughout the length of the pipeline from a Cascadia event, hazards would diminish in the eastward direction, with increasing distance from the offshore epicenter. Documented subsidence zones associated with the 1960 subduction zone earthquake in Chile (Plafker and Savage 1970) indicate subsidence on the order of 3 to 6 feet vertically distributed over a wide trough of approximately 60 miles. Pacific Connector studies (GeoEngineers 2017a) have indicated that the resultant strain accrual on a welded steel pipeline distributed over that length of pipe would not pose a substantial risk to the integrity of the pipeline.[78]

Experts indicate that buried pipelines are at greater risk of rupture from liquefaction, lateral spreading, and landslides than from earthquakes, per se, but the above assessment is arguably overly optimistic.[79] Ruptures and their consequences do occur and when they do, the impacts are likely to be significant. A recent article exploring methodologies of analyzing natural gas transmission pipeline behavior during earthquakes said this,

> Indeed, the earthquake impact on pipelines may cause significant losses in terms of economic and environmental assets and human life. As a matter of fact, in some of the strong historical and recent earthquakes, the natural gas networks suffered heavy damages, causing abrupt service stop [sic] or fires and explosions in the most severe cases as in the catastrophic earthquakes of Northridge (1994), Kobe (1995) and Kocaeli (1999).[80]

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[78] DEIS, p. 4-12-13.
[79] Shirley Weathers phone conversation with Ian Madin, Geologist, DOGAMI, 8/30/2018.
[80] Giovanni Lanzano, Ernesto Salzano, Filippo Santucci de Magistris, Giovanni Fabbrocino, "Seismic vulnerability of natural gas pipelines," Reliability Engineering & System Safety, Volume 117, September 2013, 2013, https://www.sciencedirect.com/science/article/pii/S0951832013000951

CO32 continued, page 31 of 118

CO32-34 The turbines would not result in vibrations that would have a measurable effect on the human and natural environment.

CO32-35 Engineering analyses for several worst-case scenarios that include subsidence and other earthquake impacts are discussed in section 4.2 of the EIS. The pipeline has been designed to meet the required standards for the documented ground motion criteria established by the USGS. Liquefaction hazards were evaluated using computer modeling and other quantitative studies for areas of loose sandy soils along the pipeline route. The studies included three levels of liquefaction and lateral spreading analyses to evaluate potential pipeline deformation and stresses for the maximum earthquake associated with the 2,475-year return period.

Steve Barlett, Associate Professor of Civil Engineering at the University of Utah, stated, "If an earthquake occurs, high-pressure gas lines are one of the most important items to protect. If they rupture and ignite, you essentially have a large blowtorch, which is catastrophic." He noted that pipelines are generally installed to withstand some ground movement but cannot withstand extreme shaking and instantaneous impacts such as drops of earth of several feet that are characteristic of major earthquakes. [81]

CO32-35 cont.

Indeed, the harm a major earthquake of the type geologists predict could happen in the Pacific Northwest at any time would almost certainly be far more devastating for the LNG terminal than on the pipeline that feeds it, but the DEIS insufficiently explores the question of seismic impacts on the pipeline and the conclusion of no significance is unsupported and even contrary to expert opinion.

E. The DEIS inaccurately carries forward the Applicant's claim that there are minimal risks that landslides—a major geologic feature all across the pipeline alignment—would be triggered by pipeline construction activities.

This claim is inconsistent with the Oregon Department of Geology and Mineral Industries (DOGAMI) evaluations of the project, as well as DEQ's stated concerns leading to denial of the Applicant's 401 Water Quality Permit.[82] The latter agency's thorough review and evaluation of Applicant materials makes the "Evaluation and Findings Report, Section 401 Water Quality Certification for the Jordan Cove Energy Project" an invaluable and reliable resource for assessing the adequacy of information and conclusions in the DEIS. The report provides several examples of deficiencies DEQ found in the Applicant's research, planning, and design that resulted in denial of the permit. Here are lengthy, but pertinent quotes bearing on the question of construction-triggered landslide risks and consequent increased sediment and turbidity:

CO32-36

> Construction ROW [right of way] Along Unstable Slopes. JCEP has not provided specific engineering drawings for its stormwater management system for the construction ROW and the 229-mile construction access road in areas of steep slopes and landslide susceptibility zones discussed below. JCEP is proposing to place grading spoils and, potentially, fill to level working surfaces, on geologically unstable slopes to support the 95-foot construction ROW including the Temporary Extra Work Areas (TEWAs). JCEP's Geologic Hazard Maps show geologically unstable slopes such as mapped landslides and rapidly moving landslide hazard areas in close proximity to the construction ROW. . . . For example, the Tyee Core Area Oregon's Coastal Range is an area of high landslide activity including both shallow and deep-seated landslides. The proposed pipeline traverses the Tyee Core Area from approximately Milepost 6 to 55. Research and technical references on slope stability are clear that land managers should avoid adding water or weight to unstable slopes and avoid cutting into unstable slopes without appropriate geotechnical engineering. Oregon has seen other linear infrastructure development (i.e., roads, pipelines) initiate landslides, particularly in the Oregon coast range (State Highway 20, and Coos County Natural Gas Pipeline).[83]

[81] U News Center, University of Utah, "Protecting Pipelines from Earthquakes," October 2, 2012.
[82] Oregon Department of Justice to FERC, December 1, 2017 conveying "DOGAMI Comments Related to Geologic Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Gas Connection Pipeline," November 17, 2017, p. 11-12.
[83] Oregon DEQ, "Evaluation and Findings Report, Section 401 Water Quality Certification for the Jordan Cove

CO32 continued, page 32 of 118

CO32-36 Comment noted. See our responses to the DOGAMI comments.

CO32 continued, page 33 of 118

> PCGP's ECRP does not show the engineering analysis and its technical support for how PCGP will manage the construction and post-construction stormwater above the Area of a Rapidly Moving Landslide Hazard and convergent headwall as well as the mapped landslide 115 identified by the Oregon Department of Geology and Mineral Industries.[84]
>
> Stormwater Discharge Relative to Unstable Slopes. To ensure compliance with statewide narrative criteria OAR 340-041-0007(1), DEQ developed the *Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines* (March 2018). In Section E.2.2 of these plan submission guidelines, DEQ requests that project proponents determine if infiltration of stormwater discharge should be avoided due to steep slopes or landslide risks (see Page 9). The proposed permanent ROW traverses over and along unstable slopes in numerous locations. . . . JCEP has not provided DEQ with a postconstruction stormwater plan for the permanent ROW demonstrating how JCEP would manage stormwater along the permanent ROW and, in particular, along landslide susceptibility zones. As discussed in Section 6.1.2.1 of this Evaluation and Findings Report, the stormwater discharge from slope breakers can reduce slope stability.[85]

CO32-36 cont.

F. The DEIS's conclusion that seismic issues in various areas along the 229-mile pipeline pose no significant risk of pipeline rupture from soil liquefaction is not compelling.

FERC staff acknowledge risk shortly after the pipeline connects to the LNG facility, "Quantitative evaluation of the potential for liquefaction, lateral spreading, and tsunami inundation was accomplished for the Coos Bay crossing, where liquefaction and lateral spreading hazards were identified during the initial assessment (GeoEngineers 2017a)."[86] Despite this, the conclusion is a blanket dismissal of significance of impact from geologic activities. Additionally, the Applicant states in FERC application materials that, "The PCGP Project is located in relatively sheltered areas of Coos Bay, where the effects of a tsunami on the pipeline are expected to be relatively minor."[87] This conclusion is just one of many that were challenged by Brad Avy, Executive Director and State Geologist of DOGAMI in comments on the project application submitted to FERC on December 1, 2017. Avy indicates that the claim was not backed up by any credible evidence. [88] DOGAMI considers soil liquefaction and associated lateral spreading as one of two primary causes of pipeline rupture in case of a seismic event.[89] This applies to the entire pipeline that would cross highly landslide-prone terrain and numerous waterbodies. Since any single pipeline rupture needs only an ignition source (including static electricity or a spark) to cause an explosion, resultant gas fire—and in a forested area—a conflagration, any

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Energy Project," May 2019, p. 24-25.
[84] Oregon DEQ, "Evaluation and Findings Report, Section 401 Water Quality Certification for the Jordan Cove Energy Project," May 2019, p. 17.
[85] Oregon DEQ, "Evaluation and Findings Report, Section 401 Water Quality Certification for the Jordan Cove Energy Project," May 2019, p. 37.
[86] DEIS, 4-12.
[87] FERC PCGP Application, Resource Report 6, Appendix A.6, "Geologic Hazards and Mineral Resources Report," p. 8.
[88] Oregon Department of Justice to FERC, December 1, 2017 conveying "DOGAMI Comments Related to Geologic Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Gas Connection Pipeline," November 17, 2017, p. 7.
[89] Phone conversation with Ian Madin, Geologist, DOGAMI, 8/30/2018.

liquefaction-prone areas along the pipeline should be considered "significant." In fact, according to Table 4.1.2.3-2 in the DEIS, there are 10 areas the Applicant's research showed had a "high" likelihood of liquefaction and lateral spreading, interspersed across the 229-mile pipeline route from Coos to Klamath County for a total of seven miles.[90] We urge FERC staff to review thoroughly any comments submitted by DOGAMI as part of the current public comment period before persisting in the FEIS to render the same no significance assessment for this and all other geologic hazards.

CO32-36 cont.

G. The DEIS is supposed to convey the results of a reasonably thorough investigation of issues on which to base its assessment of environmental impacts of a project, but instead, the discussion in this section relies almost entirely on the work of the Applicant's consultant.

Brad Avy's comprehensive comments on Resource Report 6 - Geological Resources (of the FERC application) to the Department of Energy on November 6, 2017 outline 51 individual substantive concerns about information gaps and design deficiencies.[91] Among them, Mr. Avy notes the use of limited and outdated source materials. As we review the DEIS, this deficiency remains, suggesting that the Applicant has not adequately addressed Oregon's lead geologist's concerns, particularly with regard to geologic issues along the pipeline route. GeoEngineers is almost the only source noted throughout and it is almost solely on the basis of their work that DEIS conclusions of no significant impact are based. This is unacceptable.

