APPENDIX R

Comments on the Draft EIS and Responses

(continued)

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impacts at the Kentuck project site include a temporary reduction in water quality due to an increase in sedimentation (e.g., resulting from import and grading of dredge material), temporary disturbances to adjacent wildlife, and a temporary impact on vegetation removed during restoration activities at the site. The mitigation contains no discussions of alternatives to this approach for the project or any other potential mitigation along the pipeline swath. Moreover, the Kentuck site already has substantial existing freshwater wetland values in this palustrine wetland/forest and its vegetative cover is used by migratory and resident wildlife and game and associated hydrological values. The eelgrass mitigation project at least proposes to provide a mitigation ratio of 3:1 to create 6 acres of eelgrass near the airport within a 9.3-acre site to replace the 1.9 acres of eelgrass destroyed on the north spit. Where is the accounting for this proposed freshwater/estuarine wetland?

CO32-65 cont.

The concept of reconnecting Kentuck Creek and slough within the Kentuck watershed to provide a wider wetland area rather than the narrow corridor that exists is a reasonable proposal, but the methods and design of the project fail to capture the full potential of this mitigation opportunity to further upstream mitigation. The fill of 4.3 acres proposed through construction of a high elevation dike or permanent levee around the area is not clear.

Moreover, the entire project at Kentuck poses a large risk from transporting the dredge material across the bay and navigation channel via scow, then through the temporary dredge transfer line, and then hydraulically pumped to the Kentuck mitigation site. There are no details for the protection of water resources during this activity, and a total absence of consideration of alternative sites or methods. The sediments destined for the Kentuck Project site would be transported using scows that would be moved to a location east of the Coos Bay Channel and the sediments on the scows would then be hydraulically pumped to the Kentuck mitigation site via a 1.3-plus mile-long pipeline. The pipeline route would traverse intertidal and shallow sub tidal portions of the estuary between the Coos Bay Channel and the Kentuck Project Site. This choice appears to be in direct contradiction to FERC's own procedural instructions.[142]

The lack of details and inherent risks of water movement and pipelines pose threats to any of the resource values in the region of the transfer. The Kentuck sub-basin watershed, including Kentuck Creek and its main tributary, Mettman Creek, are located upstream from the proposed Kentuck mitigation project. Approximately 81% of the land use is forestry and 11% agriculture (mostly livestock). Small farms and two rock quarries make up the remaining uses.[143] The forestry, livestock, and quarrying have impacted the watershed for nearly 100 years and there has been little significant positive change to date. Large recent forest clear-cuts have occurred in the Kentuck Creek sub-basin. Sediments are a problem. In April, quarry operators were issued citations and fined $68,000 by the Oregon DEQ for sediment releases 10,693% higher than the sediment level upstream.[144] Moreover, the stream surveys in the watershed show available spawning gravel is already fully utilized and much other gravel is embedded in sediments. Other features of the watershed documented by the Coos Watershed Association report show little promise and large challenges to provide appropriate habitat restoration in Kentuck drainage for increasing Coho salmon.

[142] FERC, "Wetland & Waterbody Construction & Mitigation Procedures." May 2013. A.2.
[143] Coos Watershed Association. 2006, Coos Bay Lowland Assessment and Restoration Plan, March, 2006, Charleston, OR: Coos Watershed Association
[144] Oregon DEQ 2019. Notice of Civil Penalty Assessment and Order Case No. WQ/SW-WR-2019, April 29..

Other potential impacts associated with the proposed mitigation plan at Kentuck Inlet include the likely interference with existing mariculture operations located in the bay area near the Kentuck Inlet. Those operations would be harmed as habitat for other fish and shellfish and wildlife is disrupted by transfer and logistics of sediment movement and dewatering at Kentuck.

The other site that is proposed for mitigation is the Eelgrass Mitigation site. We provide detailed information about the value of eelgrass and the proposed mitigation project in Section 4.5 (B). Our comments here are to emphasize that the concept of replacing existing eelgrass beds that would be removed with the dredging of the access channel is highly problematic. Restoration projects for eelgrass are not always a success and the design of this project in particular has serious flaws. Moreover, the increased sediments that would be released with dredging and excavations throughout the bay would likely negatively affect the existing eelgrass beds not proposed for removal. CO32-65 cont.

With the information and analysis we have provided and also for the fact that with the numerous permits that are still outstanding with regard to this project, how then can FERC be expected to be able to evaluate and complete a comprehensive evaluation of the benefits and impacts of this project?

4.4 UPLAND VEGETATION

The DEIS acknowledges impacts, but persists in dismissing their significance:

> Most of the vegetation types affected by the Project are common and widespread in the vicinity of the Project. Although constructing and operating the Project would result in the loss of 773 acres of LSOG forests, this represents only a small percentage of remaining LSOG forests in Oregon. Additionally, measures listed in section 4.4.3.3, as well as in the *BLM and Forest Service Compensatory Mitigation Plan and Amendment* (appendix F.2) and *Late Successional Reserves Crossed by the PGCP Project* (appendix F.3) would minimize or mitigate impacts to LSOG forests. Therefore, based on the types and amounts of vegetation that would be affected by the Project, the measures that would be implemented to avoid, minimize, and mitigate the resulting impacts, and the presence of similar vegetation in the affected watersheds, we conclude that constructing and operating the Project would not significantly affect vegetation.[145]

The DEIS and Applicant materials indicate that the PCGP right-of-way maintenance procedures will include application of highly toxic treatments including 2,4-D, glyphosate, and triclopyr.[146] Indeed, there is reason for concern about the spread of invasive plant species as a result of pipeline construction practices—despite the great care to prevent this promised by the Applicant. This, by itself, is a clear negative impact of the 229-mile pipeline that would bring harm to Oregon if the project is approved. But the cure for invasive species spread piles on yet another adverse impact that would be carried forward for the life of the pipeline—interjecting dangerous chemicals into the fragile environment, including waterways. We find this to be a highly risky practice. CO32-66

[145] DEIS, p. 4-178.
[146] DEIS, p. 4-224.

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CO32-66 Comment noted. As disclosed in the EIS, the use of herbicides would be required to comply with all federal, state, and local requirements, including our Plan and Procedures. Additionally, as noted in the Plan and Procedures, herbicides would not be used within 100 feet of a wetland or waterbody, unless allowed by the appropriate agency.

Invasive weeds are often able to outcompete desirable, native species. The disturbance of the land creates precisely the environment many of these plants thrive on, likely precluding the regrowth of desirable plants forever. CO32-66 cont.

4.5 WILDLIFE AND AQUATIC RESOURCES

After presenting pages of discussion of negative impacts on terrestrial wildlife expected to be exerted by project construction and operations, the DEIS makes its standard conclusion:

> Constructing and operating the Project would have both short- and long-term adverse effects on wildlife habitat and terrestrial wildlife species. We expect that some wildlife individuals would experience displacement or mortality during construction and operation, and some wildlife habitat would be removed or modified temporarily or permanently. However, based on the characteristics of the terrestrial wildlife species and habitat, the Applicant's proposed construction and operations procedures and methods, and their implementation of impact minimization and mitigation measures, we conclude that the Project would not significantly affect terrestrial wildlife.[147]

We disagree and find that this standardized approach renders whatever information is provided in the DEIS meaningless. The repetitious conclusion of no significant impact, despite evidence of adverse impact and without evidence that refutes it, is unacceptable. The project's needs are clearly deleterious in their impact of wildlife and fish, but FERC staff continues to agree with the Applicant that the ends justify the needs—and the harm. We point out just a few of the areas of concern that defy the claim of no significant impact.

A. Almost all of construction and operations in the Coos Bay and estuary present further jeopardy to the already threatened Green Sturgeon, yet the DEIS says Coos Bay is considered part of the critical habitat for the threatened distinct population of Green Sturgeon and provides important summer habitat for subadult and adult Green Sturgeon.

According to the NOAA plan for recovery of sturgeon the following JCEP activities are threats,

> Road building (resulting in sedimentation), a proposed liquefied natural gas (LNG) project, dredging, urbanization (resulting in pollution and increased peak flows), commercial shipping, stream channelization, wetland filling and draining, and development and silviculture (resulting in the loss of large woody debris and forested land cover) . . . .[148] CO32-67

B. Dredging would harm several of the many species of invertebrates that are recreationally and commercially important to the ecosystem of the bay.

[147] DEIS, p. 4-228.
[148] NOAA National Marine Fisheries Service Final Green Sturgeon Critical Habitat Biological Report – September 2009.

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CO32-67 Comment noted. We have prepared a Biological Assessment as required by section 7 of the Endangered Species Act (ESA), and the FWS and NMFS would be preparing a Biological Opinion as part of the ESA consultation process on listed species.

The removal with dredging would disrupt the water quality and the natural ecosystem of the sand/silty benthos of the bay. There are considerable areas near the target sites that are index areas for several species of clams and these populations are part of the monitoring program by ODFW (Fig. 7). They report high densities of cockle, gaper, and littleneck clams. In addition to the mollusks, these areas support beds of eelgrass as shown in the Fig. 8 below using data from ODFW in 2014.[149]

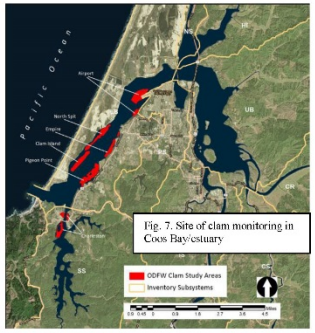

Fig. 7. Site of clam monitoring in Coos Bay/estuary

Fig. 8. Eelgrass distribution in Coos Bay/estuary

Eelgrass beds have an important role in the life cycles of fish, invertebrates and wildlife species. Because eelgrass is a rooted plant, it performs a vital function of stabilizing coastal sediments, preventing erosion. The eelgrass community provides direct and indirect food and cover for many marine species. Because the proposed development permanently destroys 1.9 acres of eelgrass, the developers propose to mitigate this through development of a larger eelgrass habitat across from the project that is currently an estuarine tideflat area south of the western tip of the North Bend Airport runway. The eelgrass mitigation site chosen already has some eelgrass associated and there are wetland values associated with the mud flats area that is proposed to be altered from its existing slope draining toward the north east. The biology and habitat requirements and constituents of eelgrass communities is complex and the biologists in the bay have been working to restore and reestablish these communities throughout the bay and estuary. The project needs to consider carefully the cumulative effects of destruction of eelgrass and how restoration practices should be accomplished using a careful scientific approach.

CO32-68

The importance of native eelgrass in estuarine systems cannot be understated. Faunal communities inhabiting eelgrass beds are comprised of organisms that occupy multiple trophic levels. Macrofaunal organisms utilize eelgrass rhizome layers as protection from predators and provide specialized assistance to the ecosystem through bioirrigation and bioturbation of

[149] Oregon Department of Fish and Wildlife (ODFW), "Status of Oregon bay clam fisheries, stock assessment, and research." [Information Report Series draft June 2014]. Oregon Department of Fish and Wildlife Marine Resources Program, 113 pp.

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CO32-68 It is the COE's responsibility to ensure that impacts to waters of the U.S. are mitigated in an appropriate way (e.g., determining if the eelgrass mitigation plan is sufficient). Any approval from the Commission would be conditioned on the applicant meeting COE requirements. 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.

sediment and other enhancements. [150] Mitigative activities to restore beds of eelgrass may not always be successful. The proposed approach to replace a destroyed area with an additional area should be looked at suspiciously as the design is not appropriate to the habitat needs of the eelgrass. We have already provided input to other agencies regarding this design. The proposed development would alter existing habitat to provide additional eelgrass. The design shape proposed appears to be more of a pond environment with sharp slopes to a depth of -2 feet below mean tide. Likely that feature would provide a trap for invertebrate or vertebrates with tidal receding. Where would the sediments removed from this be placed? Furthermore, what would be the source of eelgrass used to seed this area as proposed as donor shoots or plugs? The biology and habitat requirements and constituents of eelgrass communities is complex and the biologists in the bay have been working to restore and reestablish these communities throughout the bay and estuary.

CO32-68 cont.

Other invertebrates affected by dredging of the navigation channel would be the species of crabs that use the area (Fig. 9 below). The crabs are harvested by recreational anglers, and they also play an important role as a food source for various other species. Large numbers of crab larvae (megalops) are in the bay in late spring and early summer and are found offshore at that time of year. They settle, and in fall they would be particularly vulnerable to dredging activities. Many of the regions that are proposed for dredging and are likely affected by the actions of dredging are important parts of the food base for fish and wildlife, as well as for human harvest. The direct impact of habitat disruption and elimination would be substantial, and the cumulative impacts of creating deep water habitats where there were more shallow beds and sandy shoals are not addressed at all. These shallow areas are used for a variety of fish species including flatfish and migrating salmonid smolts.

CO32-69

The DEIS states "Based on 1978 maps of shellfish (Gaumer et al. 1978), shrimp, soft shell calms, bentnose clams, and cockles are located within the intertidal areas near the slip and within dredge areas (west of the Roseburg Forest Products Company site). The four navigation channel modifications are not located in known clamming or crabbing areas, or shrimp or oyster habitat (figure 4.5-2)."

We disagree, as data regarding shellfish are provided by us in this document and are also provided in the digital resources resulting from the *Partnership for Coastal Watersheds* regarding resource distributions.

[150] Lewis, N.S., Henkel, S. K. 2016. Characterization of Ecosystem Structure within Transplanted and Natural Eelgrass (Zostera marina) Beds. Northwest Science, 90:355-375.

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CO32-69 Text of the final EIS has been modified to include more details on crabbing. Clamming areas are not found in the navigation channel areas to be dredged. See also response to comment CO28-106.

Other fish and wildlife values are at risk with this project development and operations. In addition to clams and crabs, other invertebrates that are harvested commercially and recreationally include oysters, bay mussels, ghost shrimp, kelp worms and mud shrimp. Each of these species has a different reproductive cycle and uses different aspects of the habitat. The placement of the activity of dredging in a winter window to avoid conflicts with salmonid populations may be in conflict with critical times for other species. A recent review by Fraser et al. (2016)[151] illustrated the difficulty of this approach. The potential impacts of dredging on benthic species depend on biological processes including feeding mechanism, mobility, life history characteristics, stage of development, and environmental conditions. Environmental windows (EWs) are a management technique in which dredging activities are permitted during specific periods throughout the year; avoiding periods of increased vulnerability for particular organisms in specific locations. However, their review concluded that large gaps in knowledge exist for the timing of life history characteristics for major species of marine invertebrates, seagrasses, and macroalgae, resulting in uncertainty around their vulnerability to an increase in suspended sediments or light attenuation. They found insufficient scientific basis to justify the adoption of generic EWs for dredging operations for wide groups of organisms.

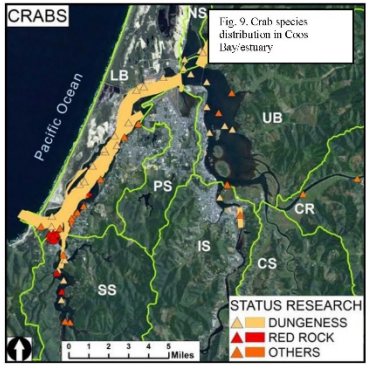

Fig. 9. Crab species distribution in Coos Bay/estuary

An active effort has been underway to increase and restore native Olympic oyster populations in the bay as part of a larger effort coastal wide [152]. In Coos Bay, despite massive shell deposits and oral history, live *O. conchaphila* were noted as absent upon European settlement. This appeared to be a recent event and is commonly attributed to the degradation of water quality from a massive fire in 1846. Commercial harvest in the late 1800s and early 1900s depleted native stocks, and sporadic repopulation efforts have taken place over time, most recently in Netarts, Yaquina, and Coos Bays. In 1986, only a few live oysters were found near commercial *Crassostrea gigas* aquaculture beds. Since that time, Olympic oyster populations in Coos Bay have expanded in range and abundance. Current work by the Oregon Department of Fish and Wildlife (ODFW) in Coos Bay focuses on establishing indices for future documentation of changes in range, abundance, and recruitment patterns.

[151] Fraser, M.W. and 21 coauthors. 2017. Effects of dredging on critical ecological processes for marine invertebrates, seagrasses and macroalgae, and the potential for management with environmental windows using Western Australia as a case study. Ecological Indicators 78: 229–242.
[152] NOAA Restoration Center. 2007. West Coast native oyster restoration: 2006 workshop proceedings. U.S. Department of Commerce, NOAA Restoration Center. 108 pp.

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CO32-70 The allowable dredging windows are set by the ODFW with the intension of avoiding impacts of greatest concern to this agency. It is outside of our jurisdiction to reduce or alter the State's timing windows.

According to the recent documentation provided by the Partnership for Coastal Waters Data Sources in their Chapter 13: Clams and Native Oysters in the Coos Estuary, the area of the mitigation site near the airport is adjacent to an area with native oysters and clams (Fig. 10).

Oyster populations are highly susceptible to sedimentation effects and to toxic releases. The proposed movements of sediments from the navigation channel and facility construction would release suspended sediments that can be carried upstream and downstream of the actual area, depending on tidal influences.

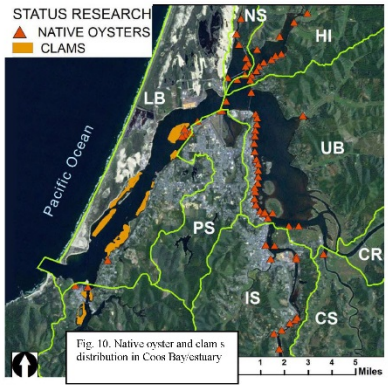

Fig. 10. Native oyster and clam s distribution in Coos Bay/estuary

C. Negative Effects on Aquatic Habitat and Aquatic Organisms are likely from ballast releases and cooling water intake and releases.

The DEIS states: "By following Coast Guard and EPA procedures for ballast water, Jordan Cove and the LNG carriers visiting its terminal would probably not introduce exotic non-native organisms from a foreign port into Coos Bay."

We disagree for the following reasons.

Of all detected non-indigenous marine species (NIMS) of all major animal, plant, and algal phyla, macroalgae not only constitute a large component of the globally introduced biota, but also cause significant economic and environmental damage over which we have only limited post-invasion control and management options. Commercial shipping is an important invasion vector, making ports and harbors among the most vulnerable environments to biological invasions.

CO32-71

The Applicant, repeats the DEIS, indicates that biocriteria, and temperature would be affected by the cooling water intake and discharge. But the assumption that biocriteria and temperature releases from cooling water intake and discharge in this slip are devoid of effects on salinity, flow dynamics, and turbidity is naive. The models provided by the Applicant consider two existing cooling systems used in ships during loading process; they do not consider the effects of these releases on the dynamics in the adjacent area from continuous use for days at a time. Where are the data sources to support the features that are provided? The repeated and frequent arrival and departure of ships in the slip would have the opportunity to change the structural and biological habitat features, allowing colonization of exotic species that may provide other consequences in the area.

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CO32-71 As noted in section 4.3, procedures would be in place to reduce the risk of invasive species being passed to aquatic areas from international vessels including hull cleaning. These regulations are required by the Coast Guard with the intention of reducing the risk of invasive species entering non-native marine and estuarine waters. The temperature model provided a range of conditions to model. Even with the wide range of possible temperature conditions, little substantial change in temperature was estimated. Modifying salinity parameters is not likely to substantially change the range of predicted temperatures.

Sediment water retention that is related to sediment size has been reported as another important factor affecting non-indigenous species (NIS) distributions in the Pacific ports studied by DiBacco et al. (2012).[153] Many common intertidal non-indigenous species including pathogenic viruses and bacteria in this region are retained in sediments. Thus, their survivorship could be higher and increase the probability of spreading. Of particular concern to our review is that the creation and operations of this large slip, higher water temperatures from cooling water discharge, mixing from discharge, prop wash, and the general movement of ships and tugs could combine to provide an enhanced opportunity for propagation of non-indigenous organisms that could affect the local resources. This slip area could serve as a point source for further colonization of other areas. Moreover, it is well known that the repeated and frequent discharge of large quantities of ballast from LNG carriers would increase the propagule pressure for any of these events to happen. The need for careful analysis of these multiple factors that can affect the biological resources and existing resource values needs to be addressed by the Applicant. The DEIS should have required that. According to the model studies provided by the Applicant, the ambient water in the slip is non-stratified during summer with the salinity of seawater (O'Neill 2014)[154]. The regulatory mixing zone (RMZ) extent was investigated for an ambient temperature of 8°C to represent the lower limit temperature during winter. In addition, the representative winter stream flow stratification impact on the RMZ extent was modeled with a stratified condition of 25 ppm salinity at the bottom, linearly decreasing to 8 ppm at the surface, with ambient temperature of 10°C, based on the field measured values in February 2014 (O'Neill 2014). These conditions are challenged by data provided in our critique earlier on water quality modeling (see p. 46 above).

CO32-71 cont.

In addition to risks from ballast releases, there are serious risks from invasive species introduced by biofouling. World-wide estimates suggest that biofouling is responsible for between 55.5% and 69.2% of the currently established NIS in coastal waters globally.[155] Because biofouling accumulates on ships, it poses risk to all ports visited. The management of biofouling is complex and not well harmonized. (Davidson et al., 2014).[156]

D. Entrainment and Impingement from Vessel Cooling Water Intake

Jordan Cove estimates that a 148,000 m^3 steam-powered LNG carrier would take in about 69.7 million gallons (264,000 m^3) of water from the slip for engine cooling during their 24-hour loading period at the terminal dock. Dual-fuel diesel electric propulsion vessels (160,000 to 170,000 m^3) would take in 20.3 million gallons (76,800 m^3) less than steam-powered vessels over 24 hours.

The DEIS indicates that "Currently, no additional screening system other than that already employed on the LNG carriers is proposed for water intakes." They also indicate "The result is likely to be that fish at fry and larger juvenile size salmonids near the intakes may be entrained

CO32-72

[153] DiBacco, C., D. B. Humphrey, L. E Nasmith, and C. D. Levings. 2012. Ballast water transport of non-indigenous zooplankton to Canadian ports. ICES Journal of Marine Science 69:483–491.
[154] O'Neill, M.A. 2014. Seasonal hydrography and hypoxia of Coos Bay, Oregon. Master's Thesis. University of Oregon.
[155] Scianni, C., Falkner, M. DeBruyckere, L. 2017. Biofouling in the U.S. Pacific States and British Columbia. Coastal Committee of the Western Regional Panel on Aquatic Nuisance Species.
[156] Davidson, I., C. Scianni, C. Hewitt, R. Everett, E. Holm, M. Tamburri, G. Ruiz. 2016. Mini-review: Assessing the drivers of ship biofouling management – aligning industry and biosecurity goals. Biofouling 32: 411-428.

