Oregon Department of State Lands

Draft Removal-Fill Permit Findings for the Jordan Cove Energy Project

The Oregon Department of State Lands has provided the following DRAFT document in response to a public records request. The Department anticipated making a decision on Jan. 31, 2020 regarding the Jordan Cove Energy Project's removal-fill permit application; staff had begun drafting the permit findings. Jordan Cove withdrew its removal-fill permit application effective Jan. 24, 2020.

Does this document contain the Department's permit decision?
No. The document that follows is an incomplete draft. When writing removal-fill permit findings, the Department reviews information for each of the nine factors considered in making a permit decision and documents information related to each of those factors. *See below for a brief overview of the factors.*

Ultimately, the Department balances all information for all considerations and makes the determinations required by law – whether the project is consistent with the protection, conservation, and best uses of the water resources of the state; and whether the project would not unreasonably interfere with preservation of waters for navigation, fishing, or public recreation.

Because the considerations precede the determinations, the determinations had not yet been made.

How far along was the Department in drafting these permit findings?
Staff had begun putting information from the agency record into the Department Considerations section for the nine factors. The agency record includes information from the application, from the applicant, from the public review period, from other state agencies, etc.

Are any parts of the document final?
The document is an incomplete draft. Drafting of the Department Considerations section was in process.

Why is some text redacted?
The redacted text is exempt from disclosure pursuant to ORS 192.355(9)(a), which exempts records that are confidential or privileged under Oregon law. In this case, the redacted text is attorney-client privileged pursuant to ORS 40.225. The redacted text was drafted in furtherance of the rendition of professional legal services.

What are the factors considered in determining whether to issue a permit?
Briefly, the nine factors are 1. public need for and likely benefits from the proposed removal or fill; 2. cost to the public if the removal or fill doesn't occur; 3. availability of alternatives to the project; 4. availability of alternative sites; 5. whether proposed activity conforms to sound policies of conservation and would not interfere with public health and safety; 6. whether the proposed fill or removal conforms with existing public uses of waters and with uses designated for adjacent land in an acknowledged comprehensive plan and land-use regulations; 7. Whether the proposed fill or removal is compatible with the acknowledged comprehensive plan and land use regulations for the area where the proposed fill or removal is to take place or can be conditioned on a future local approval to meet this criterion; 8. Whether the proposed fill or removal is for streambank protection; 9. Whether the applicant has provided all practical mitigation to reduce the adverse effects of the proposed fill or removal.

Permit Findings for Application No. 60697-RF, Jordan Cove Energy Project L.P. and Pacific Connector Gas Pipeline L.P.

Department Considerations. In determining whether to issue a permit, the Department will consider all the following factors using all the information in the agency record:

a) Public need for the proposed fill or removal and the social, economic or other public benefits likely to result from the proposed removal or fill. When the applicant for a permit is a public body, the Department may accept and rely upon the public body's findings as to local public need and local public benefit;

[redacted]

The applicant and project proponents have provided information in the application and responses to public comments, supporting social, economic and other benefits to the public from the proposed fill and removal, and the project it facilitates, in the form of:

- Temporary construction jobs for the LNG terminal, associated facilities, and the pipeline (6500 jobs estimated during peak construction).
- Permanent jobs for the operation of the facility (215 permanent family-wage jobs)
- ECONorthwest report estimated additional spin off jobs within the communities for health, food services, retail, etc.
- 500 million dollars to the Community Enhancement Plan by directing eligible Enterprise Zone tax savings to local governments, benefitting Coos Bay, North Bend and Coos County residents.
- 60 million per year approximately in local taxes to Coos, Douglas, Jackson and Klamath Counties.
- 50 million annually approximately to Oregon in new taxes
- The project as planned is an approximately 10-billion-dollar private investment in Southern Oregon. The financial 'infusion' represents the public benefits.

Project opponents have provided comments indicating negative social and economic impacts of the proposed fill or removal and the project it facilitates in the form of:

- Eelgrass impacts are virtually un-mitigatable, the impacts are not satisfactorily addressed following the states hierarchy for mitigation, avoidance first, minimization second, and lastly look to mitigate adverse impacts from necessary activities resulting in fill and removal in waters of the state. Eelgrass is a highly sensitive very important estuarine resource that provides feeding areas and cover for a multitude of species including crab, Coho and chinook salmon juveniles, a number of rockfish species at times and the 'food chain' of invertebrates and other aquatic organisms that would be impacted by the project and some impacts from the proposed mitigation as well.
- Impacts from dredging the Navigation Reliability Improvements, side slope equilibrium issues after dredging and the direct impacts that would result to adjacent subtidal and intertidal resources and potentially impacting more eelgrass and mudflats that are not accounted for nor mitigated for in the application.
- Impacts from dredging the slip and access channel to eelgrass habitats and intertidal habitats. Impacts to juvenile crabs and aquatic invertebrates understated as habitat impacted at the access channel and slip is intertidal and eelgrass directly adjacent to deeper water which provides more diversity of use by a multitude of species.
- Navigational impacts to the public, impacts to fishing, crabbing, and recreational uses in and around Coos Bay will be impacted by the project.
- Comments indicate that out of town use of Coos Bay and for salmon fishing and crabbing provides significant economic and recreational opportunities that could be lost or significantly hindered by the project construction related impacts and operational impacts of the project.
- Potential impacts to archeological sites of historical significance to the local tribes from the NRI dredging, slip and access channel dredging, vibro-compaction of the upland sites to meet seismic standards, and potentially from the mitigation sites proposed in the bay and the kentuck sites, and possibly areas along the pipeline route.
- Out of kind eelgrass mitigation is not acceptable to the general public. As proposed the eelgrass mitigation is well away from any deep water and the functional and values impacted are not replaced with a different habitat type.
- Mudflats are also very important estuarine features that provide food resources. Any impact to mudflats requires adequate mitigation, current plan does not address these issues. The conversion of mudflats at the proposed eelgrass wetland mitigation site will result in a loss of mudflat. That loss has not been mitigated.
- Kentuck mitigation site is already a functioning wetland and it would be the single largest freshwater wetland impact, but those impacts are dismissed as part of the mitigation effort.
- Out of watershed mitigation issues by consolidating all freshwater wetland conversion along the pipeline to a single mitigation site in Coos Bay.

- Reduced livability and property values in the area due to construction and operational impacts from the project dredging, LNG terminal and associated facilities, and the properties near the pipeline along its entire route. Landowners have mentioned at all venues and commenting methodologies that their properties have been impacted already for over 10 years, some longer whose lands fall along the pipelines entire route.
- Objections to the use of eminent domain to take private properties along the pipeline route for profit of a Canadian gas company.
- Possible impacts to downstream municipal water supplies from construction disturbance along the pipeline corridor.
- Impacts to wells near the pipeline corridor.
- Impacts to irrigation sources and agricultural lands from pipeline construction activities.
- Impacts on thermal loading of streams from right of way clearing, in preparation for the pipeline installation construction.
- No reasonable assurance that the construction and operation of the project will comply with applicable state water quality standards.
- Impacts to fish habitat
- Impacts to 303d listed streams, further degradation of water quality.

[redacted]

b) economic cost to the public if R/F not accomplished;

[redacted]

[redacted]

[redacted]

c) the availability of alternatives to the project for which the fill or removal is proposed;

Jordan Cove explains that the analysis of the alternatives is grounded on the purpose and need for the project, determining a geographic area for potential alternative sites, evaluation against criteria to screen alternatives and identification of reasonable alternatives for the project. Public comments question since the Malin intersection of the Gas Transmission Northwest (GTN) and Ruby pipelines is a fixed element of the purpose and need statement, it requires justification on why that interconnect is the only possible start point for an export pipeline and LNG terminal proposal. This argument is used repeatedly to discount other reasonable alternatives from further consideration.

The Ruby and GTN pipeline interconnect was used previously by Jordan Cove Energy project when the original proposal was for importing LNG to markets in Southern Oregon and northern California. Any alternative site explored by Jordan Cove since that time uses the GTN/Ruby interconnect as a start point for the export pipeline. Anything north or south is discounted for distance and economical reasons but the source gas should dictate the origin or start point, not a fixed location without justification.

For example, if the majority of the gas is sourced from western Canada and a small portion from the Ruby pipeline, it would make more sense to be closer to the point of origin for an export proposal. Numerous public comments raise similar issues around the inadequacies of the alternatives analysis and the overly narrow, unjustified 'fixed elements' of the purpose and need statement as guiding criteria for the flawed alternatives analysis. The other 'fixed element' of the purpose and need statement is the required output of 7.8 Mtpa of LNG for export, this also requires justification which Jordan Cove failed to provide an adequate response. [redacted]

For the record, Jordan Cove Energy Project (JCEP) was submitted as a 2-part application: Part 1 is the LNG Terminal and Part 2 is the pipeline. JCEP is madeup of two entities: Jordan Cove Energy Project, L.P. and Pacific Connector Gas Pipeline (PCGP), L.P. collectively referred to as JCEP. The applicant asserts that PGCP has already executed two precedent agreements with JCEP, as an anchor shipper, for 95.8% of pipeline capacity. The specific LNG export output volume (7.8 mTPA), is used to justify the purpose and need for the project.

The applicant explored other alternatives to the project. The project will provide natural gas from the U.S. Rocky Mountains and western Canada as an outlet for export to Asian markets. As a result, there are no domestic energy alternatives or energy conservation measures that would meet the projects purpose and need such as wind or solar.

System alternatives were explored that could make use of other existing or proposed LNG facilities to meet the stated purpose and need of the proposed project. Adoption of a system alternative could preclude the need to construct all or part of a project, although some modifications or additions to other existing systems would be required.

Jordan Cove explored existing and proposed LNG export terminals, the U.S. East Coast and Gulf Coast LNG export facilities, that are far removed from the Ruby GTN pipeline intersection. One existing LNG export terminal in West Coast of North America, the Kenai LNG plant located in Alaska, cannot be accessed though existing or practicable expansions of pipeline networks.