4.2 SOILS AND SEDIMENTS

The DEIS concludes the following about the impacts of the project on matters related to soils and sediments:

> Constructing the Project would result in both short-term and long-term permanent impacts on soils, including soils characterized for reclamation sensitivity. However, based on the Applicants' proposed construction and operations procedures, methods, and plans to address known and unanticipated soil contamination, and the implementation of impact minimization and mitigation measures, we conclude that constructing and operating the Project would not significantly affect soils.[92]

We do not agree.

A. Proposed modifications to the marine waterway (i.e., dredging at four points along the Federal Navigation Channel), referred to as "marine waterway modifications" or "navigation channel modifications" would have serious negative impacts from sediment displacement, yet are treated superficially as enhancements in the DEIS and are not included in cumulative effects considerations.

CO32-37

The USACE is currently reviewing the current Applicant proposal to determine if these Project-related effects to the civil works projects would constitute an injury to the public interest or affect the COE project's ability to meet its authorized purpose or impair its usefulness. However, we

[90] DEIS, p. 4-17.
[91] Oregon Department of Justice to FERC. December 1, 2017 conveying "DOGAMI Comments Related to Geologic Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Gas Connection Pipeline," November 17, 2017.
[92] DEIS, p. 4-74.

CO32 continued, page 34 of 118

CO32-37 These activities are part of the proposed action and addressed in sections 2 and 4 of the EIS (i.e., assessed in conjunction with other proposed project features).

find that these must be considered by the DEIS in the context of cumulative effects, and that the clarity of this needs to be included in weighing of alternatives. These four areas as associated with high value wildlife and fishery values, and the operations of these proposed activities have direct effects on the public use and access. The DEIS states in its updates of the project from previous submittals that the Applicant claims: "The proposal now includes the excavation of four submerged areas (removing about 700,000 cubic yards of material) lying adjacent to the existing federally-authorized Federal Navigation Channel, and dredge slurry pipelines in Coos Bay . . . ."[93] However, the David Evans document J1-000-TEC-PMT-DEA-00007-00 indicates 0.59 MCY, as does Table 2.1.1.8-1. We had previously pointed out this inconsistency with the USACE permit application. The document from the latter agency states that the Jordan Cove LNG project proposes to enlarge the Federal Navigation Channel at four locations. Approximately 584,000 CY of material would be initially dredged from four areas to facilitate Navigation Reliability Improvements (NRI).[94] They indicate this as 350,200 CY of sand and soft sandstone at RM 2; 184,000 CY of soft siltstone, sandstone, and sand from an area at RM4.5; an additional 25,200 CY of loose to dense sand to hard sandstone at RM 6; and 24,000 CY of loose to medium dense sand at RM6.8.

CO32-37 cont.

The method of removal by hydraulic dredging and placement of spoils from these sites includes a complex assembly of pipeline, booster pumps, and positioning within the bay. The Applicant proposes to lay a temporary pipeline along a total distance of ~ 8 miles to the proposed dredge material management area. The removal and disposal of wet sediments would require extensive dewatering, and the project provides no estimate of the proposed methods of dewatering or management of the area where the proposed spoils would be placed. These disposal areas (APCO Sites 1 and 2) are referenced with no clarification of the feasibility of dewatering and moving this quantity of sediment safely to this area at the bend of the bay. Moreover, the Applicant proposes to place future dredged materials during operations that would be part of maintenance of this enlarged Federal Navigation Channel at this same site. The Applicant estimates that maintenance dredging of these areas and other areas of the slip and access channel may yield approximately 37,900 to 49,800 CY every three years. The stability of this area, and the capacity for that area to receive and hold sediments is not considered, and the two sites are surrounded by wetland areas, as well. Has the Applicant considered the potential height of this, how the spoils would be contained, and the slopes of the placed materials? What will happen with storms and rain events on this pile of unconsolidated dredge spoil?

B. The DEIS has inappropriately dismissed contamination issues at the proposed LNG terminal.

"Appendix E: Contaminated Substances Discovery Plan" has the stated intent: "to outline practices to protect human health and worker safety and to prevent further contamination in the event of an unanticipated discovery of contaminated soil, water, or groundwater during construction of the [PCGP]."[95] In our review, we have several concerns with the thrust of this document and find the DEIS deficient in its consideration of the issues.

CO32-38

[93] DEIS, p. 1-4.
[94] USACE Public Notice, p. 4.
[95] "Appendix E: Contaminated Substances Discovery Plan," found in Appendix F.10 PCGP POD-Part 2-21.PDF, p. 1.

CO32 continued, page 35 of 118

CO32-38 As described in EIS sections 4.2.1.2 and 4.2.1.3, coordination with ODEQ in relation of soil contamination at the LNG Terminal area has been ongoing and continues. The requirements and approvals that may be developed by the State related to State permit applications are beyond the scope of this federal EIS.

Human-induced soil contaminants have been found wherever industrial activity has been occurred. The Applicant and the DEIS acknowledge contamination at the former Weyerhaeuser Containerboard/Mill property in the Jordan Cove area (ECSI Site #1083). In the past, DEQ has found mineral spirits, hydraulic oil, diesel, heavy-oil-range petroleum hydrocarbons, heavy metals, butylated tin compounds, polynuclear aromatic hydrocarbons, polychlorinated biphenyls, and dioxins. The Applicant claims that "The Jordan Cove Meter Station (MP 0.00) is the only location associated with the Pipeline where excavation would have the potential of encountering known contamination." The DEIS generally dismisses the chances of contaminant release.

However, DEQ provides important feedback regarding hazardous waste risks.

> DEQ expects JCEP would consult with DEQ and provide additional information as directed by FERC to identify potential hazardous waste and cleanup sites within the project area. Absent this information, violations of toxicity water quality standards are likely, and DEQ concludes there is no reasonable assurance that the proposed activities would be conducted in a manner that would not violate the Toxic Substances water quality standard. OAR 340-041-0033, OAR 340-048-0020(3).

And,

> JCEP proposes a stormwater management plan that does not demonstrate the spill containment controls are designed, for example, to capture a spill from the largest storage vessel in a drainage area:
>
> a. Without this demonstration, DEQ does not have reasonable assurance that Jordan Cove designed and located spill containment controls in manner to prevent a spill from causing a violation of the toxic substance standard. OAR 340-041-003.[96]

See also subsection A. in 4.3.1.1 Groundwater Resources—Jordan Cove LNG Project below for further discussion of contaminants known to the present in Jordan Cove and North Bend sites from historic paper and pulp milling industries.

CO32-38 cont.

C. Turbidity from dredging and drilling in Coos Bay is of great concern and is inadequately handled and estimated with their models.

With the extent of the dredging operations in Coos Bay and placement of spoils at several sites in the Coos Bay area, turbidity would be associated with all the operations. The DEIS relies on the Applicant's model of turbidity in affected areas and discusses likely effects with a series of assumptions. The Applicant indicates that the dredge would be dried before placement, but the quantity of substrates removed and the climate of our area do not appear to have been considered as factors. The Applicant states that all work within the Coos Bay estuary—including construction of the Materials Offloading Facility (MOF), dredging of the access channel and removal of the berm, and dredging associated with the NRI and eelgrass mitigation site—would be performed during the ODFW in-water work window (October 1 to February 15). However, this is a rainy season in the area; we question the ability of the Applicant to create dry dredge spoils and successfully dewater to reduce turbidity. The project proposal includes a permanent

CO32-39

[96] Oregon DEQ, "Evaluation and Findings Report, Section 401 Water Quality Certification for the Jordan Cove Energy Project," May 2019, pp. 71-72.

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CO32-39 The applicant is aware of when the operations would occur and would need to plan accordingly for the sedimentation erosion control measures. The applicant would need to meet the water quality permit requirement that would be issued by the State as part of their 401 water quality certificate. The State could require procedures that would mandate actions to ensure operation is a not a water quality issue during dredging from spoils deposition areas.

impact on 15.078 acres of mud flats, 1.9 acres of vegetated shallows for a total of 16.978 acres with a permanent impact that is proposed for their mitigation. The total acreage affected is projected at 90.951, but much of this is considered temporary of which are 58.036 acres subtidal. These subtidal areas are highly likely to produce turbidity.

Deficiencies in JCEP plans for dealing with risks of frac-outs during HDD increase the potential for significant turbidity standard violations as well as other issues. The DEIS provides these proposed locations in Table 4.3.2.2-2. We discuss this here in soils and sediments section and again in water quality. Horizontal Directional Drilling (HDD) operations required to route the PCGP under the Coos estuary are expected to produce an estimated minimum of 3,900 cubic yards of excavated sediment. We do not know where these sediments would be placed or contained. What are the estimated volumes and chemical characteristics of the sediments? How are the fluids associated with the HDD operations to be treated and disposed of? The access areas for the leg under Coos Bay from Kentuck Slough to North Bend would have considerable activity and both areas are wetlands. Likely the sediments and drilled fluids would be brought to the surface in the vicinity of two or more of the proposed inbound and outbound pipeline HDD surface penetrations; 1) a site near the shoreline of Kentuck Slough; 2) two sites in the vicinity of the South end of the Highway 101 bridge over the Coos Estuary and; 3) one site at the proposed Pacific Connector pipeline terminus at the South Dunes LNG terminal location. Because the proposed HDD operations would take place in close proximity to the shoreline of the estuary, and because HDD operations would produce a considerable volume of drilled sediment and drilling fluids, an operations and management plan for the HDD operations is not available when one examines the document referenced in footnote 42.[97] CO32-40

D. The DEIS fails to adequately consider the soils and stability of the land mass along the pipeline.

Landslides are well documented within areas of proposed Pacific Connector pipeline. The slides could be triggered by earthquake events or from storm related events, the instability of the geology, or construction activities. The proposed route crosses four regional physiographic provinces in Oregon: Coast Range, Klamath Mountains, Cascade Range, and Basin and Range. The Coast Range is especially vulnerable to slides and erosion, as it has relatively soft marine sedimentary rocks that overlie basalt, and the frequency of slides and erosion is high and well known. Moreover, areas that are disturbed and cleared of vegetation would have increased risks of failure. The proposed use of ridge tops would expose soils and erosion and channeling of overland water flow can be expected to result in increased risks for slides, slope failures, and mass wasting. Landslides are one of the most common and most devastating geohazards in Oregon and contribute over $10 million of economic losses every year[98], Seismically induced landscapes have been modeled for Oregon and show the highest risk in areas of southern Oregon that combine marine sediment and slopes with seismic risks to provide an overlay. In addition, below (Fig. 3) we note seismic risk areas from Sharifi-Mood et al. 2017.[99] CO32-41

[97] The footnote references PCGP FERC Application, Appendix G.2 of Resource Report 2 which indicates the information is forthcoming.
[98] Mahalingam, R., Olsen, M.J., O'Banion, M.S. 2016. Evaluation of landslide susceptibility mapping techniques using lidar-derived conditioning factors (Oregon case study), Geomatics, Natural Hazards and Risk, 7:6, 1884-1907.
[99] Sharifi-Mood, M., Olsen, M. J; Gillins, D. T., Mahalingam, R. 2017. Performance-based, seismically-induced landslide hazard mapping of Western Oregon. Soil dynamics and earthquake engineering 103:38-54.