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CO32-72 Text of the final EIS has been modified to address comments related to entrainment of fish and invertebrates..

or impinged during cooling water intake. It is expected that a high portion of juvenile larval stages of fish and invertebrates entrained or impinged would result in mortality."[157]

We agree with this statement. However, the DEIS continues to indicate that this would not be consequential and provides the expert opinion, and then proceeds to make several assumptions and step through rationalization of the limited effect.

> Nevertheless, natural mortality of these early life stages is extremely high. The result would be less than 1 percent of earliest life stages reaching adult size, with natural mortality over 20 to 30 percent per day during earliest growth periods (Comyns pers. comm. 2003).[158]

These assumptions are not supported with data or modeling.

Without providing data, the support for their estimate is made with reference to a personal opinion expressed in conversations regarding the natural mortality of ichthyoplankton on 21 May 2003 at University of Southern Mississippi. We find it inconceivable that appropriate data and modeling of entrainment were not provided.

From this single statement they conclude that overall, the loss of marine fish and their prey resources from entrainment, relative to numbers in Coos Bay, would be small based on the information discussed.

We also question FERC as to why there are not requirements for model studies related to this entrainment. The current requirements for use of surface waters as cooling water at conventional power plants results in careful consideration of the impingement of aquatic organisms at cooling water intake structures (intakes). These are to be screened to limit the size of particles passing through condenser systems. In the absence of regulations, permitting authorities rely on impact assessments, regulatory decisions, EPA administrative findings, and resource management objectives to assess compliance on a case-by-case basis. The treatment of the organisms as food source for marine predators, rather than intrinsically important organisms to the ecosystem is also inappropriate. The data provided for estuarine entrainment was for larval invertebrates and larval fish.

CO32-72 cont.

E. The DEIS erroneously dismisses significant harm to fish reliant for survival on already degraded waterways in the vicinity of the pipeline.

The LWV of Umpqua Valley conducted a study of water issues on the Umpqua River in 2009.[159] The South Umpqua River is one of the nearly 500 waterways that would be impacted by the PCGP. The League found that over the last 100 years of forest management of both private and public lands, the South Umpqua River riparian zones have been severely degraded. The Umpqua is one of Oregon's most important producers of Spring Chinook, Fall Chinook, Winter and Summer Steelhead, Coho, and sea-run Cutthroat Trout. The Umpqua system accounts for more total and wild Coho spawners than any other river system in Oregon and about 15% of Coho spawners coast-wide.[160] Anadromous fish, such as Coho and Chinook Salmon and

CO32-73

[157] DEIS, p. 4-256.
[158] DEIS, p. 4-256.
[159] League of Women Voters of Umpqua Valley, *Local Water Study; Phase One Report,* June 2009.
[160] *Partnership for the Umpqua Rivers Action Plan,* June 2007, p. 3.

65

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CO32-73 The effects to listed species of fish as a result of "already degraded waterways" are addressed in detail in the BA, and included in the EIS via reference. Adverse effects to listed coho salmon were acknowledged and disclosed.

Steelhead (and resident Rainbow and Cutthroat) Trout, swim, feed and spawn in the rivers and streams of the Umpqua National Forest. In the 1930s, the entire South Umpqua watershed was inventoried, and the data were vastly different from present conditions. Historically, the South Umpqua was a larger producer of salmon than the North Umpqua. By the time of the study, the South Umpqua was too warm to support salmon in the summer. Coho, once abundant there, had declined significantly. Juvenile salmon must spend two to three years in their natal stream before going to the ocean. They must have adequate stream flows and acceptable quality of fresh water.[161] Any construction associated with the PCGP in the South Umpqua River basin would almost certainly further degrade this already at-risk river and watershed and place the fish in even greater jeopardy.

CO32-73 cont.

F. The Oregon Department of Fish and Wildlife (ODFW) has articulated on many occasions its numerous concerns about detrimental potential impacts of the JCEP to fish and wildlife.

In its segment of the State of Oregon's Scoping Comment to FERC in the fall of 2017, ODFW provided a list of issues related to various species of fish, mule deer, elk, and wolves and described its responsibilities and protective plans for each. They mentioned that mitigation plans would likely be needed for many issues—a practice we find troubling and will discuss below—but we note ODFW's different approach to potential negative impacts to Category 1 habitats. These are defined as, "coniferous old growth and late successional forest (a portion of this acreage with spotted owl and marbled murrelet use); vernal pool wetlands; mature oak woodlands; and rare plant habitat." Citing the Applicant's "Fish and Wildlife Habitat Mitigation Policy," ODFW states, "The Department *shall* act to protect Category 1 habitats described in this subsection by recommending: (A) *avoidance* of impacts through alternatives to the proposed development action; or (B) *no authorization* of the proposed development action if impacts cannot be avoided [emphasis added)."[162]

G. The spread of invasive species as a result of construction activities over 229 miles multiplied by 95'-wide clear-cut, TEWAs and roads, hydrostatic testing, etc., seems highly likely to have an unacceptably significant cumulative impact.

1. Noxious weeds.

The Oregon Department of Fish and Wildlife (ODFW) has serious concerns about this. In their comment to the U.S. Army Corps of Engineers and the Department of Environmental Quality, they say this:

> Invasive species (e.g. noxious weeds) have been identified as one of the seven key conservation issues (threats to conservation) in Oregon in the Oregon Conservation Strategy (ODFW 2016). Hundreds of thousands of dollars are expended annually on both public and private lands to combat invasion and expansion of noxious weeds and their deleterious effects on fish, wildlife, and their habitats.[163]

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[161] LWVUV, p. 6.
[162] Ellen F. Rosenblum, Oregon Department of Justice to Kimberly D. Bose, Federal Energy Regulatory Commission, August 15, 2017, pp. 11-34.
[163] Sarah Reif, Oregon Department of Fish and Wildlife to U.S. Army Corps of Engineers and Oregon Department of Environmental Quality, RE: Jordan Cove Liquefied Natural Gas and Pacific Connector Gas Pipeline permit application to the US Army Corps of Engineers NWP-2017-41, and Oregon Dept of Env Quality Water Quality 401

ODFW goes on to provide two pages of recommendations designed to prevent the proposed project from dramatically exacerbating the already-existing problem.

It is well known that invasive plant species including noxious weeds thrive precisely because they prefer disturbed habitats. Conversely, native species often require established habitats. Once eliminated during the construction process and from the disruption of land by heavy equipment and even human trampling, preferred species may never have a chance to come back as they would be persistently out competed by invasive species. The DEIS fails to acknowledge the widespread permanence of vegetation destruction. CO32-74

2. Invasive aquatic species and pathogens.

The DEIS admits that the hydrostatic testing process includes plans in some locations the discharge of waters from one watershed into another and, in the process, could spread undesirable or non-native aquatic species and pathogens. This outcome runs afoul of state and federal regulations, therefore in its "Hydrostatic Testing Plan," the Applicant indicates that it would disinfect the water with chlorine.[164]

In order to legally discharge hydrostatic test water in any location, the Applicant would have to obtain an Individual Industrial Water Pollution Control Facility Permit from DEQ. That agency, indicated among materials provided with its denial of the Applicant's Section 401 Water Quality Permit that they had not yet received the former application.[165] Since that information is not yet available, it is unknown whether DEQ will find the discharge of toxic chlorinated water to be acceptable. Chlorine can be expected to have a negative impact on water quality as well as on organisms living wherever water is discharged. We would expect concerns, either by DEQ or ODFW or both because the point of chlorine treatment is to kill organisms. Treated water discharged into a "new" watershed would not only kill invasive or unwanted species from the watershed of origin, it can be expected to kill any native organisms in the "new" watershed, as well.

DEQ points out in its 401 Denial materials that information providing assurances that construction activities would not harm resident biological communities is lacking.

> JCEP has not demonstrated that methods employed in pipeline construction, the development of the construction ROW, and the use of the construction access roads would sufficiently protect State waters to avoid detrimental changes in resident biological communities to comply with Oregon's biocriteria standard.[166]

H. The DEIS acknowledges that pesticides and herbicides with the potential to harm sensitive aquatic species would be applied as part of the Applicant's Pest Control Plan, but dismisses impacts as insignificant. CO32-75

Certification Application, July 19, 2018, p. 40-42.
[164] DEIS, Appendix F.10 PCGP POD-Part 4-23.PDF, Appendix M, "Hydrostatic Test Plan."
[165] Oregon DEQ, "Evaluation and Findings Report, Section 401 Water Quality Certification for the Jordan Cove Energy Project," May 2019, Attachment B, "Jordan Cove Energy Project / Pacific Connector Gas Pipeline Additional Information Request," p. 14.
[166] Oregon DEQ, "Evaluation and Findings Report, Section 401 Water Quality Certification for the Jordan Cove Energy Project," May 2019, p. 47.

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CO32-74 The EIS discloses the impact that invasive species would have to the human and natural environment, as well as the measures that would be implemented to minimize these effects (see section 4.4).

CO32-75 Comments noted. As noted in the EIS, the applicant would be required to adhere to our Plan and Procedures, as well as all applicable federal, state, and local requirements related to herbicide use. As stated in the applicant's *Integrated Pest Management Plan* (attached to the EIS in appendix F.10), hand and mechanical methods would be the first choice for noxious weed control, as practicable. Additionally, as discussed in the EIS, herbicides would not be used for general brush/tree control within the 30-foot maintained operational easement. Furthermore, as stated in the EIS, herbicides would not be used within 100 feet of a wetland or waterbody, unless allowed by the appropriate agency.

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The DEIS concludes that the Applicant's Plan would have adverse effects on various species. For example, it states:

> Control of noxious weeds helps to preserve native plants that pollinators require for survival; however, some chemicals used to control noxious weeds have been shown to have a detrimental effect on pollinators when used within typical to maximum application rates, such as 2,4-D, glyphosate, and triclopyr (Forest Service 2005b). These three herbicides are included in the Pacific Connector's *Integrated Pest Management Plan* and would likely have adverse effects on pollinators when applied in the immediate vicinity of project disturbances.[167]

Despite acknowledgment of harm, per the Applicant's Erosion Control and Revegetation Plan (ECRP) these dangerous herbicides would be used to control vegetation, including invasive noxious weeds, in the pipeline right-of-way throughout the lifetime of operations. These substances, even when used with care, cannot be considered harmless and have negative consequences for a wide variety of species. DEQ points out that the Applicant has committed to comply with less stringent federal regulations, thereby falling short of complying with Oregon's water quality regulations. The "Evaluation Report" says this,

CO32-75 cont.

JCEP would maintain portions of the permanent right-of-way in an herbaceous state to facilitate access for pipeline maintenance and inspection. Methods to control vegetation are described in the Erosion Control and Revegetation Plan and include the application of herbicides and pesticides. The plan references procedures in FERC's Waterbody and Wetland Construction and Mitigation Procedures that prohibit chemical applications within 100 feet of wetlands or waterbodies except as allowed by federal or state authorities. To comply with the Toxic Substances water quality standard, Applicants must comply with state regulations regarding the application of chemical herbicides and pesticides at locations that may directly or indirectly affect waters of the state.[168]

It makes no sense for FERC to accept practices that would violate the water quality standards of a state when the project cannot receive FERC certification unless the Section 401 Water Quality Permit which protects those standards is obtained.

We join the Oregon Department of Fish and Wildlife in raising the potential and likely harm use of these chemicals pose to both aquatic and terrestrial wildlife. ODFW has been clear in their concerns about the practice with regard to use near streams and wetlands: "ODFW recommends against general use of herbicides and pesticides in wetlands. ODFW recommends any use be judicious and meet federal, state, and local, regulatory requirements."[169]

We look forward to learning whether the Applicant has agreed to implement the agency's recommendations, although we believe that information should have been available for review

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[167] DEIS, p. 4-224.
[168] Oregon DEQ, "Evaluation and Findings Report, Section 401 Water Quality Certification for the Jordan Cove Energy Project," May 2019, p. 71.
[169] Sarah Reif, Oregon Department of Fish and Wildlife to U.S. Army Corps of Engineers and Oregon Department of Environmental Quality. RE: Jordan Cove Liquefied Natural Gas and Pacific Connector Gas Pipeline permit application to the US Army Corps of Engineers NWP-2017-41, and Oregon Dept of Env Quality Water Quality 401 Certification Application, July 19, 2018, p.32.

in this DEIS. In any case, it is deeply disturbing to contemplate the harm to wildlife and aquatic species, as well as other living things including humans from the extensive and widespread use of these toxic chemicals as a result of this project, and for the life of the project.

CO32-75 cont.

4.6 THREATENED, ENDANGERED, AND OTHER SPECIAL STATUS SPECIES

A. The DEIS admits and then erroneously and without support dismisses adverse impacts on numerous species.

The DEIS admits that the project would be harmful for Northern Spotted Owls (NSO).

> Jordan Cove has indicated an interest in working with the FWS to discuss possible mitigation and conservation measures but has not proposed compensatory mitigation. In the absence of mitigation other than avoidance and minimization, the Project would result in long-term negative effects on this threatened species.[170]

The DEIS indicates the absence of details about concerns about the Lost River sucker and its habitat. Failure to include information on this matter in the DEIS precludes the ability of the public and other agencies from evaluating and commenting. This is inappropriate.

CO32-76

> Below is the determination of effects summary for Lost River sucker and critical habitat. *Details will be provided in our pending BA* [emphasis added].[171]

The DEIS addresses the potential negative impacts on the shortnose [sic] sucker in the event of a frac-out during HDD crossing of the Klamath River. We do not agree with the claim below that the risk of frac-outs is "discountable." That does not align with the literature:

> However, the Project is not likely to adversely affect designated critical habitat for the shortnose sucker because:
> - HDD crossing methods would avoid critical habitat in the Klamath River;
> - the potential for hydraulic fracture during HDD drilling is so unlikely as to be discountable; and
> - in the event of released bentonite, corrective actions would contain and temporally limit drill mud volumes.[172]

CO32-77

Table 4.5.1.1-2 in the DEIS summarizes the assessment of impacts of the various proposed alterations of habitat by the project. The summary provides a total of permanent and temporary effects estimated at 576.9 acres. This definition of temporary alterations is not supported by any data from studies of such disruption, rather they rely on the inaccurate assumption that when the activity is completed, the effects are withdrawn.

CO32-78

The DEIS states that Jordan Cove has indicated that estuarine habitat values lost to the construction of the LNG terminal and related facilities would be replaced in-kind at the eelgrass and Kentuck mitigation sites.

CO32-79

[170] DEIS, p. 4-329-330.
[171] DEIS, p. 4-340.
[172] DEIS, p. 4-340. Note, the above claim is included in the section of the DEIS for the Lost River sucker. It is unclear whether it is misplaced or a typographical error has occurred.

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CO32-76 Available information on habitat is supplied in the BA, and included in the EIS via reference, which provides the total assessment of factors affecting listed species from project actions. However, the types of effects to fish presented in detail in section 4.5.2 include actions that would affect listed fish as well as general fish species.

CO32-77 The rationale for the impact determination considers the type, likely magnitude, and likely occurrence of effect, mitigative actions, and likely presence of fish in the area. Considering these factors, we retain our current assessment.

CO32-78 Table 4.5.1.1-2 identifies the acreage of habitat proposed to be temporarily disturbed during construction, but the EIS does not assume that effects cease when activities are completed. We have added reference to the anticipated habitat recovery periods in section 4.5.

CO32-79 The scope and suitability of wetland mitigation is determined by the COE. Therefore, the Commission and the EIS defer this decision to the COE. The COE and ODSL are currently working with the applicant on wetland mitigation requirements. The COE would determine the specific type and amount of compensatory mitigation that would be required to offset the loss of wetland acreage and functions that cannot be avoided or minimized as part of the CWA Section 404 permit process and by the ODSL as part of the state Removal-Fill permit process.

We disagree. Additionally, the losses of estuarine habitat are widespread and not equivalent with the two proposed mitigative measures. Support for this is in sections 4.3 and 4.5. above. CO32-79 cont.

The DEIS states "Project-related construction noise is not expected to adversely affect wildlife in the region."[173]

We disagree with that conclusion, also.

Pile driving and noise related to construction and dredging have the potential to affect migratory fish activities, settlement of invertebrates, movements of marine mammals, and a suite of other organisms. CO32-80

Even after providing this statement claiming adverse impacts, the DEIS continues to indicate there could be effects on great blue heron rookery located 300 feet from the Jordan Cove Road. The comparisons made to support their little effect finding are not appropriate, as the intermittent truck traffic at the Roseburg wood chip facility is not the same as the magnitude of the noise and disruption of construction.

B. Fish and wildlife values would be reduced by aspects of the project.

The presence of federally protected species in the area of impact requires consultation with federal partners, as well as Indian tribes. The JCEP project would disrupt the critical habitat of federally protected aquatic species, including Coho Salmon (*Oncorhynchus kisutch*) and Green Sturgeon (*Acipenser medirostris*). Indian Tribes, NOAA fisheries, and the State of Oregon have worked hard to restore the salmon populations in the south coast. The State has invested significant amounts of Oregon taxpayer money to restore water quality and salmon in all six of the sub-basins that would be affected by the JCEP—the Coos, Coquille, South Umpqua, Upper Rogue, Upper Klamath, and Lost River sub-basins.

The Western Environmental Law Center (WELC) determined total expenditures by the Oregon Watershed Enhancement Board (OWEB) of over $37 million. The *ESA Coho Salmon Recovery Plan* produced by NOAA National Marine Fisheries Service outlines major threats, "Degraded water quality, reduced water quality, including high water temperatures, and increased fine sediment levels affect Coho Salmon production in several populations. Increased water temperature is the primary source of water quality impairment for Oregon Coast Coho Salmon, and rising water temperatures due to climate change could add to this problem. Land use activities have contributed to increased water temperatures in coastal streams by removing riparian vegetation, disconnecting streams from floodplains, and reducing streamflow through water diversions."[174]

4.7 LAND USE

The DEIS's conclusion is typically unacceptable in its unsupported dismissal of significant impact: CO32-81

[173] DEIS, p. 4-188.
[174] NOAA National Marine Fisheries Service, *ESA Coho Salmon Recovery Plan*, p. 6.

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CO32-80 The EIS acknowledges that wildlife near the LNG terminal would be disturbed by construction activities and noise, and may move farther away. However, significant adverse effects are not anticipated because construction noise would be temporary and occur in the context of existing industrial operations. Also, dredging and in-water pile driving would occur during the in-water work window, which is generally outside the breeding season when wildlife are most sensitive to disturbance. As described in the EIS, if the great blue heron rookery located 300 feet from the Jordan Cove Road becomes active, Jordan Cove, in consultation with ODFW, would develop an appropriate mitigation plan.

CO32-81 Legal challenges regarding county-level permit actions are outside the scope of this EIS.

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> Constructing and operating the Project would have both temporary and permanent effects on land use. Some land uses would be permanently converted to industrial use, others (such as affected orchards, vineyards, and forests) would no longer being permitted directly over the pipeline, Other land uses would be converted to more natural conditions than they are currently (as part of the proposed Project-related mitigation sites). Based on the proposed mitigation and minimization measures the Project would not significantly affect land use.[175]

We disagree and wish to note especially that the land-uses to be negatively impacted inventoried in the second sentence should be recognized for the real-life consequences they represent. The orchards, vineyards, and forests to "no longer [be] permitted directly over the pipeline" belong to private landowners whose lives, plans, and economic well-being will be harmed if this project is approved. CO32-81 cont.

The League of Women Voters of Oregon supports the Land Conservation and Development Commission (LCDC) as the statewide planning agency and the 19 statewide land use goals. The League supports policies that promote both conservation and development of land as a natural resource, in accordance with Oregon's land use goals.

The Applicant describes land use as follows: "Approximately 61.86 percent of the land crossed by the Pipeline is classified as Forest Land; 13.68 percent is classified as Agricultural Lands; 14.43 percent as Rangelands and 8.05 percent as Urban or Built-up Lands. The other land classifications combined (Water, Wetlands, Barren Lands) comprise about 2 percent of the Pipeline."[176]

Throughout the history of this project, there have been land use conflicts in at least two of the four affected counties—Coos and Douglas. Most recently, the Land Use Board of Appeals (LUBA) rejected Coos County's earlier approval of JCEP's application, finding that the County erred with respect to

1) its treatment of the public benefit and trust standard for the estuary,
2) impacts to Henderson Marsh bordering the terminal site,
3) dredge and fill impacts,
4) impacts of dewatering at the terminal site,
5) approval of the Southwest Oregon Regional Safety Center; and
6) reliance on suspended FERC permits.[177]

There are currently three cases brought by four landowners against Douglas County pending in the Douglas County Circuit Court. The lawsuits are contesting the PCGP Conditional Use Permit extensions by the County and an amendment to the original permit to allow the pipeline to be used for export, rather than import, purposes.[178]
FERC is aware that the LUBA decision and other Land Use cases may have implications for a number of state and federal permits. We were unable to find any mention of this issue in the DEIS.

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[175] DEIS, p. 532.
[176] PCGP Resource Report 8: Land Use, Recreation, and Aesthetics, p. 8.
[177] Oregon Shores Conservation Alliance, "Land Use Board Blocks Jordan Cove Permit," 2016.
[178] Communication with Stacey McLaughlin, Plaintiff, July 13, 2018.

4.8 RECREATION AND VISUAL RESOURCES

Recreational water-based concerns: Public trust rights with respect to submerged lands and navigable waters are rooted in the principle that the Department of State Lands shall not authorize a proposed use if it would result in an unreasonable interference with the public trust rights of commerce, navigation, fishing and recreation.[179]

The proposed activities of dredging and the outcome of operation of the facilitywould encroach upon the public's rights to use the navigable waters in Coos Bay and Jordan Cove. Fishing activity in the bay occurs throughout the year for various targets.