The Canadian West Coast proposed LNG terminals were explored, but Jordan Cove concludes that none are currently authorized to export U.S. sourced natural gas. Without authorization to export, the Canadian West Coast projects cannot meet the purpose and need, and are not discussed any further.

The applicant then explored LNG terminal site alternatives and based the alternatives analysis focused on characteristics that determine whether or not a proposed alternative site can meet the Projects purpose and need or is reasonable from a technical, cost and logistical perspective. The screening criteria used was 1) Land Availability, 2) Channel depth, 3) Navigational Accessibility, 4) LNG vessel transit distance and 5) Pipeline length and costs. Five sites that could meet the screening criteria were identified for further evaluation. Oregon sites-Coos Bay, Astoria, Wauna and Port Westward and Washington-Grays Harbor. All five site alternatives would require construction of new natural gas pipelines, and in four cases, modification and upgrades to existing transmission pipelines to access western Canadian and U.S. Rocky Mountain natural gas sources from the intersections of the GTN Pipeline and Ruby Pipeline near Malin, OR. The pipeline cost comparison result when applied to the five site alternatives shows that the cost of new pipeline to provide comparible access to western Canadian and U.S. Rocky Mountain gas is between 1.1 billion and 1.8 billion more than siting the LNG terminal in Coos Bay. If the start point was anything else besides the interconnect at the GTN and Ruby Pipelines, the alternatives analysis would yield different results. Environmental analysis was the next step in identifying the proposed LNG terminal location, the analysis explains that the main differences between the potential impacts for the various sites were in regards to the pipeline environmental impacts associated with each LNG terminal location. All other sites not close to the GTN and Ruby interconnect rationally did not fare well and were dismissed from further consideration. Based on the specific purpose and need statement, Coos Bay was determined to be the site that would meet the purpose and need for the project with the least environmental impacts.

Some commenters request further analysis of alternate routes and terminal sites, including Wauna, Oregon, and Humboldt Bay, California. To the extent alternative sites were feasible or practicable, they were analyzed in detail in the March 2019 DEIS. From the DEIS Section 3.3.2: "Three sites (Astoria, Port Westward, and Grays Harbor) would have a significantly greater number of residences located within 1 mile, while one site (Wauna) would have significantly fewer. Three sites (Wauna, Port Westward, and Grays Harbor) would have less impact on freshwater wetlands than the proposed site, while one site (Astoria) would have more. One site (Astoria) is estimated to require significantly more impact on estuarine and open water habitats than the proposed site. All four alternative sites would require at least 100 more miles of supply pipeline than the proposed site, ranging from an estimated 103 miles (Port Westward) to 170 miles (Astoria) of additional pipeline required, which would require an estimated 2,224 to 3,672 additional acres of disturbance for pipeline construction. When evaluating these potential impacts, we have not identified an alternative site that would result in a significant environmental advantage over the proposed site. Therefore, we conclude that none of the regional alternative sites would result in a significant environmental advantage over the proposed site in Coos Bay."

Humboldt Bay was analyzed as an alternative site in the DEIS Section 3.3.1, page 3-9: "California has 11 public ports. The closest deepwater port to Coos Bay in California is the Port of Humboldt Bay. The Port of Humboldt Bay is located approximately 185 miles south of Coos Bay and 225 miles north of San Francisco (the next closest deepwater port is in San Francisco bay). The Samoa Peninsula lies between the Pacific Ocean and Humboldt Bay and hosts several active and former marine facilities, berths, docks, and terminals. According to the 2018 Humboldt Bay Maritime Industrial Use Market Study, 948 acres of land have been designated for Coastal Dependent Industry (CDI) on the Samoa Peninsula including the approximately 344-acre Eureka Municipal Airport site which has waterfront access and is the largest single property on the peninsula.

It is unknown whether a combination of other CDI properties equaling approximately 200 acres is available. The channel system leading into and within Humboldt Bay varies in length, width, and depth. The Bar and Entrance Channel is approximately 8,500 feet long, 500 to 1,600 feet wide, and is authorized to a depth of 48 feet mean low level water (MLLW). The North Bay Channel which serves the Samoa Peninsula is 18,500 feet long, 400 feet wide, and is authorized to a depth of 38 feet MLLW. The distance by air from Malin, Oregon to Humboldt Bay is about 170 miles (the distance from Malin, Oregon to Coos Bay by air is also about 170 miles). We estimate the pipeline distance between these two points would be at least 200 miles, which is comparable to the proposed pipeline. An LNG terminal in Humboldt Bay would impact the environment in a manner similar to that of the proposed Project, including; permanent conversion of land use, dredging, turbidity, loss of wetlands, visual impacts, air quality and noise. Concerns at this location such as marine traffic restrictions, socioeconomic impacts, tsunamis, and public safety would also be the same as the proposed Project.

A natural gas transmission pipeline from Malin, Oregon to Humboldt Bay, California would traverse Klamath County, Oregon as well as Siskiyou and Humboldt Counties, California. The environment crossed by a pipeline from Malin to Humboldt Bay would be similar to that of the proposed route, including; mountainous terrain, several large rivers, three national forests, and BLM-managed lands. This pipeline route would also cross the ranges of over 20 federally-listed threatened and endangered species including NSO, MAMU, and salmon. Concerns with this pipeline route such as rural property values, socioeconomic impacts, and public safety would also be the same as the proposed Project. Based on the expected similar impacts of an LNG terminal in Humboldt Bay and the associated natural gas transmission pipeline from Malin, Oregon to Humboldt Bay, we conclude this alternative would not result in a significant environmental benefit when compared to the proposed action."

[redacted]

Commented [ME1]: [redacted]

d) The availability of alternative sites for the proposed fill or removal;

Commented [ME2]: [redacted]

Jordan Cove used site specific evaluation criteria for potential LNG terminal sites along Coos Bay. The search area was confined to below the Hwy 101 bridge for navigational hazard reasons. The following site specific criteria used to select an LNG terminal site were 1) Environmental Impacts, 2) Parcel Size, 3) Land Availability, 4) Airport approach compatibility, 5) Safety Exclusion Zone and 6) Socio-Economic. Three potential sites in lower Coos Bay were evaluated with priority given to provide safe harbor for the LNG vessels that will call on the LNG terminal to meet US Coast Guard criteria. DB Western, Ingram Yard and South Dunes sites were evaluated using criteria stated above, the DB Western site is directly within the airport runway approach and does not meet land availability requirements and was dismissed. The key differentiating criteria that resulted in Ingram Yard being identified as the best Coos Bay site was the area of estuarine and wetland impacts when compared to the South Dunes site.

The slip and access channel that connects the facility to the navigation channel was the chosen design configuration as opposed to a dock, trestle, or offshore structure design, none of which fit the safety criteria set by the Coast Guard. Other design alternatives were explored such as alternatives to the marine slip and access channel design, LNG storage tank designs, alternative sites to place the Southwest Oregon Regional Safety Center, alternatives for the workforce housing site, alternatives for the primary entrance to the facility, alternatives for electric power, liquefaction alternatives and dual mixed refrigerant alternatives or design alternatives.

Site layout alternatives were also explored for the access and utility cooridors and the raising of the South Dunes site above tsunami elevations are discussed in the application. Dredged Materials Disposal plan contains an alternatives analysis on alternative disposal sites and supporting information. Other alternatives provided were in response to public comments such as the pile dike rock apron and the expanded alteratives analysis for the NRI dredging.

Due to the linear nature of a pipeline, it is impossible to avoid crossing wetlands and waterbodies along the 229 miles of the alignment. As detailed in the application, the preferred route was developed by considering construction requirements for a large diameter, high pressure, natural gas transmission pipeline. Constructability/integrity requirements were the primary consideration for routing the pipeline while minimizing potential impacts to sensitive resources such as the number of waterbody and wetland crossings and landowner encumbrances.

Based on the feasibility analysis, a cross-country route was selected which traverses ridgelines and watershed boundaries to ensure the safety, stability, and long-term integrity of the pipeline. By following ridgelines and watershed boundaries, the route potentially avoids some impacts to wetlands and waterbodies. Pipeline routing alternatives were provided in the application, though JCEP not having access to all properties does limit our impact analysis potential to speculative at best due to the lack of site specific information.

The pipeline portion of the project is still lacking a concurred wetland delineation as required for those properties they have access to along the pipeline alignment cooridor. [redacted]
There are also a number of properties with denied access, those properties for obvious reasons do not have delineation concurrence either.

[redacted]

e) Whether the proposed fill or removal conforms to sound policies of conservation and would not interfere with public health and safety;

Commented [ME3]: In addressing this we need to look to see if impact can be mitigated and if mitigation proposed is adequate.

The application proposed impacting the following waters of the state for the construction of a slip and access channel for an LNG Terminal, the associated facilities, and the 229 mile Pacific Connector Gas Pipeline across Coos, Douglas, Jackson, and Klamath Counties:

Estuarine impacts;

- Permanent impact to 3.08 acres of eelgrass beds (slip and access channel and pile dike rock apron)

- Permanent impact to 19.54 acres of mudflat, salt marsh and shallow subtidal areas (slip and access channel)
- Permanent impacts to 81.63 acres of deep subtital habitats (NRI dredging and slip and access channel dredging).
- Total fill in estuary 39,483 cubic yards.
- Total removal in estuary 1,784,475 cubic yards.

