Public Comments on the Jordan Cove LNG Terminal and Pacific Connector Pipeline Project, Section 404/10/103 Permit Application NWP-2012-441 / Oregon DSL No. 54484-RF, 54908-RF

Submitted to the Oregon Department of Environmental Quality
On Behalf of:

Oregon Shores Conservation Coalition
Western Environmental Law Center
Center for Biological Diversity
Oregon Coast Alliance
Cascadia Wildlands
Citizens Against LNG
Rogue Riverkeeper
Landowners United
Bob Barker
Oregon Wild
Rogue Flyfishers
Klamath Riverkeeper
KS Wild
350 Eugene
South Umpqua Rural Community Partnership
Food & Water Watch
Northwest Environmental Defense Center
Friends of Living Oregon Waters
Columbia Riverkeeper
Umpqua Watersheds
Waterkeeper Alliance
Pacific Coast Federation of Fishermen's Associations
Institute for Fisheries Resources
Sierra Club
Oregon Council Trout Unlimited
Rogue Climate
Pipeline Awareness Southern Oregon

March 13, 2015

TABLE OF CONTENTS

CRAG LAW CENTER

917 SW Oak St.
Suite 417
Portland, OR
97205

Tel:
503.525.2724

Fax:
503.296.5454

Web:
www.crag.org

Courtney Johnson
Staff Attorney
courtney@crag.org

March 13, 2015

Oregon Department of Environmental Quality
Attn: Chris Stine, 401 Water Quality Project Manager
Eugene Office
165 E 7th Avenue, Suite 100
Eugene, Oregon 97401

Comments submitted electronically to 401publiccomments@deq.state.or.us

U.S. Army Corps of Engineers
Mr. Tyler J. Krug
North Bend Field Office
2201 N. Broadway Suite C
North Bend, Oregon 97459-2372

Comments submitted electronically to NWP-2012-441@usace.army.mil

Department of Land Conservation and Development
635 Capital Street NE, Suite 150
Salem, Oregon 97301-2540

Comments submitted electronically to coast.permits@state.or.us

Re: NWP-2012-441 – Public Comment / Oregon DSL No. 54484-RF, 54908-RF

Please accept these comments on behalf of Oregon Shores Conservation Coalition, Western Environmental Law Center, Center for Biological Diversity, Oregon Coast Alliance, Bob Barker, Cascadia Wildlands, Citizens Against LNG, Rogue Riverkeeper, Landowners United, Oregon Wild, Rogue Flyfishers, Klamath Riverkeeper, KS Wild, 350 Eugene, South Umpqua Rural Community Partnership, Food & Water Watch, Northwest Environmental Defense Center, Friends of Living Oregon Waters (FLOW), Columbia Riverkeeper, Umpqua Watersheds Inc, Waterkeeper Alliance, Pacific Coast Federation of Fishermen's Associations, Institute for Fisheries Resources, Sierra Club, Oregon Council Trout Unlimited, Rogue Climate, and Pipeline Awareness Southern Oregon (the Coalition). Each organization has members who would be harmed by the proposed Jordan Cove LNG terminal and/or the Pacific Connector Pipeline. Each individual would also be harmed by construction and operation of the terminal and/or the pipeline. Members of the coalition have been recognized as parties to the proceeding and have submitted lengthy detailed comments on the 2008 Draft Environmental Impact Statement ("2008 DEIS"), 2009 Final Environmental Impact Statement ("2009 FEIS"), local land use proceedings in Douglas and Coos Counties, and have submitted oral and written testimony at hearings on the proposed project.

Members of the coalition submitted comments on the current 2014 Draft Environmental Impact Statement ("2014 DEIS") and comments on this JPA to the Army Corps of Engineers (the Corps), and the Oregon Department of Land Conservation and Development (DLCD) on January 12, 2015. Along with the following comments, Oregon Department of Environmental Quality (ODEQ), the Corps and DLCD must also consider the issues raised in each of these previous submissions, including the voluminous DEIS and FEIS comments and subsequent letters to the Federal Energy Regulatory Commission ("FERC") which we incorporate by reference in their entirety.