The DEIS states,

> Recreational clamming and crabbing that takes place outside the navigation channel would not be directly affected by LNG carrier traffic transiting the waterway to and from the LNG terminal. *Effects would be similar to those presently experienced during the passage of other deep-draft ships* [emphasis added]. However, if crabbing or clamming activities were to occur within the established security zones, those activities may be required to cease, with attending vessels required to temporarily move out of the security zone while the LNG carrier in transit moves by.[180]

CO32-82

We disagree. This is a vast understatement of the negative impacts on recreation of the JCLNG project.

A. The recreational crab fishery would be among those most vulnerable and affected by the traffic in the navigation zone. This includes the effects from habitat alterations during construction, but also during operations.

All boat-based crab fishing takes place around the slack high tide water events. The fishers deploy rings and set them with bait and then the retrieval occurs during the two hours around high tide. The fishers retrieve each of these and harvest and sort the crabs. Many boats use up to a dozen rings, and all activity takes place in the two-hour slack high tide period. This same time is when the LNG ships would of necessity be moving fully loaded out of the bay. This would totally and thoroughly disrupt and interfere with the recreational access to what is a highly socially and economically important component of the functional use of the estuary. Clam harvest by scuba fishers is done at slack low and high tides.

Other ship traffic would be unreasonably affected by this high density of ship traffic in and out of the bay. Commercial fishing fleets depend on weather conditions for access. In the winter, often the access into and out of the bay can be limited by weather conditions. Having large ships with exclusion zones surrounding them would affect all other associated fish fleet traffic.

B. The loss of access for recreation from removal of the tidal areas in the Access Channel region is also of concern.

[179] Oregon Department of State Lands. "Public Trust Doctrine," https://www.oregon.gov/dsl/About/Documents/Public_Trust_Doctrine.pdf.
[180] DEIS, p. 4-538.

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CO32-82 Jordan Cove expects that the proposed LNG terminal would be visited by about 100 to 120 LNG carriers per year, which would equate to approximately two carriers visiting a week. During LNG carrier transit in the waterway to the terminal, an exclusionary Coast Guard safety and security zone would be implemented. Non-LNG vessels would be allowed to transit through the safety zone and would also be allowed in the safety zone during passage provided that these other vessels do not impede the safe navigation of the LNG carriers in the restricted channel, and that the other vessels do not pose a security threat or concern to the LNG carriers in transit. The timing and constraints associated with LNG carrier transit through the channel entrance bar area would be similar to existing constraints on chip ships and log carriers calling at the port.

Jordan Cove would dredge four areas abutting the current boundary of the navigation channel between RM 2 to RM 7, as well as the proposed LNG terminal access channel and slip. One of the areas abutting the navigation channel (Dredge Area 4) is near the BLM boat launch. All in-water work would be restricted to the in-water work window from October 1 to February 15 limiting potential impacts to recreational activities in and around the boat launch. However, recreationists using that area while dredging is taking place would be aware of dredging, which could detract from the quality of their experience.

Recreational boating and clamming and crabbing access from the nearby Bureau of Land Management (BLM) boat launch would be severely curtailed during some of the dredging operations. Even if access is possible, noise and interference from the activities would hamper most activities. The public access for hunting and access to open water areas is focused out of the BLM launch. Many recreationalists walk with their families and pets along the tidal areas. The proposed Access Channel dredging is just upstream from this important area with proposed channel alterations affecting 22 acres of tidal and subtidal habitat, 15 of which are deep subtidal habitat.

CO32-82 cont.

The enormity and unique needs of an LNG export operation of this nature can be expected to take precedence over all other uses of the channel. The two other LNG facilities in the U.S. are situated in ports with less complex multiple uses and without the limited geography of Coos Bay. Navigation in and around the project facilities in the Coos Bay by all other users would necessarily be curtailed and disrupted to make way for the tanker and facility operations. With the explosive nature and risks to safety of the project, existing recreational and commercial shipping in the area would be affected. This proposed dredging and construction, as well as operation of the facility would restrict in significant ways all other commercial and recreational water uses including fishing, a public trust right in Oregon.[181]

C. In addition to boating, the DEIS outlined considerable state, federal, tribal, county, and local recreational facilities in the area, but they, too, are included in the blanket dismissal by FERC staff of significant impact.

As will be covered in section 4.9 Socioeconomics, the estuary and associated coastal resources are an important resource. The BLM administered lands include 709 acres that are classified as an Area of Critical Environmental Concern (ACEC) and the remainder are designated as Recreation Management Areas (RMAs). Close to the project is the North Spit Trail System, which is approximately 300 feet from the Trans-Pacific Parkway. The DEIS indicates that more than 6,000 people travel annually on the sand road to the North Jetty. The traffic alone in the construction phase would interfere with access to and from the recreational areas of the North Spit. The southern boundary of the Oregon Dunes National Recreation Area (ODNRA) is about 100 feet north of the Jordan Cove LNG terminal site, across the Trans-Pacific Parkway, and the Horsfall Campground is located about 0.5-mile northeast of the LNG terminal site. According to the DEIS and 2011 data, the Forest Service identified 1.6 million visits to the Siuslaw National Forest, including the ODNRA, with 23.6 percent of visitors engaging in off highway vehicle (OHV).[182] There are frequent rally activities with large numbers of visitors. Access alone would be a challenge during construction. On the other side of the recreation area, off road vehicles are prohibited. There are bike trails, water trails, and many recreational assets that are near and associated with the general area of this facility.

CO32-83

The DEIS states:

> There may be some conflicts between recreational drivers on the Trans-Pacific Parkway and construction traffic traveling to and from the Jordan Cove LNG Project. Recreational drivers in this context could include recreationists using the Trans-Pacific Parkway to

[181] *Oregon Shores Conservation Coalition v. Oregon Fish and Wildlife Commission*, 62 Or 481, 493 (1983).
[182] DEIS, p. 4-535.

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CO32-83 Potential impacts to recreation access and driving for pleasure during construction of the proposed LNG terminal are discussed in section 4.8.1.1 of the EIS. As discussed in this section, these types of impacts are most likely to occur during peak commuting hours for the construction workforce. The traffic impact analysis conducted for the Project (DEA 2017b) and proposed mitigation measures are described in section 4.10.1.2.

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> access recreation sites, including the ODNRA, as well as people recreating by driving for pleasure.[183]

CO32-83 cont.

This is understated; the conflict is certain. The overall access to, and interest in, the area of recreation would be affected by the construction and the operation of the facility. In terms of tourism, the Coos Bay-North Bend-Charleston area is named "Adventure Coast," and opportunities for water and land based tourism and recreation are highlighted throughout the region and marketed by the Coos Bay–North Bend Visitor & Convention Bureau.[184] Additional discussion of this impact is provided in Visual Resources just below.

4.8.2 Visual Resources

The treatment of impacts to visual resources follows a general section on recreation. The two are most certainly related, particularly for those elements that consider the coastal features and importance of natural areas to perception, as well as function of an area.

The DEIS states,

> Constructing and operating the Jordan Cove LNG Project would result in substantial short-term and long-term changes to the existing landscape within the viewshed of the Project. As described in the preceding sections, the LNG tanks and related facilities at the terminal would be visible from a range of viewpoints within the surrounding area and the visual effects were assessed to be low to high dependent on the user and viewpoint location. Jordan Cove attempted to optimize design factors for the LNG tanks and has adopted various measures to mitigate for the visibility of the Project facilities, including use of landform contouring and stabilization, vegetative screening, architectural treatments, and use of hooded lighting. However, based on the size and location of the proposed LNG facilities we conclude that the Jordan Cove LNG portion of the Project *would significantly affect* visual resources for some views and viewing locations [emphasis added].[185]

The DEIS recognizes impacts to various areas, but the conclusions and evidence of the impact of visual resources in the area of the terminal and associated construction and operations have several misleading components. We provide evidence for the following:

1) Export terminal lighting is inadequately described and mischaracterized as to degree of impact.
2) New construction of various types is not included in the analysis of the viewshed, which appears based on dated information at least two years old.
3) With little description or analysis of the visual impact of LNG carriers visiting the bay, the degree of that impact is not fully assessed.
4) The major added impact on visual resources of dredge spoil disposal at APCO Sites 1 & 2 is not identified and analyzed in the DEIS.
5) Lack of Applicant plans and an established regulatory requirement with specific guidelines and financial guarantees providing for the retirement, reclamation, and

[183] DEIS, p. 4-538.
[184] https://oregonsadventurecoast.com/.
[185] DEIS, p. 4-586.

restoration of the LNG terminal and associated infrastructure, neglects a highly significant impact on visual resources.

6) Due to various deficiencies and omissions in identifying, describing, and analyzing project visual impacts in the DEIS, the cumulative impacts on visual resources are far more significant than the DEIS concludes.

1. Lighting.

While the DEIS recognizes LNG facility lighting as having an impact, it does not adequately assess the nature or magnitude of that impact. The Applicant suggests care in design of facility lighting, including use of directional light sources and shielding fixtures, though little detail permits evaluation of the effectiveness of those measures, which the Applicant states would be provided in a final lighting plan.[186]

LNG facility lighting is known to be extensive and very bright, having a high impact on surrounding areas. The DEIS description that added lighting associated with the LNG project would approach a moderate incremental impact could mean that lighting might add 50-60% to nighttime light impacts combined with those already nearby. A review of more than 110 nighttime photos of various LNG facilities shows they are usually extremely brightly lit in all details, understandable with the unique security and safety concerns that must be addressed for such projects. An LNG carrier at berth while loading is also similarly illuminated for the same reasons. Nonetheless, the negative impact exists. CO32-84

Light spillage may be controlled by a choice of fixtures, but that would not abate reflected light from light-colored tanks and other facility components, said by the Applicant to be required to reduce heat absorption.[187] Those brightly illuminated features would clearly be seen for miles as the highly visible mid-toned Roseburg Forest Products chip pile nearby shows at night.

It is certain--due to the size of the 240-acre site, extent of its infrastructure, and special security and safety requirements--that the proposed project area, including tanks, liquefaction trains, and berthed carriers, would be by far the most prominently lighted area on the entire North Spit. Terminal lighting impact would be highly visible to anyone having a daytime view and would introduce light pollution affecting westward views of sunsets and the night sky.

2. New Construction.

The FERC DEIS states the following: "The only projects listed in table 4.14-2 that involve new permanent aboveground facilities within the viewshed of the LNG terminal is the City of North Bend's Department of Human Services Building and the CTCLUSI Hollering Place."

This understates the actual situation going forward. CO32-85

The Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians (CITCLUSI) Hollering Place Cultural Visitor Center is under construction on the waterfront at a historic location and the narrowest spot on the Coos Bay Channel. However, several other building projects have been completed in the last 2-3 years which would also have continuous, permanent visual impacts resulting from the LNG export terminal and LNG carriers transiting the bay. These are not mentioned in the DEIS, which may have relied on information not completely up to date.

[186] DEIS, p. 4-566.
[187] DEIS, p. 4-566.

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CO32-84 Although the comment stresses the characteristics of night lighting that would be associated with the LNG terminal, it appears to be generally consistent with the draft EIS discussion of incremental lighting impacts in an area with extensive urban uses. The text of section 4.82 has been edited somewhat for the final EIS to clarify the expected conditions with regard to lighting.

CO32-85 As stated in the introduction of section 4.14, we generally do not include in our analysis small projects located within towns and other developed areas because these actions have a small footprint, are consistent with surrounding land uses, and contribute only minutely to cumulative impacts on the resources evaluated in this EIS. However, this section of the final EIS has been updated to specify that single family homes and condominiums are considered small projects that are not included in our cumulative effects analysis.

Those impacts would also likely be reflected in the ability of owners to lease, rent, or sell their dwellings over the period of facility construction, during operation, and after closure. Coos Bay construction, having bay frontage, includes: 1) a 7-unit condominium overlooking the bay and export facility at Fenwick and Maxwell Streets (distance, 1.14 miles), and 2) three high value single family homes on Chickses Drive (distance, 1.5 miles), two of which have remained unsold for several months.

CO32-85 cont.

3. LNG Carriers.

A representation of an LNG carrier appears to be part of the simulation shown in Figure K-11. Visually comparing the size of one of the LNG storage tanks (measuring 180 ft. high by 267 feet wide) and located further away upland from the pictured LNG carrier, the carrier appears to be far too small to simulate the actual size of carriers visiting Coos Bay that would sit at berth in the facility slip. The simulated carrier placed in the JCEP-supplied photo should appear close to twice the length and twice the height of the one used in that 24mm wide-angle view to adequately represent the nearly 1,000-foot LNG carriers expected to visit the proposed terminal. A clear misrepresentation is caused by the Applicant's use of a simulated image of an LNG carrier at only half the size. It should be in proportion to the facility tanks and if it were, this subject would actually appear four times larger (in all dimensions) in our 50mm photo at the same location. Whether this was deliberate cannot be known, but the fact must be noted.

CO32-86

4. APCO sites 1 and 2.

A further important visual impact from disposal of up to 1.8 million cu. yds. of dredge spoils from construction and periodic maintenance dredging for the project at the APCO sites 1 & 2 has not been sufficiently described for reliable conclusions to be drawn regarding its impact. The dredge spoil piles that would be placed at APCO sites 1 and 2 would tower 50 to 60 feet above ground level of the bridge and would be highly visible from all traffic crossing the McCullough Bridge especially south bound traffic coming into North Bend. This bridge is listed on the National Register of Historic Places as a structure deemed worthy of preservation for their historical significance. Spoiling the view in this way would have an impact worthy of note. Visual pollution diminishes this value.

CO32-87

5. Retirement and Reclamation of Site.

Since there are no current federal, state, or local requirements and specific regulations for the retirement and restoration of LNG export facility sites after closure, the prospect that this expensive work would be thoroughly carried out seems slight. The fact that detailed plans for this post-closure work by the Applicant are not discussed at all in this DEIS, including financial guarantees for its completion, make that outcome extremely unlikely. Therefore, it is reasonable to expect the work of retirement, reclamation, and site restoration of the LNG export terminal and related infrastructure would pass to local, state, or federal governments and funding sources, with a highly uncertain timeline. As FERC recognizes in this DEIS, significant, permanent visual impacts would occur to visual resources from construction and operation of the proposed LNG terminal. The failure of the Applicant to address this additional cumulative factor on Visual Resources would appreciably lengthen the duration of the significant, permanent visual impacts of the LNG export terminal on visual resources of the Coos Bay area, potentially far beyond what is acknowledged.

CO32-88

6. Cumulative Impacts and misrepresented photos.

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CO32-86 The comment is correct that the simulation provided as figure K-11 includes a depiction of an LNG carrier within the marine slip at the proposed terminal. However, the specific wording of the comment suggests that several points made in this comment are based on erroneous assumptions. With respect to realistic dimensions of the LNG carrier shown in the simulation, the comment fails to account for the fact that the sheet pile wall on the west side of the terminal slip obscures a substantial part of the carrier's length because of the viewing angle available at Viewpoint 11; note that the upper portion of the vessel's superstructure can be seen extending above the sheet pile wall, providing a better indication of the total length of the vessel is considerably longer than the portion that is in clear view at this angle. Figure K-10 reflects a similar viewing condition, in which the sheet pile wall on the east side of the terminal slip partially obscures an LNG carrier within the slip. The comment asserts that the photo used for the simulation was based on a 24mm wide-angle view, but provides no information to substantiate that statement. The comment asserts at one point that the simulated image shows the LNG carrier at only half the actual size and at another point that the carrier would appear four times larger in all dimensions. These two statements appear to be internally contradictory. In addition, they seem to suggest that the simulation should depict an LNG carrier that is at least 360 feet high, which would clearly be an exaggerated and inaccurate height dimension. Regardless of any reviewer's opinion as to whether the simulation includes a realistic depiction of an LNG carrier, the salient point is that the impact analysis nevertheless indicates that recreational users in the Coos Bay area would notice to moderate to high visual contrast, depending on their viewing location and distance. The draft EIS also stated that the LNG terminal would permanently and significantly affect the visual character of Coos Bay's northern shoreline.

CO32-87 The statement in the comment that up to 1.8 million cubic yards of dredge spoils from construction and periodic maintenance dredging would be deposited at APCO sites 1 and 2 is not substantiated, is inconsistent with information provided in the draft EIS, and appears to be inaccurate. Per draft EIS section 2.1.1.8, only material dredged for marine waterway modifications would be deposited at the APCO sites and the volume would be 0.59 million cubic yards. The comment does not substantiate the assertion that the dredge spoils would "tower 50 to 60 feet above the ground level of the bridge." Note that figure K-6 in the draft EIS provides a simulated view from the southern end of the McCullough Bridge that includes what we consider to be a realistic depiction of the simulated condition for the APCO dredge disposal sites. Also note that the existing view in figure K-6 demonstrates that the landscape as seen from this location has already been substantially modified through previous human development activity.

CO32-88 As acknowledged by the commenter and described in the final EIS, constructing and operating the LNG facilities would result in a permanent and significant impact on the visual character of Coos Bay.

The DEIS discussion (4.14.1.6) accurately states that, "…because the Project's impact on Coos Bay's visual character would be significant, a significant cumulative impact would result." We appreciate that acknowledgment, but we assert that considering the discussion and the images submitted to support the Applicant's assertions regarding impact to Visual Resources from the construction and operation of its Jordan Cove Energy Project LNG export terminal, the conclusions reached by the FERC greatly understate the visual impact on those who reside in the Coos Bay area, visiting tourists, and recreationists who enjoy use of the resources of the Bay. Also, the large LNG carriers would produce visual impacts in-transit and while loading at-berth, both of which have not been fully described and adequately analyzed in the DEIS.

The photographic illustrations in Appendix K have been taken with wide angle lenses. Photographic images provided to FERC to support the analysis and conclusions regarding project impacts on Visual Resources from construction and operation of the export terminal are inadequate and very misleading. It is apparent that a lens with a wide-angle focal length was used for photos found in the DEIS, Appendix K.[188] A wide-angle focal length lens provides a wider field of view, but also, one where distant objects appear more distant and smaller than they appear to the human eye. This was readily confirmed by taking sample photos at various lens focal lengths from the actual locations JCEP obtained its images, then reviewing the EXIF data, or camera settings, that our digital cameras recorded with every image. The lens focal length used in the DEIS for all Coos Bay images showing visual impacts appears to have been of 24mm focal length--or very close to that—for both the existing views and views with added simulations. This is a very wide-angle focal length lens, which has implications for the accuracy of the Applicant's representations of visual impacts of the proposed project.

CO32-89

We repeated photos at four of the Appendix K Viewpoints, replicating as closely as possible the images supplied in the DEIS. A 24mm lens focal length was used to represent the same wide-angle view resulting in the reduced apparent size of objects in the Applicant's submitted photos found in Appendix K. For comparison, photos were made at the same four Appendix K Viewpoints, using a 50mm focal length lens (confirmed by EXIF data)—which very closely approximates the actual view of human eyesight and which is often referred to as a "normal" lens. No simulations for the LNG facility were applied to our images as that would change the EXIF data and show the images had been modified by software enhancement.

There being a direct optical relationship between lens focal length and image size, the size of an object in a view photographed at 24mm focal length will appear to be twice as large in the same view photographed with a 50mm focal length lens. It is easy to make a visual comparison of objects in the 24mm view of the Applicant's images and the same objects in our 50mm views to confirm the near doubling of the size of objects at 50mm (approximating human perception). It is also easy to visualize the size of the simulated objects in the Appendix K photos but represented at twice that size in our corresponding 50mm views.

We provide four pairs of digital images directly from the camera, unchanged in EXIF data and unedited by any image enhancement software (located either in-camera or on a computer). When compared with the images in Appendix K, these illustrate the inadequate, misleading characterization of visual impacts in all the images submitted by the Applicant for this section. The four pairs of images correspond to the locations photographed in Figures K-1, K-9, K-10,

[188] There are two appendixes in the DEIS designated as Appendix DEIS, Appendix K. We refer to Appendix K Visual Resources-30.PDF, "Appendix K, Visual Resources," pp. various.

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CO32-89 The visual resources documentation that the applicant has submitted does not address the focal length used for the photographs of the viewpoints addressed in the draft EIS. Therefore, we do not currently have the ability to determine whether the applicant's photos were in fact taken with a 24mm lens as the comment alleges. We do not have other information that would cause us to suspect that the applicant's consultant used a 24mm lens, however, because it is standard practice within the visual resource assessment community to use "normal" lens-based photos to document existing conditions and prepare visual simulations. Regardless of whether any reviewer believes the photos presented in the draft EIS were taken with an appropriate focal length, we do not see how that opinion should require any changes to the EIS conclusions regarding visual impacts of the LNG terminal. Section 4.8.2 of the draft EIS effectively discloses the visual impacts of the Project, including the impacts associated with LNG carriers, and it identifies the types of viewers who would experience these impacts. There would be no meaningful purpose or value if the EIS were to describe the visual impacts as more than significant, or include extended description of the specific character of those impacts.

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and K-11 in the DEIS, are labeled as in Appendix K, but with the focal length of each added to the Figure number (i.e. K-1, 24mm, K-1, 50mm, etc.). These can be accessed at the following Dropbox link:
https://www.dropbox.com/sh/91p3on5rmqqr2md/AACM1gUaFSPOtUQLywapqzBya?dl=0

We also provide figures for comparison in this document to exemplify the issue (Fig 11 &12).

To emphasize the accuracy of photos, our EXIF data are embedded in our submitted images and can be read to verify camera settings using the available software features within PC and Apple operating systems, or several free applications for that purpose. A close visual correspondence to the Applicant-supplied images was determined by examination and place descriptions for Viewpoints given in Appendix K when establishing our photo locations and compositions. The JCEP photos were taken in late summer or fall judging from foliage color and possibly 1-2 years prior, noting vegetation growth and some brush removal at one site (Fig. K-1).