Freshwater Wetland impacts;

- Permanent impact to 1.91 acres of dunal wetlands (LNG terminal and associated facilities)
- 39,273 cubic yards of fill
- 23 cubic yards of removal

Pipeline Impacts Wetlands and Waters:

- Pipeline will affect 342 waterbodies. Of the 342 waterbodies, 66 are perennial, 163 are intermittent, 100 are ditches, 9 are lakes or stock ponds, and 4 are estuarine crossings (2 HDD bores under Coos Bay and the Coos River Crossing.
- Pipleine will cross a total of 5.3 miles of wetlands. The construction right-of-way and temporary extra work areas will affect 112.19 acres of wetlands. 106.71 acres of palustrine emergent wetlands, 2.3 acres of palustrine scrub-shrub wetlands, and 2.55 acres of palustrine forested wetlands. Additionally 0.64 acres of palustrine unconsolidated bottom or aquatic bed wetlands will be disturbed by the pipeline.
- Permanent vegetation type conversion impacts will affect a total of 0.91 acres of wetlands, including 0.73 palustrine forested and 0.18 palustrine scrub-shrub wetlands.
- Approximately 9800 cubic yards of removal and fill (pipeline installation) in waters.
- Approximately 49,000 cubic yards of removal and fill (pipeline installation) in wetlands.

The November 7, 2018 application proposed several avoidance strategies and best management practices for the construction and operation of the facility to avoid and minimize impacts to waters of the state outlined below.

LNG Terminal and associated facilities:

- The LNG terminal access and utility cooridor was sited to avoid most wetlands as possible given logistical constraints of raising site elevations above the tsunami inundation zones.
- The workforce housing site and Southern Oregon Regional Saftety Center result in unavoidable impacts due to needing to raise the site to elevations above the tsunami inundation zone.

- Some wetlands at the terminal site were avoided by use of retaining walls. Others will be temporarily impacted during construction and restored when no longer needed.
- Temporary impacts at the APCO disposal sites for construction of a temporary pile support for bridge construction, no permanent impacts will result.
- There will be temporary and permanent fill into Coos Bay during the Marine Offloading Facility, the temporary fill will be removed during dredging of the access channel.
- All dredging is proposed to occur within the approved In-water work period
- Dredging pollution and control plans developed to minimize turbidity impacts during dredging.
- Trans-Pacific Parkway widening will result in 0.5 acres of estuarine impact. Sheet piling is proposed to isolate the work area from the bay.
- Dredged materials transfer lines will be placed on piling supports to avoid eelgrass areas between the NRI dredge sites and the APCO disposal site.
- Connection of the access channel and the slip to be excavated from uplands will be separated by a berm (ie. The existing shoreline) until such time the two are connected via dredging.
- 50 foot buffer will be maintained between the slip and the eastern edge of henderson marsh (an adjacent 190 plus acre high value freshwater wetland).
- All piles driven into Coos Bay will be concrete or steel piling, no treated timbers will be used.
- All piles in fish-bearing waters will be driven 'in the dry' in order to minimize acoustic disturbances to fish and aquatic species.
- All equipment cleaned and inspected daily.
- Floating spill containment booms and absorbent booms will be maintained on-site during all phases of constuction to facilitate cleanup in the case of accidental spills.
- A spill prevention, control, and containment plan will be developed and implemented.

Pacific Connector Gas Pipeline:

- Routing efforts to minimize wetland and waterbody crossings. The proposed route primarily follows ridgelines as it traverses the Coast, Klamath, and Cascade mountains and foothills. This ridgeline alignment provides the most stable landscape position for the pipeline and minimizes the number of waterbodies crossed.
- Incorporating FERC's Wetland and Waterbody Construction and Mitigation Procedures into the design minimizes the extent and duration of disturbance in wetlands and waterbodies.
- Locating temporary extra work areas a minimum of 50 feet from the edge of wetlands and waterbodies, where possible, to minimize impacts to wetland buffers and riparian zones as required by FERC's Wetland and Waterbody Procedures.

- Incorporating 5 HDD's to install the pipeline beneath the 1) Coos Bay estuary/2 HDD's; 2) Coos River; 3) Rogue River; and 4) Klamath River. In addition, a Direct Pipe crossing method has been incorporated to cross the South Umpqua River (mile post 71.27).
- Conventional bore will be used to cross the Medford Aquaduct, and 26 other canals, ditches, and drains which include all of the Bureau of Reclamation's jurisdictional facilities in the Klamath Basin.
- Crossing all streams flowing at the time of construction by dry open cut crossing procedures in the FERC manuals.
- Where clearing in wetlands outside the trench line and travel land, PCGP will cut, mow, or shear woody vegetation so that the roots are left intact.
- Sediment barriers will be intalled immediately after clearing and prior to initial ground disturbance.
- Sediment barriers will be properly maintained throughout construction and reinstalled as necessary.
- Where wetlands are adjacent to the construction right-of-way, sediment barriers will be installed to protect the wetlands.
- Sediment barriers will be removed after restoration is complete and revegetation has stabilized the disturbed areas.
- In wetlands where standing water or saturated soils occur or if equipment is causing rutting, timber mats will be used along with low ground pressure equipment.

The Department received thousands of comments that the construction or operation of the facility may lead to adverse effects to aquatic habitats, fishing or public health and safety. In summary they raised concerns about:

- Impacts to navigational safety, safe bar passage for commercial and recreational boaters, and to non-motorized boaters using lower Coos Bay are understated with no mitigation proposed.
- Impacts to fishing, scuba diving, and crabbing in Coos Bay waters, no mitigation proposed.
- Conflict between loaded LNG ships transiting at high tides, corresponding with optimal crabbing tides while currents are the slowest at 'slack tide'.
- Impacts to the dungeness crab fishery from the direct and indirect impacts of dredging (eelgrass beds, intertidal areas and subtidal areas) impacting all life stages of crab.
- Impacts to recreation and tourism, no mitigation proposed.
- JCEP eelgrass mitigation proposal relies on "best case scenario" for success of the mitigation effort without adequate documentation. ODFW is concerned about the excavated JCEP eelgras mitigation basin filling in with sediment, and that the rate of sedimentation may not be conducive to survival, growth, and propogation of the planted eelgrass plants.
- ODFW recognizes that the ODSL mitigation ratio must be at 1.5:1 for creation of a new eelgrass bed at the proposed JCEP eelgrass mitigation site. However, the transplanting of eelgrass proposed by JCEP only achieves a

mitigation ratio of 1:1, which is insufficient to meet ODSL standards. The Applicant predicts that the transplanted eelgrass will survive, grow, and expand over a period of five years to fill out the excavated basin in order to achieve the required mitigation ratio of 1.5:1. The expectation by JCEP for the transplanted eelgrass to flourish has a great deal of uncertainty, and optimism by the applicant should not be considered as a guarantee to meet DSL's required mitigation ratio.

- ODFW recommends that the applicant increase the spatial extent of eelgrass transplants to achieve the mitigation ratio of 1.5:1 at the initiation of the planting (time-zero) rather proceed with the expectation that the required ration will be met after a period of five years. The Applicant will not meet the ODSL mitigation policy standards unless the transplant activities begin with a ratio of 1.5:1.
- ODFW is concerned not only about sediment accretion rates but also there is concern over the lack of characterization or description of the expected underlying sediments that will be exposed by dredging. The underlying sediments may be compacted or anaerobic with relatively little interstitial space for the establishment of eelgrass roots/rhizomes and the movement of water. These expected characteristics of the underlying sediments are not conducive to survival and growth of transplanted eelgrass.
- The proposed mitigation actions for eelgrass should be designed to retain the full array of ecosystem services provided by eelgrass beds in the JCEP area. Planned mitigation activities should follow established in-kind, in-proximity standards established by ODFW.
- ODFW recommends a more detailed analysis of eelgrass mitigation sites that characterize the location, species composition, and abundance of the eelgrass and other submerged aquatic vegetation at the alternative sites. They further recommend JCEP provide a more detailed rationale for rejection of the alternative sites and acceptance of the proposed site. The existing JCEP Mitigation Plan is incomplete because it does not provide a full description of the steps that were taken to avoid adverse impacts to existing eelgrass beds in Coos Bay.
- The applicant does not document that serious consideration was given to avoidance of impacts to eelgrass beds.
- 5 years monitoring is insufficiently short time period to adequately evaluate long-term mitigation success.
- JCEP project description identifies permanent removal of eelgrass associated with the dredging and excavation of the access channel that will be constructed to provide ship access to the LNG terminal. Eelgrass beds that currently inhabit the intertidal and subtidal zones in the area of the proposed access channel will be dug up, salvaged and relocated into the intertidal zone at the Jordan Cove Embayment Site. The proposed mis-match in tidal elevation between eelgrass plants harvested from the access channel site (intertidal and subtidal) and the Jordan Cove transplant site (intertidal only) provides evidence that the transplants may face a high likelyhood for failure.

- ODFW raised concerns over poor water quality issues with the shallow excavated basin design, this will likely cause water quality issues without design modification which is recommended. The proposed mitigation site should be designed to include a functional hydrodynamic connection to the primary tidal channel.
- Unconsolidated soft-sediment habitat is widespread in the Coos Bay estuary where it occurs extensively throughout the intertidal zone and sub-tidal zone along the bottoms, sides, and margins of primary and secondary tidal channels. Impacts from NRI dredging, the resulting side-slope equillibrium and the dredging of the slip and access channel will impact these habitats. Those unconsolidated soft-sediment tidal habitats provide the 'nursery' area for the bottom of the food chain and have implications to the estuary and its fishery. Crab and several species of clams are year round residents of these habitats as they are important feeding and rearing areas. When soft-sediment habitat is chronically disturbed and altered by dredging of the sub-tidal zone, there may be a permanent loss and impact to benthic invertebrate populations and a decline in the biodiversity of benthic communities.
- The JCEP Eelgrass Mitigation Plan does not adequately address the potential for loss of sediment adjacent to NRI areas 2-4, and does not give adequate consideration to loss or disturbance of the important eelgrass donor bed and reference bed located adjacent to NRI 4.
- ODFW recommended truncation of the in-water work period to protect the herring spawing for the Coos Bay dredging, not incorporated into project timelines by JCEP.
- The applicant has verbally committed to redesigning the Kentuck mitigation elevation plan to develop additional acreage that will be below elevation +5.5 NAVDD88 (the elevation threshold for saltmarsh development) on the site. This will offset loss of Category-2 Algae/Mud/Sand habitats that will be dredged and regraded at the eelgrass mitigation site south of the North Bend Airport runway. The exact acreage (6.81 acres + slope area) of grading/dredging at the eelgrass location has of yet not been finalized. ODFW will need updated Kentuck mitigation design plans and a complete eelgrass site dredging/grading plan in order to determine if the loss of the Category-2 Algae/Mud/Sand will be offset. ODFW recommends that the applicant include this information in a revised Compensatory Wetland Mitigation Plan.
- The Kentuck site is slated for disposal of 300,000 cubic-yards of dredge spoils from development of the JCEP access channel. ODFW will need to understand where fill proposed to be disposed of at Kentuck will be relocated in order to allow the Kentuck grading plan to produce the additional acres below elevation +5.5ft. There will also be a need to update the grading and erosion control plans for both the eelgrass mitigation site and Kentuck Mitigation site, which may have additional or different impacts to fish and wildlife.
- ODFW has reviewed the applicant's Comprehensive Mitigation Plan (submitted to the FERC Docket in September 2019; also see the FERC FEIS Sections 2.1.4 and 2.1.5), the proposed mitigation for permanent impacts to