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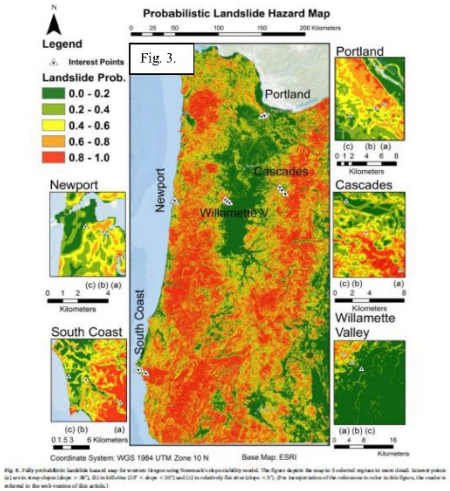
CO32-40 Excavated sediment from the HDD drilling and pit formation is subsurface soils and could be disposed of using standard soil disposal methods. HDD drilling pit would be designed to handle the volume of these sediments borings or move the soils to disposal areas before the pit is filled so that these sediments would not enter adjacent waters. HDD drilling fluid is mostly inert bentonite clay and water. The applicant would need to follow federal, state, and local requirements to confirm that the substance is safe for disposal off site or provide a safe location to dispose of this fluid. This would be handled through state and local permitting process. See response to comment CO28-173 about risks of frac-out.

CO32-41 Soils are addressed in section 4.2.2 of the EIS; and slopes are addressed in section 4.1.2.4 of the EIS.



E. The DEIS wrongly dismisses the potential impacts of contaminated and toxic hazards caused by pipeline construction on the natural and human environment.

The potential for toxic and contaminated materials to find their way into the numerous water bodies to be crossed by the PCGP is dismissed as insignificant by the Applicant and the DEIS. We contend that the Applicant's investigation and description of potential contaminants is insufficient and the DEIS irresponsibly accepts their guarantees. The Applicant acknowledges that contamination exists, but claims use of Best Management Practices (BMP) would eliminate significant impacts. As we explain below, our review of project information indicates that they understate, underreport, and under-evaluate numerous potential issues. Reliance on their conclusion in the DEIS is evidence of insufficient investigation.

CO32-42

"Appendix E: Contaminated Substances Discovery Plan" included with the DEIS has the stated intent: "to outline practices to protect human health and worker safety and to prevent further contamination in the event of an unanticipated discovery of contaminated soil, water, or groundwater during construction of the [PCGP]." [100] We have several concerns with the thrust of

[100] DEIS, "Appendix E: Contaminated Substances Discovery Plan," found in Appendix F.10 PCGP POD-Part 2-

CO32 continued, page 38 of 118

CO32-42 ODEQ has reviewed the list of contaminated sites that was contained in the draft EIS. Revisions have been made to the EIS based on ODEQ's letter relating to existing contaminated sites along the pipeline route.

CO32 continued, page 39 of 118

this document and believe the DEIS is deficient by accepting it as adequate for purposes of the NEPA analysis.

First, although in Appendix E, PCGP purports to have evaluated "sites within construction areas" and "sites in proximity to pipeline project area" by consulting DEQ's Environmental Cleanup Site Information Database (ECSI). They conclude "no risk of impact" for each one. The rationale most often provided is that the areas would only be used as pipe yards. We contend that this approach disregards the realities of how dangerous and harmful contaminants are acted upon by ongoing forces such that they can be released to cause deleterious impacts, regardless of use. Contaminated soils do not suddenly become stable and inert once a construction period is over. If that were the case, why would the EPA and DEQ concern themselves at all with contaminated sites, as long as human activity that created that situation has ceased. In fact, the massive disturbance the construction phase of this project would generate is just the beginning of a potential set of cascading and long-term circumstances. Every hard rainfall that sends water, if not mud, rushing across a clear-cut easement and eroding its way down a steep embankment poses the risk of contaminant release. And looking only at the construction phase, we are not assured by the Applicant's promise at 5.0 that, when ". . . unanticipated contaminated soil, water and/or groundwater is encountered during construction . . . . All construction work in the immediate vicinity of areas where hazardous or unknown wastes are encountered will be halted" and a long list of measures will be implemented before construction resumes.[101] Are we to be confident that work stoppage on a tightly budgeted project would be consistently implemented? Under what circumstances? Would blowing dust be considered adequate cause for action?

CO32-42 cont.

More concerning is that Appendix E is silent on other egregious sites of known contamination in close proximity to the pipeline construction route. Human-induced soil contaminants have been found wherever industrial activity has been done historically. The Applicant has not investigated and reported on the most enduring industry, timber and wood products, beyond the former Weyerhaeuser Containerboard/Mill property in the Jordan Cove area (ECSI Site #1083). The Applicant claims that "The Jordan Cove Meter Station (MP 0.00) is the only location associated with the Pipeline where excavation would have the potential of encountering known contamination." They go on to list nine ESCI or Leaking Underground Storage Tank (LUST) sites, none of which they expect would pose problems. Whether or not they are correct in that warrants further investigation, but what is missing is any mention of seriously contaminated sites that have been under investigation by the EPA and DEQ for decades to the east of the last site JCEP addresses, the Thomason Mining Property near MP 109-10, leaving almost 100 miles (over 40 percent of the total pipeline) without analysis.[102]

There are conceivably several unknown sites of contamination within that segment of proposed pipeline, but there is at least one known site of significance JCEP failed to discuss. A 660-acre site in Klamath Falls formerly owned by Weyerhaeuser and now owned by Collins Company is on DEQ's database (ECSI #655). It is located near MP 198 and bounded on the south side by the Klamath River. The site of concern includes an old landfill, storm water outfall, a sawmill and powerhouse, and sediment. Limited testing has been done and most is over a decade old. But extant test results show that all areas contain multiple contaminants. An excerpt from the ESCI

21.PDF, p. 1.
[101] DEIS, "Appendix E: Contaminated Substances Discovery Plan," found in Appendix F.10 PCGP POD-Part 2-21.PDF, pp. 7-8.
[102] Ibid., pp. 1-6.

states, "It should be noted that this segment of the Klamath River is listed as water-quality-limited. In particular, total maximum daily load (TMDL) limits for pH, dissolved oxygen, temperature, ammonia toxicity, and chlorophyll-a are exceeded. The primary reasons for this are thought to be unrelated to point sources, and include algae entering the river from Lake Ewauna and Upper Klamath Lake, agricultural runoff, and historic storage and transfer of logs on the river. The Klamath River National Wildlife Refuge is across the river from the plant."[103] The ESCI database entry for the site indicates that appropriate cleanup measures have not been executed due to a disagreement over distribution of responsibility between the former and current owner. The fact that the Applicant presents no information about this only marginally tested, but clearly contaminated ESCI site, is deeply concerning and should have been investigated by FERC staff.

CO32-42 cont.

We note that DEQ, in its Evaluation Report accompanying denial of the 401 Water Quality Permit, indicates that information provided by the Applicant is deficient to ensure contaminants are not released to Oregon's waters. We find it useful to again quote extensively from the Report:

> Trenched crossings across waterbodies can increase the mobilization, solubility, and availability of soil contaminants. As discussed above, sources of soil contaminants include naturally occurring minerals, legacy wastes from mining operations, and chemical contaminants from industrial operations.
>
> On March 11, 2019, DEQ requested JCEP develop site-specific water body crossing and restoration plans for each waterbody affected by the pipeline. The plans are necessary to address methods needed to restore hydrologic and habitat function to predevelopment conditions. At locations where toxic or hazardous substances may be present, DEQ would rely on these plans to determine that construction and site restoration is completed in a manner that prevents the mobilization of soil contaminants.
>
> DEQ has not yet received the waterbody crossing plans from JCEP. Absent such plans, DEQ cannot conclude that project actions avoid or minimize activities that discharge toxic substances into waters of the state.[104]

Dismissal of significant risk in view of these types of information gaps is unacceptable. It is also not acceptable for the right to the public to information and comment for the DEIS to simply ensure that the inadequacies in the contaminated substances plan will be rectified "before construction."[105]

F. The DEIS should not go beyond following the Applicant's lead in finding the potential for mercury contamination from historic mines of insignificant concern based solely on a report prepared in 2007 by the Applicant's consultant.

CO32-43

The PCGP would be routed near the Red Cloud, Mother Lode, Nivinson, and Elkhorn mining groups, posing the potential for mercury contamination from historic cinnabar mines. The

[103] Oregon DEQ, Environmental Cleanup Site Information (ECSI) Database Site Summary Report - Details for Site ID 655, Weyerhaeuser - Klamath Falls.
[104] Oregon DEQ, "Evaluation and Findings Report, Section 401 Water Quality Certification for the Jordan Cove Energy Project," May 2019, p. 70.
[105] DEIS, p. 4-60.