Another inadequacy appears in the DEIS Appendix K photographs illustrating impacts to visual resources. Photos submitted by the Applicant appear most sharply focused in the foreground (at approx. 10-30 ft. in front of the camera position), becoming progressively less sharp and blurred out to the horizon, where the simulated LNG facility is often located in pictures. The effect is to further soften the visual impact of the LNG export facility taken with a very wide-angle lens (24mm), which represents the facility at less than half the size it will appear to the human eye at that same location if photographed with a 50mm lens. The photos presented in the Appendix K simulations present visual predictions of the structures appearing much smaller than they would be seen with a 50 mm lens. Moreover, the focus softening of the subjects is unusual since the images appear to be taken on sunnier days, which usually produces automatic camera settings that result in great depth of field, appearing as generally having sharp focus from foreground to the horizon. CO32-89 cont.

Finally, the location of one of the sets of images (Appendix K, Figure K-2), presumably shows a simulation of facility storage tanks (or possibly containment structures) at the export facility. This is confusing and mistaken. The pictured view is not the location of the facility site, which the simulation would imply. The viewpoint location of the Applicant's images for Figure K-2 is approximately ½ mile northeast of the actual proposed facility site. The simulation shows a structure at that location, but none exists there, nor does the DEIS discussion for Figure K-2 refer to the misapplied simulation at all.

The DEIS states that "Figures K-1 through K-11 in Appendix K show the existing conditions (or "before" view) for each viewpoint, and a visual simulation (or "after" view) illustrating the expected appearance of built portions of the Project."[189] It's also stated that the visual simulations "are accurate within the constraints of available site data, such as site topography, the proposed LNG terminal design, and photography obtained in the field." Our visits to Viewpoints photographed for Appendix K and photographic examples at four of them show that both the Appendix K existing and simulation views do not illustrate the existing views or the "expected appearance of built portions of the Project." The Applicant's use of a wide-angle focal length lens for both types of views show all objects in their images, including the simulated export facility at slightly less than half its actual size. As previously noted, the focus of all

[189] DEIS, p. 4-561.

images is oddly soft in the background of images, further reducing the visual impact of the simulated export facility.

The DEIS makes various conclusions based on a series of selected viewpoints and prominent features. We provide two plates with photographic comparisons of these visual images that show that the photographic representations of these areas and simulated viewscapes are deficient and misleading. The two view comparisons are of the tanks from the road and from the BLM boat launch as our Figs 11 and 12 shown below.

CO32-89 cont.

Fig. 11A.

Fig. 11B.

Fig. 11C.

Figure 11 A, B, C. Comparison of landscape of site photographed at Site K.1.
11A. Photo by our group of site with wide angle 24 mm lens.
11B. Photo of same site by our group with 50 mm lens.
11C. Photo of site provided by Applicant in Appendix K.

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Fig. 12A.

Fig. 12B.

Fig. 12C.

Figure 12 A, B. C. Comparison of landscape of site photographed at Site K.11.
11A. Photo by our group of site with wide angle 24 mm lens.
11B. Photo of same site by our group with 50 mm lens
11C. Photo of site provided by Applicant in Appendix K.

4.9 SOCIOECONOMICS

The DEIS acknowledges some impacts on socioeconomic resources, but in typical fashion, they are dismissed as temporary and short term, associated only with the construction phase of the project, seemingly therefore not significant. Examples are increased demand for law enforcement and fire protection, and medical services. On the other side of the scale, benefits are named, "constructing the Project would provide direct employment for local workers, support jobs and income elsewhere in the local and state economies, and generate tax revenues for local, state, and federal agencies."[190]

In a rare acknowledgment of significant adverse impact on the human environment, FERC staff points out what the project's construction phase would do to housing availability.

> . . . when the combined effects of the Jordan Cove LNG Project and Pacific Connector Pipeline Project are taken into consideration collectively, construction of the Project has the potential to cause significant affects to short-term housing in Coos County. These impacts could include potential displacement of existing and potential residents, as well as tourists and other visitors. Tourists and other visitors could also be displaced during peak construction in Douglas and Jackson counties as Project-related demand for hotel and motel rooms would likely exceed the normally available supply. With the Applicant's proposed construction and operations procedures and mitigation measures in place, construction and operation of the LNG terminal and pipeline facilities are not expected to result in significant impacts on socioeconomic resources or services, with the exception of housing availability.[191]

We agree with the conclusion. The situation has also come to the attention of the U.S. Department of the Interior such that they included this in their comment on the DEIS:

> The Department recommends additional detailed analysis relative to identified significant impacts to housing in the Coos County area. Specifically, the BLM requests that project-related temporary housing needs for both the liquefied natural gas facility and the pipeline be addressed cumulatively with other projects relative to the displacement of visitors, recreationists, and low-income residents. Additional analysis regarding rental rates and housing costs associated with the demand for temporary housing is also requested.[192]

This type of "boom and bust" project is almost irrevocably tied to a variety of housing-related problems. However, we find FERC staff understates the seriousness of this situation, especially on low-income communities. We discuss this further below under the subheading Environmental Justice. The DEIS states that the Coos Bay area would be the only area that would suffer in this way. As noted, the Department of Interior disagrees with this, as do we.

A. The DEIS does an unbalanced and therefore ineffective presentation and analysis of the economic impacts of the JCLNG Project.

CO32-90

[190] DEIS, p. 4-603.
[191] DEIS, p. 4-621.
[192] U.S. Department of the Interior to Kimberly D. Bose, Federal Energy Regulatory Commission, "COMMENTS – Jordan Cove Energy Project Draft Environmental Impact Statement, CP17-494-000 and CP17-495-000," July 3, 2019, p. 3. http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20190703-5127.

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CO32-90 ECONorthwest (2017c) estimated that 60 percent of pipeline construction jobs would be filled by Oregon workers, with about 22 percent of jobs estimated to be filled by workers normally resident within daily commuting distance of the Project. Potential impacts to other industries are addressed in sections 4.9.1.7, 4.9.1.8, 4.9.2.7, and 4.9.2.8 of the EIS. Potential impacts to public services are discussed in sections 4.9.1.6 and 4.9.2.6.

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We believe there is ample reason to find that, on balance, JCEP is likely to result in more economic detriments than benefits. The Applicant cites jobs as a benefit, and we would agree that there is a need for good jobs in our state and local communities. However, we are not confident that this project would result in employment circumstances the Applicant describes. The number of temporary jobs claimed has been elevated from 2,000 in the previous submittal to up to 8,000 in the current application. The reason for the increase is unclear, since this project lacks the jobs associated with potential of construction of the power plant sector included in the earlier version. Around 100 permanent jobs are claimed. The Applicant implies, and supporters appear to believe, that these jobs would go to local, or at least state, residents. Over the decades, communities across the nation have learned that oil and gas projects don't necessarily deliver on those promises. One of the primary reasons is that the necessary skill sets workers need for a project of this magnitude and complexity must be gained by specialized training and experience. The DEIS acknowledges this,

> Jordan Cove's estimated construction workforce would average 1,023 workers over the 53-month construction period, with projected employment expected to peak in month 30 with an estimated 1,996 workers employed on site (ECONorthwest 2017a). Construction would require workers in highly skilled crafts, such as pipefitters, ironworkers, electricians, carpenters, and management staff, including safety specialists. Jordan Cove anticipates that the workers hired will already have these skills, having gained experience in other related industries, including the oil and gas and power industries.[193]

CO32-90 cont.

Clearly, Pembina is not planning to hire and pay the costs to train thousands of Coos County residents or southern Oregonians to lay 229 miles of 36-inch pipe through extremely challenging terrain when there are thousands of experienced pipefitters, welders, etc., in North and South Dakota, Pennsylvania, eastern Colorado, Texas, and so on who are looking for work. But full discussion of the claimed job creation benefit must also include factor in jobs lost as a result of the JCEP.

In the review of economics, many existing industries have potential to be harmed, e.g., oyster and other fishing, tourism, and private timber companies. The DEIS, however, largely glosses over these impacts. In its comments on the 2015 DEIS, the Oregon Department of Agriculture pointed out that the adverse impacts on the commercial oyster industry in the Coos Bay project area had not been disclosed such that the state and the public were not adequately informed. The Department outlined operations of the two major producers and indicated how dredging and access restrictions during construction and operation would likely jeopardize this local established industry. While the current DEIS does rectify the earlier silence on the subject, we find the treatment unsatisfactory.

B. Key contributions to the local economy from commercial fishing are at risk of being lost if the project goes forward.

The Coos Bay area is an important port for commercial fishing and the third largest working waterfront on the Oregon Coast.[194] The Charleston Boat Basin, which is outside of the Coos

[193] DEIS, p. 4-588.
[194] Port of Coos Bay 2018 Annual Report: https://www.ojpcbannualreport18.com/charlestonmarina, extracted June 20, 2019. Also, Port of Coos Bay, "Year in Review: Letter from the CEO," June 30, 2019; https://www.portofcoosbay.com/news-releases/2019/1/30/year-in-review-letter-from-the-ceo.

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Bay city limits and closer to the mouth of Coos Bay, is the primary area that houses the commercial fleet, processing infrastructure, and marine-related services. A small number of commercial vessels dock in downtown Coos Bay.

Between 200 and 250 commercial fishing vessels operate out of the Charleston boat basin during the spring, summer, and fall months when major fisheries for Pacific pink shrimp (*Pandalus jordani*), Chinook salmon (*Oncorhynchus tshawytscha*), Pacific hake (whiting; *Merluccius productus*), albacore tuna (*Thunnus alalunga*), and market squid *(Doryteuthis [Loligo] opalescens*) are operating. A number of these are transient vessels that deliver product to processors or offload for shipment to other processing facilities out of the area. They also take advantage of the ice facilities and marine supply stores that operate near Charleston and in the city of Coos Bay. The boat basin is considered the home port to more than 200 commercial fishing vessels year-round that range in size from about 30 feet long (salmon trollers and small combination vessels) to almost 100 feet long (trawlers and seiners). The Port of Coos Bay facilities (ice plant, docks, moorage, etc.) can support a commercial fishing fleet of 250 vessels.[195] CO32-90 cont.

Two small fishermen's markets offer retail services on the docks, one in Charleston and one in Coos Bay. Retail seafood stores and seafood restaurants operate in Charleston, Coos Bay, and the adjacent city of North Bend.

Commercial landings are increasing in volume and value in the Charleston/Coos Bay area. In 2017, commercial harvests were seven percent of the Oregon landings by volume but accounted for 21 percent of Oregon's ex-vessel value (ex-vessel value is based on the prices paid by processors to fishermen) for all species for a total of $30.6 million. In 2018, those figures increased to 10 percent of statewide landings by volume and to 23 percent by value to $40.2 million.[196] A standard economic multiplier of 2.5 increases the commercial seafood industry's value to the local community to $76.5 million in 2017 and $100.6 million in 2018.

Pink shrimp and other shrimp species, including spot prawns, account for the highest landings volume, but Dungeness crab and related crab species account for the greatest value. In 2018, shrimp and prawn landings were 5,440.8 metric tons or 11,994,911 pounds, followed by Dungeness crab/crab species at 2,721.6 metric tons or 6,000,101 pounds. However, Dungeness crab remains the primary economic driver of commercial fisheries, with a value of $19.7 million in 2018, followed by pink shrimp at $9.3 million.[197]

Carefully managed fisheries have been recovering and adding to the economic value of the coastal economy. In 2018, West Coast trawl fishermen increased their groundfish catch by more than 14 million pounds, a 300 percent increase over what they caught in 2017.[198] Trawlers

[195] Port of Coos Bay 2018 Annual Report; https://www.oipcbannualreport18.com/charlestonmarina, extracted June 20, 2019. Also, Port of Coos Bay, "Year in Review: Letter from the CEO." June 30, 2019; https://www.portofcoosbay.com/news-releases/2019/1/30/year-in-review-letter-from-the-ceo.

[196] Pacific States Marine Fisheries Commission; Pacific Fisheries Information Network (PacFIN) APEX fish ticket reporting system for Oregon data. Report: ALL005, WOC All Species by Port Group, with filters for data by year. Extracted at 10:17 p.m. on June 13, 2019 (https://reports.psmfc.org/pacfin/f?p=501:1000:::::).

[197] Pacific States Marine Fisheries Commission; Pacific Fisheries Information Network (PacFIN) APEX fish ticket reporting system for Oregon data. Report: ALL005, WOC All Species by Port Group, with filters for data by year. Extracted at 10:17 p.m. on June 13, 2019 (https://reports.psmfc.org/pacfin/f?p=501:1000:::::).

[198] SeafoodNews.com, "West Coast Trawlers see Highest Groundfish Landings Since 2000 with Rockfish Resurgence," Feb. 12, 2019; https://www.seafoodnews.com/Story/1131867/West-Coast-Trawlers-see-Highest-

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delivering to Charleston share in some of that increase that is expected to continue to grow over time. Much of Oregon's trawl industry relied on groundfish, a federally managed group of almost 100 species of midwater and bottom-dwelling rockfish (yellowtail rockfish, widow rockfish, and others in the genus Sebastes); roundfish (such as sablefish, Pacific hake, lingcod); flatfish (such as starry flounder, soles, petrale); sharks and skates; and other species.[199]

In 2000, the West Coast groundfish fishery was declared a failure due to undetermined, but likely natural causes. Managing the fishery conservatively, in order to account for scientific and management uncertainty, contributed to reduced quotas. Factors that may have contributed to the declines include changes in ocean conditions, low productivity, and five El Nino events since 1982, according to the U.S. Department of Commerce.[200] Between 1999 and 2002, nine species of groundfish were listed as overfished, which meant draconian management measures had to be taken to rebuild the long-lived species.[201] Now, roughly 20 years later, all but two of the stocks have been rebuilt (recent stock assessments for some species show they were never overfished in the first place) and both sport and commercial fishermen are enjoying the benefits. Sport fishermen have had longer seasons and increased bag limits. Commercial fishermen have begun to reclaim markets lost almost two decades ago.[202]

CO32-90 cont.

The detailed table report below was generated using state agency fish ticket data from the PacFIN comprehensive fish ticket table. This report includes all U.S West Coast catch areas including the Puget Sound and other inland areas where marine fish are caught. (Only the portion relating to Charleston/Coos Bay and Oregon statewide landings have been included here; Canadian and Alaskan catches have been excluded).[203] Shoreside reported catches have species and area composition samples applied. Data that involve fewer than three vessels or dealers have been withheld to preserve confidentiality.

Many of Oregon's fisheries are certified as sustainable according to global Marine Stewardship Council certification standards. Oregon pink shrimp, several rockfish species, Chinook, and Dungeness crab are either certified, have been certified or are undergoing re-certification under the MSC. This certification makes these fisheries more marketable both locally and globally.

We provide this detailed information to illustrate the economic importance and future promise of the fishing sector in the Coos Bay area. As we discussed above, all of these endeavors are threatened by the proposed JCLNG facility and export activities. It should be clear, although the

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Groundfish-Landings-Since-2000-with-Rockfish-Resurgence, extracted June 30, 2019.

[199] National Marine Fisheries Service Northwest Fisheries Science Center, Fisheries Resource Analysis and Monitoring Division. "What are groundfish?"; https://www.nwfsc.noaa.gov/research/divisions/fram/economic/economic_data_groundfish.cfm, extracted June 30, 2019.

[200] U.S Department of Commerce, National Oceanic and Atmospheric Administration press release No. NOAA 00-R103, "Commerce Secretary Daley Announces West Coast Groundfish Fishery Failure," January 19, 2000; https://www.fisheries.noaa.gov/webdam/download/65032875, extracted June 30, 2019.

[201] National Marine Fisheries Service/NOAA Fisheries West Coast Region, "Rebuilding plans pay off for West Coast groundfish fishery," April 2016.

[202] National Marine Fisheries Service/NOAA Fisheries, feature story: "Rebounding Populations and New Flexibility Boos Catches by West Coast Groundfish Fleet," April 15, 2019; https://www.fisheries.noaa.gov/feature-story/rebounding-populations-and-new-flexibility-boost-catches-west-coast-groundfish-fleet.]

[203] Pacific States Marine Fisheries Commission; Pacific Fisheries Information Network (PacFIN) APEX fish ticket reporting system for Oregon data. Report: ALL005, WOC All Species by Port Group, with filters for data by year. Extracted at 10:17 p.m. on June 13, 2019 (https://reports.psmfc.org/pacfin/f?p=501:1000;::::).

DEIS does not acknowledge it, that LNG tanker activity would both take precedence over and otherwise interfere with all other boating uses. Security measures due to the potential for terrorist activity add to this conclusion. The economic cost to the communities that rely on the Coos Bay for their livelihood must be fully considered.

CO32-91

CO32-90 cont.

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CO32-91 The potential effects of LNG vessels on other boaters are assessed in several locations in the draft EIS, including sections 4.8.1.1, 4.9.1.7, 4.9.1.8, and 4.10.1.1. These assessments include the potential effects of the exclusionary Coast Guard safety and security zone that would be implemented during LNG carrier transit in the waterway to the terminal.

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CO32-90 cont.

Year	Management Group	Common Name	COOS BAY, OR AREA Round Weight (mt)	COOS BAY, OR AREA Revenue ($)	STATEWIDE TOTAL Round Weight (mt)	STATEWIDE TOTAL Revenue ($)	CB area as a percent of statewide landings and volume Round weight	CB area as a percent of statewide landings and volume Revenue
2017	CPEL SUBTOTAL	__ALL COASTAL PELAGIC	0.0	$0	473.5	$38,500	0%	0%
2017	CRAB SUBTOTAL	__ALL CRAB	2,193.8	$15,249,301	8,625.8	$58,728,089	25%	26%
2017	GRND SUBTOTAL	__ALL GROUNDFISH	1,444.8	$4,458,179	112,344.2	$51,274,338	1%	9%
2017	HMSP SUBTOTAL	__ALL HIGHLY MIGRATORY	793.2	$3,728,572	2,152.5	$10,803,127	37%	35%
2017	SAMN SUBTOTAL	__ALL SALMON	17.9	$256,568	542.8	$5,556,227	3%	5%
2017	SHLL SUBTOTAL	__ALL SHELLFISH	0.0	$0	317.4	$624,444	0%	0%
2017	SRMP SUBTOTAL	__ALL SHRIMP & PRAWNS	3,753.3	$4,760,327	10,458.5	$12,688,375	36%	38%
2017	XXXX SUBTOTAL	WITHHELD FOR CONFIDENTIALITY**	985.9	$1,485,885	1,642.9	$2,426,192	60%	61%
2017			**9,251.1**	**$30,619,374**	**137,132.6**	**$144,071,592**	**7%**	**21%**
2018	CPEL SUBTOTAL	__ALL COASTAL PELAGIC	2,171.7	$2,025,316	2,343.9	$2,028,961	93%	100%
2018	CRAB SUBTOTAL	__ALL CRAB	2,721.6	$19,728,194	10,494.6	$74,527,007	26%	26%
2018	GRND SUBTOTAL	__ALL GROUNDFISH	1,695.2	$3,683,147	107,051.1	$47,832,282	2%	8%
2018	HMSP SUBTOTAL	__ALL HIGHLY MIGRATORY	850.0	$3,071,173	2,638.7	$9,722,792	32%	32%
2018	OTHR SUBTOTAL	__OTHER SPECIES (NO M-GROUP)	43.4	$511,198	411.3	$1,660,408	11%	31%
2018	SAMN SUBTOTAL	__ALL SALMON	45.3	$712,994	444.7	$5,727,903	10%	12%
2018	SHLL SUBTOTAL	__ALL SHELLFISH	0.0	$0	308.9	$710,041	0%	0%
2018	SRMP SUBTOTAL	__ALL SHRIMP & PRAWNS	5,440.8	$9,298,541	16,271.5	$26,908,622	33%	35%

CO32-90 cont.

2018	XXXX SUBTOTAL	WITHHELD FOR CONFIDENTIALITY**	660.1	$1,197,456	2,095.4	$3,337,850	32%	36%
2018			**13,628.1**	**$40,228,019**	**142,060.1**	**$172,455,866**	**10%**	**23%**
2019	CPEL SUBTOTAL	__ALL COASTAL PELAGIC	173.1	$187,586	901.5	$1,047,350	19%	18%
2019	CRAB SUBTOTAL	__ALL CRAB	2,304.7	$18,640,937	8,375.0	$65,611,817	28%	28%
2019	GRND SUBTOTAL	__ALL GROUNDFISH	604.5	$814,637	14,787.5	$9,771,434	4%	8%
2019	HMSP SUBTOTAL	__ALL HIGHLY MIGRATORY	-	-	0.0	$0		
2019	OTHR SUBTOTAL	__OTHER SPECIES (NO M-GROUP)	0.0	$0	16.5	$40,848	0%	0%
2019	SAMN SUBTOTAL	__ALL SALMON	0.2	$4,686	15.8	$321,898	1%	1%
2019	SHLL SUBTOTAL	__ALL SHELLFISH	0.0	$0	132.9	$366,080	0%	0%
2019	SRMP SUBTOTAL	__ALL SHRIMP & PRAWNS	0.0	$0	1,616.5	$2,041,596	0%	0%
2019	XXXX SUBTOTAL	WITHHELD FOR CONFIDENTIALITY**	315.7	$467,547	787.0	$1,385,343	40%	34%
2019			**3,398.2**	**$20,115,393**	**26,632.7**	**$80,586,366**	**13%**	**25%**

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C. The unique and historical value of Oregon Coastal communities and resources would be jeopardized at significant economic and social loss by construction and operation of the proposed Project.

Although only about 225,000 of the state's nearly four million residents live in coastal counties, many Oregonians use, rely on, or benefit from the coastal region that supports almost $60 billion annual coastal and ocean economy driven by fisheries, agriculture, timber, tourism, and ocean industries. As articulated in the Oregon Sea Grant Strategic Plan 2014-2017, the state has pioneering land-use laws to conserve marine resources and ecological function for long-term benefits.[204] In addition, the Oregon Beach Bill of 1967 guarantees public access to our beaches; there is an average of two public beach-access sites per mile of coastline. Coos Bay is the largest estuary within the state, and is the location of two educational institutions, the Southwestern Oregon Community College and the University of Oregon's Institute of Marine Biology. In addition, the estuary is the site of the South Slough National Estuarine Research Reserve (SSNERR). The SSNERR agreement between Oregon and the federal government was the first estuarine sanctuary in the United States created under Section 312 of the Coastal Zone Management Act (CZMA) of 1972 (P.L. 92-583) and redesignated as the South Slough National Estuarine Research Reserve by federal law (P.L. 99-272). The management policy for the reserve is to:

- Maintain the integrity of the estuary;
- Protect the estuary from uses and activities, both within and beyond its boundaries, that may alter or affect the ecosystem and its natural dynamic processes; and
- Preserve the area for long-term scientific and educational uses.