streams and riparian habitats impacted by the pipeline. ODFW does not find the proposed mitigation meets the Fish and Wildlife Habitat Mitigation Policy's goal of no net loss of fish and wildlife habitat. Also, the mitigation actions are almost entirely on U.S. Forest Service (USFS) and Bureau of Land Management (BLM) lands even though impacts will also occur on private lands. While ownership is not necessarily a requirement in the ODFW Fish and Wildlife Habitat Mitigation Policy, having mitigation be in-kind and in-proximity to the impacts are standards of the policy.

- Fish passage approvals within the CZMA mostly addressed with ODFW but not approved, two updated appendices are needed for final review according to ODFW.
- Fish passage plan for the non CZMA streams has not received by ODFW.
- The pipeline will cross 155 perennial streams. The pipeline right-of-way will impact a 75-foot wide corridor through riparian habitats. The excavation of the trench to install the 36" pipe will result in direct stream channel impacts at least 20 feet in width and bank to bank. A number of these stream locations are Essential Salmonid Habitat. Stream habitats often require several years post-disturbance for the channel bed, banks, and upslope to stabilize and recover at least minimal function. Normally in stream channel restoration projects, a minimum of three to five years is often needed moderate function recovery. It is ODFW's understanding that the applicant is developing Stream Function Assessment Method (SFAM) information for stream crossings. However, ODFW has not yet received this information and therefore cannot determine whether or how this information might affect mitigation plans.
- ODFW has noted that the PCGP applicant has not developed a plan to address:
    - The temporal loss of function to aquatic habitats and associated riparian forest (see ODFW Protest of BLM and USFS Plan Amendments, cited above and attached to this letter).
    - Consistency with the habitat categories and mitigation standards of the ODFW Fish and Wildlife Habitat Mitigation Policy,
    - SFAM evaluations for each crossing and how that might change compensatory mitigation,
    - Large Woody Debris that adequately offsets impacts. The PCGP Large Woody Debris Plan (included in the September 2019 Comprehensive Mitigation Plan) documented that up to four pieces of LWD will be placed where streams are rebuilt after trenching and installation of the 36" pipe. This is considered inadequate for restorative uplift to replace lost function (see ODFW protest of the BLM RMPA).
- ODFW has been reviewing the GIS files provided by the PCGP consultant for pipeline permanent and temporary impacts to freshwater wetland habitats. The specific impact acreages by type of wetland and ODFW Habitat Category have not been incorporated into the Compensatory Wetland Mitigation Plan, nor has the plan been assessed for its consistency with the ODFW Fish and Habitat Mitigation Policy. ODFW acknowledges that permanent impacts will result in a limited quantity of permanent impacts (0.91) acres. However,

ODFW has substantive concern with temporal loss of function for the 112.19 acres of freshwater wetland that will be heavily damaged and then addressed through revegetation measures outlined in the applicant's Erosion Control and Revegetation Plan. It is ODFW's opinion that recovery of the functions and values in many of these freshwater wetland habitats will likely require 5 to 7 years, which is beyond DSL's 24-month definition of 'temporary' and is deserving of additional compensatory mitigation to address temporal loss of habitat for fish and wildlife.

- In-water Blasting Plan has not been coordinated with ODFW.
- Impacts to fish habitat, spawing areas in intermittent or perennial stream crossings and rearing habitat implications related to pipeline impacts.
- Impacts to tribal fishing, eelgrass beds, collection of first foods, potential historical fish weirs and other archeological issues, and long standing uses of the north spit and Coos Bay.
- Constuction of an LNG Terminal in an area likely subject to a Cascadia subduction earthquake event and resulting tsunami.
- Independent utility, JCEP funding the Port's Channel Modification project.
- NRI dredging to enable LNG vessels to navigagte at higher wind speeds is a safety issue.
- Long term maintenance dredging needs not being adequately addressed.
- Impacts to wells, municipal drinking sources.
- ODEQ's denial of the 401 water quality certification in May 2019. No reasonable assurance that the construction and operation of the project will comply with applicable State of Oregon water quality standards.
- Turbidity impacts to aquatic environments.
- 303d listed streams crossed by the pipeline, how will the water quality not be made worse?
- Contaminents related to dredging impacts and potential issues along some of the pipeline route.
- Loss of property values and livability near the pipeline.
- ODFW concerns for aquatic habitat function associated with horizontal directional drilling (HDD) risks. Primary risks are frac-out and subsequent drilling fluid 'mud' reaching the water column, drill bore site erosion and mobilization through precipitation, and drill bore hole impacts to pasture wetlands and stream adjacent habitats. ODFW recommended monetary bonds be retained at all the HDD sites on this project to cover mitigation costs
- Coos Bay East HDD feasibility anaysis presented with minimial information, frac outs would damage the aquatic environment and are not adequately analyzed. HDD contingency plan is inadequate to protect aquatic resources as proposed.
- HDD feasibility anaylsis for Coos Bay East was incomplete, adverse impacts to special aquatic sites expected without installing a casing on the Kentuck side of the alignment. The purpose of the casing is to surround and isolate the first 70 feet of the bore entrance hole down to competent material. The feasibility report states that further analysis is required yet not completed to

assure that the casing installation is possible to protect against inadvertent release of drilling fluids during the HDD process and pipline installation.

- HDD fracout risk at the proposed Rogue River HDD is not adequately addressed and the HDD contingency plan is inadequate to protect critical aquatic resources at that location. This reach of the Rogue River where the pipeline would cross is just downstream of Trail Creek, and provides critical spawning habitat for endemic Rogue Basin spring Chinook.
- Geotechnical/Engineering concerns over liquefaction at the LNG Terminal Site.
- Geotechnical/Engineering concerns over stability of the APCO Dredged Material Disposal Site containment berms and potential for aquatic impacts to adjacent mudflats and eelgrass beds.
- Federal Aviation Administration (FAA) presumed hazards determinations not addressed by the applicant.
- LNG storage tank sizing-changing height to meet FAA requirements, changing dimensions would change the diameter and federal safety requirements.
- Temporary impacts not sufficient for mitigation along the pipeline route.
- Out of watershed mitigation for conversion impacts not appropriate.
- Impacts from noise, dust, diesel exhaust during construction.
- Increasing the risk of wildfires.
- Landslides, steep slopes, erosion concerns.
- Improper facility siting, not following SIGTTO standards.

f) Whether the proposed fill or removal is in conformance with existing public uses of the waters and with uses designated for adjacent land in an acknowledged comprehensive plan and land use regulations;

Commented [ME4]: Commerce, navigation, fishing and recreation.

Existing Public Uses: The proposed fill and removal to construct the Jordan Cove Energy Project will impact existing public uses in and around Coos Bay. Those public uses in Coos Bay are commercial navigation, commercial and recreational fishing, tribal subsistence fishing and public recreation.

Conformance with plan and regulations: Jordan Cove states that the area where the proposed removal-fill activities are to take place is currently zoned for industrial uses or designated as available for water-dependent industrial uses under the Coos Bay Estuary Management Plan (CBEMP). Limited areas require a Post Acknowledged Plan Amendement (PAPA). Current land use compatibility statements have not been received as promised by Jordan Cove for the City of Coos Bay, City of North Bend or Coos County. Existing land use to the west is henderson marsh wetland complex. Land use to the north is BLM dunes recreational area, to the east is Roseburg Chip Facility (wood products export) industrial uses. To the south is open waters of the Coos Bay estuary underlain by State owned submerged lands. Current uses are navigation, fishing, and recreation.

[redacted]

[redacted]

g) Whether the proposed fill or removal is compatible with the acknowledged comprehensive plan and land use regulations for the area where the proposed fill or removal is to take place or can be conditioned on a future local approval to meet this criterion;

The Applicant has not provided the Department with all applicable land use compatibility statements as required.

[redacted]

h) Whether the proposed fill or removal is for stream-bank protection; and

The proposed fill or removal is not for stream-bank protection.

i) Whether the applicant has provided all practicable mitigation to reduce the adverse effects of the proposed fill or removal in the manner set forth in ORS 196.800

The Department of State Lands (DSL) requested the Oregon Department of Fish and Wildlife (ODFW) provides the following update on its ongoing technical review of the Jordan Cove Energy Project removal-fill application (DSL Application # APP0060697). These comments follow up on ODFW's original impact assessment provided as formal comment to DSL on February 3, 2019, as well as the multiple meetings and electronic correspondence between Jordan Cove LNG (the applicant), DSL, and ODFW that have occurred over the previous year.

In summary, there are some components of the Jordan Cove Energy Project removal-fill application that still do not meet the criteria and/or standards of ODFW statute and rule. Those components include:

- Fish Passage Authorizations (ORS 509.580 through .910 and OAR 635 Division 412)
- In-Water Blasting Permits (ORS 509.140)

- Avoidance, Minimization, and Mitigation of Impacts to Fish and Wildlife (ORS 496.012, ORS 496.171-182, OAR 635-415-0000 to -0025), particularly as it relates to:
- In-Water Work Windows
- Horizontal Directional Drilling
- Estuarine impacts associated with dredging and construction of the terminal
- Eelgrass mitigation plans
- Kentuck mitigation plans
- Pipeline Wetland/Waterway Mitigation.