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CO32-43 There is no evidence to indicate additional investigation is necessary in relation to the potential for mercury contamination in areas of associated historic mining. The 2007 investigation was performed by a qualified contractor.

Applicant's consultant, GeoEngineers, conducted sampling and produced a report on their findings in 2007. At 6.2.2 Ecological Health Risk Screening, the report notes,

> Mercury was detected in soil and stream sediment samples at concentrations that exceed ecological risk screening criteria at each of the sampling areas, except in presumed background areas. However, the proposed construction should not alter or adversely affect ecological health at the site or downstream areas because appropriate erosion and sediment control measures at upland and in-stream areas will be rigorously implemented in accordance with the PCGP Erosion Control and Re-vegetation Plan (ECRP) and the site-specific erosion and sediment control plan.[106]

CO32-43 cont.

GeoEngineers concluded: "It is our opinion that the relatively low concentrations of mercury in sediment in the EFCC channel at the proposed pipeline crossing, along with the limited disturbance area (less than 95 linear feet), does not pose a significant risk to downstream human and ecological receptors."[107]

We cannot assess the accuracy of Geoengineers findings or conclusions. However, the extent of disturbance required for this project coupled with factors such as the terrain, the potential for collapsing mining structures, and weather conditions over time suggest that at least more thorough study and consideration of operations and cumulative impacts is needed before any water quality permits are issued for this project. DEQ appears to be calling for that, too. GeoEngineers' work was done over a decade ago and some of the information they relied on is quite a bit older. The DEIS should have required more recent investigation and, as we have noted before, reliance solely on the work of the Applicant's consultant lacks credibility.

4.3 WATER RESOURCES AND WETLANDS

4.3.1.1 Groundwater Resources—Jordan Cove LNG Project.

The DEIS concludes that "impacts on groundwater resources at the Jordan Cove LNG Project would be minimized to the extent practicable and would not be significant."[108]

We disagree.

A. The DEIS treatment of groundwater resources is incomplete and assumptions as to the interactions with the aquifer, removal and fill operations affecting surface and estuarine tidal and subtidal areas are not considered in any cumulative effects model.

CO32-44

From our examination of information about the Dune-Sand Aquifer, there is a high potential that the land filling, road building, and excavating activities of the site would affect water wells. The report and modeling by USGS (Jones 1992)[109] of water levels in wells across this aquifer shows the contours of the water table. The general flow of the water table is toward the north and west;

[106] "Mine Hazards Evaluation and Mercury Testing at the Red Cloud, Mother Lode, Nivinson, and Elkhorn Mining Groups, Jackson and Douglas Counties, Oregon, August 23, 2007." At Appendix R.2 of PCGP FERC application.
[107] "Mine Hazards Evaluation and Mercury Testing at the Red Cloud, Mother Lode, Nivinson, and Elkhorn Mining Groups, Jackson and Douglas Counties, Oregon, August 23, 2007." At Appendix R.2 of PCGP FERC application.
[108] DEIS, p. 4-77.
[109] Jones, M. A. 1992. Ground-water availability from a dune-sand aquifer near Coos Bay and North Bend, Oregon. U.S.G.S. Open-File Report 90-563.

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CO32-44 Additional discussion regarding the effects on CBNBWB well field and surface waters has been added to section 4.3.1.1. The cited USGS report indicates groundwater flow is south towards the Project site. See Figure 8 in USGS Open-File Report 90-563, Ground-water availability from a dune-sand aquifer near Coos Bay and North Bend, Oregon (Jones 1992).

the aquifer is highly permeable. The substrate permeability and slopes appear to support the expectation that runoff from the site and changes in water flow would likely influence and infiltrate the groundwater and groundwater-related surface water resources of the North Spit. The western and southern boundaries of the aquifer drain into the tidally influenced portions of the Coos estuary. The lateral boundaries are not bounded by impervious materials. The movement of water and horizontal flux is much greater than vertical flux rates, and thus the large excavation of the slip would provide a profound influence on flux.

CO32-44 cont.

Moreover, industrial wastewater contaminants from prior activities at the site should be carefully considered as these relate to the proposed JCEP and its permit application. In 1963, many years prior to JCEP's project proposal, a pulp and paper mill were built at Jordan Cove by Menasha Wooden Ware Company (now Menasha Corporation) and operated using a sulfite pulp process. The mill was purchased by Weyerhaeuser Corporation which operated it until 1995 when it ceased pulp mill operations and began making recycled paper. Effluent from the mill was pumped to a 230-acre wastewater treatment lagoon located approximately 0.5 miles from the proposed JCEP operation. An environmental assessment stated that the groundwater quality was slowly improving with time around the lagoon and a 30-acre aeration stabilization basin (later added by Weyerhaeuser) which was associated with the 230-acre lagoon.

The sulfite process of pulp bleaching used elemental chlorine in bleaching the pulp at the North Bend mill at least until 1981 and perhaps until 1995. In the process, it also produced highly toxic dioxins, dioxin-like PCBs, furans, and various metals, including mercury, lead, cadmium, and chromium. Dioxins, dioxin-like PCBs, and furans are very persistent in the environment and bio-accumulate in fish, shellfish and waterfowl. The half-life of some of these compounds in the environment range from 25-100 years according to the Environmental Protection Agency's (EPA) website. The wastewater treatment lagoon was used unchanged from 1963-1972, using evaporation and infiltration (dilution, essentially) to reduce the volume of effluent and disburse it into the sand. In 1972, a pipeline was constructed, and the effluent pumped from the lagoon to an ocean outfall, possibly reducing environmental exposure of the North Spit to the effluent as detailed by Oregon DEQ[110]

CO32-45

The DEIS follows the lead of the Applicant in failing to address issues relating to the extent and risk posed by previous industrial contamination at the proposed site and neighboring areas. The potential exists for the project's proposed dredging and excavation to expose the surface and groundwater to several subsurface chemical contaminants directly or by altering the hydrology around the site, mobilizing sequestered contamination to move into the aquifer.

Table 4.3.1.1-1 in the DEIS indicates that Jordan Cove estimates that it would need a total of about 667 million gallons of water for construction and operation of the Jordan Cove LNG Project. They indicate that three of four Roseburg Forest Products wells would be buried to create a construction staging area and would be permanently abandoned in accordance with state regulations.[111] Jordan Cove would drill new wells to the east to replace the buried wells. The understanding of this aquifer's ability to deliver these is not provided, and they Applicant claims that neither construction nor operation of the Project would impact the CBNBWB wells to the north due to the distance of the wells from the Project (the closest CBNBWB well is about 3,500 feet north of the terminal). Where are the data to support their conclusion? The quantity of

CO32-46

[110] 2006 Environmental Cleanup Site Information (ECSI) Database Site Summary Report—Details for Site ID 4704, Weyerhaeuser Ingram Yard.
[111] DEIS, p. 4-75-76.

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CO32-45 Potentially contaminated soils and groundwater are discussed in section 4.2.1.2.

CO32-46 Additional discussion has been added to section 4.3.1.1.

removal expected for testing and construction needs is estimated by the Applicant to total 600 million gallons, with estimated peaking needs for grading and hydrotesting of the LNG tanks. CO32-46 cont.

At the same time there would be massive dewatering during the excavation and grading required to create the marine slip. The Applicant considers this to be a minor effect. Moreover, the DEIS states that the contractor would determine the most appropriate method for dewatering excavations and appropriate permits.[112] These activities need to be considered up front in this DEIS, as they are all likely to be factors in the environmental consequences. CO32-47

In addition, this section considers the aspects of operations on the groundwater with regard to spills of various types. Because of this, the project proposes to have a system of curbs, drains, and basins to collect and contain any spills of LNG during operation. They propose to have about 100 acres with impervious surface materials, such as asphalt, concrete, and compacted gravel. The conversion of pervious surface to impervious surface typically causes a decrease in the local recharge of shallow groundwater by converting infiltration to runoff. They propose to capture this runoff except during times of high flows where it would run off directly to the bay, yet provide no details as to the way this operation would be conducted. CO32-48

4.3.1.2 Groundwater—Pacific Connector Pipeline Project

The DEIS concludes this about the potential impacts of the pipeline on groundwater resources:

> The construction of the Project would temporarily affect groundwater. However, based on the characteristics of underlying groundwater, the Applicant's proposed construction and operations procedures and methods, and their implementation of impact minimization and mitigation measures, we conclude that constructing and operating the Project would not significantly affect groundwater resources.[113]

We do not have confidence in the latter statement. It lacks basis in research or fact. It is further evidence of residual adverse effects from this project that the DEIS attempts to make by accepting Applicant assurances.

A. The DEIS does not adequately consider the potential for groundwater disruption or loss along the pipeline due to construction or blasting.

The Applicant does not identify the location of all wells, springs, and seeps within 150 feet of the construction right-of-way for the pipeline. Springs and seeps supplied by shallow groundwater could be affected by the pipeline project. The pipeline and its bedding material would substantially alter surface and subsurface flow patterns. Blasting is planned for numerous locations along the pipeline route and could easily alter groundwater flow to the point where water wells would be disrupted or ruined. Pacific Connector has developed a *Blasting Plan,*[114] but a plan can't control the impact of blasting on complex geologic structures. This is a significant and serious concern for impacted landowners along the pipeline route who rely on springs on their property for drinking water and domestic uses. CO32-49

[112] DEIS, p. 4-76.
[113] DEIS, p. 4-82.
[114] DEIS, p. 4-81

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CO32-47 As stated in the LNG Terminal Dredging Pollution Control Plan (April 09, 2019), the applicant would construct areas to hold the dredging spoils and return any excess decant water to the slip and ultimately to Coos Bay when they remove the berm used to separated excavation areas. Monitoring of turbidity generated from these actions would be conducted to ensure they would meet State designated turbidity standards. If standards are not met, operations would stop until they could be met.