In addition to these educational and research related assets, the area is surrounded by major parks owned and managed by the county, state, and cities.

CO32-90 cont.

This unique position provides economic benefits felt throughout the coastal regions. According to a Travel Oregon study, outdoor recreation continues to be one of the fastest-growing travel markets in the United States. On the Oregon Coast, outdoor recreation accounted for about 10 percent of all visitor spending in 2017, amounting to about $200 million. In 2017, visitors to Coos County spent more than $258.1 million on hotel stays, food & beverage, shopping, recreation, fuel, and more.[205] Even more importantly, visitor spending in Coos County supports more than 3,300 jobs, more jobs than Bay Area Hospital and the forestry/wood products industry combined.[206] Travel generates $1.5 million in local tax revenues. In comparison, direct visitor spending in the state of Oregon topped $11.8 billion in 2017, a 4.7 percent increase over 2016 spending and increased to $12.3 billion in 2018. This spending supports more than 112,000 Oregon jobs and generates $314.5 million in state tax revenues. Visitor spending in Oregon in 2017 divided by the total population of Oregon, 4,141,100 is $2,850. This number goes up exponentially when you look solely at Coos County. For every resident in Coos County, approximately 63,310, visitors to the county spent $4,076 per resident. The Cities of Coos Bay and North Bend, as well as the Coquille Indian Tribe, collect a 7 percent tax on overnight stays in

[204] Oregon Sea Grant Strategic Plan 2014-2017. Oregon Sea Grant. Oregon State University. Corvallis, OR 97333. https://seagrant.noaa.gov/Portals/1/Strategic%20Plans/OR_2014-2017plan-Final_glossy.pdf.
[205] Runyan and Associates 2019. Oregon Travel Impacts Statewide Estimates 1992 – 2018. Oregon Tourism Commission.
[206] Nicolas, A. Johnson, "Visitor spending data released by Travel Oregon," *The World*, July 16, 2018

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hotels, motels, bed & breakfast inns, RV parks and vacation rentals and a portion of this provides a portion of this tax revenue to help with marketing.[207]

The recreational fishing industry in Oregon has broadscale economic impact and is tied to trips out of regional bays. Recreational angling for finfish contributes substantially to coastal economies. Trip spending generated $66.7 million in 2013 of total personal income to coastal economies and $68.9 million in 2014. These numbers do not include shellfish harvesting trips that are more tied to the bays.[208] In addition, the commercial fisheries and working waterfronts are essential sources of jobs and economic growth, according to the Oregon Coastal Zone Management Association (OCZMA), which conducts studies of Oregon's coastal economy and provides information to an extensive network of government and other agencies, aiming to improve the region's standard of living. "Fisheries also provide part of the overall ambience folks want to experience when visiting the Oregon coast or opting to live there. They help attract artists, writers and others, including a growing number of retirees, who in turn make their own contributions to an ever-changing diverse economy and culture. Travelers spend time watching and photographing the fishing fleets, and visitors often show up at the coast seeking fresh, locally caught seafood."[209] To the extent that the JCEP would disrupt the above activities, the area would suffer losses in both jobs and tax revenues.

D. Tax revenue is cited by the Applicant as a public benefit, but we do not see appropriate discussion of cost-benefit analysis.

No doubt, additional money would help the affected counties. However, the equation is far more complicated than just dollars-in. The costs to county government directly related to JCEP activities—especially Coos County where most of the construction would occur—would be significant. These must be factored into any responsible balancing of benefits and detriments. Socioeconomic studies and law enforcement records show that boom projects of this type can lead to community disruption of many sorts that put strains on local and state government budgets and service capacity, e.g., domestic violence, drug and alcohol abuse, increased crime, and homelessness. [210]

CO32-90 cont.

Communities that host boom and bust economic events such as in Wyoming, Utah, Colorado, the Dakotas, and Louisiana, have found their economic development has down sides. During the boom phase, they struggle, often unsuccessfully, to meet adequately the shared and disparate needs of both temporary and permanent residents. When boom projects end, there are employment constrictions and other economic complications.[211] And project-wide, the expected costs can include lost forest and agricultural productivity on the pipeline route, decreased property values, increased fire danger and costs, landslide events and road repair, water resource loss and quality degradation, invasive species risks, and damage to fish and other

[207] League of Oregon Cities Transient Lodging Tax. https://pamplinmedia.com/documents/artdocs/00003561114159.pdf.
[208] *Oregon Marine Recreational Fisheries Economic Contributions in 2013 and 2014, Revision 2.2*, prepared by The Research Group, LLC for Oregon Department of Fish and Wildlife and Oregon Coastal Zone Management Association, September 2015.
[209] Terry Dillman, "Oregon Ports Stimulate Coastal, State Economy," *Fisherman's News*, May 1, 2013.
[210] Uintah Basin Homeless Coordinating Committee, "Homelessness Research Project Phase II: Community Impacts of the Oil & Gas Boom," 2007.
[211] Numerous studies support this contention, for example Bret A. Weber, Julia Geigle, and Carenlee Barkdull, "Rural North Dakota's Oil Boom and Its Impact on Social Services," *Social Work*, January 2014, pp. 62-72; Ruth Seydlitz, Shirley Laska, "Social and Economic Impacts of Petroleum 'Boom and Bust' Cycles," U.S. Department of the Interior, Minerals Management Service University Research Initiative, June 1994.

ecosystem services. There is the potential for additional costs later in the life of the project that may have to be borne by local governments, as well. One notable example is costs to eventually decommission and clean up the site. We have not seen evidence that JCEP has completed binding agreements with local governments and other government agencies to accomplish that. Those costs could exceed tax revenues and even constitute a sizable net loss to communities and taxpayers.

CO32-90 cont.

We noted above that the JCEP would provide no energy to U.S. customers; it may also raise domestic gas prices. Industrial Energy Consumers of America (IECA) has submitted detailed communications to FERC in opposition to the project, including this concern. IECA is an association of energy-intensive, trade-exposed (EITE) manufacturing companies. They stated in one filing, "EITE industries use 75 percent of the natural gas and 73 percent of electricity consumed by the manufacturing sector and would be negatively impacted if natural gas prices increase as a result of exporting LNG. EITE industries account for over 40 percent of all manufacturing jobs."[212]

E. Environmental Justice is undervalued as an issue in the DEIS.

The League of Women Voters has strong positions on the need for governmental decisions to be based on open processes that are inclusive of all people, most especially low-income and minority populations. We supported creation of the Environmental Justice Task Force (EJTF) by the 2007 Legislature (SB 420) to help protect Oregonians from disproportionate environmental impacts on affected populations. The EJTF encourages state agencies to give all people knowledge and access to decisions that affect environment and the health of all Oregonians.

CO32-92

The EJTF considered the JCEP proposal at its June 8, 2018 meeting and concluding by finding it to be not to be in Oregon's best interests.[213] Tribal leaders from four tribes testified at that meeting in Klamath Falls, voicing their concerns and opposition. The Klamath Tribes, the Yurok and the Karuk have all come out in strong opposition to the proposed project, and six Tribes have filed as intervenors in the federal regulatory process.

The League greatly appreciated the public hearing opportunities DSL Director Walker provided during January 2019 in all four counties that would be affected by the JCEP, as well as in Salem, and her insistence that the voices of Oregon's tribal communities be heard, including with regard to environmental justice concerns. From our observations, opposition to the JCEP by tribal leaders and members at those hearings was almost universal and in large part, a key consideration was the potential harm to the precious, life-giving waters of the state and all living things that rely on them. The pipeline route and LNG liquification facility and LNG shipping channel work would impact the traditional homelands and culturally significant landscapes of six federally recognized tribes. The rivers, streams, wetlands, shoreline, intertidal resources, and subtidal habitats continue to be used as locations for fishing, gathering and transportation by native American and low-income residents. Local Native American communities, in particular the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians have Tribal holdings and development plans in Empire at the Hollering Place and in Coos Head in Charleston. Traditional

[212] Paul N. Cicio, President, Energy Consumers of America to FERC (filing), June 1, 2016.
[213] Minutes from that EJTF meeting are not yet available publicly, but the decision was captured and is available on video at "Live video feed of the June 8, 2018 meeting of the Environmental Justice Task Force Meeting," Rogue Climate Facebook Page, https://www.facebook.com/rogueclimate/videos/905631742943143.

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CO32-92 Section 4.9.1.9 of the draft EIS identifies Tribal populations as a minority population with the potential to be disproportionately affected by construction and operation of the terminal as a result of their unique relationship with the surrounding environment. As noted in that section, government-to-government consultations between the FERC and Indian tribes are still ongoing and are discussed in detail in section 4.11 of this EIS.

As discussed in the draft EIS (section 4.9.2.3), increased demand from Project-related construction workers would likely reduce housing vacancy rates and place upward pressure on rental rates in Coos County, resulting in the potential displacement of other existing or potential residents seeking rental accommodation. These impacts, as noted in the Environmental Justice discussion (section 4.9.1.9), "would affect the market as a whole, but would likely be more acutely felt by low-income households who are spending a large share of their income on housing." We address this issue in the final EIS by recommending that Jordan Cove and Pacific Connector designate a Construction Housing Coordinator that addresses construction contractor housing needs and potential impacts in the four affected counties, including Coos County.

Reliability and safety concerns are addressed in section 4.13 of the EIS. We concluded that with the incorporation of the mitigation measures and oversight discussed in this section, the Jordan Cove LNG Project design would include acceptable layers of protection or safeguards that would reduce the risk of a potentially hazardous scenario from developing into an event that could impact the offsite public.

Potential housing impacts are addressed in sections 4.9.1.3 and 4.9.2.3 of the EIS. The Jordan Cove workforce housing facility is the only workforce housing development that has been proposed by Jordan Cove and Pacific Connector. Construction workers not residing at the proposed facility are expected to seek other temporary living situations as discussed in the above referenced sections. As noted above, we address potential housing-related issues in the final EIS by recommending that Jordan Cove and Pacific Connector designate a Construction Housing Coordinator to addresses construction contractor housing needs and potential impacts in the four affected counties, including Coos County.

The commenter's health and wellbeing concerns related to the Klamath Compressor Station are addressed in response to comments CO32-96 and CO32-97. The discussion of the environmental justice assessment prepared for this application has been expanded in the final EIS to more fully explain the methodology used and the findings of the analysis. The census tract (9706) where the compressor station would be located is identified as a potential minority population, with minorities accounting for 46 percent of the population compared to a statewide average of 23 percent (see section 4.9.2.9 in the final EIS). According to the latest 5-year estimates (2013 to 2017) from U.S. Census

Bureau's American Community Survey, an estimated 65 percent of the population of the nearby city of Malin was identified as Hispanic or Latino.

CO32 continued, page 91 of 118

subsistence would be affected, and the cultural resources of the Coos Indians are likely to bear significant impact.

Indeed, this project holds potential to disproportionately impact minority and low-income populations. Coos County, where the impacts of the proposed JCLNG project would be felt, has a higher than average proportion of people at or near poverty. The DEIS acknowledges this, but concludes that the impacts would be low with the exception of a brief mention of the outsized impact of the housing shortage.[214] We applaud FERC staff for recognizing that the project would put significant pressure on housing, but there is too little discussion of the meaning of that situation on local residents, especially when it is estimated to go on for at least four years. Despite the DEIS's denial (without factual basis) that the project can be characterized as creating a boom and bust phenomenon, that is precisely what would occur. Sudden booms in communities are documented to create housing shortages, domestic violence, and homelessness.

CO32-92 cont.

The many safety hazards we have pointed out in these comments would be visited on everyone in the Coos Bay vicinity. But on balance, the considerable health and safety risks associated with this project would be disproportionately borne by communities identified by the EJTP and Executive Order 12898 because of their financial vulnerability. And, the facts that low-income people in general have a lower health status than those with more financial resources and may lack access to adequate health care suggest that the DEIS inappropriately understates the issue.

Hazards of concern to environmental justice of this project include the risks of spill, explosion and fire, particularly for the areas along the pathway of dredging, filling, and ship operations when the facility is under construction and operation. The extensive habitat alterations of the project create a large carbon footprint for the facility and proposed navigation features. The public consequences of these operations would dramatically enhance Oregon's CO2 footprint and have been estimated and evaluated for other projects (Anderson and Barkdoll 2010).[215] Additional continuous releases of CO2 would occur with emissions from operation, as the facility would require a 60-megawatt chiller to cool the gas to liquid that would be running 24 hours per day.

The results of increased CO2 in the oceans ready have affected our local and regional fishermen. Fishing is often their only source of livelihood. Elevated concentrations of CO2 are promoting toxic algae growth and increasing ocean acidity.[216] Elevated ocean temperatures have reduced growth of many species and these three factors resulted in the delay in the Dungeness crab season again this past year. The review of these issues, consequences, and summary of the multi-nation coastal effort in ocean acidification and its urgency are provided in the Oregon Ocean Coordinating Council report[217]. Last year a law suit from the Pacific Coast Federation of Fisherman was filed against major oil companies.[218] The consequences of elevated CO2 on

[214] DEIS, p. 4-603.
[215] Anderson, MJ and Barkdoll, BD. 2010. Incorporation of air emissions in dredging method selection. Journal of Waterway, Port, Coastal, and Ocean Engineering. Vol. 136, 136: 191-199.
[216] Howarth, R., F. Chan, D. J. Conley, J. Garnier, S. C Doney, R. Marino,and G. Billen. 2011. Coupled biogeochemical cycles: eutrophication and hypoxia in temperate estuaries and coastal marine ecosystems. Front Ecol Environ. 9(1):18–26.
[217] Barth, J.A., C.E. Braby, F. Barcellos, K. Tarnow, A. Lanier, J. Sumich, S. Walker, F. Recht, A. Pazar, L. Xin, A. Galloway, J. Schaefer, K. Sheeran, C. M. Regula-Whitefield. 2018. The Oregon Coordinating Council on Ocean Acidification and Hypoxia. First Biennial Report. September 2018. *oregonocean.info/index.php/ocean-acidification.*
[218] Benjamin Hulac, "Fishermen Sue Oil Companies Over Rising Ocean Temperatures," *E&E News,* November 15,

crabs are shown in a recent peer reviewed study on closely related European brown crab that the growth and behavior of individuals is altered by decreased pH resulting from CO2 content of the oceans.[219]

As for the PCGP part of the project, the DEIS erroneously concludes that negative impacts on communities entitled to environmental justice consideration would be low:

> The preceding review suggests the presence of potential environmental justice or vulnerable populations in several of the census block groups that would be crossed by the Pacific Connector pipeline. Construction and operation of the pipeline are not expected to result in high and adverse human health or environmental effects on any nearby communities and the likelihood that these potential environmental justice and vulnerable populations will be disproportionately affected relative to other populations in the census tracts crossed by the pipeline is low.[220]

CO32-92 cont.

We disagree.

As noted above, the Coos Bay area and communities all along the pipeline route would face housing shortages due to the influx of outside workers and, in some cases, their families. The DEIS denies that the Applicant would establish "man camps," rather workers would stay in campgrounds. The point is to suggest thereby that higher crime rates and other forms of social disruption associated with "man camps" would not occur, but we fail to see anything in that regard but a semantic difference between company-owned congregations of outside workers and those created informally in public campgrounds. But from a housing perspective, the latter arrangement would most certainly close off camping options for low-income individuals, as well as local residents seeking recreational camping, and fire-fighters. Other housing options planned by the Applicant would also be reduced to the greatest detriment to low-income residents. Without accommodations provided by the Applicant, workers would stay in motels and rental units, guaranteeing displacement or reduction in living options for low-income populations.

We discuss below in subsection 4.12 the health and wellbeing concerns related to the compressor station to be expanded near Malin, OR. The community where a large compressor station would subject the surrounding community to unhealthy levels of noise and air pollution is over 70% Latinox, while the rest of Klamath county is only about 13% Latinox, placing a disproportionately harmful burden on people of color.

Regulatory elements of the project bear the signature characteristics that are the focus of Executive Order 12898 on Environmental Justice. The astoundingly voluminous, disjointed, and highly technical manner in which material is presented in the application severely limits review and comprehension by individuals across the spectrum of educational levels, including those with no technical expertise or with intellectual, language, or literary challenges. People with any of those challenges are almost automatically excluded from participating in the process. The insistence on using acronyms, each set specific to its own agency or field of expertise, is in conformance with the times and desire for efficiency—we all err in this regard—but it is exclusionary. The FERC applications plus subsequent filings and responses to information

CO32-93

2018. https://www.scientificamerican.com/article/fishermen-sue-oil-companies-over-rising-ocean-temperatures/

[219] Wang, Y. Wang Y, Hu M, Wu F, Storch D and Pörtner H-O (2018) Elevated pCO2 Affects feeding behavior and acute physiological response of the Brown Crab Cancer *pagurus*. Front. Physiol. 9:1164.

[220] DEIS, p. 4-617.

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CO32-93 We appreciate the concern regarding the length of the document and supporting materials. The key findings of the EIS process are, however, summarized in the six-page-long Executive Summary at the beginning of the EIS. In addition, each resource addressed in section 4, Environmental Analysis, ends with a conclusion section that summarizes the findings of the analysis for that resource. For reviewers interested in more detailed information, there are the EIS sections themselves, which are, in turn, supported by information available in appendices and elsewhere on FERC's website.

requests must number over 30,000 and the DEIS includes 5,000 pages. These volumes are beyond the ability of any audience to review, evaluate, and respond to within a 90-day period. There is no basis to claim that the process is accessible to individuals with average or below average English proficiency. It is certainly inaccessible to those groups the Legislature had in mind when it established the EJTF and committed to give them a voice in matters with an outsized impact on them.

CO32-93 cont.

4.11 CULTURAL RESOURCES

The DEIS indicates that the Applicant has not yet completed all required phases of cultural investigations and considerations, but without evidence expresses confidence that there would be no difficulties associated with finalizing MOAs and moving on. This approach ignores entirely extensive and widespread concern among Tribal communities and, for several, official opposition to the project. FERC staff states this,

> We have not yet completed the process of complying with Sections 101 and 106 of the NHPA. Additional cultural resource inventories, evaluations, and associated reports are to be completed, as are a final ethnographic study, HPMP, and UDP. Consultations with tribes, SHPO, and applicable federal land-managing agencies have also not been concluded. As such, the Project would result in an adverse effect under Section 106 of the NHPA and a significant impact under NEPA. However, should the Project be approved by the Commission, an MOA would be developed with the goal of resolving adverse effects under Section 106. It is expected that the resolution of adverse effects through an MOA and implementation of treatment plans would mitigate impacts at affected historic properties to a less-than-significant finding under NEPA."[221]

CO32-94

This assessment does not correspond to what we know of the views and concerns of affected Tribal groups. We cannot speak for them, but we find appalling the cavalier assurance in the DEIS that, when the time comes, the Applicant and the federal government will prevail.

The Karuk Tribe, Klamath Tribes, Yurok Tribe, Round Valley Tribe, and the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians (CTCLUSI) have all expressed deep concerns about cultural resources that would be endangered, destroyed, or otherwise harmed by the JCEP. They have also noted repeated failures of governmental entities and the Applicant to properly and lawfully consult them regarding the project.

CO32-95

For example, the Karuk Tribe said this to FERC in their request for formal, government-to-government consultation:

> For the Karuk Tribe, cultural resources need to be understood in the context of a living culture, of all species and not just humans within the environment, and within a defined Klamath Riverscape. The Klamath River is on course to be substantially restored by 2021 by the removal of four dams upstream. The Pacific Connector project would cross under the Klamath River in the vicinity of Klamath Falls. It threatens the integrity of Karuk cultural resources, and of the lifeways of the Karuk people, by threatening the fish on this vital salmon-rearing watershed.[222]

[221] DEIS, p. 4-655.
[222] Alex R. Watts-Tobin, Ph.D., Karuk Tribe THPO/Archaeologist to Kimberly Bose, FERC, May 3, 2018.

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CO32 continued, page 93 of 118

CO32-94 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 the we would produce an MOA, in consultation with the consulting parties, including tribes, to resolve adverse effects at affected historic properties.

CO32-95 The EIS acknowledged that some tribes (like the Klamath Tribes) have submitted letters stating opposition to the Projects. Nevertheless, we have conducted government-to-government consultations with all interested Indian tribes, as documented in section 4.11.1.2.

CO32 continued, page 94 of 118

The Klamath Tribal Council stated that,

> . . . the Klamath Tribes strongly oppose the Pipeline because a significant portion of the proposed construction would take place on lands that are within the traditional territory of the Klamath Tribes, where there are located many significant cultural resources and waters of current and historical and spiritual importance to the Tribes. The Klamath Tribes have a long-standing policy that all cultural and traditional sites are sacred, and therefore any risk of disturbance to human remains and cultural sites is unacceptable.[223]

The Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians (CTCLUSI) have stressed,

> . . . specific problems faced by the Confederated Tribes, and by our neighboring Tribes, as we have struggled to compel FERC and USACE to consult openly and willingly with our Tribes, and to compel FERC and USACE to adequately address the many concerns we have raised about the archeological resources, human burials, and sacred places that will be utterly destroyed if the Jordan Cove LNG project is approved as currently designed.[224]

CO32-95 cont.

Tribal spokespersons for the CTCLUSI, the Klamath Tribes, the Yurok Tribe, and the Cow Creek Band of Umpqua Tribe of Indians shared their concerns about the impacts of the JCEP at the June 8, 2018 meeting of the Oregon Environmental Justice Task Force in Klamath Falls. As noted above, the Task Force concluded that the project is not in the best interests of the State of Oregon and indicated that they would convey that finding to the Governor and other decision-makers.[225]

In contrast to the concerns and positions expressed by affected Tribal groups, a general description of traditional, cultural resources is included in the DEIS, but we see no weighting factor associated with the cumulative social, environmental, and economic effects. The lands of the North Spit and the Coos watershed and geographic area of Coos Bay is considered by the CTCLUSI to be a Traditional Cultural Property (TCP), "Q'alay ta Kukwis schichdii me."