These comments respond to the ODEQ deadline for public comment of March 13, 2015, and supplement the Coalition's initial public comments submitted to the Corps and DLCD that were submitted on January 12, 2015. These comments address in further detail compliance with state water quality standards under the Clean Water Act section 401.

Introduction

The current application (NWP-2012-441) revises and replaces the prior application (NWP-2007-855/NWP-2008-592) submitted by Jordan Cove Energy Project and Pacific Connector. The primary difference between the two projects is the change from a Liquefied Natural Gas (LNG) import terminal to an export terminal.

These comments reference the 2014 Draft Environmental Impact Statement ("DEIS") prepared by FERC for Jordan Cove because it is the most comprehensive document describing the proposal, though it falls far short of adequacy. Many of the original FERC application documents have since been updated and amended. In addition, Jordan Cove has provided the Corps with updates to the JPA including supplemental information, while it appears that Pacific Connector has not provided any additional or supplemental information since the October 2013 application. The multitude of documents and cross-references to documents long since updated is confusing for the public, and makes meaningful public input exceedingly difficult and time consuming. The public is understandably confused by the many contradictory statements in the DEIS, subsequent filings to FERC, the applicants' testimony at public meetings, and the joint application discussed here. Before ODEQ can consider the 401 application complete, the agency should require that the applicant provide a comprehensive application, including all of the most recent data, plans, maps and routing information, and addressing the serious concerns expressed by the affected communities, local, state and federal agencies.

In addition to the significant alteration of the purpose of the project from import to export of natural gas, the current applicant alters several important elements of the project proposal. These changes include but are not limited to the following:

- Increase in number of LNG vessels from 80 per year to 90 per year;
- Addition of the 420-megawatt South Dunes Power Plant;
- New 1-mile, 150-foot wide utility corridor between South Dunes and terminal;
- New barge dock;
- Addition of 4 liquefaction trains to replace 6 vaporizers;
- Addition of refrigerant storage and resupply system;

- Redesign of control and administration buildings;
- New temporary work areas;
- Relocation of industrial wastewater line and raw water line;
- Addition of temporary workers camp in North Bend;
- Addition of the 8-acre Southwest Oregon Regional Safety Center; and
- Major pipeline route realignments and associated meter and compressor station changes.

Many of these changes result in additional and significant impacts to wetlands and waters of Oregon and the United States. The applicants propose to dredge 5.65 million cubic yards of sediment across 53 acres of the Coos Bay estuary for the purpose of constructing a liquefied natural gas export terminal, slip dock and turning basin for the LNG tankers. The DEIS states that 38.0 acres of wetlands would be affected by the construction of the LNG terminal and facilities, with 35.6 acres permanently affected during operations. DEIS at 4-407. The project would cause a permanent loss of habitat due to maintenance dredging. Maintenance dredging will remove an additional 360,000 cubic yards during the first 10 years of the terminal operation, and 330,000 cubic yards of sediment during the second 10 years.

The applicants also propose to construct a 232-mile, 36-inch high-pressured gas pipeline through Coos Bay, crossing and permanently impairing streams, wetlands, and sloughs, along with causing associated deleterious impacts to upland habitat, forest, farm, recreational, and residential uses. The pipeline would cross 400 waterbodies (RR2 at 6), require clear cutting of 1,013[1] acres of the remaining old growth forests in Oregon, cross steep and remote terrain prone to landslides where emergency response is limited to local volunteers, and impact and permanently impair approximately 5,938 acres of state, federal and privately owned lands. DEIS at 4-448. The DEIS states that the Pacific Connector Gas Pipeline (PCGP) would cross approximately 11.6 miles of wetlands. DEIS at 4-412. The Joint Permit Application ("JPA") states that the PCGP would cross approximately 11.64 miles of wetlands, impacting approximately 239 acres of wetlands. Resource Report 2 at 70. The JPA also states that 87,454.19 cubic yards of material will be excavated from wetlands, and 39,117.61 cubic yards of material from waters, for a total of 126,571.80 cubic yards to be excavated along the pipeline route. According to the JPA, 660 features of potentially jurisdictional wetlands and other waters were identified within the project corridor. Resource Report 2 (Table 2A-3 of Appendix 2). The DEIS states that approximately 239 acres of wetlands will be disturbed during construction of the project. DEIS Appendix N, Table N-1b at N-67.