Over the last year, the applicant has provided ODFW with several technical memoranda, maps, GIS data, and electronic correspondences that improve upon the original removal-fill application. At this time, it is difficult for ODFW to provide an updated comprehensive review when the most current information has only been provided in a piece-meal fashion. ODFW has requested that these various documents be integrated into a revised Compensatory Wetland Mitigation Plan, or perhaps organized into a few more specific topical plans (eelgrass mitigation, Kentuck Slough mitigation plan, stream/riparian restoration and mitigation plan, etc.) to help facilitate this review and to ensure the public and interested stakeholders are aware of this new information. It is ODFW's understanding that the applicant is actively preparing updated plans for the public record.

Horizontal Directional Drilling

ODFW continues to have concerns for aquatic habitat function associated with horizontal directional drilling (HDD) risks. The primary risks for aquatic habitats associated with HDD are considered to be: 1) frac-out and subsequent drilling fluid "mud" delivery to the water column; 2) drill bore site soil rutting/denigration and mobilization through precipitation to the waterway; 3) drill bore site impacts to pasture wetlands and stream-adjacent habitats.

HDD frac-outs are difficult to predict but can have significant impacts to local fish and wildlife populations depending on the time of year in which they occur. HDD risks to stream habitat function are primarily linked to the potential for frac-out, upland disturbance of soils with subsequent delivery of sediment to streams, and spills of fuels/hydraulic fluids. Release of drilling fluid ("mud") into waterways can result in heavy sediment plumes that potentially can result in embedment of spawning gravels, direct short-term reduction in the ability of fishes to pursue food items due to poor visibility, and direct impacts to gill filaments.

To address this risk, ODFW recommends that monetary bonds be retained at all the HDD sites on this project to cover mitigation costs associated with a frac-out event and the resulting fish/wildlife losses and habitat damages. The ODFW Fish and Wildlife Habitat Mitigation Policy states "the Department may recommend or require the posting of a bond, or other financial instrument acceptable to the Department, to cover the cost

of mitigation actions based on the nature, extent, and duration of the impact and/or the risk of the mitigation plan not achieving mitigation goals" (OAR 635-415-0020(6)).

HDD in Coos Bay:

In a meeting between the applicant and ODFW on January 3, 2020, the applicant noted that they will be revising the Coos Bay HDD plan to include: 1) that there will not be a need for dredging of equipment access channels to the drill bore site; 2) that the language will be adjusted in the HDD plan for the dual HDD with tie-in option. This revised written plan is necessary for ODFW to determine if the plan will sufficiently address concerns.

In the applicant's HDD plans, ODFW notes a limited number of geotech borings along the two-mile HDD line under Coos Bay. ODFW remains concerned that the frac-out risk may not have been adequately analyzed. This concern needs to be resolved prior to ODFW having enough information to determine if the proposed crossing strategy is considered a "reliable" method under OAR 635-415.

ODFW and the applicant are currently in discussions concerning the In-water work window (IWWW) timing for the Coos Bay HDD. ODFW recommends the standard October 1 to February 15 IWWW for drilling. In addition, ODFW has strongly encouraged the applicant to construct the preparatory bore site pads during drier months and to include access construction with rock base to prevent site rutting and sediment transport during wetter months. ODFW needs resolution of Coos Bay HDD construction timing prior to full assessment of the ability to meet the standards of the ODFW Fish and Wildlife Habitat Mitigation Policy.

Rogue River HDD Crossing:

ODFW is highly concerned with the potential for frac-out risk at the Rogue River HDD site. The project engineering/design plans identify the pipeline crossing for the Rogue River is at milepost 122.6. The geotech survey indicates the pipe will be 56ft below the surface of the lowest thalweg location of the Rogue River, which may provide substantive overburden protection. However, a release of drilling fluid through the riverine and streambank portions of the 4,200+ft HDD would deliver drilling fluids directly to active Rogue River flow.

This reach of the Rogue River is just downstream from Trail Creek and provides critical spawning habitat for endemic Rogue Basin spring Chinook (Oncorhynchus tshawytscha). Construction of William Jess Dam/Lost Creek Reservoir reduced the amount of spawning habitat available for spring Chinook salmon on the Rogue River. Spring Chinook spawning habitat is now limited to approximately 30 miles of the river just downstream of a barrier dam at Cole Rivers Fish Hatchery. Spring fed Big Butte Creek is the only tributary of the Rogue that is used by spawning spring Chinook on an annual basis. Because of dam construction, habitat volume is considered a limiting

factor for the population in the Rogue Spring Chinook Salmon Conservation Plan (ODFW 2007).

Surveys conducted by ODFW during 2016-2018 found that, unlike some other rivers on the west coast, the Rogue spring Chinook population maintains a strong component of fish that are homozygous for the allele(s) that determine spring migration. Introgression with fall chinook genetic material is limited. Therefore, despite the limited habitat volume described above, the Rogue River maintains a genetically healthy population of spring Chinook. This knowledge has further increased the need to protect the ecological function of habitat that remains for this important population. A mistake here could have profound consequences.

HDD risks to stream habitat function are primarily linked to the potential for frac-out, upland disturbance of soils with subsequent delivery of sediment to streams, and spills of fuels/hydraulic fluids. Various versions of PCGP design plans have reported that HDD at this location can be done with low risk. ODFW acknowledges reading that assessment from the applicant but considers the recently submitted contingency plan (implemented if a frac-out were to take place) to be inadequate to address the risk of frac-out for spring Chinook in the Rogue River.

Avoidance, Minimization, and Mitigation of Fish and Wildlife Impacts

This section outlines the remaining resource issues associated with the removal-fill application for which the applicant has not fully demonstrated its ability to avoid, minimize, and mitigate its impacts to fish and wildlife and their habitats in accordance with the state's Wildlife Policy, the Food Fish Management Policy, and the ODFW Fish and Wildlife Habitat Mitigation Policy.

Dredging Impacts to the Coos Estuary Tidal Basin:

The JCEP will include dredging and removal of unconsolidated sediment from the intertidal and subtidal zones of the Coos estuary, and the removal of sediment will have substantial impacts to aquatic habitats and species. Direct impacts to estuarine habitats associated with removal of sediment from the navigation channel (NRI Areas 1-4), construction of the vessel slip, access channel, temporary material barge berth, the material offloading facility, and rock pile apron are expected to be long-lasting and substantial. In particular, the estuarine portion of the Jordan Cove LNG Facilities would include direct impacts to about 37 ac of estuarine habitat, including 2 ac of eelgrass habitat, 13 ac of intertidal unvegetated habitat, 4 ac of shallow subtidal habitat, and 18 ac of deep subtidal habitat. The JCEP also includes extensive dredging and excavation of four submerged areas of the sub-tidal zone in Coos Bay (total 40 ac) along the Federal Navigational Channel and vessel access route to improve navigation reliability for the LNG carriers.

Unconsolidated soft-sediment habitat is widespread in the Coos estuary tidal basin where it occurs extensively throughout the intertidal zone and sub-tidal zone along the

bottoms, sides, and margins of primary and secondary tidal channels (Cortright et al., 1987; Rumrill, 2003). Soft-sediment habitats provide a series of diverse, productive, and dynamic ecological functions in the estuary, including provision of habitat and forage areas for invertebrates, fish, birds, and marine mammals, as well as serving as an important source of detritus. Soft-sediments also play an important role in the microbial and biogeochemical transformations of organic materials and nutrient cycling, and they typically serve as a sink or reservoir for the deposition of water-borne particles. Diverse communities of motile, epifaunal, and infaunal invertebrates inhabit the soft-sediments, and the communities of crabs, shrimp, amphipods, polychaete worms, copepods, hydroids, anemones, clams, and other invertebrates are specifically adapted to survive, feed, grow, and reproduce themselves in the unconsolidated sediments (Simenstad 1983; Emmett et al., 2000). Microbial activity and deposition of organic matter associated with fine-grained sediments together support a complex food web that includes multiple resident (infaunal, epifaunal, motile) and transitory (seasonal, migratory) species.

Mixed communities of shellfish, such as Dungeness crab, red rock crab, bay shrimp, gaper clams, butter clams, littleneck clams, softshell clams, cockles, and many other species are year-round residents of the intertidal and sub-tidal areas of the Coos estuary. Some of these shellfish are motile (i.e., crabs and shrimp) and periodically move to different locations or migrate through the intertidal and sub-tidal zones, while others are stationary (i.e., bivalves) and remain largely in place over the duration of their adult lives. The mixed communities of living bivalves and the beds of their non-living shells (e.g., shell rubble or shell hash) are particularly important because they function to stabilize unconsolidated sediments and provide heterogeneous habitat for numerous species of adult and juvenile fishes, crabs, shrimp, amphipods, worms, and other estuarine organisms. Moreover, filter-feeding by dense populations of living clams can sometimes play an important role in the removal of phytoplankton and smaller particulate materials, thereby decreasing turbidity and increasing light penetration through the estuarine water column. Consequently, maintenance of suitable soft-sediment habitat is essential for survival of the moderately long-lived (life-span 10-15 years or longer) gaper, butter, and cockle clams, particularly in the sub-tidal zone. When soft-sediment habitat is chronically disturbed and altered by dredging of the subtidal zone, there may be a permanent loss and impact to benthic invertebrate populations and a decline in the biodiversity of benthic communities. Loss of some or all of these sub-tidal populations of bay clams has implications for both the ecological functioning of sub-tidal habitats and the ability of the bay clams to serve as broodstock to support the recreational and commercial shellfish fisheries in Coos Bay (D'Andrea 2012).
It is expected that dredging and removal of the soft-sediments will likely have substantial and immediate local impacts on the sub-tidal populations of benthic invertebrates and shellfish, such as gaper clams, butter clams, and cockles. This may include the physical removal of the clams and their surrounding sediments, as well as a disruption of the mixed ecological communities of shellfish, mobile and infaunal invertebrates, and fish that make use of the sub-tidal habitats. The application states that dredging would directly remove benthic organisms (e.g., worms, clams, benthic shrimp, starfish, and vegetation) from the bay bottom within the access channel and

navigation channel modifications. Mobile organisms such as crabs, many shrimp, and fish could move away from the region during the process, although some will be entrained during dredging so that direct mortally or injury could occur.