The DEIS does acknowledge a number of types of evaluations that have not been done:

> Of the 125 sites on non-federal land (including one site that is on private and federal land), 26 have been evaluated as not eligible for the NRHP and require no further work. The Oregon SHPO has concurred with these recommendations and we agree (see appendix L). Seventy-nine sites are outside the APE or can be avoided. Six sites were previously recorded by other investigators and not relocated by Pacific Connector's consultants. The remaining sites are either NRHP-eligible or unevaluated. Avoidance plans can be found in the draft HPMP filed with the FERC on October 5, 2018. The HPMP is subject to revision based on ongoing consultations between Pacific Connector, tribes, SHPO, and cooperating agencies. However, not all unevaluated,

[223] Donald C. Gentry, Chairman, Klamath Tribes of Oregon to Kimberly D. Bose, FERC, May 2, 2018.
[224] Mark Ingersoll, Chairman, Confederated Tribes of Coos, Lower Umpqua, and Suislaw [sic] Indians to Larry Roberts, Assistant Secretary – Indian Affairs (Acting), U.S. Department of the Interior, November 30, 2016, pp. 3-4.
[225] Minutes from that EJTF meeting are not yet available publicly, but the decision was captured and is available on video at "Live video feed of the June 8, 2018 meeting of the Environmental Justice Task Force Meeting," Rogue Climate Facebook Page, https://www.facebook.com/rogueclimate/videos/905631742943143.

> potentially NRHP-eligible, and NRHP-listed sites that can be avoided by the Project have avoidance plans; therefore, the draft HPMP still needs further revision. Forty-three sites are unevaluated and cannot be avoided, so they need additional investigations, either survey or testing. The unevaluated sites requiring additional work are listed in in appendix L. Twenty sites, listed in appendix L, have been determined to be eligible for or listed on the NRHP and cannot be avoided. Data recovery excavations are recommended as mitigation for these sites. In most cases, the Applicants prepared treatment plans for these sites, which were reviewed and accepted by appropriate interested Indian tribes, federal land management agencies, the Oregon SHPO, and the FERC staff.[226]

CO32-95 cont.

The qualifier—"in most cases"—and the practice of simply listing what has not yet been done appears to us to be an attempt by FERC staff to minimize the degree of disagreement with JCEP plans held by key tribal nations and understate the level of opposition that exists. The Applicant appears willing to more opening misrepresent the situation, stating to investors in a May meeting, "Looking down at Oregon . . . the First Nations are by and large in favor."[227]

The planned destruction of resources and disrespect for the needs and values of these sovereign nations amount to adverse impacts that cannot be mitigated and must not be allowed.

4.12 AIR QUALITY AND NOISE

The DEIS acknowledges, but then dismisses without rationale or factual bases, negative impacts on landowners and communities of air quality and noise as follows:

> Constructing and operating the Project would result in short and long-term impacts on air quality. However, based on the implementation of the required BMPs, the Project would not significantly affect air quality.[228]
>
> Constructing and operating the Project would result in noise-related impacts. However, based on the implementation of the proposed BMPs as well as inclusion of the recommendations made in this EIS, the Project would not cause significant noise-related impacts.[229]

We disagree with these conclusions.

A. The DEIS fails to fully discuss health concerns associated with compressor station operation noise.

The DEIS reveals that the design plans of the Klamath Compressor station have not been completed so that the discussion is theoretical. Still, noise impacts during operation are dismissed as insignificant.[230]

CO32-96

First, this conclusion is not consistent with findings for compressors stations already in operation. In a recent study specifically relating to natural gas compressor stations, the author indicated,

[226] DEIS, P. 4-652-53.
[227] Mick Dilger, Pembina Investor Day – May 14, 2019 Transcript at 02:37:46.
[228] DEIS, p. 4-678.
[229] DEIS, p. 4-697.
[230] DEIS, pp. 4-693-696.

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CO32 continued, page 95 of 118

CO32-96 See response to comments IND291-1 and IND291-3 above.

"We found that five out of six homes that we monitored which were located within 750 meters of a compressor station had combined outdoor average sound levels greater than 55 decibels over a 24 hour period."[231] Various other studies have shown that long-term exposure to noise levels associated with compressor station operations have been associated with "sleep disruption, poor academic performance, and hypertension." Also, "Noise-induced hearing loss, oxidative stress, increased cardiovascular effects, endocrine disruption, and an increased risk of developing diabetes" have been implicated.[232] Adverse effects on individuals may vary by age or health status—children, elderly, people with hearing impairments, those who take certain drugs, and others may be more heavily affected.[233]

CO32-96 cont.

Second, we find it disturbing that, although the DEIS spends considerable time discussing regulatory limits on noise levels and for each, indicates that the Applicant intends on ensuring those levels are not exceeded, we could find no discussion of the impacts on humans, a central point of NEPA requirements for an EIS. The research on this topic is readily available, therefore we must conclude that FERC staff simply accepted the Applicant's choice to protest significant impact, rather than attempting to truly assess what that impact could be on nearby residents. This is unacceptable.

B. The DEIS ignores the well-documented adverse health impacts on people living near pipelines and compressor stations due to emissions.

Pipelines and compressors stations leak. Emissions (volatile organic compounds or VOCs) can be particularly strong in the vicinity of compressor stations. Type of emissions can vary, but for example, in Dish, TX, ". . . some chemicals identified as exceeding Texas's ambient air standards, measured at a variety of locations near and on residential properties 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.[234]

CO32-97

Health issues range widely from annoyance and discomfort to debilitating and life-threatening. There is evidence that the distance of homes from compressor stations is one determining factor about the seriousness of impacts. For example, a much higher percentage of people living 500 feet away from the facility suffered from sinus problems, burning eyes, headaches, rashes, and throat irritation than those living 1,500 feet away.[235] The cumulative effect of long-term exposure to emissions, most severe during periodic blowdowns, can bring more serious health impacts, including cancers, respiratory and cardiovascular illness, and birth defects.

[231] Meleah D. Boyle et. al., "A pilot study to assess residential noise exposure hear natural gas compressor stations," *Plos*, April 3, 2017, https://doi.org/10.1371/journal.pone.0174310.
[232] W. Passchier-Vermeer, W.F. Passchier, "Noise exposure and public health," *Environmental Health Perspectives*, March 2000, http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1637786&tool=pmcentrez&rendertype=abstract.
[233] I van Kamp, H. Davies, "Noise and health in vulnerable groups: a review," *Noise Health*, January 21, 2013, https://www.ncbi.nlm.nih.gov/pubmed/23689296.
[234] Clean Water for North Carolina, "Dangerous Neighbors: Pipelines, Compressor Stations, and Environmental Injustice," 2016, https://cwfnc.org/documents/Dangerous-Neighbors-Final-6-8-2016.pdf.
[235] Clean Water for North Carolina, "Dangerous Neighbors: Pipelines, Compressor Stations, and Environmental Injustice," 2016, https://cwfnc.org/documents/Dangerous-Neighbors-Final-6-8-2016.pdf.

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CO32-97 Estimated potential emissions of volatile organic compounds (VOCs) and hazardous air pollutants (HAPs) from operation of the Klamath Compressor Station and Pacific Connector Pipeline are presented in table 4.12.1.4-2 of the EIS. Potential emissions for these categories of pollutants are below the major source thresholds that would require more detailed analysis of the impacts on nearby ambient air quality. Potential emissions are expected to remain below these major source thresholds even with the added potential emissions from a condensate storage tank. A detailed description of the potential symptoms that may be caused by exposure to certain compounds is beyond the scope of this EIS, which is limited to evaluating whether the present proposed action is likely to cause ambient conditions that contribute to adverse health impacts. Based on the potential emissions presented table 4.12.1.4-2, we conclude that potential emissions of VOCs and HAPs from the proposed action are unlikely to cause or contribute to any adverse health impacts.

As with noise impacts on residents forced to live near compressors stations, the DEIS repeats the Applicant's claims that allowable regulatory levels would not be exceeded. We question how well such measures are adequate to protect nearby residents, but the DEIS is entirely deficient by omitting critical information about associated health impacts. And as with the air quality discussion, facility design has not been finalized so as to allow regulatory measures to even be considered. For example,

> New large storage tanks containing liquids that can emit significant amounts of VOCs—i.e., where the equilibrium partial pressure exerted by the VOC exceeds 3.5 kPa—are subject to NSPS Subpart Kb. While the design of the Klamath Compressor Station has not been finalized, a condensate storage tank is likely to be installed. The potential applicability of NSPS Subpart Kb will be determined once the final storage tank specifications are known.[236]

CO32-97 cont.

It is entirely unclear why an effective project design cannot be available for scrutiny after over a decade of being on the drawing board, but a DEIS is premature when this and so many other matters have not been completed.

C. Landowners and communities, as well as workers, would suffer residual adverse effects due to emissions from equipment and fugitive dust.

The DEIS admits that these,

> . . . will result from earthmoving (dust generation) and heavy equipment use, which is typically diesel fueled. These emissions would be generated from timber clearing, grading activities associated with right-of-way construction, trenching activities, and laying the pipeline (stringing, welding, laying, backfilling) as well as restoration activities.

However, the matter is dismissed as follows:

CO32-98

> Timber removal and pipeline construction equipment will typically include yarders, loaders, skidders, feller-bunchers, bulldozers, graders, backhoes, front-end loaders, welding machines, trucks, pickups, and other miscellaneous equipment, each of which will have normal types of silencers and emissions control equipment (catalytic converters) commonly used for these types of equipment.[237]

Again, the health impacts are avoided.

D. The DEIS admits the potential health risks posed by construction activities that act on serpentinite rocks and soils that would be disturbed by the Pipeline, but it is unclear that construction activities in areas where it is found would be done in a manner that is safe for workers and nearby communities.

The DEIS acknowledges that there are areas where pipeline construction would encounter a type of soils and rocks that, if disturbed, would present serious health problems associated with naturally occurring asbestos (NOA). The Occupational Safety and Health Administration (OSHA) has included this phenomenon in its Final Rule Making on asbestos (OSHA 2009b),

CO32-99

[236] DEIS, p. 4-660.
[237] DEIS, Appendix F.10 PCGP POD-Part 1-20.PDF, Appendix B, "Air, Noise and Fugitive Dust Control Plan," p. 2.

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CO32-98 Pacific Connector would employ the mitigation measures identified in its Fugitive Dust Control Plan, and summarized in section 4.12.1.4 of the EIS, to minimize local air quality impacts during construction. As noted in that section, we conclude that construction would have temporary local impacts on air quality in areas adjacent to the construction corridor, but that construction would not cause any long-term, permanent impacts on local air quality.

CO32-99 Wetting of exposed soils and roadways is an effective method for suppressing the creation of airborne fugitive dust. In areas where naturally occurring asbestos may be present, Pacific Connector would also employ other specific mitigation measures identified in its Fugitive Dust Control Plan for the protection of workers and nearby communities. A summary of these specific measures has been added to section 4.12.1.4 of the EIS.

acknowledging that, ". . . airborne asbestos during earthmoving activities may result in significant exposures." However, we are shocked to see that OSHA regulations are so lax as to go on to state that,

> In such cases, wetting of the excavation site, often required by local authorities, should be sufficient to suppress measurable airborne asbestos concentrations. In the absence of information which is readily available showing asbestos contamination of soil in the immediate vicinity of a construction site, the employer is not required to take any action under this standard. [238]

CO32-99 cont.

To PCGP's credit, the DEIS reports that the Applicant has put some effort into seeking information. It states that GeoEngineers reviewed existing maps and a Table 1 provides milepost ranges where Ultramafic rocks and serpentine soils have been reported to exist. However, given the serious potential health consequences of exposure by workers and nearby communities, we have three concerns with the apparent comfort level in the DEIS with the Applicants planned response.

1. The DEIS indicates that the Applicant found "existing geologic mapping" across the entire 229-mile pipeline alignment, including in the many remote areas to be crossed, does not reflect all deposits where these conditions exist. [239]

2. Regardless of what OSHA regulations allow, "wetting of the excavation site" does not appear to be adequate, or even a possible, under the circumstances of pipeline construction. Materials exposed and roiled by excavation required to bury the pipeline cannot reasonably be "wetted" sufficiently to hold down asbestos, but the Applicant is clear that a significant amount of blasting would be required. The regulation is clearly not applicable if worker and community safety is to be considered at all.

3. The plan to "prior to construction" does not satisfy our concerns and we don't believe the DEIS should sign off on this plan either.

E. Noise from equipment, blasting, etc., during construction constitute adverse impacts on communities along the pipeline route.

The DEIS indicates that blasting is highly likely to be used to excavate pipeline trenches along almost half of the route although FERC staff have concluded that adverse impacts would not be significant due to the Applicants use of mitigation and best management practices.[240] We stated our concerns with blasting in areas with NOA formations just above.

CO32-100

Nonetheless, blasting would have adverse consequences for communities in terms of noise and transportation delays, as well as other inconveniences related to public safety. Additionally, blasting has the potential to disrupt groundwater, including permanently; kill fish; harm aquatic life cycles by creating turbidity; cause injury; frighten and stampede livestock; trigger landslides that would pollute surface water and could destroy property and disrupt transportation; and discourage travel and tourism.

[238] DEIS, Appendix F.10 PCGP POD-Part 1-20.PDF, Appendix B "Air, Noise and Fugitive Dust Control, pp. 7.
[239] DEIS, Appendix F.10 PCGP POD-Part 1-20.PDF, Appendix B "Air, Noise and Fugitive Dust Control, pp. 3-6.
[240] DEIS, p. 4-27.

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CO32-100 Blasting would only occur in areas where bedrock is found within the pipeline trench depth and where other methods such as rock saws, ripping, and/or hydraulic hammers were found to be ineffective. A blasting plan has been prepared (see appendix F.10 of this final EIS) that details mitigation measures for blasting activities. Blasting is a short duration event as compared to rock removal methods, such as using track rig drills, rock breakers, jack hammers, rotary percussion drills, core barrels, and/or rotary rock drills. Blasting techniques include the electronically controlled ignition of multiple small-explosive charges in an area of rock 8/1,000th of a second apart, resulting in a total event duration of approximately 3/10th of a second. The detonations are timed so the energy from individual detonations destructively interferes with each other, referred to as wave canceling. As a result, very little of the kinetic energy generated during the detonations is wasted as audible noise. For this phase, sound levels at 50 feet are predicted to be 95 dBA L_{eq} and would attenuate to 87 dBA L_{eq} and 74 dBA L_{eq} at 100 feet and 300 feet, respectively. Noise would diminish rapidly as the distance from the noise source increases. Based on the short duration of blasting activities, we do not believe that rock blasting would represent a significant noise impact.

4.13 RELIABILITY AND SAFETY

4.13.1 Jordan Cove LNG Project

Before discussing our many individual concerns, it is our view that the JCEP as a whole poses an unacceptably high risk public safety hazard and should be denied due to the countless residual adverse effects on landowners; the communities of Coos Bay, North Bend, Empire, Charleston, and Malin; communities along the pipeline route; and at least in terms of the high risk of wildfire, the entire southern Oregon region.

For one instance, we made the point in Chapter 2. Alternatives Analysis that safety should be a paramount concern in any analysis of the human environment. Any comparison between a potential alternative location for the LNG terminal and the proposed location on the bay side of the North Spit of Coos Bay in such close proximity to population centers would need to take into account the numerous and egregious risks to human safety and therefore should find the alternative of significantly lesser negative environmental impact than the proposed project. These hazards are natural and beyond avoidance or mitigation. They are hazardous as a direct result of the fact that the location is excessively proximate to a significant population center with attendant vulnerabilities due to, for example, an airport, as well as schools, hospitals, and so on. CO32-101

In this context, the DEIS has been issued without resolution of innumerable identified safety issues. It notes countless instances of required design and technical plans that are incomplete or have not yet been submitted. With regard to the Jordan Cove LNG facility, it acknowledges and discusses the various issues, but then dismisses all impacts as insignificant and pronounces the project safe and reliable, *providing that 14 pages of FERC staff's own recommendations have been implemented*. The DEIS thereby denies the public and other agencies the ability to assess, evaluate, and comment on this most essential element of the human and natural environmental impacts of the project, leaving us with this referencing the LNG terminal: CO32-102

> Based on our preliminary engineering and technical review of the reliability and safety of the Jordan Cove LNG Project, we recommend the following [98] mitigation measures as conditions to any order authorizing the Project. These recommendations would be implemented prior to the end of the DEIS comment period, prior to initial site preparation, prior to construction of final design, prior to commissioning, prior to introduction of hazardous fluids, prior to commencement of service, and throughout the life of the facility to enhance the reliability and safety of the facility and to mitigate the risk of impact on the public.[241]

We find it instructive to quote extensively from the DEIS description of how the process by which FERC authorizes the siting and construction of LNG terminals in compliance with USDOT safety requirements.

> The FERC authorizes the siting and construction of LNG terminals under the NGA and delegated authority from the DOE. The FERC requires standard information to be submitted to perform safety and reliability engineering reviews. FERC's filing regulations are codified in 18 CFR 380.12 (m) and (o), and requires each Applicant to identify how its proposed design would comply with the USDOT's siting requirements of 49 CFR 193 Subpart B. The level of detail necessary for this submittal requires the Applicant to

[241] DEIS, pp. 4-755-68.

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CO32-101 See response to similar comments from the League of Women Voters

CO32-102 See response to comment CO28-85.

perform substantial front-end engineering of the complete project. The design information is required to be site-specific and developed to the extent that further detailed design would not result in significant changes to the siting considerations, basis of design, operating conditions, major equipment selections, equipment design conditions, or safety system designs. As part of the review required for a FERC order, we use this information from the Applicant to assess whether the proposed facilities would have a public safety impact and to suggest additional mitigation measures for the Commission to consider for incorporation as conditions in the order. If the facilities are approved and the suggested mitigation measures are incorporated into the order as conditions, FERC staff would review material filed to satisfy the conditions of the order and conduct periodic inspections throughout construction and operation.[242]

CO32-102 cont.

A project proposal that is so unsatisfactory that it requires 98 recommended additions or modifications must be adjudged as, at least, vastly incomplete as provided and doesn't appear to meet the minimum requirements of the above process. The public's right to comment is so vastly diminished by this construct as to be meaningless. FERC staff's recommendations may or may not be made conditions of the Commission's Order. Or perhaps only a percentage of them would be adopted—80 percent? 50 percent? 5 percent? And of those, which ones? We see nothing that in any way binds the Commission to ensure conditions are implemented.

Moreover, although some of the recommendations pertain to requirements known to, but not yet carried out by, the Applicant. Others, though, call for other actions to be taken. The additional cost to the Applicant of a percentage of 98 changes or additions to their plans has not been revealed, but it most certainly would be substantial. As noted elsewhere in this comment, Pembina has already acknowledged insufficient financial resources to carry out this project. This mechanism opens the door to the Applicant to attempt to negotiate away especially some of the more expensive requirements. Even if all recommended conditions were to be included in a Record of Decision by the Commission, are we not asking, through such a process, for the Applicant to be unmotivated to comply, cut corners, or short-change other costly elements of the proposed project to make up for additional costs?

Additionally, we identify and comment on the following safety hazards that we believe stretch the bounds of reasonableness in terms of putting the public at risk via a facility of this type, noting that this is not an exhaustive list.

A. Flight hazards from LNG storage tanks identified by the FAA conflict with the public interest.

The FAA determined that both LNG storage tanks constitute a "Determined Hazard to Air Navigation" unless they are reduced in height to below 204' Above Mean Sea Level (AMSL). The DEIS concludes that "FERC needs to identify the "Determined Hazard to Air Navigation" and demand that the LNG Storage Tanks be reduced in height to 204' AMSL. On 7 May 2018, the FAA issued thirteen "Notices of Presumed Hazards" pertaining to JCEP structures violating obstruction standards for the nearby Southwest Oregon Regional Airport (SORA). Two of these notices discussed the proposed LNG Storage Tanks. [243]

CO32-103

[242] DEIS, p. 4-699.
[243] DEIS, p. 4-750. Copies of these notices are included in the docket at Accession No. 20180510-5165, Part 8.

100

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CO32-103 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.

In the DEIS, FERC staff deals unacceptably with the FAA's Determined Hazard to Air Navigation and subsequent requirement for the Applicant to lower the stack height.[244] Instead, FERC describes the LNG Tanks heights as "presumed" rather than "determined," and recommends that the Applicant resolve the issue with the FAA, even though the FAA explicitly states that leaving the tank heights taller than 204' AMSL is unacceptable. . We are alarmed that this matter is being pushed into the future beyond the ability of the public and other entities to ensure that it is resolved appropriately. The FAA must not be influenced or pressured to sign off on the project since it does not appear that a solution can be found.

CO32-103 cont.

B. Flight hazards from carrier vessel stack heights identified by the FAA conflict with the public interest.

The FAA requires the Applicant to lower the LNG Carrier Vessel (aka Tanker) Stack Height to 136' AMSL. Nine of the FAA's "Notices of Presumed Hazards" addressed the LNG Carrier Vessel Stack Heights at various transit points. FERC failed to discuss the identified hazard that the LNG Tankers constitute at their current proposed size.[245] The public and other agencies need to know the dimensions for the largest LNG tanker anticipated to call on the Port, including total stack height, beam, length, and draught. The total stack height must not exceed the maximum 136' AMSL limit identified by the FAA. The FAA must not be pressured or influenced to sign off on the project since it does not appear that a solution can be found.