CO32-48 The applicant would need to obtain a 1200-series NPDES stormwater permit for operations actions that affect water discharges. The applicant would be responsible for all permit applications to the State. It is not the role or scope of the federal EIS to assess the Project's compliance with State regulations or OARs, or to outline these requirements. We assume that the State would determine if the Project is in compliance with the State requirements and OARs during their review of the applicant's State permit applications. Details needed for permit approval would include the methods used to collect waters if the State determines they are needed. As disclosed in section 5 of the EIS, any authorization from the Commission would be conditional on the applicant acquiring all applicable federal and federally delegated permits.

CO32-49 Potential effects on groundwater supplies from blasting are presented in section 4.3.1.1. As stated in the draft EIS, if a groundwater supply is affected by the Project, Pacific Connector would provide a temporary or permanent supply of water depending on the situation.

Additionally, the pipeline would cross six wellhead protection areas (WHPA), vulnerable areas where contaminants can be introduced into groundwater and harm drinking water supply.[115] There are 116 sites with cleaned-up, potential, or confirmed soil and/or groundwater contamination within 0.25 mile of the pipeline route where there is the potential to encounter contaminated soil or groundwater during construction.[116]

B. The DEIS wrongly follows the Applicant's lead in dismissing the potential for groundwater harm from frac-outs during hydraulic directional drilling on major rivers along the pipeline.

Please see pp. 50-51.

4.3.2 Surface Water

4.3.2.1 Jordan Cove LNG Project

FERC staff depart in this subsection from the general pattern of phrasing a conclusion—generally of no significant impact—about the overall topic at the end. Instead, a number of potential impacts to surface water are dealt with separately. In addition to inaccurately assessing impacts, the segmentation inappropriately masks the cumulative impacts. CO32-50

A. The DEIS erroneously claims that dredging and construction activities would result in, "temporary increases in turbidity and sedimentation in Coos Bay".[117] Dredging of an access channel and slip that is deeper than the deepest of the navigation channel would change the nature of sediment and water flow, especially given the large outside bend with an access channel (nearly 10 feet deeper) over the depth of the navigation channel of the estuary. For this reason alone, there would likely be increased need for maintenance dredging in this reach. The fact that the access channel is deeper than that of the Federal Navigation Channel is a totally new condition, likely to complicate sedimentation and sediment dynamics. CO32-51

In addition, added turbulence from the heavy use of the slip by carriers, propeller wash from the LNG carriers and tugboats associated with the Project can be expected. Clearly the increased wake, as well as ship wakes (waves) breaking on shore, could increase erosion along the shoreline and resuspend loose sediment along the shallow shoreline area, resulting in temporary increases of turbidity and sedimentation in the bay, both of which would affect water quality. The effects of these actions relating to sediment, bottom disturbance, and wave actions on marine aquatic resources are discussed further in our comments on DEIS subsection 4.5 Wildlife and Aquatic Resources.

Additional alterations of the bay—the so-called modifications to the marine waterway, include four dredge locations located adjacent to the Federal Navigation Channel The dredging of the tidal and subtidal areas to provide this modification would occur during one in-water work window of October through February 15.

[115] DEIS, p. 4-79.
[116] DEIS, p. 4-80.
[117] DEIS, p. 4-83.

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CO32-50 Comment noted. Impacts to water quality are appropriately address in section 4.3.2. Cumulative effects are addressed in section 4.14.

CO32-51 As indicated in section 4.3, models of changes in currents and tidal level indicate almost no changes in these areas over the entire bay so permanent changes to turbidly from changes in currents would not occur. The effect of ongoing project actions was presented accurately to their potential changes in local turbidity. The frequency and magnitude of maintenance dredging and resulting turbidity is provided accurately in section 4.3. The relative contribution other actions (vessel wakes, propeller wash) are acknowledges in the text. The most recent applicant-developed Dredging Pollution Control Plans (part of August 27, 2019 submittal to FERC) provide commitments to meet State designated turbidity limitations during dredging related construction actions including water returning from land disposal areas or stop operations and remedy the conditions to meet these requirements before continuing actions. Again all the proposed actions that affect water quality would require State-approved permits before construction could begin.

B. The DEIS erroneously claims that the effects of maintenance dredging and disposal would be localized and short term.

According to the DEIS,

> Based on the turbidity modeling conducted for both construction and maintenance dredging, the effects of maintenance dredging and disposal are predicted to be localized and relatively short term. Effects of maintenance dredging on suspended sediment concentrations and distribution in the slip, access channel, and Federal Navigation Channel would be similar to those discussed for the respective type of dredging methods used (Moffat & Nichol 2017c). However, the duration would be shorter for maintenance as less material would be removed than during construction.[118]

We disagree for the following reasons:

CO32-51 cont.

1. The Applicant provides minimal information to assure that maintenance dredging would not affect water quality. We instead foresee, due to the massive habitat alterations at the site, there would be need for frequent maintenance dredging throughout the lifetime of the project.

The process of hydraulically transferring dredged material to the APCO sites and discharge of the slurry material to temporary containment berms would be risky. Hydraulic transfer requires large volumes of water to maintain dredge material in suspension during transfer. JCEP's Dredge Material Management Plan includes no proposal to manage and treat discharge from these containment areas to remove suspended material and reduce turbidity. The deposition and dewatering of sediments dredged from the NRI sites at the APCO #1 and #2 dredged material disposal sites would initially elevate the soil surface a minimum of 37 to 49 feet above the existing soil surface elevations at these sites. These activities hold potential impact ground water quality and seasonal groundwater recharge dynamics in the vicinity of the dredged material disposal sites. This work window is also within a time of significant rainfall events and winter storms.

2. Operational impacts of ships entering, loading, and moving in and out of the slip and Federal Navigation Channel would introduce nearly constant, permanent disruptions to other use of the area by human or wildlife.

The propeller wash from LNG carriers and tug boats associated with the Project, as well as ship wakes (waves) breaking on shore, could increase erosion along the shoreline and resuspend loose sediment along the shallow shoreline area, resulting in temporary increases of turbidity and sedimentation in the bay, both of which would affect water quality. The effects of propeller wash related actions causing increased sediments, bottom disturbance, and wave actions on marine aquatic resources are discussed in section 4.5 of the DEIS, but the aspects of ship operations are highly relevant to water quality. Their effects are not temporary. They would be permanent alterations, especially with the predicted visitation of 100 to 120 ships each year for a total of 200 to 240 round trips. Given the loading times of at least 24 hours and limitation of travel to high tide, these disturbances would be long term and cumulative. The proposed additional space for ships in the slip provides insight that it is likely that at times, two ships would be there at once.

[118] DEIS, p. 4-86.

C. The DEIS erroneously claims that the discharge of ballast and engine cooling water into the slip would not negatively impact water quality in the Coos Bay.

According to the DEIS,

> While berthed, LNG carriers would release ballast water and engine cooling water into the marine slip. No wastewater would be discharged from the LNG carriers into the slip. The LNG carriers may arrange with licensed private entities for refueling, provisioning, and collection of sanitary and other waste waters contained within the carrier. The licensed private entities would transport the waste to a permitted treatment facility. Discharges from vessels are subject to regulation by EPA. EPA currently regulates these discharges via the Vessel General Permit.[119]

CO32-52

Each LNG carrier is expected to discharge approximately 9.2 million gallons of ballast water during the loading cycle to compensate for 50 percent of the mass of LNG cargo loaded. What would be the effect of these 9.2 million gallons of high salinity sea water released into the slip on the distribution of sediments and the dynamics of the area?

Without any supporting data the DEIS also states,

> Discharging ballast water would not substantially affect water quality in Coos Bay. At the point of discharge, the interface with Coos Bay would experience temporary changes in salinity, temperature, pH, and dissolved oxygen. However, these changes to water quality would be highly localized and would quickly dissipate. While open ocean water has generally higher salinity (e.g., 35 practical salinity units [psu]) than typically occurs in Coos Bay (range 16 to 33 psu; Shanks et al. 2010, 2011) due to the high volume of water passing by the loading area, the contribution of ballast water would be only about 0.3 percent of the water passing by the terminal. Therefore, no measurable changes in salinity, other than directly at the discharge port, would occur.[120]

We disagree.

Using the total volume of water in the slip area is not an appropriate way to address toxicity or impact. The relation of release of water to the fact that mixing may or may not occur, and the relation of temperature and salinity are complex considerations. Moreover, the release of cooling water discharge from the ship during filling is also a factor the DEIS does not take into account. These are interactive and cumulative effects are poorly dealt with here and will be part of discussion later in our comments in Section 4.14.

D. The DEIS erroneously claims that construction activities in the bay would have minimal effects on temperature and tidal and other water movement.

In section 4.3 Water Resources and Wetlands, the DEIS reports in discussions of turbidity and sedimentation that modeling conducted by Moffatt and Nichol (2017d) was done to determine the potential effects of all proposed actions, including slip and access channel excavation, marine waterway modifications, and Eelgrass Mitigation site dredging on flow hydraulics in the bay. They conclude:

CO32-53

[119] DEIS, p. 4-88.
[120] DEIS, p. 4-88.

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CO32-52 The effects of ballast and cooling water discharge to the slip are accurately addressed. Discharges are being forcefully discharged from the vessel which would enhance mixing. The area where discharges occur is large, allowing direct rapid mixing. Additionally, the slip water would be further mixed over the day from tidal exchange, which would occur several times a day. So the consideration mixing and dilution is justified in this assessment.

CO32-53 We disagree with your determination, and believe that our assessment of changes in the physical conditions of the bay that would occur as a result of dredging is accurate. The current models provide detailed assessment of changes in flow velocity and tidal levels using standard methods of analysis including detailed information on local currents and bathymetry. Additionally, recent modeled developed by the COE assessing the likely effects of their much more extensive dredging for the whole navigation channel estimated very slight, likely unmeasurable changes over the whole bay in salinity, temperature, or dissolved oxygen. These study results are noted in the revised text of the final EIS.

> Construction in these areas would produce no or negligible impacts on overall tidal flow, tidal range, current velocity, and circulation in Coos Bay. . . . Additionally, the result of the tidal flow circulation modeling and analysis predicts that there would be localized velocity reduction as well as localized small increases in velocity in portions of the bay. These would include slight velocity increases near the pile dikes at the eastern corner of the access channel. The deepening of the channel near the mouth of the bay (NRI 1 channel deepening area) at the entrance turn also appears to have resulted in locally increased currents to the north in Log-Spiral Bay. . . . Overall the effects of Project actions on the Coos Bay tidal prism were unsubstantial, and effects on tidal current velocity changes were also negligible except for a few localized areas.[121]

Again, we disagree with their conclusions.