JCEP acknowledges that dredging, removal, and disturbance of the soft-sediment habitats will directly remove benthic organisms from the bay bottom and estimate that recovery would occur in about one year for benthic resources particularly in the area of navigation channel modifications. The JCEP estimate of the rapid rate of community recovery is problematic, however, because the technical references cited to support the JCEP estimate are drawn from earlier investigations of dredging impacts that generally used a group small-bodied, rapidly-growing invertebrates (including amphipods, polychaete worms, small bivalves, etc. that have life-spans on the scale of months to a few years) as the focal species to provide metrics for the estimates of species and habitat recovery. These small opportunistic species are not representative of the large-bodied, long-lived bay clams that typically exhibit episodic recruitment and have life-spans on the scale of 10-20 years in the Oregon estuaries. Moreover, large-scale dredging modifications that include subsequent maintenance dredging every 5-10 years may not provide the opportunity for bay clams and other shellfish to recruit successfully and fully re-colonize after the repeated disturbance events. It is also likely that benthic food resources may also be impaired or lost for other estuarine species (i.e., forage fish, salmonids, crab) as a result of dredging actions. Consequently, dredging activities that significantly disturb and/or remove the mixed communities of long-lived bay clams from soft-sediment habitat in the sub-tidal zones of Coos Bay are expected to have longer-term impacts that extend well beyond a time period of many years.

The JCEP also includes dredging of four submerged areas (NRI Areas 1-4; removing about 700,000 cubic yards of material) that are located adjacent to the existing federally-authorized Coos Bay Navigation Channel. In particular, the JCEP will include dredging of four submerged areas that directly abut the current boundary of the Navigation Channel between RM 2 to RM 7. These dredging activities will modify and alter the physical morphology of the Navigation Channel by widening four turns to allow for more efficient transit of LNG carriers.

It is likely that dredging of the four submerged areas (NRI Areas 1-4) will have indirect impacts to side slopes and soft sediment habitats located adjacent and in close proximity to the dredged areas. For example, the JCEP will include significant dredging and removal of unconsolidated sediment from NRI Area 2 (RM 4.5), NRI Area 3 (RM 6), and NRI Area 4 (RM 7), coupled with erosion of sediment from the adjacent subtidal and intertidal areas. Technical review by the U.S. Army Corps of Engineers indicates that the banks of the dredged areas are intended to be stable, and that side slope equilibration may occur over about a 6-year period. Loss of sediment from these immediately adjacent areas, however, will likely be substantial (i.e., loss of 1-2 ft (30-60 cm) in depth over the first 3 years). Loss of the upper 30-60 cm of sediment from the side slopes located adjacent to the NRI dredged areas during the equilibration process is certainly not insignificant and may result in further impacts and loss of eelgrass, infaunal invertebrates, and degradation of the habitat for shellfish and fish. Loss of the

upper 30-60 cm of sediment from the side slope of NRI Area 4 is particularly alarming, because this side slope is located in the immediate vicinity of the important eelgrass donor bed and eelgrass reference bed identified as essential components of the proposed JCEP eelgrass mitigation activities. Potential loss or disturbance of the eelgrass donor bed and eelgrass reference area in the vicinity of NRI Area 4 puts the proposed JCEP eelgrass mitigation plan in jeopardy. The JCEP Eelgrass Mitigation Plan does not adequately address the potential for loss of sediment adjacent to NRI Areas 2-4 and does not give adequate consideration to loss or disturbance of the important eelgrass donor bed and reference bed located adjacent to NRI Area 4.

Construction of the Marine Terminal – Indirect Effects to Eelgrass Beds:

The JCEP project includes dredging and construction of a new access channel to connect the JCEP LNG Terminal to the Federal Navigation Channel at about RM 7.3. The access channel will be about 700 feet in length, and about 2,200 feet wide at confluence with the Navigation Channel, and about 780 feet wide at the Terminal. The access channel would be approximately 45 feet deep and would cover about 22 acres below the highest measured tide elevation of 10.3 feet (NAVD88). The proposed JCEP dredging activities will permanently destroy about 2 ac of established native eelgrass located in the intertidal and shallow subtidal zones of the Project area. Dredging in the intertidal and shallow subtidal zones within the JCEP area is expected to have significant deleterious effects on native eelgrass habitats and the species found therein. In addition to the direct removal of eelgrass at the JCEP dredging sites, it is likely that dredging operations carried out to implement the JCEP may also result in indirect impacts to adjacent eelgrass beds located in the vicinity of the JCEP area. For example, nearby eelgrass beds will likely experience periods of increased turbidity, sedimentation, and attenuated light levels resulting from dredging during construction and during subsequent periods of maintenance dredging. In this regard, the indirect effects of the JCEP to adjacent eelgrass beds have not been adequately addressed by the JCEP Comprehensive Wetland Mitigation Plan.

Eelgrass Mitigation Plan:

In order to offset the loss of 2 ac of eelgrass the JCEP includes a proposed eelgrass mitigation plan that relies on the "best case scenario" for full success by creating 6 ac of eelgrass (3:1 ratio) within a 9 ac site in the intertidal zone near the impact area. ODFW has noted several potential problematic issues associated with the proposed JCEP eelgrass mitigation plan that have not been fully considered and addressed by the applicant.

ODFW is concerned that the excavated JCEP mitigation basin may refill with sediment, and that the rate of sedimentation may not be conducive to survival, growth, and propagation of the planted eelgrass plants. For example, Mills and Fonseca (2003) conducted a series of field experiments to determine the susceptibility of eelgrass (Zostera marina) to burial by estuarine sediments. Results from the study demonstrate that eelgrass plants experience an increased likelihood of mortality and decreased

productivity under burial conditions, and that the threshold level of burial tolerance for Z. marina is extremely low. Burial of eelgrass to depths as low as 25% of the aboveground plant height (4 cm) substantially increase mortality of eelgrass, causing death of >75% of the plants. Moreover, the probability of eelgrass mortality reached 100% for burial depths of 50% (8 cm) to 75% (12 cm) of plant height, depending on the types of sediment (e.g., sand, silt, combined) in which the plants were buried. These empirical observations indicate that eelgrass can only tolerate rapid sedimentation events that cover less than half of its photosynthetic surfaces, and that small levels of rapid sedimentation are detrimental to survival of Z. marina.

Earlier research (Thom et al. 2018) has shown that eelgrass beds are typically limited by the availability of proper substrata, light, heat stress, and desiccation. Survival of the transplanted eelgrass within the excavated JCEP eelgrass mitigation site will be dependent upon several ecological factors, including characteristics of the excavated sediment, sedimentation rate, erosion, light availability, nutrient availability, grazing upon seeds, seedlings, and blades, and a suite of inherent physical factors (i.e., current velocities, wind fetch, slope, depth, seawater temperature, air temperature, humidity, desiccation, etc.). The proposed mitigation actions for eelgrass should be designed to retain the full array of ecosystem services provided by eelgrass beds in the JCEP area, and to achieve no-net loss of eelgrass over the entire lifespan of the JCEP operation in Coos Bay. In this regard, the planned mitigation activities should follow established in-kind, in-proximity standards established by the state of Oregon and require long-term monitoring and remedial replanting of eelgrass as needed to compensate for losses that may occur over the entire lifespan of the Project.

The applicant proposes to remove existing eelgrass in the Project area and to offset the loss of eelgrass habitat by excavation of an eelgrass mitigation area coupled with replanting of eelgrass taken from a nearby donor bed. The applicant proposes to monitor the effectiveness of the replanting effort for a period of only five years. It is important to note that failure of eelgrass replanting efforts is common in the Pacific northwest region (Thom et al., 2008), and that five years is an insufficiently short time period to adequately evaluate long-term mitigation success.

The applicant does not demonstrate that serious consideration has been given to avoidance of impacts to eelgrass beds. In a December 11, 2019 meeting with DSL, ODFW, and the US Army Corps of Engineers, the applicant reviewed a draft alternatives analysis that considered alternative sites for eelgrass transplant. ODFW has raised additional alternatives to the applicant since that meeting. However, a more thorough alternatives analysis has not been provided nor has the Compensatory Wetland Mitigation Plan been updated to include the December 2019 analysis. ODFW recommends a more detailed analysis of eelgrass mitigation sites that characterize the location, species composition, and abundance of the eelgrass and other submerged aquatic vegetation at the alternative sites and provide a more detailed rationale for rejection of the alternative sites and acceptance of the proposed site. The existing JCEP Mitigation Plan is incomplete because it does not provide a full description of the steps that were taken to avoid adverse impacts to existing eelgrass beds in Coos Bay.

Earlier attempts to mitigate for the damage or loss of eelgrass beds have met with limited success in Pacific Northwest estuaries. For example, Thom et al. (2008) conducted a review of 14 eelgrass mitigation and transplant projects. They concluded that it is sometimes possible to restore eelgrass under favorable site conditions and when the reason for the initial loss of eelgrass is understood and corrected. The authors also noted, however, that eelgrass restoration science is hampered by knowledge gaps, which reduce restoration success. The underlying mechanisms for recent eelgrass loss in the Pacific Northwest region are not obvious, which suggests that the scientific understanding of eelgrass biology and ecosystem conditions is currently inadequate to fully support environmental management actions (Thom et al. 2008).