These comments identify multiple inadequacies in the JPA and DEIS, including:

- The JPA lacks essential information;
- The proposed action would cause or contribute to violations of Oregon state water quality standards including the antidegradation policy;
- The application fails to incorporate practicable steps that will minimize potential adverse impacts of the discharge on the aquatic ecosystem; and,
- The JPA fails to adequately identify and address adverse direct, indirect, and cumulative impacts from the project.

[1] This includes 858 acres of construction-related clearing and 155 acres of operation-related clearing. DEIS at 4-456.

Even in the absence of critical information regarding the project's activities, overall, it appears that the project would cause violations of Oregon's water quality standards. The Coalition is particularly concerned about the impacts of the following project activities:

- **Thermal impacts of vessel discharge water** based on evidence of actual and expected temperature of those discharges and number of vessels;
- **Cumulative thermal impacts of vegetation removal** along the pipeline right of way and work areas;
- Risk of **frac-out** from horizontal directional drilling waterway crossings;
- **Re-suspension of contaminants**, bacteria, and other pollutants from dredging, particularly **in Haynes Inlet**;
- Significant **alteration of the benthic habitat** in Coos Bay;
- Source **withdrawal and discharge of hydrostatic testing water** along the pipeline route;
- **Short and long term contribution of turbidity** and sediments to waterways from crossings and pipeline right of way construction and maintenance;
- **Mobilization of elemental and legacy mercury** from sediments and streambeds during construction and maintenance of the project;
- Risk of **landslides along the pipeline route** as a result of project activities and their impact to water quality; and
- **Release of toxics** from contaminated site locations to waters of the Coos Bay estuary and the Klamath River.

Finally, the environmental, economic, and social harms of the LNG terminal and pipeline clearly outweigh any benefit of this proposal.

Clean Water Act Requirements

The purpose of the Clean Water Act ("CWA"), 33 U.S.C. §1251 *et seq*., is to restore and maintain the chemical, physical, and biological integrity of waters of the United States. Under Section 401 of the Clean Water Act:

> (1) Any applicant for a Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters, shall provide the licensing or permitting agency a certification from the State in which the discharge originates or will originate, or, if appropriate, from the interstate water pollution control agency having jurisdiction over the navigable waters at the point where the discharge originates or will originate, that any such discharge will comply with the applicable provisions of sections 301, 302, 303, 306, and 307 of this title. ... No license or permit shall be granted until the certification required by this section has been obtained or has been waived as provided in the preceding sentence. No license or permit shall be granted if certification has been denied by the State, interstate agency, or the Administrator, as the case may be.

33 U.S.C. § 1341(a).

As discussed more fully below, the State of Oregon may not certify that the project will comply with Section 303 of the Clean Water Act, which encompasses water quality standards adopted by the State. The proposed project would do immense damage to water quality in Oregon. The proposed project would violate Oregon's antidegradation policy by causing significant temperature increases in numerous stream segments, by causing significant decreases in dissolved oxygen levels in Coos Bay, and further degrading stream segments that are already water quality impaired for temperature, dissolved oxygen, pH, turbidity, mercury, and sedimentation.

The proposed project would violate Oregon's statewide narrative criteria by creating conditions deleterious to aquatic species, including Coho salmon (Oncorhynchus kisutch), green sturgeon (Acipenser medirostris) and eulachon (Thaleichthys pacificus); by permanently converting 6.8 acres of highly productive intertidal habitat to low productive deep-water habitat; by entraining and killing fish as LNG vessels uptake millions of gallons of engine cooling water; by discharging heated cooling water above ambient temperatures into Coos Bay; by killing and injuring aquatic life through ship-animal collisions (vessel strikes) and beaching (stranding) of animals in the vessels' wakes; and by permanently removing coastal riparian vegetation along Henderson Marsh and Coos Bay that is an essential component of the food chain for fish and aquatic life.