The reported effects in the DEIS are supported by models and documents by Moffitt and Nichol (various dates), consultants of the Applicant, and they are not representative of other models in progress or published regarding the dynamics of the estuary. Current work provided in the Partnership for Coastal Watersheds by David Sutherland and his students provides a different perspective. A manuscript by Eidam et al. (in press[122]) documents that in the past 150 years, the total Coos Bay estuary area has decreased by 12% due to dredging, the primary navigation channel has 26 deepened from ~6.7 m to 11 m (a 64% increase), and the volume has increased by 21%. These changes have driven a 33% increase in tidal amplitude, an 18% increase in salinity intrusion length, and an increase in 28 ebb dominance of currents. They used the Finite Volume Coastal Ocean Model (Chen 2003)[123] to further simulate proposed changes to the navigation channel and provide evidence of further increase of salinity intrusion. They pose potential influence of this on the existing oyster restoration, existing oyster farming, healthy eelgrass communities, and hydrodynamic information relevant to navigability and larval transport. These authors suggest and support with reference to other studies (MacCready and Geyer 2010)[124] that in many estuaries, including Coos Bay, increase in channel depth increases both the estuarine circulation and residual stratification, resulting in a nonlinear increase in subtidal salt flux and landward expansion of the salinity field. We offer the limited nature of the models used by the Applicant and lack of peer review of the work provided as evidence that conclusions regarding impact by the Jordan Cove consultants should be questioned. CO32-53 cont.

According to the Partnership for Coastal Watersheds, multiple waterways in the estuary are considered water quality-limited under the Clean Water Act for high temperatures and low dissolved oxygen. In addition, data regarding salinity and temperature provide a good basis for information that should be included in the assessments, but they are not.

Cindi Roye (1979) provided a comprehensive inventory of the estuarine resources at the time of delineating the zoning and scientific basis for the existing Coos Bay Estuary Management Plan (CBEMP). This is a substantial documentation of the condition and function of the estuary at the CO32-54

[121] DEIS, p. 4-85.
[122] Eidam, E.F., Sutherland, D.A., Ralston, D.K., Dye, B., Conroy, T., Schmitt, J., Ruggiero, P., Wood, J. *in press*. Impacts of 150 years of shoreline and bathymetric change in the Coos 1 Estuary, Oregon, USA.
[123] Chen, C., Liu, H., & Beardsley, R.C. (2003). An unstructured grid, finite-volume, three-dimensional, primitive equations ocean model: application to coastal ocean and estuaries. *Journal of Physical Oceanography*, *20*, pp.159-186.
[124] MacCready, P., & Geyer, W.R. (2010). Advances in estuarine physics. Annual Rev. Mar. Sci., 2, 35-58, 719 doi:10.1146/annurev-marine-120308-081015.

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CO32-54 While temperatures differed seasonally, stratification remains low in summer or winter. These differences were considered in the analysis. Additionally, models addressing sediment and turbidity from dredging were based on winter conditions as that is when dredging would occur. Summer flow scenario are not relevant to these models. Also, while river flows do vary seasonally, they are a small component compared to tidal influence. Also see our response to comment CO32-53 about COE models finding only very slight changes in dissolved oxygen from much more extensive future dredging than Project dredging.

date of publication. The DEIS uses some of these data in the description of the estuary water exchanges but ignores other information, such as her reference to temperature stratification. The lower bay was documented to have thermal stratification in summer months (see Fig. 4 and Fig. 5 below from temperature profiles from Roye). The operational window for ships is year around, and thus there are significant differences in the nature of the estuary during different times of the years. What the sediment models look like in the winter would be different from during low river flows in the summer, and all of these aspects are impacted by the inflows from the rivers feeding the estuary.

CO32-54 cont.

Nuisance phytoplankton growth could also be fostered with these discharges. We suggest that the alteration of landscape and changes in the flows, especially in the area of the slip, elevated temperature and dynamic nutrient and flow regimes could give rise to nuisance phytoplankton blooms. In addition, the wetland areas of the North Spit should be explored for consequences of disruption of the ground water flows and potential for developing nutrient related algal blooms. These are not investigated at all in the DEIS.

CO32-55

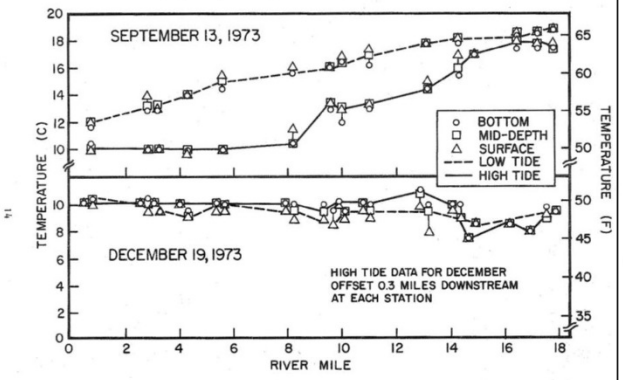

Fig. 4. Temperature vs. river mile, Coos Bay, September 13 and December 19, 1973 (Arneson 1976).

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CO32-55 Changes in flow and temperature would not be measurable. Additionally, areas of any concentrated changes (such as directly at LNG carrier ports) would occur to very small areas that rapidly equilibrate with surrounding water. Therefore, no changes in algae blooms are expected to occur.

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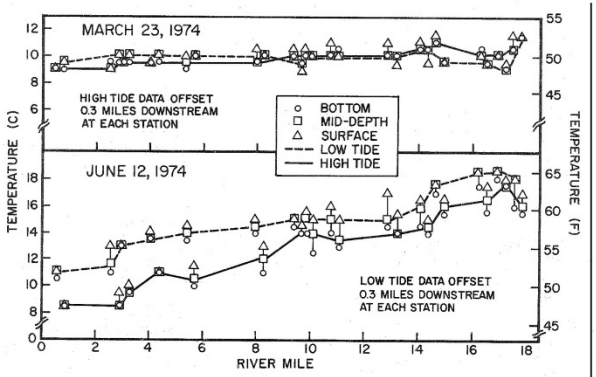

Fig. 5. Temperature vs. river mile, Coos Bay, March 23 and June 12, 1974 (Arneson 1976).

CO32-54 cont.

Southerland and O'Neill (2016)[125] studied dissolved oxygen variability and salinity in Coos Bay and found that there were different regimes affected by river flows and oceanic conditions. They documented further the temperature profile that as summer progresses, temperatures increase as does the variability, most likely due to the interplay between warmer riverine-influenced waters and colder, upwelled waters coming from the mouth of the bay. They also showed the changes in salinity in transects that are similar to those provided by Roye (1979) but provided in meters not miles. As a result, the Roye document provides a somewhat longer profile (Fig. 6). The increased intrusion of upwelled waters can alter dissolved oxygen profiles throughout the area during summer conditions.

[125] Sutherland, D.A. and O'Neill, M.A., 2016. Hydrographic and dissolved oxygen variability in a seasonal Pacific Northwest estuary. Estuarine, Coastal and Shelf Science, 172:47-59.

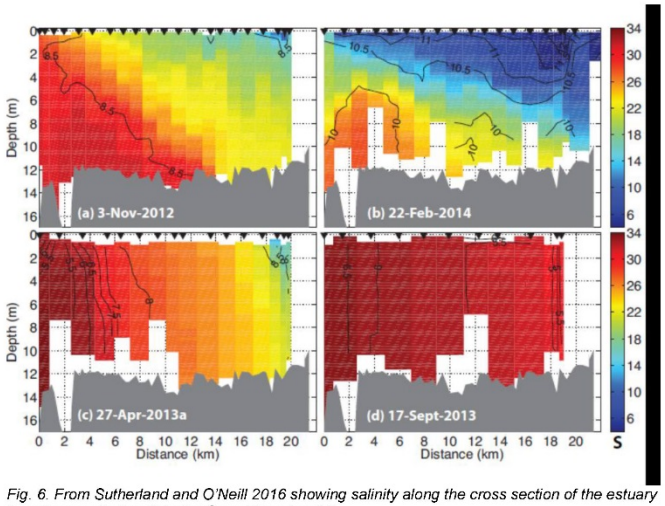

Fig. 6. From Sutherland and O'Neill 2016 showing salinity along the cross section of the estuary from the mouth (km 0) to the Coos River (km 20).

The DEIS indicates that wastewater generated during construction and operation of the Jordan Cove LNG Project would be treated by the City of North Bend's wastewater treatment system via a new sewer line, and therefore the Project is not likely to add fecal coliform to Coos Bay. We fail to understand how a new sewer line can handle this capacity and assure that water quality would be maintained, especially given extensive volumes of water proposed for testing of various systems, storage tanks, and distribution pipes.

CO32-56

4.3.2.2 Surface Water—Pacific Connector Pipeline Project

The DEIS again relies on the Applicant's assurances—those primarily based on studies done by their consultant, GeoEngineers—to make yet another claim of no significant impact on surface water along the pipeline alignment:

> Constructing and operating the Project would result in short-term and long-term impacts to surface water resources. However, based on Jordan Cove's proposed dredging and vessel operation methods and its impact minimization and mitigation measures (including its implementation of erosion controls, dredging procedures, construction and stormwater management procedures, and construction timing), as well as Pacific Connector's proposed waterbody crossing and restoration methods and its impact minimization and mitigation measures, we conclude that the Project would result in

CO32 continued, page 50 of 118

CO32-56 The statement is correct relative to fecal coliform as the City is responsible for ensuring any discharges meet State water quality standards. Any other discharges (e.g., see response to comment CO32-48) from the project area would require NPDES permits that would require that they meet State designated standards.