C. Thermal plume hazards identified by the FAA conflict with the public interest.

FERC ignores the thermal plume hazard created by the gas combustion turbines used in the liquefaction process. According to a study by the National Academy of Sciences, "Exhaust plumes from (power plant) cooling systems have the potential to create in-flight hazards that affect the control and maneuver-ability of aircraft. Under certain conditions, the plumes generated by the facilities can create turbulent conditions for aircraft that fly over or through the plumes."[246] FERC addressed this concern by stating, "Jordan Cove commissioned a thermal plume study for the previously proposed LNG terminal in 2013 . . . which showed that the combustion turbines that were part of the previously proposed South Dunes Power Plant were identified as the main potential source of thermal plumes from the terminal. The South Dunes Power Plant is not part of the current proposal and therefore the LNG terminal would not general [sic] thermal plumes."[247] This statement is incorrect. First, the referenced study did not assign 100 percent of the potential thermal plumes to the South Dunes Power Plant. But more importantly, in lieu of building the South Dunes Power Plant to power the liquefaction train, the current proposed JCEP terminal would be equipped with five direct-drive combined-cycle combustion turbines to power refrigerator compressors, each rated at 524.1 MMBTU/hour. These turbines—which are proposed to be located closer to SORA than the South Dunes Power Plant—would, in fact, generate thermal plumes, and thus the risk to airport operations for the new design needs to be studied, not dismissed as the DEIS does.[248]

CO32-104

D. Heavy hydrocarbon vapor cloud explosion hazards conflict with the public interest.

[244] DEIS, p. 4-750.
[245] DEIS, p. 4-750.
[246] Patricia T. Weber, P.E., "Jordan Cove Export Project—FERC Recommendations Place Oregonians at Risk."
[247] DEIS, 4-625-26.
[248] Patricia T. Weber, P.E., "Jordan Cove Export Project—FERC Recommendations Place Oregonians at Risk."

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CO32-104 See comment responses CO28-62 and CO32-103.

LNG Export Terminals that handle and store large quantities of heavier-than-methane hydrocarbons are attended by hazards of Unconfined Vapor Cloud Explosion (UVCE). FERC underestimates the risk of UCVEs by an order of magnitude. According to Jerry Havens, (Distinguished Professor Emeritus Department of Chemical Engineering, University of Arkansas),

> The new Draft Environmental Impact Statement (DEIS) for the Jordan Cove Export Terminal, just issued, continues to seriously underestimate vapor cloud explosion overpressures (damage) that could occur following credible releases of heavy hydrocarbons at the JCET site. The latest predictions that I am aware of appear to be an order of magnitude lower than are indicated by physical evidence of numerous documented UVCEs that have occurred worldwide with the potential to cause injuries and deaths to persons and result in destruction of the facility.[249]

CO32-105

FERC needs to evaluate the potential for unconfined vapor cloud explosions (UVCEs) using the best available research from the scientific community.

E. Several hazardous siting and design factors are contrary to SIGTTO Recommendations specifically designed to protect public safety; these conflict with the public interest.

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. Additionally, SIGTTO recommends against siting on a bend, where vessels with be berthed adjacent to each other, near other docking facilities, in a channel that is less than five times the minimum width of tankers, or where tankers would not have ready escape to the open seas at all times.

CO32-106

F. Numerous factors make this siting for the LNG terminal accident-prone and therefore contrary to the public interest.

Additional constraints regarding access of the proposed facility are of concern. The entrance to the bay and navigation channel from open waters has a history of problems since the time of early navigation into the bay due to the nature of shore winds, and sea conditions. These problems continue to the present. There is a 90-degree turn from the entrance into the bay, and then another bend near the proposed site that other ship traffic, including commercial and recreational uses, must navigate past to enter the Coos Bay, North Bend harbor. The DEIS fails to consider these factors or the fact that the Applicant has not addressed how such an eventuality as an LNG running aground would be handled.

CO32-107

G. LNG leak, spill, and explosion hazards conflict with the public interest.

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. We have searched both the JCEP application and the current

CO32-108

[249] Jerry Havens, "Comment by Jerry Havens, Distinguished Professor Emeritus, University of Arkansas," submitted to U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, September 22, 2018.

CO32 continued, page 102 of 118

CO32-105 USDOT's Letter of Determination on the LNG siting requirements under 49 CFR 193 Subpart B considered overpressures from vapor cloud explosions. Also see response to comment CO32-17.

CO32-106 See response to comment IND556-20.

CO32-107 The proposed LNG marine vessel route is described in section 4.13.1.3 of the final EIS. Specifically, LNG Marine Vessel navigation through Coos Bay would be under the direction of a local pilot. In addition, the pilot boat (i.e., tug boat) as well as Coast Guard recommended tug boats would move along with each LNG marine vessel and the tug boats would be able to influence vessel movements depending on the orders from the pilot. For the LNG marine vessel to run aground, the vessel would somehow need to go off course while transiting under pilot and tug boat direction through the approximately 300 feet wide shipping channel and reach an area of insufficient depth of water. In addition, in the rare circumstance that a LNG marine vessel has run aground, such as the incidents described in the Reliability and Safety section of the final EIS, the consequences have been minimal in part because of the safeguards in place, including a double hull that better protects LNG marine vessels compared to other marine vessels carrying hazardous cargos.

CO32-108 Section 4.13.1.3 of the final EIS describes the impacts within each Zone of Concern and provides figures 4.13-1 and 4.13-2 depicting the areas these zones would encompass. In the event of a large release of LNG that ignited, the extent of impacts to public would depend on the location of the release and subsequent fire.

DEIS and found no mention of this threat to public safety and life. This omission is unacceptable. *An unacknowledged hazard must be defined as a residual adverse effect.*

CO32-108 cont.

> In accordance with the August 31, 2018 MOU, USDOT will issue a LOD to the Commission after USDOT completes its analysis of whether the proposed facilities would meet the USDOT siting standards. The LOD will evaluate the hazard modeling results and endpoints used to establish exclusion zones, as well as Jordan Cove's evaluation on potential incidents and safety measures incorporated in the design or operation of the facility specific to the site that have a bearing on the safety of plant personnel and surrounding public. The LOD will serve as one of the considerations for the Commission to deliberate in its decision to authorize or deny an application.[250]

What is the timing for USDOT analysis and issuance of the LOD? Certainly, it cannot occur before all of the required but still missing information from the Applicant is available. Would the Commission delay their ROD if the Applicants' tardiness in providing information to USDOT delays issuance of the LOD? It would seem that they should. Would USDOT issue the LOD without having full access to, and performing a thorough investigation of, all pertinent information? That would be unconscionable given the potential consequences.

CO32-109

H. Derelict infrastructure and potential for partial completion of projects is not addressed and is contrary to the public interest.

There is concern of the potential environmental and human risk of partially completed projects, if there were construction, and unforeseen events that caused for abandonment of the facility or any of the infrastructure to and from the terminal including the pipelines. What would result if any stage of the project were abandoned, and who would assume the risk and responsibility of containment or removal?

CO32-110

I. Building the massive proposed LNG liquefaction, storage, and export terminal in the Cascadia Subduction and tsunami zones defies reason, given the horrific and unimaginable ways it would exacerbate the already overwhelming human cost.

4.13.2 Pacific Connector Pipeline LNG Project

The DEIS begins this section by acknowledging hazards,

> The transportation of natural gas by pipeline involves some incremental risk to the public due to the potential for accidental release of natural gas. The greatest hazard is a fire or explosion following a major pipeline rupture. Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic, but is classified as a simple asphyxiant, possessing a slight inhalation hazard. If breathed in high concentration, oxygen deficiency can result in serious injury or death. Methane has an autoignition temperature of 1,000°F and is flammable at concentrations between 5.0 percent and 15.0 percent in air. An unconfined mixture of methane and air is not explosive; however, it may ignite and burn if there is an ignition source."[251]

CO32-111

The DEIS concludes, however,

[250] DEIS, p. 4-702.
[251] DEIS, 4-768-69.

CO32 continued, page 103 of 118

CO32-109 The USDOT PHMSA submitted the LOD to the FERC on September 11, 2019, which found that the proposed siting of the Project complies with the Federal Pipeline Safety Standards set forth in 49 CFR 193.

CO32-110 Comment noted.

CO32-111 Pipeline safety is addressed in section 4.13. As shown in the EIS, the risk of a FERC licensed pipeline failing is very low.

CO32 continued, page 104 of 118

> The pipeline would be constructed in compliance with the USDOT pipeline standards (as published in 49 CFR Parts 190-199; Part 192 of 49 CFR). Based on the implementation of the required BMPs and adherence to USDOT standards, the Project would not significantly affect public safety.[252]

We disagree.

The proposed Jordan Cove LNG Export Project would rely on a 229-mile, highly pressurized 36-inch natural gas pipeline to bring gas from Malin, OR in Klamath County to the liquefaction facility and export terminal in Coos Bay, OR. Pembina has been in the oil industry since 1954. This would be the first natural gas project Pembina has constructed and the first LNG facility it has operated.[253]

The pipeline would be buried at an average depth of 10 feet and cross 485 waterbodies and wetlands. Work would be done assembly-line style across each of at least five "spreads" of 37-59 miles. The Applicant plans for pipeline construction to begin in January 2021 and be completed in December 2022, with peak work during the summer of 2021. They anticipate a total of 1,500 workers across the five crews.[254] Due to the largely rural nature of the route, the majority of the pipeline would be of Class 1 construction, employing the thinnest pipe gauge and lowest quality welds allowed by the Pipeline and Hazardous Materials Safety Administration (PHMSA).

We have a number of concerns about the pipeline, especially regarding the difficulty of the terrain it would cross and the potential for rupture, explosion, and fire, but upon reviewing the DEIS discussion about these and other possible risks, we found few answers and little actual information about how PCGP plans to proceed with the project in terms. The multi-page discussion of pipeline reliability and safety provides almost no project-specific information, rather most topical subsections begin with reference to USDOT standards that PCGP must meet and then proceeds to describe the pertinent standard. DEIS Table 4.13.2.1-1 informs the reader that all but five percent of the pipeline would be constructed to Class 1 standards—the lowest legally allowable—because of the single factor of population.[255] There is note that commenters have expressed concerns about that fact, but the response is that "FERC does not have the jurisdiction to require safety standards beyond those outlined by Part 192 of 49 CFR (which are required and enforced by the USDOT).

CO32-111 cont.

It appears that the public and the governmental entities that are bound to protect us and our property from wildfire are caught in a regulatory vacuum while the Applicant protects their bottom line by keeping their construction materials costs as low as possible.

A. Pipeline Accidents cannot be fully mitigated and therefore must be considered to be residual adverse impacts on landowners and communities.

It is a well-documented fact that pipelines leak and accidents occur. An estimated $1.1 billion worth of natural gas (17.55 billion cubic feet) leaked from pipelines in the U.S. between 2010 and 2017. During that same period, pipeline incidents resulted in almost 100 deaths, injured 500, and

[252] DEIS, p. 4-781.
[253] http://www.pembina.com/about-us/history.
[254] PCGP FERC Application, Resource Report 1, General Project Description, "Construction Procedures," p. 10.
[255] DEIS, p. 4-770.

104

forced the evacuation of thousands of people.[256] Pipeline accidents may be triggered by rupture caused, for example, by pipe damage during installation; third-party, post-construction activity; seismic activity; soil liquefaction or lateral spreading; and landslides. An ignition source in the presence of released gas can result in explosion and gas fire. 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 risks of leaks, explosions, and gas fires which may also spread to structures and/or 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.[257]

The PHMSA letter stated that,

> Hazardous liquid pipeline operators reported 5,094 accidents from 1991 to 2009 and 2,653 exceeded PHMSA's significant incident threshold. The PHMSA determined that 13 accidents from this time period occurred at inland water crossings. All 13 failures exceeded PHMSA's significant incident threshold. . . . A depletion of cover, sometimes in the waterway and other times in new channels cut by flood waters, has been a factor in all 13 of these failures. [258]

CO32-111 cont.

The Applicant's project anticipates almost 500 stream crossings. The PHMSA Report goes on to identify that one incident occurred in a buried pipeline water crossing that had a defective weld. Two incidents resulted from internal corrosion, one was caused by scouring during flooding, and two were caused by failures at the girth weld as a result of external loading caused by exposure to flood conditions.[259] The 36-inch pipeline proposed by Applicant would have thousands of such welds, almost all of which would be installed at the lowest allowable standards, making each weld more susceptible to failure.

B. Various factors pose increased risk of wildfire during construction and would constitute residual adverse impacts.

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. PCGP plans to construct 229 miles of pipeline simultaneously in five spreads. For various reasons, the Applicant indicates that pipeline construction would take place during the "dry season," apart from some areas of Klamath County where the Applicant has agreed to construction during the winter months to avoid disrupting irrigation practices. In an average year in southern Oregon, that would put the construction phase for the bulk of the pipeline from mid-May or early June through October. However, the Applicant has committed to

CO32-112

[256] Jonathan Thompson, "A map of $1.1 billion in natural gas pipeline leaks," *High Country News*, November 29, 2017, https://www.hcn.org/issues/49.22/infographic-a-map-of-leaking-natural-gas-pipelines-across-the-nation. We note that DEIS-provided statistics are not for comparable years, but still appear to conflict (are significantly lower) than our source. The DEIS provides no source for verification purposes (p. 4-779).
[257] U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration to U.S. Congress, August 27, 2013.
[258] U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration to U.S. Congress, August 27, 2013, p. 7.
[259] U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration to U.S. Congress, August 27, 2013, p. 8.

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CO32-112 The risks of wildfires (both the effects of the project on the likelihood of wildfires occurring as well as the effects of fires on the project) are addressed in sections 4.4 and 4.13. Landslides and earthquakes are addressed in section 4.1 and 4.13. Pipeline safety is addressed in section 4.13; as shown in the EIS, the risk of a FERC licensed pipeline failing is very low.

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avoid construction activities in certain areas along the pipeline route during critical bird nesting and other wildlife protection periods. That would push the construction period further into the summer in applicable areas.

The proponent would need to obtain permits or authorizations to operate heavy equipment from landowners, including the Oregon Department of Forestry (ODF), the U.S. Forest Service, and the Bureau of Land Management. For example, ODF requires a Permit to Operate Power Driven Machinery (PDM). Authorizations require the Applicant to agree to comply with prescribed practices to minimize the risk of a fire being ignited and be prepared to respond in the event of fire.[260] ODF evaluates requests for waivers of restrictions on the basis of conditions at the time and place of work and the willingness of the operator to agree to take precautions to make the operation fire safe.[261] PCGP can be expected to commit to comply with necessary procedures, but fire officials can expect public apprehension about all summertime pipeline construction, let alone waivers allowing work during Industrial Fire Prevention Level IV periods when work stoppage is generally enforced.

The last step of the pipeline construction process is reclamation. Among other activities, an average of 1 ton per acre of slash left by the original clearcutting would be spread over the right-of-way, adding to already existing fuel loads. This amount exceeds the Federal Energy Regulatory Commission's (FERC) "Upland Plan;" the Applicant has indicated that they would seek a waiver.[262]

In recent years, due at least to climate change caused increased temperatures and drier conditions, the risk and incidence of accidental, human-caused fires getting out of hand is increasing. More fires are becoming conflagrations. Circumstances in the wake of the two most recent destructive and deadly fires in California may suggest liability issues could be raised.

CO32-112 cont.

C. Increased risk of wildfire and consequences due to landslide, seismic activity, or other natural phenomenon during operation constitutes a residual adverse impact on landowners and communities.

The DEIS indicates that PCGP's practices would reduce the risk of fire to insignificant levels and points to Appendix K—"Fire Prevention and Suppression Plan." Review of the plan's brief discussion of procedures once the pipeline is operational reveals its inadequacy with this description of the minimal circumstances under which fire would occur:

> During pipeline operation, the risk of fire danger is minimal. The primary causes of fire on the right-of-way result from unauthorized entry by individuals utilizing the right-of-way for recreational purposes and from fires started outside of the right-of-way. In the latter case, the right-of-way can be used by authorities as a potential fire break provided that the grade is not altered above the pipeline. During maintenance operations, PCGP will equip personnel with fire-fighting equipment including fire extinguishers and shovels. Maintenance crews will also carry fire suppression contacts as listed in Table 4-1.[263]

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[260] Oregon Department of Forestry, "Industrial Fire Precaution Levels (IFPLs) for Oregon Department of Forestry Protection west of the Cascades." https://www.oregon.gov/ODF/Fire/Documents/2017%20IFPL%20for%20Web.pdf
[261] Email from Dave Lorenz dated 1.8.2019.
[262] PCGP FERC Application, Resource Report 1, General Project Description, "Construction Procedures," p. 18-19.
[263] DEIS, Attachment 1, p. 3 of Appendix K – Fire Prevention and Suppression Plan in Appendix F.10_PCGP_POD-Part 3-22.PDF.

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The conclusion is false and overly simplistic. Pipeline rupture during operation and gas release as a cause of fires cannot be ignored as a possibility. In fact, the greatest clear and present dangers of pipelines are explosion and resultant fire. Gas release can occur in various ways, as can sparks that ignite it. A gas pressure surge can create a rupture by itself or can hit a weak spot such as a stressed or inadequate weld, pipe corrosion, or damage during or after burial. Third-party activities such as logging and other heavy equipment are another frequent cause for explosion and fire.

CO32-112 cont.

The plan is clearly boilerplate and should not have been accepted by FERC staff. The template PCGP selected was not even developed for hilly or mountainous terrain and ignores the excessively dry conditions along the pipeline route. A pipeline crossing southern Oregon, is at particular risk of pipeline rupture due to our unique geologic conditions. The most dramatic of geologic hazards related to this pipeline is the potential for seismic events. A pipeline rupture could occur during an earthquake where subsidence affects the pipeline where it crosses a fault line, ground-shaking from an earthquake may also cause pipeline failure and even more likely to cause rupture are landslides and soil liquefaction or lateral spread where pipelines cross water.[264] PCGP acknowledges that there are several sites susceptible to liquefaction or lateral spreading along the pipeline route, yet did not manage to even mention any of these potential causes of fire during operation in their prevention and response plan.[265]

The Oregon Department of Land Conservation and Development (DLCD) lists as landslide hazards during operation:

- Intense or prolonged rainfall, or rapid snow melt, that causes sharp changes in groundwater levels;
- Undercutting of a slope of cliff by erosion or excavation;
- Shocks or vibrations from earthquakes . . . ;
- Vegetation removal by fires, timber harvesting, or land clearing; and
- Placing fill (weight) on steep slopes.[266]

Application materials include narrative assurance that "The Pipeline route was selected through an iterative process to avoid areas with high risk of geologic hazards,"[267] but the terrain between Malin and Coos Bay makes that a false claim. For example, a map set, prepared by the Applicant at the request of DOGAMI to allow assessment of pipeline rupture risk, shows numerous landslide-prone areas. The terrain from PCGP Mile Post (MP) 110 to 168—the Jackson County portion--is marked by scores of landslide-prone areas that could be activated by an earthquake and potentially result in a pipeline break.[268]The maps are referenced in several tables developed by the Applicant that report that the risk of landslide along the pipeline route is "low" or "none."[269]

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[264] Conversation with Ian Madin, Geologist at Oregon Department of Gas and Mining Industry (DOGAMI), 8/30/2018.
[265] PCGP FERC Application, Resource Report 6, Appendix A.6, Geologic Hazards and Mineral Resources Report," p. 23.
[266] https://www.oregon.gov/LCD/HAZ/pages/landslidesgeninfo.aspx
[267] DEIS, p. ___.
[268] Ibid, Appendix F, Geologic Hazards Maps (2), Figures 24-35.
[269] 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.

D. Risk of pipeline explosion or other hazard in the event of a wildfire caused by other means cannot be entirely mitigated and therefore is a residual adverse impact on landowners and communities.

It is disturbing to learn in the DEIS that JCEP has not yet prepared and made available for review their Emergency Response Plan (ERP), designed to minimize risk in case of wildfire. A draft is said to be included in the Plan of Development, Appendix H, but what is there is a concept paper, outlining an "Emergency Plan and Preparedness Manual" and a "Public Safety Response Manual."[270] Attachments that would allegedly provide instructions on various kinds of safety procedures are all blank and marked "forthcoming." The narrative states that these essential materials will not necessarily be available until "prior to the pipeline being placed in service."[271] Here again, there will be no opportunity for public, or perhaps even agency, review or comment. CO32-113

Additionally, important topics are not even referenced in the DEIS. For example, we cannot locate any acknowledgment that the presence of a 36-inch pipeline within a minimum of 24" of ground level may restrict fire-fighting activities. We also note that, even if a buried pipeline would not be harmed by a wildfire, the DEIS did not acknowledge or describe how above-ground pipeline facilities would not be vulnerable to over-heating and explosion.[272] Those include three meter stations, five pig launcher/receiver assemblies, 17 mainline valves (MLV), and 15 communications towers.[273] There is ample evidence of the damage the intense heat of wildfires can do to all types of structures and materials. It is alarming that neither the Applicant nor FERC staff have addressed this rather obvious fact. CO32-114

E. The DEIS accepts the Applicant's contention that the risk of landslide during operation is low and as a result, states concurrence with PCGP's plan for minimal measures to monitor the pipeline.

The Applicant relies on their consultant GeoEngineers' assessment that "High-risk landslides (active or dormant young) that pose a hazard to a Pipeline are typically instrumented so that movement can be measured," but then goes on to state that "The proposed PCGP Pipeline does not cross known active or recently active landslides that require installation of instrumentation." Instead, "All Class 1 and 2 areas will have annual air patrols and semi-annual land patrols."[274] Given that, as we have stressed elsewhere, a major consequence of landslides in terrain crossed by or overlain by pipelines can be rupture, explosion, and fire. In the largely dry, forested area along the majority of the pipeline, Oregon can't afford for the Applicant and the DEIS's conclusion to be wrong, but we believe it is. In fact, Brad Avy, Executive Director of DOGAMI outlined in a letter his disagreement with GeoEngineer's generalizations and called for further investigation. We have not learned whether that has occurred or the current view of DOGAMI on this or any of the other numerous concerns Mr. Avy expressed about the entire project at that time.[275] CO32-115

[270] DEIS, p. 4-775.
[271] DEIS, Appendix F.10 PCGP POD-Part 3-22.PDF, "Appendix H."
[272] DEIS, p. 4-775.
[273] DEIS, p. 2-19.
[274] PCGP FERC Application, Resource Report 6, Appendix A-6, GeoEngineers, "Geologic Hazards and Mineral Resources Report," September 2017, p. 37.
[275] 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.