Local complexities in hydrologic flow regimes are known to affect potential for success in eelgrass restoration efforts. These local complexities include considerations of the following:

- Habitat conditions created through excavation or filling are often ephemeral and subject to subsequent deposition/erosion that results in movement of conditions outside of the range of preferred variability for eelgrass.
- Flow regimes including severity of wave action and current speed contribute to the potential success of a site for eelgrass establishment and growth. Sites that are created through excavation or fill are an artificial modification of conditions that have formed through the geomorphological features that drive flow regimes. Factors such as water depth reflect deposition/erosion rates from water transported sediments. Excavation or filling to a specific elevation is attempting to alter the natural elevation conditions in relation to hydrologic conditions for many sites that might serve as potential mitigation. Consequently, the potential for success is limited for projects that modify water depth/elevation of the substrates for creating conditions appropriate for eelgrass mitigation unless the site chosen has substrate elevation that has been artificially created from previous disturbance or the conditions are dominated by factors other than hydrology.
- Use of eelgrass sites immediately adjacent to or within the mitigation area for obtaining plants/shoots results in impacts to these locations, potentially weakening the vigor of eelgrass at these locations, which is counter to goals.
- Excavation of locations adjacent to existing eelgrass beds can result in hydrologic changes such as erosion of surrounding substrates resulting in impacts to currently productive stands.
- The monitoring plan should be amended to include more robust methods such as diver or low tide visual count surveys with established known planting densities at time-0 and subsequent measurable surveys with quantifiable methods.
- Due to the potential for minimal success the eelgrass mitigation ratio is likely insufficient to offset impacts at the JCEP project impact location.

For all the reasons listed in the discussion above, ODFW recommends the eelgrass mitigation strategies be re-evaluated to favor avoidance.

Unresolved Issues related to Sedimentation, Hydrodynamic Connection of the Eelgrass Mitigation Site, Adaptive Management Plan, and Proposed Mitigation Ratio:

The applicant has generated several new technical reports and documents related to JCEP's development of a Compensatory Wetland Mitigation Plan and an Eelgrass Mitigation Site to offset impacts to eelgrass habitat from the construction and operation of the JCEP LNG terminal. The proposed project components include re-contouring of an existing un-vegetated sandbar located near the end of the airport runway to create an area of optimal eelgrass habitat, and then transplanting eelgrass from an adjacent donor site into the mitigation area.

ODFW has identified several issues regarding eelgrass impacts and mitigation raised by the proposed JCEP, including characterization of permanent and transitory impacts to existing eelgrass, and shortcomings inherent in the proposed Eelgrass Mitigation Plan. The most recent (2018) JCEP eelgrass surveys indicate that construction of the Access Channel and Rock Apron will result in displacement of 2.26 acres of eelgrass. This estimate is consistent with the JCEP application which identifies "anticipated impacts to at least 2.3 acres of eelgrass habitat in the Coos Bay estuary from the Jordan Cove LNG Project" but inconsistent with the FERC FEIS which identified impacts to only 2 ac of eelgrass.

The JCEP Project description identifies permanent removal of eelgrass associated with dredging and excavation of the access channel that will be constructed to provide ship access to the LNG terminal. Eelgrass beds that currently inhabit the intertidal and subtidal zones in the area of the proposed access channel will be dug up, salvaged and relocated into the intertidal zone at the Jordan Cove Embayment site.

It is not clear why eelgrass plants that currently inhabit the intertidal and subtidal zones (+2.0 to -10.0 ft MLLW) at the access channel site will be transplanted only into the intertidal zone at an elevation of +1.3 and -2.0 ft MLLW. The eelgrass plants salvaged from the intertidal zone will occupy a similar tidal elevation at the transplant site, whereas eelgrass plants that occupy the subtidal zone (where they are constantly submerged) will be placed into a new environment characterized by periodic exposure to air and desiccation. The proposed mismatch in tidal elevation between eelgrass plants harvested from the access channel site (intertidal and subtidal) and the Jordan Cove transplant site (intertidal only) provides evidence that the transplants may face a high likelihood for failure.

The JCEP Project Description proposes to excavate an existing sandy shoal located near the end of the North Bend airport runway to serve as an Eelgrass Mitigation Site. Specifically, the JCEP proposal is to "reduce and re-contour a 9.34-acre area of the intertidal shoal down to an average depth of 1.0 to -2.0 ft NAVD 88 (-0.28 to -1.28 ft

MLLW) to create 6.78 acres of optimal eelgrass habitat." The existing sandy shoal currently has an elevation in the intertidal zone that reaches about +2.7 ft MLLW, so the excavation will reduce the tidal elevation by about 1.7 to 4.7 ft and remove about 0.04 million cubic yards (MCY) of the shoal material to create the shallow tidal basin that will serve as the mitigation area. The proposal is to re-contour the shoal material and create 6.78 acres of "Optimal Eelgrass Habitat" at a tidal elevation of -0.28 to -1.28 ft MLLW. The rationale for designation of the narrow tidal range of -0.28 to -1.28 ft MLLW as optimal eelgrass habitat is poorly developed. More specifically, Thom et al. (2003) shows that eelgrass clearly occupies a more extended tidal range of +3.0 to -1.6 ft MLLW in Coos Bay. The rationale provided by JCEP for designation of only a portion of the tidal elevation range as "optimal" for eelgrass at the proposed mitigation site is not clear.

The JCEP project description states that "an evaluation of both eelgrass distribution and depth indicates that the principal limiting factor for eelgrass in the general vicinity of the Eelgrass Mitigation Site is elevation." However, JCEP fails to point out that eelgrass can (and does) currently exist in Coos Bay at sites that have a tidal elevation of +2.7 ft MLLW, and that eelgrass is largely missing from the sandy shoal habitat at this tidal elevation at the proposed Eelgrass Mitigation Site. Earlier research (Thom et al. 2018) has shown that eelgrass beds are typically limited by the availability of proper substrata, light, heat stress, and desiccation. The virtual absence of eelgrass currently at the proposed Eelgrass Mitigation Site is likely due to a combination of ecological factors other than simply tidal elevation.

The JCEP includes excavation of about 0.04 million cubic yards (MCY) of the shoal material to create a shallow circular tidal basin that will retain estuarine water and serve as the primary site for eelgrass mitigation activities. Concern has been repeatedly raised about the likelihood for poor water quality conditions (including low dissolved oxygen concentrations and elevated temperature) and trapping of decaying drift algae and other organic materials within the shallow excavated basin. JCEP does not provide any technical analysis nor rationale for the shape of the shallow excavated tidal basin, nor any explanation about the time frame that is expected for the newly excavated basin to re-fill with sediments. It will be beneficial for the excavated mitigation basin to include channels that have a substantial hydrodynamic connection to the primary tidal channel in an effort to enhance tidal flushing and help ensure adequate water quality conditions to support eelgrass, invertebrates, and fish within the excavated basin.

The proposed eelgrass mitigation site should be designed to include a functional hydrodynamic connection to the primary tidal channel. The supplementary technical report generated by JCEP (Section 3.2.2; page 18) indicates that "the proposed grading boundary of the Site may be re-contoured from the current design to allow drainage from the Site so it does not become a shallow bowl that retains water at minus low tides." However, the proposed short channel (excavated at -1.3 ft MLLW) that extends to deeper water is not clearly identified, and further clarification is needed to illustrate the expected directional pathways for water, sediment, and debris to enter and exit the excavated mitigation basin during flood and ebb tides. It is not clear at this point where

the short channel will be located, and whether the short channel will persist over time at the project site. Bathymetry maps should be revised and updated for the proposed JCEP Eelgrass Mitigation Site to include the "short channel" at -1.3 ft MLLW to make a hydrodynamic connection to adjacent channels to improve flushing of the excavated shallow basin.

ODFW is concerned that the excavated JCEP mitigation basin may refill with sediment, and that the rate of sedimentation may not be conducive to survival, growth, and propagation of the planted eelgrass plants. For example, Mills and Fonseca (2003) conducted a series of field experiments to determine the susceptibility of eelgrass (Zostera marina) to burial by estuarine sediments. Results from the study demonstrate that eelgrass plants experience an increased likelihood of mortality and decreased productivity under burial conditions, and that the threshold level of burial tolerance for Z. marina is extremely low. Burial of eelgrass to depths as low as 25% of the aboveground plant height (4 cm) substantially increase mortality of eelgrass, causing death of >75% of the plants. Moreover, the probability of eelgrass mortality reached 100% for burial depths of 50% (8 cm) to 75% (12 cm) of plant height, depending on the types of sediment (e.g., sand, silt, combined) in which the plants were buried. These empirical observations indicate that eelgrass can only tolerate rapid sedimentation events that cover less than half of its photosynthetic surfaces, and that small levels of rapid sedimentation are detrimental to survival of Z. marina.

The methods proposed by the applicant to detect sedimentation within the excavated mitigation basin have a coarse depth resolution of + 4 inches (10 cm). These proposed methods are insufficient to detect the finer-scale measurement of local sedimentation (i.e., 2-4 cm) that can result in damage and loss of eelgrass plants.

Existing sediments at the sandy shoal that is proposed for excavation at the Eelgrass Mitigation Site currently consist of medium to coarse sand, and the site is characterized by wind chop during high tides. The JCEP includes excavation of about 0.04 million cubic yards (MCY) of the intertidal shoal material down to an average depth of -0.28 to -1.28 ft MLLW to create the 6.78 ac shallow tidal basin. The project description, however, does not include a detailed description or characterization of the underlying sediments that will be exposed by the dredging and excavation work. The characteristics of the underlying sediment are important, because these underlying sediments will provide the foundation for transplanted eelgrass plants. It is likely that the characteristics of the underlying sediment differ substantially from the surface sediment, and that the underlying sediment may be compacted and anaerobic with relatively little interstitial space for the establishment of eelgrass roots/rhizomes and the movement of water. These expected characteristics of the underlying sediment are not conducive to survival and growth of the transplanted eelgrass. The project description points out that the dredging work and excavation will occur about 1-year before transplants of eelgrass from a donor area, and it is expected that the excavated tidal basin will naturally receive transported sediment from the greater Coos estuary. Moreover, the expected rate of sediment accretion is not identified by the JCEP Project Description, nor the time frame when the excavated tidal basin is expected to fill with transported sediment. Further

technical analysis is required to characterize the underlying sediments and to identify the rate of sediment accretion that is expected within the excavated eelgrass mitigation site.