> short-term, localized, construction-related water quality impacts, but would not significantly affect surface water resources.[126]

We disagree with the conclusion, but more importantly, Oregon's Department of Environmental Quality (DEQ)—charged with protecting the state's water resources—concluded on May 6, 2019 that the Applicant had failed to provide adequate information about how their construction and operations would comply with Oregon's Water Quality Standard and therefore denied JCEP's application for a 401 Water Quality Certification. We will discuss a few concerns below, including some examples of DEQ's concerns, but we call FERC's attention to the entire "Evaluation and Findings Report, Section 401 Water Quality Certification for the Jordan Cove Energy Project," a 200-page document DEQ prepared to accompany the 401 Denial and indicate deficiencies in the Applicants' materials. CO32-57

We understand that the FERC cannot issue the Certificate of Public Convenience and Necessity the PCGP seeks to construct and operate the pipeline without the Applicant first securing a Section 401 Water Quality Certification from the state. We contend that the deficiencies DEQ identified in this project's plans and design underscore our point that FERC staff's reliance on those plans and design has resulted in a deficient DEIS and give evidence that the authorization and certification should be denied.

A. The critical importance of our water resources and the threats posed by the JCEP are a central reason for our opposition to this project.

In the pipeline construction, the proposed JCEP would have the following impacts that are against the public interest: 1) Further degrade stream segments that are already water quality impaired for temperature, dissolved oxygen, pH, turbidity, and sedimentation. 2) Increase water temperature to unacceptable and harmful levels by removing riparian vegetation that shades streams, causing stream heating along a minimum 95-foot wide construction easement. 3) Unacceptably increase turbidity by causing a more than 10% increase in natural turbidity levels in stream segments impacted by pipeline installations. 4) Impair beneficial uses in the Rogue, Umpqua, and Klamath Basins by engaging in blasting activities that would adversely impact surface water and groundwater used for drinking and commercial and recreational fishing. 5) Foul surface and groundwater by failing to adequately prevent herbicides from entering Impaired Waterways or their tributaries, as well as wetlands, again harming the habitat of endangered animals and fish and contributing to the overall degradation of Oregon waters. 6) Foul surface and groundwater by failing to adequately prevent fertilizers from entering Impaired Waterways or their tributaries and other waterbodies. 7) Expose through dredging and filling and other construction activities—both in the bay and along the pipeline—significant amounts of contaminated soils from various current and historical industrial activities, such as timber processing and mining. 8) Risk jeopardizing six major rivers with numerous important values, five by using hydraulic directional drilling (HDD) and one with an open cut across already impaired water.

According to the DEIS,

> Water quality parameters, including water temperature and intragravel dissolved oxygen, might potentially be affected at crossings where hyporheic exchange is extensive and active. Thus, streams with a "high" and "moderate" sensitivity would be the streams CO32-58

[126] DEIS, p. 4-118.

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CO32-57 It is not the role or scope of the federal EIS to assess the Project's compliance with State regulations or OARs. We assume that the State would determine if the Project is in compliance with the State requirements and OARs during their review of the applicant's State permit applications. As disclosed in section 5 of the EIS, any authorization from the Commission would be conditional on the applicant acquiring all applicable federal and federally delegated permits.

CO32-58 The final EIS has been modified to address this issue.

where water quality could potentially be compromised due to alteration of the hyporheic zone.[127]

We appreciate this acknowledgment, but the DEIS provides little to address these risks other than produce a set of protocols for implementation after the fact, rather than call for advance planning. They instead note: *Stream Crossing Risk Analysis and Stream Crossing Risk Analysis Addendum* (GeoEngineers 2017d, 2018a), that they would implement additional site-specific stream crossing restorations plans, of streams not yet field surveyed, after final pre-construction surveys. The Applicant proposes that blasting would be conducted on dewatered sections. CO32-58 cont.

The DEIS notes that at least 15 crossing were proposed for streams categorized as having a high sensitivity to hyporheic zone alterations. Two of the "high" sensitivity crossings are the Coos River crossing at MP 11.13R and the Rogue River crossing at MP 122.65. Their solution to this is to use HDD, rather than open trenching across the stream channel. A "moderate" sensitivity indicates that the stream crossing displays some indicators that a hyporheic zone is active and functional. They note that approximately 66 crossings fit this category, most of them upper to middle watershed streams.

According to Table 4.3.2.2-2, Jackson County-Rogue River-Shady Cove and Lake Ewauna-Upper Klamath crossings would be accomplished using HDD. Pacific Connector proposes to cross 26 already impaired waterbodies using dry/diverted open-cut crossing techniques. Conventional boring, DP, or HDD methods would be used to cross 5 of the impaired waterbodies.

B. As discussed in section 4.1 Geologic Resources, the landslide-prone terrain crossed by much of the pipeline poses a risk that pipeline construction would trigger landslides and, among other hazards, potentially increase sedimentation and turbidity in violation of Oregon's water standards, resulting in harm to all water users, wildlife, and aquatic species.

We repeat here that the Applicant appears to be unwilling to accept or even adequately research the forces of nature that exist all across this project and instead, offers BMPs on the way to dismissing the likelihood of significant impacts. The DEIS appears to indicate comfort with that approach. Moreover, some of the designs the Applicant proposes are ill-suited to the terrain to be confronted and would exacerbate landslide potential and along with it, water degradation. DEQ's "Evaluation" describes just one example: CO32-59

> PCGP's proposed activities create a significant risk of sediment transport to both perennial and intermittent streams. In Section 4.6.1 of Resource Report 6 (Geologic Resources), JCEP identifies two primary ways that pipeline construction methods would reduce slope stability and create a risk of sediment transport. Those are deep excavation perpendicular to the slope (i.e., creating a cut across a slope), and capturing and concentrating stormwater along the ROW and discharging this stormwater to potentially unstable slopes. Placing fill on a headwall is a third way that pipeline construction would reduce slope stability.[128]

[127] DEIS, p. 4-113.
[128] Oregon DEQ, "Evaluation and Findings Report, Section 401 Water Quality Certification for the Jordan Cove Energy Project," May 2019, p. 28.

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CO32-59 The EIS acknowledges the risks of landslides, and discloses measures and actions that would be taken to minimize the risks. In addition, as discussed in section 4.1.2.4 of the EIS, moderate and high risk landslides have been avoided to the extent possible, and therefore, the risk of debris flows has been minimized. Identified moderate risk landslides crossed by the pipeline would have additional mitigation and monitoring requirements as discussed in the EIS. The requirements and approvals that may be developed by the State related to State permit applications are beyond the scope of this federal EIS.

A primary reason for DEQ's denial was the inadequacy of information provided by the Applicant and, despite highly detailed requests for specific missing information, failure by the Applicant to fulfill the requests. This has been a consistent pattern, including during the last iteration of the project. The agency cannot fulfil its legal obligation to protect Oregon's water quality without enough information to determine whether compliance with the law is likely. Here is an example related to Oregon's narrative criteria:

> Without more developed information about the extent of areas of landslide risk and BMPs, DEQ is unable to determine what engineering controls for the design and construction of the pipeline are both feasible and reasonably likely to succeed in keeping waste materials out of public waters and minimizing erosion of cut banks, fills, and road surfaces. DEQ also is unable to determine whether JCEP can or would utilize the highest and best practicable treatment and/or control of wastes, activities, and flows so as to maintain dissolved oxygen and overall water quality at the highest possible levels and water temperatures, coliform bacteria concentrations, dissolved chemical substances, toxic materials, radioactivity, turbidities, color, odor, and other deleterious factors at the lowest possible levels. As a result, DEQ concludes that it is unable to determine that JCEP's proposed activities would be conducted in a manner that would not violate the statewide narrative criteria in OAR 340-041-0007."[129]

C. The JCEP is incompatible with water conservation and would reduce the supply available for other beneficial and legally required purposes.

It is unclear whether there are adequate available water rights in the pipeline corridor that could be appropriated for purposes of this project. Construction of the 229-mile pipeline would require water for dust control. In addition, hydrostatic testing of the completed pipeline would use an estimated 60 million gallons of water.[130] We find these uses of water, especially under current drought and weather conditions, to be an adverse impact on the natural and human environment that is not possible to mitigate. CO32-60

D. Hydraulic Directional Drilling (HDD) is planned for use at several major river crossings and raises a number of concerns, none of which are adequately addressed in the DEIS.

Frac-outs in the performance of HDD are a known risk. Their frequency and difficulty of avoidance is well acknowledged.[131] However, we did not find the caliber of evidence of planning that we believe would allow FERC staff to be assured that frac-outs would be aggressively precluded. We have reviewed the Applicant's "Drilling Fluid Contingency Plan"[132] and find it unsatisfying in terms of acknowledgment of impact and evidence of preparedness. Another report, "Failure Mode Procedure for the HDD Pipeline Installation Method"[133] looked promising for detailed analysis and preparation tailored to specific conditions on pertinent water bodies. However, the majority consisted of generic discussions of HDD procedures. CO32-61

[129] Oregon DEQ, "Evaluation and Findings Report, Section 401 Water Quality Certification for the Jordan Cove Energy Project," May 2019, p. 29.
[130] PCGP FERC application, "Appendix V.2, Hydrostatic Test Plan," September 2017, p. 5.
[131] Jessica Dickers, "What is a Frac-out in HDD?" *Utility Magazine*, May 4, 2016; State of Oregon, DEIS comments, 2015, p. 102.
[132] PCGP FERC Section 7 Certification Application, Resource Report 2, Appendix H.2 of Attachment C, 2017.
[133] PCGP FERC Section 7 Certification Application, Resource Report 2, Appendix I.2 of Attachment C, 2017.

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CO32-60 Your opinion is noted.

CO32-61 Comment noted. Multiple boring of sediment composition were conducted at the proposed Rogue River HDD crossing. The GeoEngineers document concludes that there was a low risk of HDD frac-out into the flowing river channel. See response to comment CO28-173.