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CO32-113 Jordan Cove submitted a draft ERP to address emergency events and potential release scenarios in the Application. The ERP would include public notification, protection, and evacuation. As part of the FEED review, FERC staff evaluated the initial draft of the emergency response procedures to assure that it covers the hazards associated with the Project. In addition, we recommend in section 4.13.1.6 that Jordan Cove provide additional information, for review and approval, on development of updated emergency response plans prior to initial site preparation. We also recommend in section 4.13.1.6 that Jordan Cove file three dimensional drawings, for review and approval, that demonstrate there is a sufficient number of access and egress locations. If this Project is authorized and constructed, Jordan Cove would coordinate with local, state, and federal agencies on the development of an emergency response plan and cost sharing plan. We recommend in section 4.13.1.6 that Jordan Cove provide periodic updates on the development of these plans for review and approval, and ensure they are in place prior to introduction of hazardous fluids. In addition, we recommend in section 4.13.1.6 that Project facilities be subject to regular inspections throughout the life of the facility and would continue to require companies to file updates to the ERP.

CO32-114 See response to comment CO28-216.

CO32-115 See previous response to similar comment from the League of Women Voters. Also see section 4.13 of the EIS for discussion of fire protection including detection systems and emergency shut-down procedures. It is also noted that the pipeline would minimize the potential for fires due to its location underground.

4.14 CUMULATIVE IMPACTS

A. We have reviewed the DEIS and concluded that this evaluation of cumulative impacts is wholly inadequate.

This massive project, likely the largest in the area since building of the railroads, affects land movement across approximately 229-mile-long route and multiple crossings of waterways to the largest estuary within Oregon. In the DEIS, the Appendix Table N-1 illustrates the absence of any integrated approach to cumulative effects for aquatic or terrestrial systems and their interactions. The only somewhat interactive and interdisciplinary approach was to provide assessments at various Hydrologic Unit Code (HUC) levels for the terrestrial components across the pipeline.[276]

According to 40 CFR §1508.7,

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

CO32-116

The science of understanding cumulative effects requires up to date tools and methodology. In aquatic systems particularly the complexity of habitats and life histories requires advanced tools to appreciate and understand the connected nature of the system. A recent modeling of quantitative values of habitats for marine and estuarine populations provides insight into Coastal habitats—such as seagrass beds, shallow subtidal and intertidal habitats, kelp beds, near-shore open water, salt marshes, and rocky bottom—that serve as locations for spawning, nurseries, feeding, sheltering, and migration corridors. Understanding the roles and absolute value of each of the multiple habitats is an emerging science, as recently shown in modeling by Lipcius et al. (2019).[277] Moreover, consideration of the effects of climate change on each of the actions is an important part in future scenario building. The consequences of exported gases would result in increasing the global emissions during transportation and use in Asia. A 2018 study of lifecycle project emissions found that the JCEP would result in a global GHG emissions of 36.8 million metric tons of CO2e per year, or the annual equivalent of 7.9 million passenger vehicles.[278]

Since the passage of the requirements for environmental assessments and requirements to evaluate cumulative effects, scientists and managers have provided examples of appropriate modeling that includes making assumptions transparent and building of scenarios in coupled human and natural systems. This area of study is replete with review of methods and analyses,

[276] DEIS, Appendix N Cumulative Effects-33.PDF, "Table N-1—Past, Present, or Reasonably Foreseeable Actions that May Cumulatively Affect Resources."
[277] R.N. Lipcius, D.B. Eggleston, F.J. Fodrie, J. van der Meer, K.A. Rose, R.P. Vasconcelos, K.E. van de Wolfshaar, "Modeling quantitative value of habitats for marine and estuarine populations." *Frontiers in Marine Science*, 2019, 6. doi: 10.3389/fmars.2019.00280.
[278] Oil Change International, "Jordan Cove LNG and Pacific Connector Pipeline Greenhouse Gas Emissions Briefing,", January 2018, p. 5.

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CO32-116 Consistent with 40 CFR 1508.7, Table N-1 in appendix N identifies past, present, and reasonably foreseeable actions that could contribute to a cumulative impact on the environment. Table N-1 was not designed to describe an approach to assessing cumulative impacts. Pages 4-783 thru 4-791 of the draft EIS describe staff's approach to assessing cumulative impacts on the environment. In this discussion, staff cites relevant CEQ guidance concerning cumulative impacts analyses; defines past, present, and reasonably foreseeable projects; describes the geographic scopes (and the methodology used to determine these scopes) in which cumulative impacts may occur; describes the considerations made when determining the significance of a cumulative impact; considers project-specific conditions; considers the temporal relationships of projects that may cumulatively impact the environment; and acknowledges challenges associated with a cumulative impacts analyses. Staff's approach to the cumulative impacts analysis and the environmental impact analysis in the EIS is consistent with other FERC-regulated projects and CEQ guidance.

With regard to considering effects of climate change in the cumulative impacts analysis, see response to Air Quality and Climate Change comment number

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such as those by Jones (2016),[279] Foley et al. (2017),[280] and Willsteed et al. (2018).[281] These assessments provide insight for the challenges and tools for evaluating multiple factors.

The DEIS articulates each of the disclosure of impacts into separately listed impacts or effects and then proceeds to rank each these with a relative scope of short term, temporary, longer term, or permanent. There are no metrics that explain these qualitative judgements, not one reference to scientific studies, but just speculation from the description of each of these.

CO32-116 cont.

In doing so, the DEIS fails to follow the Federal guidance provided in 40 CFR §1502.16, wherein it is said that the assessment of environmental consequences should include a discussion of:

> (a) Direct effects and their significance (40 CFR §1508.8).
> (b) Indirect effects and their significance (40 CFR §1508.8).

With regard to those instructions, the DEIS mentions direct and indirect effects and provides estimates of the limits of indirect effects, but without substantial evidence and is therefore presenting arbitrary analysis. One example of this is provided in the following about Coho salmon:

> Direct and indirect effects on SONCC Coho salmon are not expected within the marine analysis area. Coho salmon can avoid acoustic effects from LNG carriers during transit. Potential oil and gas spills from LNG carriers in the marine analysis area are highly unlikely to occur; even if LNG spilled or leaked, it would turn to vapor and would not mix with water, and vessel response plans required to address accidental spills of LNG and other petroleum products onboard would be implemented. Effects within the riverine analysis area are expected from in-water construction activities resulting in short-term increased sediment levels that would be stressful to fish, short term benthic food source reduction, temporary migration impedance, short-term terrestrial/riparian habitat modifications, and limited long-term reduction in LWD sources. Limited fish mortality would also occur from fish salvage.[282]

Thusly, FERC staff have failed to provide evidence for their conclusions, failed to use any more modern tools to integrate single impacts at one location to other potential risks, and failed to provide any assessment of the losses against the benefit of no action. The only detailed elements provided are series of proposed mitigative measures, and most all the proposed mitigative measures are vague and involve nothing beyond best management practices. How would these be monitored and would they be applicable to these sites?

Moreover, the document further defines impacts in Section 4 that are not part of the categories used in the EIS guidance and have highly subjective decision criteria, such as is defined in their document as follows:

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[279] Jones, F. C. 2016. Cumulative effects assessment: theoretical underpinnings and big problems, *Environmental Review*. 24: 187–204.
[280] Foley, M., Mease, L.A., Martone, R.G., Prahler, E.E., Morrison, T.H., Murray, C.C., Wojcik, D. 2017. The challenges and opportunities in cumulative effects assessment. *Environmental Impact Assessment Review*. 62:122-134.
[281] Willsteed, E.A., Birchenough, N.R., Gill, A.B., Jude, S. 2018. Structuring cumulative effects assessments to support regional and local marine management and planning obligations. *Marine Policy* 98:23-32.
[282] DEIS, p. 4-330.

> . . . temporary impact generally occurs during construction with the resource returning to preconstruction condition almost immediately afterward. A short-term impact could continue for up to three years following construction. An impact is considered long-term if the resource would require more than three years to recover. A permanent impact would occur if an activity modifies a resource to the extent that it would not return to preconstruction conditions during the life of the Project. Permanent impacts may also extend beyond the life of the Project. For example, we consider the clearing of mature forests a permanent impact because it would take several decades for these habitats to attain their pre-construction condition.[283]

CO32-116 cont.

These assumptions of condition are provided without any transparent criteria used for determination and ranking of assessments. They are arbitrary, and without evidence, they are clearly in violation of guidance 40 CFR §1502.24 regarding methodology and scientific accuracy that states,

> Agencies shall insure the professional integrity, including … identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement. An agency may place discussion of methodology in an appendix.

In reference to the guidance provided in 40 CFR §1502.16, the assessment of environmental consequences should also include a discussion of:

> (c) Possible conflicts between the proposed action and the objectives of Federal, regional, State, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned.

In the DEIS's treatment and discussion of the cumulative effects and conflicts of this project, there is no treatment of the social components of the significant conflicts that are underway in local permitting at the county and city level. The proposals for alternation of the lands and waterways of the Coos Bay estuary and surrounding lands are in conflict with various elements of local Coos Bay Estuary Management Plan and associated zoning. The Applicant has been seeking variances and special permitting as a result of these conflicts. None of these issues is clearly resolved and remands and appeals are in progress. The entire project and management of the estuary is part of the Coastal Zone Management obligations and use permits, and compliances with coast wide policies and values have not been resolved either locally or state-wide.

CO32-117

The following components of the Federal requirements are listed below and the DEIS is deficient in the treatment of cumulative effects, particularly with regard to the no action alternative and the requirement for interdisciplinary preparation to include nature and social sciences as per 40 CFR §1502.6.

CO32-118

> (d) The environmental effects of alternatives including the proposed action.
> (e) Energy requirements and conservation potential of various alternatives and mitigation measures.

[283] DEIS, p. 4-1.

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CO32-117 The role of other federal agencies with review and permitting authority is described in section 1.3 of the EIS. Federal and major state plans, permits, and authorizations that are applicable to the Project are summarized in the discussion of the status of major permits and authorizations in section 1.5 of the EIS. Various sections of the EIS also evaluate compliance with federal land management plans for the portion of the proposed pipeline that would cross federally managed lands. The status of major state and local permits is listed in table 1.5.1-1, but review of conflicts that the Project may have with these permits and authorizations is not within the scope of the NEPA analysis.

CO32-118 See response to Air Quality and Climate Change comment numbers 1, 2, and 3.

(f) Natural or depletable resource requirements and conservation potential of various alternatives and mitigation measures.
(g) Urban quality, historic and cultural resources, and the design of the built environment, including the reuse and conservation potential of various alternatives and mitigation measures.
(h) Means to mitigate adverse environmental impacts.

CO32-118 cont.

Many of the environmental impacts of the terminal and associated facilities must be dealt with separately from the pipeline, but the cumulative effects must consider both components. We note here that this project has impacts at multiple scales—from local to state, national to global—by creating 36.8 million metric tons (MMT) of lifecycle greenhouse gas (GHG) emissions annually for at least 30 years of projected operations.[284] Oregon is far from being on track to meet its GHG emissions goals of 10 percent below 1990 levels by 2020 and 75 percent below 1990 levels by 2050.[285] That projection is based on the assumption that the Boardman Coal Power plant will be closed in 2020. It does *not* consider the 2.6 MMT per year of "new," in-state emissions that would be generated if the JCEP were to be built. It is sobering to realize that, if JCEP were to be built and if Oregon were to manage to meet its GHG goal for 2050 of 14.1 MMT/year, 16% of Oregon's GHG emissions would be squandered to support this corporate enterprise's operations without delivering one kilowatt hour of energy to Oregonians. There is little on a cost-benefit balance sheet to weigh against the momentous environmental detriments—from GHG emissions to water degradation to harm to fish and wildlife to increased risk of wildfire to risks of spreading of invasive species to disruption of water rights to seizure of/control over private land through eminent domain without a clear public use, and other deleterious effects that this project would pose.

The DEIS proceeds to refuse to address climate change impacts in its subsection 4.14 Cumulative Impacts, contending that,

> Climate change is a global phenomenon; however, for this analysis, we will focus on the existing and potential cumulative climate change impacts in the Project area.
>
> The GHG emissions associated with construction and operation of the Project are identified in section 4.12.1.1 for the Jordan Cove LNG Project and section 4.12.1.2 for the Pacific Connector Klamath Compressor Station and pipeline. Both the Jordan Cove LNG Project and the Pacific Connector Klamath Compressor Station and pipeline would remain below PSD major source thresholds and are therefore not required to conduct a Best Available Control Technology analysis for mitigating GHG emissions. The construction and operation of the Project would increase the atmospheric concentration of GHGs, in combination with past, current, and future emissions from all other sources globally and contribute incrementally to future climate change impacts. Project emissions would contribute incrementally to future climate change impacts.[286]

CO32-119

In discussing climate change with regard to the state, they simply describe without analysis:

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[284] Oil Change International, *Jordan Cove LNG and Pacific Connector Pipeline Greenhouse Gas Emissions Briefing*, January 2018, http://priceofoil.org/2018/01/11/jordan-cove-lng-and-pacific-connector-pipeline-greenhouse-gas-emissions/.
[285] Oregon Global Warming Commission, *Biennial Report to the Legislature, 2017*, p. 24, http://www.keeporegoncool.org/reports/.
[286] DEIS, p. 4-806.

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CO32-119 Comment noted. Review of the Project is limited to the economic and environmental impacts of the proposal before the Commission; therefore, the effects of LNG combustion in end-use/importing markets are outside of the scope of this EIS.

> We have not been able to find any GHG emission reduction goals established at the federal level. The State of Oregon has set GHG reduction goals with a state-wide target of 51 million metric tons of CO2e by 2020 (a 10 percent reduction from 1990 levels), and 14 million metric tons of CO2e by 2050 (a 75 percent reduction from 1990 levels) (Oregon Global Warming Commission 2017). The Oregon Global Warming Commission projects that Oregon will fall short of these goals without additional legislative action. Direct emissions from the Jordan Cove LNG and Pacific Connector Pipeline Projects would result in annual CO2e emissions of about 2.14 million metric tons of CO2e, which would represent 4.2 percent and 15.3 percent of Oregon's 2020 and 2050 GHG goals, respectively.[287]

The DEIS does not provide any comprehensive effort to provide even a range of estimates, and instead states, "Without the ability to determine discrete resource impacts, we are unable to determine the significance of the Project's contribution to climate change."[288] CO32-119 cont.

The requirements of the cumulative effects and evaluations of environmental effects asks only that the application follow the NEPA regulations that require:

> (e) Energy requirements and conservation potential of various alternatives and mitigation measures.
> (f) Natural or depletable resource requirements and conservation potential of various alternatives and mitigation measures.

We invite the preparers to examine climate models provided in publications such as those by Jenkins et al. (2018)[289] who suggest ways to model CO2 to account for various tools to improve on radiative forcing. Scientists such as Jenkins et al. propose new ways of comparing greenhouse gases by converting them into a "forcing equivalent" quantity of CO2.

We also suggest that *at a minimum* this DEIS should have provided life cycle assessments of the range of emissions with each stage of the project and present these in understanding alternatives. The US Army Corps of Engineers has produced publications that provide the emissions from dredging[290] and other sources that allow for estimation of GHG from road in different geological bases, e.g. Karlsson et al. 2017.[291]

In the last 50 years, world population increased from 2.5 billion in 1950 to 7.6 billion in 2017 bringing in the most extensive change in the world's ecosystems. This new Epoch has been termed the Anthropocene where humans are major factors in ecosystem.[292] Even with mitigation CO32-120

[287] DEIS, p. 4-807.
[288] DEIS, p. 4-805.
[289] Jenkins, S., Millar, R. J., Leach, N., Allen, M. R. (2018). Framing climate goals in terms of cumulative CO2-forcing-equivalent emissions. *Geophysical Research Letters*, *45*, 2795–2804.
[290] Anderson, M.J., Barkdoll, B. D., 2010. Incorporation of Air Emissions in Dredging Method Selection *Journal of* Waterway, Port, Coastal, and Ocean Engineering. 136: 191-199.
[291] Karlsson, C.S.J. Miliutenko, S., Björklund, A. Mörtberg, U., Olofsson, B., Toller, S. 2017. Life cycle assessment in road infrastructure planning using spatial geological data. Int J Life Cycle Assess. 22:1302–1317.
[292] Steffen, W., Grinevald, J., Crutzen, P., Mencill, J., 2011. "The Anthropocene: conceptual and historical perspectives." Phil. Trans. R. Soc. A Math. Phys. Eng. Sci. 369:842-867.

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CO32-120 Comment noted.

CO32 continued, page 114 of 118

of the drivers and pressures (exogenic and endogenic) of global change soon, estuarine and coastal baselines and coastal forests will continue to shift. We would expect that the evaluation of cumulative effects would consider the resilience of the estuary and coastal watershed to respond to the emerging challenges.

CO32-120 cont.

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CHAPTER 5. CONCLUSION

At the end of their evaluation and assessment of the project, FERC staff stated this:

> We conclude that constructing and operating the Project would result in temporary, long-term, and permanent impacts on the environment. Many of these impacts would not be significant or would be reduced to less than significant levels with the implementation of proposed and/or recommended impact avoidance, minimization, and mitigation measures. However, some of these impacts would be adverse and significant. Specifically, we conclude that constructing the Project would temporarily but significantly impact housing in Coos Bay and that constructing and operating the Project would permanently and significantly impact the visual character of Coos Bay. Furthermore, constructing and operating the Project is likely to adversely affect 13 federally listed threatened and endangered species including the marbled murrelet, northern spotted owl, and Coho salmon.[293]

In response to the first part of that conclusion, we have shown in numerous subsections of Section 4 that the JCEP has fallen short of providing the information FERC staff needed to have at hand to be able to determine whether or how they would avoid or minimize impacts. And yet, the DEIS proceeds with its conclusion of minimal adverse impacts.

We have shown in numerous subsections that JCEP's mitigations measures appear to fall short of serving the purpose for which they were proposed.

We have shown that allowing this project to go forward would do serious harm to endangered species. DEIS acknowledges this impact, but will that be taken into account?

We have shown that the downside socioeconomic impacts of the lengthy construction period of the Jordan Cove LNG Project, despite the costs and lengths to which the Applicant has gone to show net benefits to the community, in fact are almost certain to result in significant net harm, especially, but not exclusively in the long-term. The DEIS acknowledges adverse housing impacts in the Coos Bay area and we agree with that, but we contend that there are many more socioeconomic impacts that have been dismissed by FERC staff as not significant.

We understand that the Commission is not bound by conclusions of impact in an FEIS. That is only one factor to be considered. However, the Commission should, in accordance with its Certificate Policy Statement, decide against the JCEP applications because of the many additional factors arguing for denial in its step by step guidance for decision-making.

As in 2016, the Commission should deny the Section 7 application because the Applicant fails to demonstrate adequate need, demand, or public use for the pipeline through any binding contracts . . . while construction and operation of the pipeline would require significant use of eminent domain and resultant further harm to private landowners on top of the past 15 years of harm to force this project into existence.

If the Commission decides against denial on the above bases, they should deny the Section 7 application because the public benefits conveyed by the PCGP pale in comparison to the

[293] DEIS, p. ES-5

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adverse impacts on communities caused by a pipeline slated to be built over terrain and under conditions almost certain to result in ruptures, explosions, and fire across . . . as well as almost certain fouling of water quality, including for drinking and as habitat for the iconic and culturally significant salmon . . .

If the Commission is not prepared to deny the project on the above bases, they should do so because the Coos Bay area is simply and profoundly wrong for the site for which it has been continuously and repeatedly proposed for all these years. Tremendous natural safety hazards attend the project—many of which are beyond mitigation or the control of humans whatsoever. In a DEIS where the preparers managed to acknowledge that the LNG terminal would pose a significant negative visual impact, it is astounding to find near to total dismissal of the deadly hazards posed by locating the project in the CSZ and tsunami zone, in the flight line of an airport, without adequate design sophistication to address the potential of a thermal plume, and so on as we have described.

We urge the Commission to deny with prejudice these two applications.

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The League of Women Voters is a volunteer organization without any motive other than to work for the best interest of all our citizens. Thank you for accepting and considering our thoughts and concerns and thank you for your service.

Sincerely,

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Cc: Governor Kate Brown
Secretary of State Bev Clarno
Treasurer Tobias Read
Senator Ron Wyden
Senator Jeff Merkley
Congressman Greg Walden
Congressman Peter DeFazio
Oregon Senator Dallas Heard
Oregon Senator Dennis Linthicum
Oregon Senator Floyd Prozanski
Oregon Senator Arnie Roblan
Oregon Representative Kim Wallan

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Oregon Representative Cedric Hayden
Oregon Representative Gary Leif
Oregon Representative Mike McLane
Oregon Representative E. Werner Reschke
Oregon Representative David Brock Smith
Oregon Representative Caddy McKeown
Coos County Commissioners John Sweet, Bob Main, Melissa Cribbens
Douglas County Commissioners Chris Boice, Tim Freeman
Jackson County Commissioners Rick Dyer, Colleen Roberts, Bob Strosser
Klamath County Commissioners Donnie Boyd, Derrick DeGroot, Kelley Minty Morris
Coos Bay Mayor Joe Benetti
North Bend Mayor Rick Wetherell
Shady Cove Mayor Lena Richardson
Shady Cove City Council
Myrtle Creek Mayor Ken Brouillard
Canyonville Mayor Jake Young
Winston Mayor Sharon Harrison
Riddle Mayor William Duckett
Klamath Falls Mayor Carol Westfall
Jason Miner, Governor's Natural Resources Policy Advisor
Tom Byler, Director, Oregon Water Resources Department
Lisa Sumption, Director, Oregon Parks and Recreation
Brad Avy, State Geologist, Oregon Department of Geology and Mining Industries
Janine Benner, Oregon Department of Energy
Jim Rue, Director, Department of Land Conservation and Development
Vicki Walker, Interim Director, Department of State Lands
Curt Melcher, Director, Oregon Department of Fish and Wildlife
Meta Loftsgarrden, Director, Oregon Watershed Enhancement Board
Peter Daugherty, State Forester, Oregon Department of Forestry
Alexis Taylor, Director, Department of Agriculture
Matt Garrett, Director, Oregon Department of Transportation
Richard Whitman, Director, Oregon Department of Environmental Quality
Chris Carson, President, LWVUS
Rebecca Gladstone, President, LWVOR