The proposed project would also violate Oregon's water quality standard for temperature by removing riparian vegetation that shades streams, causing stream heating along a minimum 95-foot wide construction easement. The proposed project would violate Oregon's water quality standard for turbidity by causing a more than 10% increase in natural turbidity levels in Coos Bay and stream segments impacted by pipeline installations. The proposed project would violate Oregon's toxics standard by disturbing and re-suspending contaminated material in and around waters of the state. The proposed action would also impair beneficial uses to be protected in the Rogue, Umpqua and South Coast Basins by engaging in blasting activities that will adversely impact surface water and groundwater used for drinking, and by impairing commercial and recreational fishing in estuaries and adjacent marine waters in the South Coast Basin.

The State of Oregon Should Deny the 401 Certification Request.

The Coalition requests that DEQ deny the Section 401 Certification request because: the permit application is incomplete and contains insufficient and inaccurate data such that a decision cannot be made at this time; the project violates Oregon water quality standards and § 401 implementation regulations; practicable alternatives to the project exist that have less adverse impact on aquatic resources; the project violates the Endangered Species Act ("ESA"), 16 U.S.C. §1531 *et seq*.; and the project is inconsistent with the Oregon Coast Management Plan and the Coastal Zone Management Act ("CZMA,") 16 U.S.C. § 1451 *et seq*. As discussed in detail below, the proposed action would cause unacceptable degradation of water quality in Oregon, and would fail to protect the beneficial uses of Oregon's waters.

1. The Application for Certification Fails to Contain the Mandatory Minimum Information.

Oregon's 401 Certification regulations require that the applicant provide basic information by which the state can evaluate the impacts of the proposal on water quality. Under Oregon Administrative Rule ("OAR") 340-048-0020(2):

> An application filed with the department must contain, at a minimum, the following information: …
> (c) A description of the activity's location sufficient to locate and distinguish existing and proposed facilities and other features relevant to the water quality effects of the activity; …
> (e) A complete written description of the activity, including maps, diagrams, and other necessary information;
> (f) The names of affected waterways, lakes, or other water bodies.

In addition to this basic project information, DEQ may request any additional information necessary to adequately evaluate the project impacts on water quality. OAR 340-048-0020(3). The applicants have not provided critical information necessary for the certification. Assuming that DEQ will request additional information from the applicants, the Coalition requests that any supplemental responses provided by the applicant be made available to the public via the Department's website or other electronically accessible format.

Impacts of the Oregon Gateway Marine Terminal Project

The application materials demonstrate intent to design the primary slip berth to accommodate deep draft cargo vessels unrelated to LNG export. The DEIS fails to explain why this deep-draft marine slip has not been evaluated as part of the project. At the same time, the DEIS rejects smaller project design elements as unsuited to the purpose and need of the project. The Army Corps of Engineers, U.S. Environmental Protection Agency, and ODEQ have all identified this deficiency in the scope of the environmental analysis in the DEIS. According to EPA:

> It appears reasonable to conclude that the Port's multi-use concept is dependent on the Jordan Cove slip design. Development of Henderson marsh would not be viable without a slip designed to accommodate a west berth. That would seem to indicate that plans for the west berth and future port development plans are interdependent. This could necessarily expand the scope of the project….
>
> We recommend the FEIS analyze whether future port expansion at Henderson Marsh is viable without the west berth. If it is determined that future development is not viable, without the west berth, the FEIS should analyze impacts associated with the Port's proposed use of the west berth and any expansion into Henderson Marsh consistent with 40 CFR 1508.25.

EPA Region 10 Detailed Comments at 3 (Feb. 11, 2015).

The Army Corps of Engineers raised this concern again in an email to FERC in detail:

> As the applications read to both of our agencies (right now), the slip and access channel multi-use [are] part of the Proposed Action. Due to the fact it is part of the Proposed Action it must have alternatives, and it must have direct, indirect and cumulative environmental effects. The multi-use of the slip and access channel appear to meet the requirements of 40 CFR 1508.25(a) and (b)….
>
> Until further clarified, the Corps needs to consider the multi-use component of the Project as part of the Proposed Action. I've brought this to your attention in the past. For this reason we cannot agree with FERC's proposed Purpose and Need right now….