The DEIS states that, "Detailed surveys and plans have been made for each of the HDD crossing sites"[134] and cites Appendix G.2 of Attachment C of Resource Report 2. We are not certain what is meant by "detailed surveys and plans," but GeoEngineers stated in the referenced document that, "Because most of the Rogue River HDD path is situated within bedrock, we did not perform a numerical hydraulic fracture analysis," and instead based their design on a ". . . qualitative evaluation of the potential for drilling fluid surface releases along the Rogue River HDD."[135] Might the volcanic nature of rocks in this area present special issues for HDD procedures that should be known prior to rendering an environmental assessment? Nonetheless, the DEIS dismisses the risk to water as temporary and therefore, acceptable. CO32-61 cont.

One risk of a frac-out during HDD operations is contamination of drinking water. In addition to chemical release in drilling fluids, the Rogue River is known to contain mercury and arsenic from the surrounding soils. The consequences of a frac-out in any location could be significant. If one were to occur at the Rogue crossing near Shady Cove, Oregon, drilling pollutants and the naturally occurring toxic substances could easily find their way into this critical river. Shady Cove is a community of approximately 3,000 residents, most of whom obtain drinking water from private wells. These wells provide the only source of drinking water to residents. There are an estimated 150 wells within a mile of the planned HDD crossing. Additionally, several hundred residents obtain drinking water from a private water company that takes water from the Rogue to serve its customers. The Rogue River is also the back-up water supply for the City of Medford. Historically, Shady Cove has had challenges with private wells going dry as the population grew. The aquifer into which private wells are drilled has pockets of water that are interconnected in ways that are difficult, if not impossible, to discern. Drilling or fouling a well in one location could have widespread detrimental effects on wells throughout the system. Fouling of the Rogue could potentially affect the drinking water of 160,000 people.[136] CO32-62

Klamath County offers an equally disturbing example of impacts from pipeline activities and an HDD frac-out. Above, we discussed soil contaminants at the Collins Company on the banks of the Klamath River and under a mile from the HDD location for the river crossing. It is unacceptable for the DEIS to conclude no significant impact for HDD operations at this site until a thorough investigation of potential interplay between planned activities and known and unknown potential contaminants has been conducted in any case. We are uncomfortable with the "self-reporting" approach taken by the Applicant in its "Contaminated Substances Recovery Plan." State agencies are not adequately staffed to conduct monitoring to guard against violations. Responding to degradations with fines and enforcement actions after the fact is not a prudent approach to protect ecosystem services. The critical importance of our water resources and the threats posed by the JCEP are a central reason for our opposition to this project.

The Rogue is also home to several species of endangered fish we discuss elsewhere in this comment. Fouling the water of the Rogue and aquifer could have devastating consequences to the drinking water supply and to the local economy which depends on tourism, fishing, rafting CO32-63

[134] DEIS, p. 4-106.
[135] GeoEngineers, "Geotechnical Engineering Services and Hydraulic Directional Drilling Design, Rogue River HDD," PCGP FERC Section 7 Certification Application, Resource Report 2, Appendix G.2 of Attachment C, September 1, 2017, p. 7.
[136] Research to compile the extent of potential impact was performed by Physicians for Social Responsibility and reported in Rogue Riverkeeper, et. al. to Bob Lobdell, Public Comment on DSL APP0060697 (Jordan Cove Energy Project and Pacific Connector Gas Pipeline) Application for Removal-Fill Permit, January 30, 2019, p. 29.

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CO32-62 The crossing is a substantial distance from any known wells so effects to these wells from HDD are not expected to occur. Drilling fluids would be contained during crossings. Additionally, drilling fluid is basically inert. While there is a concern for mercury in water of the Rogue River there is no known concentrations near the crossing of the Rogue River. The total area disturbed would be small and erosion control methods would be in place at all crossings, reducing the likelihood of entry to waters.

CO32-63 The potential effects of HDD crossing were addressed adequately in sections 4.3 and 4.5.2.

and recreation. The fact that a major additive to drilling mud, bentonite, is "naturally occurring" does not reduce the potential impact on fish and other aquatic life in the event that hundreds of gallons of tainted mud are released in Coos Bay or the Coos, Rogue, or Klamath Rivers. The DEIS fails to acknowledge the potentially severe impacts to Southern Oregon/Northern California Coast Coho (SONCC) and its designated critical habitat as a result of HDD failure. This area is a serious deficiency in the DEIS.

CO32-63 cont.

E. The use of an estimated 60 million gallons of water for hydrostatic testing of the completed pipeline is an irresponsible use of water resources when much of the area where it would be drawn from are already suffering drought conditions.

All 229 miles of pipeline would need to be tested for integrity and leaks. This would be done by hydrostatic testing, i.e., pumping water at high pressure through a run of pipe segments to check for leaks.[137] The DEIS reports that the Applicant proposes to withdraw up to 60 million gallons of water from Oregon waters. It is reasonable to expect that two or more tests could be required in some areas to ensure that the PCGP is leak-free. Some of the water acquired for hydrostatic testing would come from Impaired Waterways and their tributaries. It is also probable that the water table would be significantly impaired, harming wetlands and habitats of endangered species of fish and other animals. The Applicant does not address the impacts of removing such a significant amount of water from Impaired Waterways and their tributaries, such as increased temperature and FERC staff appears to accept that. They are nonspecific regarding the manner and location for removing and returning water used in hydrostatic testing to the watershed. The statement of work includes deliberate contamination with chlorine which would further degrade Oregon's Impaired Waterways and the habitat of endangered species of fish that the State of Oregon has spent so much time, money, and commitment to restore.[138] We do not share FERC staff's apparent satisfaction that, because the Applicant has prepared a "Hydrostatic Testing Plan," that the many issues related to the process are reduced to insignificant.[139]

CO32-64

4.3.3 Wetlands

The DEIS summary of wetland mitigation efforts states:

> In total the Project would impact a total of about 198 acres of wetlands, about 27 acres of which would be permanently lost. Based on our review of the Project and Jordan Cove and Pacific Connector's implementation of measure to reduce impacts on wetlands, we conclude that constructing and operating the Project would not significantly affect wetlands. Additionally, to mitigate wetlands impacts, Jordan Cove and Pacific Connector have prepared a Compensatory Wetland Mitigation Plan.[140]

We disagree with this conclusion.

The wetlands affected by this project are of a wide range of wetland categories. Wetlands identified in the area include estuarine subtidal, estuarine intertidal, palustrine unconsolidated bottom, palustrine aquatic bed, palustrine emergent, palustrine scrub-shrub, and palustrine

[137] DEIS, p. 4-111.
[138] DEIS, Appendix F.10 PCGP POD-Part 4-23.PDF, Appendix M. "Hydrostatic Test Plan," p. 16.
[139] DEIS, p. 4-111.
[140] DEIS, p. 4-134.

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CO32-64 See response to comments CO28-157 and CO28-250.

forested wetlands. However, the majority of these are estuarine wetlands affected by construction of the ship and access channel and MOF and Navigation Reliability Improvement dredge areas.

USACE's "Permitting Process Information" states that, "A fundamental principle of the Section 404(b)(1) guidelines is that dredged or fill material should not be discharged into wetlands and other waters, *unless it can be demonstrated that the discharge will not have unacceptable adverse impacts on those waters* [emphasis added]."[141] Historically and to date, the Applicant has not only failed to demonstrate the absence of adverse impacts, they have not provided adequate information to allow the public or state and federal agencies to identify and assess project impacts to wetlands. A total of six miles of wetlands would be impacted across all four affected counties.

Resource Report 2 of JCEP's application to FERC inadequately describes the wetlands that would be impacted and misses entirely the fact that wetlands are ecosystems that are highly subject to disruption, degradation, and destruction. The Applicant acknowledges cumulative disruption of 169 acres of wetlands via construction of the Jordan Cove LNG Terminal and Liquefaction Facility, but dismisses that impact as "temporary," without regard for the fact that, even done right, living communities of flora and fauna disrupted by dredging, filling, earth-moving, draining, etc., may never recover. Their answer to these risks and certain negative impacts is the contention that all would be well under their Mitigation Plan. FERC must not assume that this plan provides an appropriate trade-off, nor should USACE. Below we provide a detailed discussion of issues related to wetlands and JCEP's dredging and mitigation plans.

A. The proposed mitigation for loss of wetlands is inadequate and poorly conceived.

Two areas in Coos County are addressed as mitigation sites for the loss of wetlands from the entire PCGP project and the LNG terminal. Those mitigations include a proposed eelgrass mitigation site of 6.03 acres near the airport terminal across the bay from the proposed LNG terminal, and the 100-acre proposed Kentuck mitigation project. Both sites contain wetland values that would be affected or destroyed by the projects. We question why this approach was even considered. The DEIS identifies that restoration efforts at the Kentuck project and Eelgrass Mitigation sites would result in some short-term and permanent impacts; however, the *Compensatory Wetland Mitigation Plan* provided by Jordan Cove is supposed to account for these impacts and provide mitigation to offset these impacts. The DEIS makes no ruling on these plans, as the USACE and Oregon DSL are still reviewing their applicability. The DEIS acknowledges that approval of these mitigation plans by these agencies would be required prior to issuance of federal and state wetland permits.

CO32-65

B. Kentuck inlet mitigation project poses numerous problematic issues.

The mitigation project at Kentuck has been proposed as a way to dispose of massive quantities (300,000 CY) of unconsolidated sand and silty sand sediments from dredging operations in the Coos Bay area, but also as wetland mitigation for the loss of all wetlands throughout the disruption of wetland, riparian, and associated areas by the proposed 229-mile pipeline project. The DEIS states that approximately 108.7 acres of wetlands (6.0 acres of estuarine wetlands and 102.7 acres of freshwater wetlands and open water) would be temporarily affected at the Kentuck project site in association with wetland restoration and mitigation activities. Potential

[141] USACE, "Permitting Process Information," p. 4.

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CO32-65 It is the COE's responsibility to ensure that impacts to waters of the U.S. are mitigated. Any approval from the Commission would be conditioned on the applicant meeting COE requirements related to mitigation. The COE and ODSL are currently working with the applicant on wetland mitigation requirements. Per the requirements of the Clean Water Act, the applicant would have to demonstrate that all impacts to wetlands are avoided or minimized to the extent practical as part of the 404 and 401 permitting process. These agencies can then require mitigation to compensate for any permanent impacts.