The JCEP should include establishment of a series of experimental test plots to determine the likelihood of success for eelgrass plants transplanted into the excavated Eelgrass Mitigation Site. These replicated test plots should be constructed in a manner that mimics the excavated elevations within the proposed shallow tidal basin and should also be carried out in a manner to evaluate the success/failure of the proposed transplant techniques. The test plots should be established 1-2 years in advance of the excavation and dredging activities and should be evaluated on a quarterly basis to determine standard metrics for the survival, growth, cluster coalescence, and seed production by the eelgrass plants. For example, Thom et al. (2018) recently used test plantings as one of several criteria to evaluate the likelihood for success at numerous potential eelgrass restoration sites in Puget Sound. Results and information derived from the test plots indicated that fine-scale data are needed to improve the predictive capability of proposed restoration, enhancement, and mitigation activities. The technical approach outlined by Thom et al. (2018) provides a clear roadmap and analytical process to identify and evaluate potential eelgrass mitigation sites and increase the overall likelihood for project success.

The JCEP monitoring activities and adaptive management plan make progress toward identification of contingencies that may be encountered if the transplanted eelgrass fails to become established or fails to grow and expand as expected over the timeframe for the Project. The adaptive management plan, however, has not yet identified a series of quantitative thresholds or metrics for sedimentation rates that will be used to trigger corrective or remedial adaptive management actions (such as re-planting, re-dredging, or abandonment of the excavated site). In addition, JCEP has not yet identified a suitable alternate site located elsewhere in Coos Bay that can be used for the mitigation work if the primary eelgrass mitigation basin becomes unworkable.

ODFW recognizes that the ODSL mitigation ratio must be at 1.5:1 for creation of a new eelgrass bed at the proposed JCEP eelgrass mitigation site. However, the transplanting of eelgrass proposed by JCEP only achieves a mitigation ratio of 1:1, which is insufficient to meet ODSL standards. The Applicant predicts that the transplanted eelgrass will survive, grow, and expand over a period of five years to fill out the excavated basin in order to achieve the required mitigation ratio of 1.5:1. The expectation by JCEP for the transplanted eelgrass to flourish has a great deal of uncertainty, and optimism by the applicant should not be considered as a guarantee to meet DSL's required mitigation ratio.

ODFW recommends that the applicant increase the spatial extent of eelgrass transplants to achieve the mitigation ratio of 1.5:1 at the initiation of the planting (time-zero) rather proceed with the expectation that the required ration will be met after a period of five years. The Applicant will not meet the ODSL mitigation policy standards unless the transplant activities begin with a ratio of 1.5:1.

Kentuck Slough Mitigation Plan:

ODFW has requested, but has not yet received, a long-term management plan for the Kentuck mitigation site, including:

- Long-term protection and stewardship strategies to ensure the mitigation site will be durable for the life of the project's impacts
- Long-term water management strategies for the Kentuck Creek water control structure.

Without this information, ODFW does not consider the Compensatory Wetland Mitigation Plan complete, in accordance with the ODFW Fish and Wildlife Habitat Mitigation Policy.

The applicant has verbally committed to redesigning the Kentuck mitigation elevation plan to develop additional acreage that will be below elevation +5.5 NAVDD88 (the elevation threshold for saltmarsh development) on the site. This will offset loss of Category-2 Algae/Mud/Sand habitats that will be dredged and regraded at the eelgrass mitigation site south of the North Bend Airport runway. The exact acreage (6.81 acres + slope area) of grading/dredging at the eelgrass location has of yet not been finalized. ODFW will need updated Kentuck mitigation design plans and a complete eelgrass site dredging/grading plan in order to determine if the loss of the Category-2 Algae/Mud/Sand will be offset. ODFW recommends that the applicant include this information in a revised Compensatory Wetland Mitigation Plan.

The Kentuck site is slated for disposal of 300,000 cubic-yards of dredge spoils from development of the JCEP access channel. ODFW will need to understand where fill proposed to be disposed of at Kentuck will be relocated in order to allow the Kentuck grading plan to produce the additional acres below elevation +5.5ft. There will also be a need to update the grading and erosion control plans for both the eelgrass mitigation site and Kentuck Mitigation site, which may have additional or different impacts to fish and wildlife.

Pipeline Mitigation, Generally:

ODFW has reviewed the applicant's Comprehensive Mitigation Plan (submitted to the FERC Docket in September 2019; also see the FERC FEIS Sections 2.1.4 and 2.1.5), the proposed mitigation for permanent impacts to streams and riparian habitats impacted by the pipeline. ODFW does not find the proposed mitigation meets the Fish and Wildlife Habitat Mitigation Policy's goal of no net loss of fish and wildlife habitat. Also, the mitigation actions are almost entirely on U.S. Forest Service (USFS) and Bureau of Land Management (BLM) lands even though impacts will also occur on private lands. While ownership is not necessarily a requirement in the ODFW Fish and Wildlife Habitat Mitigation Policy, having mitigation be in-kind and in-proximity to the impacts are standards of the policy.

For a fuller discussion of ODFW's concerns, please see ODFW's recent Protest of the BLM Proposed RMP Amendments (DOI-BLM-ORWA-M000-2017-0007-EIS) dated December 20, 2019 and Protest of the USFS Proposed Forest Plan Amendments (#28132) to the Umpqua, Rogue River-Siskiyou, and Fremont-Winema National Forests dated January 6, 2020. Both of these protests have been provided as attachments to this letter, for your reference.

Since the project's inception, ODFW has recommended the applicant crosswalk the federal land compensatory mitigation plans with the standards in the ODFW mitigation policy to ultimately ensure that fish and wildlife impacts are avoided, minimized, and mitigated across all land ownerships (see ODFW's comments on page 80 of Oregon State Agency Comments on FERC's Draft Environmental Impact Statement for Docket Nos. CP-17-494-000 and CP17-495-000 dated July 3, 2019). As of the date of this letter, this crosswalk has not been included in the FEIS or in the DSL removal-fill application. Therefore, ODFW does not have the information it needs to ensure the project's impacts will be offset to the standards of its Fish and Wildlife Habitat Mitigation Policy.

Freshwater wetland impacts:

ODFW has been reviewing the GIS files provided by the PCGP consultant for pipeline permanent and temporary impacts to freshwater wetland habitats. The specific impact acreages by type of wetland and ODFW Habitat Category have not been incorporated into the Compensatory Wetland Mitigation Plan, nor has the plan been assessed for its consistency with the ODFW Fish and Habitat Mitigation Policy. ODFW acknowledges that permanent impacts will result in a limited quantity of permanent impacts (0.91) acres. However, ODFW has substantive concern with temporal loss of function for the 112.19 acres of freshwater wetland that will be heavily damaged and then addressed through revegetation measures outlined in the applicant's Erosion Control and Revegetation Plan. It is ODFW's opinion that recovery of the functions and values in many of these freshwater wetland habitats will likely require 5 to 7 years, which is beyond DSL's 24-month definition of 'temporary' and is deserving of additional compensatory mitigation to address temporal loss of habitat for fish and wildlife.

Stream/riparian impacts:

The pipeline will cross 155 perennial streams. The pipeline right-of-way will impact a 75-foot wide corridor through riparian habitats. The excavation of the trench to install the 36" pipe will result in direct stream channel impacts at least 20 feet in width and bank to bank. A number of these stream locations are Essential Salmonid Habitat. Stream habitats often require several years post-disturbance for the channel bed, banks, and upslope to stabilize and recover at least minimal function. Normally in stream channel restoration projects, a minimum of three to five years is often needed moderate function recovery. It is ODFW's understanding that the applicant is developing Stream Function Assessment Method (SFAM) information for stream crossings. However, ODFW has not

yet received this information and therefore cannot determine whether or how this information might affect mitigation plans.

ODFW has noted that the PCGP applicant has not developed a plan to address:

- The temporal loss of function to aquatic habitats and associated riparian forest (see ODFW Protest of BLM and USFS Plan Amendments, cited above and attached to this letter).
- Consistency with the habitat categories and mitigation standards of the ODFW Fish and Wildlife Habitat Mitigation Policy,
- SFAM evaluations for each crossing and how that might change compensatory mitigation,
- Large Woody Debris that adequately offsets impacts. The PCGP Large Woody Debris Plan (included in the September 2019 Comprehensive Mitigation Plan) documented that up to four pieces of LWD will be placed where streams are rebuilt after trenching and installation of the 36" pipe. This is considered inadequate for restorative uplift to replace lost function (see ODFW protest of the BLM RMPA).
- Specific mitigation proposals previously submitted by ODFW. There were several mitigation proposals submitted in 2015 by ODFW local and headquarters staff that specifically address offsetting impacts of the Project to stream and riparian habitats. These were resubmitted in the July 3, 2019 State of Oregon Comments on the 2019 FERC DEIS.

Department Determinations.

a) Had independent utility;

The Port has proposed a long-term project to improve the Port's facilities and allow larger vessels to utilize the Port's facilities. It will also allow the Port to expand its capabilities and attract new business to the area. However, the Port's channel expansion project is not required for the LNG Terminal JCEP proposes to construct and operate. Furthermore, the independent utility of the Project is acknowledged by the U.S. Coast Guard (USCG) letter of authorization, dated November 7, 2018, which supports the Applicants' position that the Project does not require further Port modification or expansion

b) Is consistent with the protection, conservation and best use of the water resources of this state as specified in ORS 196.600 to 196.990; and

c) Would not unreasonably interfere with the paramount policy of this state to preserve the use of its waters for navigation, fishing and public recreation.