Email from Tyler Krug, Army Corps of Engineers Portland District (Feb. 25, 2015).

The Army Corps identified a set of seven complex questions about the scope of the project and information necessary to evaluate its impacts on the environment and the water quality of Coos Bay. *Id.* These questions identify significant gaps in the information available to the reviewing agencies (including ODEQ) about the impacts of the project, including:

- The specific details of the multi-use of the slip and access channel including ship size, cargo type, and shipping schedules,
- The number of vessels using the channel each year,
- The impact of the action on the use of the channel and associated maintenance needs,
- What limitations on channel use would be in place,
- Coast Guard recommendations for slip size,
- What shore side facilities would be constructed on the west berth,
- The impacts to Henderson Marsh (mostly wetlands) from those facilities,
- The relationship of the planned federal navigation channel improvement project to this project and analysis of the inter-related project.

These issues are directly relevant to the ODEQ analysis of water quality impacts from the project on Coos Bay. ODEQ noted this deficiency in scope of review in its comments to FERC on the DEIS. The Coalition agrees with the analysis of the Corps, EPA, and ODEQ about the need to include the full multi-use project within the analysis of the direct, indirect, and cumulative impacts of the project.

Identification of Impacted Waterbodies

The application materials do not consistently specify the number of waterbodies that would be crossed. As noted by DEQ, the pipeline will necessitate direct impacts to waters at 510 locations, including 218 to 383 water body crossings. According to Resource Report 2, the pipeline would cross 400 waterbodies (RR2 at 6). The DEIS states that the pipeline would cross or affect 274 waterbodies. DEIS 4-582.

In addition, the application does not identify the location of all wells, springs, and seeps within 150 feet of the construction right-of-way for the pipeline. Springs and seeps supplied by shallow

groundwater could be affected by the pipeline project. In particular, if the pipeline is located up-gradient of a spring or seep location, it should be evaluated. DEIS at 4-355. This is a significant and serious concern for impacted landowners along the pipeline route who rely on springs on their property for drinking water and domestic uses. The pipeline and its bedding material will substantially alter surface and subsurface flow patterns and will likely impact waters regulated by DEQ. For example, landowner John Schofield submitted comments to FERC on February 13, 2015, stating that his home, located at pipeline milepost 60.11 to 60.26, is located within 500 feet of the proposed pipeline route on his property. Mr. Schofield's family relies on its spring for drinking water, and is concerned that the installation of the pipeline will alter the course of the spring water and negatively impact the source of the family's drinking water. These types of impacts must be disclosed by the applicant and evaluated by ODEQ.

Unless and until the applicants provide a consistent and complete list of waterbodies that would be affected by the proposed action, and name each affected waterbody, the application fails to contain the mandatory minimum information required under OAR 340-048-0020(2)(c), (e) and (f) and must therefore be rejected as incomplete.

Contaminated Soils at Terminal and Related Sites

The DEIS states that testing at the former Weyerhaeuser mill site indicated that concentrations of contaminates are below screening levels that would represent a risk to public health, and that DEQ recommended "No Further Action" at this location. The DEIS explains that Jordan Cove would "cover the former mill site with clean sediments from the marine slip and access channel" to raise the elevation of those sites. DEIS at ES-6. This information is incorrect and incomplete.

According to DEQ's Environmental Cleanup Site Information (ECSI) Database, both the Ingram Yard property (ECSI 4704) and the Weyerhaeuser North Bend Containerboard Mill (ECSI 1083) sites contain levels of potentially bioaccumulating chemicals and "must not be placed in waters of the state" and are both listed as "Partial No Further Action" as of 2006. The DEQ reports acknowledge that the recommendation for no further action is contingent upon there being no "new or previously undisclosed information" becoming available.

On December 16, 2014, Barbara Gimlin, former Environmental Inspector at the Jordan Cove LNG terminal site and employee of SHN Consulting, submitted testimony to FERC regarding discovery of contaminants at the site during a March 2014 exploratory test program. (Comments attached). Ms. Gimlin describes her knowledge of discovery of contaminated soils along the Jordan Cove shoreline during a September 2013 cultural resources survey by Southern Oregon University Laboratory of Anthropology. Ms. Gimlin then describes her personal observations of excavations at the site exposing potential contaminates including "black soils (north to south in Ingram Yard, including near the shoreline), bright yellow granulated/powder found in clumps of varying sizes, gray gummy material found in clumps (likely related to hydraulic drilling conducted by GRI), and the exposure of an underground concrete storage tank punched through by heavy equipment with unknown liquid inside." These exposures occurred during the March 2014 Kiewit test program.

The description of exposure and discovery of potential contaminants at the site as recently as April of 2014 should be investigated further. This information, provided by an individual with personal knowledge and professional experience of the discovery of potential contaminants should be considered "new or previously undisclosed information" "which warrants further investigation." Given that the project calls for excavating and moving large amounts of soils from one area to another, to be used as fill for the South Dunes Power Plant location and other construction areas, the extent and condition of the contamination at these sites must be fully investigated, disclosed, and addressed to ensure contaminants do not reach waterways.

Hydraulic Alteration at Each Pipeline Stream Crossing

The pipeline will cross tributaries and mainstream rivers within the Coos, Coquille, South Umpqua, Rogue and Klamath basins, most of which are impaired for several water quality parameters. The applicants have not provided analysis of potential risk for hydraulic and geomorphic alteration upstream and downstream from the impact areas. DEQ requested the applicants provide risk assessment for stream crossings based on fluvial geomorphic analyses as recommended by the U.S. Fish and Wildlife Service for all proposed stream crossings. The applicants did not provide this information. This information is needed for DEQ to evaluate the project ability to comply with the biocriteria (OAR 340-041-0011) as well as other criteria.

Potential Interference of Subsurface Flow Regimes from Pipeline Construction

The applicants have not provided information demonstrating the potential effects of pipeline construction, including streambed and bank disturbance and placement of pipe and backfill, on the hyporheic regimes of affected waterbodies. As noted by DEQ, rerouting of subsurface water or prevention by barriers (such as buried pipes) of subsurface flows interacting with stream flows can increase temperature. These interactions have a greater impact at low flow periods, when baseflow impacts are critical. Hyporheic exchange often allows for cool water pockets, providing thermal refuge for migrating cold water fish like threatened Coho salmon. In addition, other water quality parameters including pH and dissolved oxygen can be impacted by disturbances to hyporheic exchanges.

Impacts from Trenching through Coos Bay & Hayes Inlet

The applicants propose to install pipeline through Coos Bay over a 7-mile section, sidecasting material in the water without proposed turbidity control measures. After the pipeline is placed in the trench, the sidecast material will be used to backfill the trench. DEQ expressed concern that this activity in the waters of Coos Bay and the resulting suspension of large volumes of silty material over a long duration, will potentially result in exceedances of Oregon's turbidity standard. DEQ has repeatedly advised the applicants of the need for sediment evaluation in this area due to known contaminated sediments in Coos Bay. The applicants have responded that the sediments are suitable for backfill (Response to DEQ, June 2013) but have not provided information to address the impacts of suspended sediments as a result of trenching activities in the bay. Without this information, DEQ cannot provide the requested certification of compliance with water quality standards.

DEQ also requested that the applicants develop alternative methods for dredging and containment of suspended sediments to meet the turbidity standard and prevent distribution of fine and/or contaminated material. The applicant's response discusses alternatives to the pipeline route, but did not provide a discussion of alternative methods for the pipeline trench dredging and containment of suspended settlement that would meet the turbidity standard or the allowable exceedance.

Expected Temperature Increases in Discharged LNG Vessel Cooling Water

Jordan Cove states that water will be discharged from engine cooling at 3 degrees C (5.4 degrees F) above ambient water temperatures. Modeling of mixing zones and dissipation of water temperature increases were likewise based on this assumed 3 degrees increase. However, Jordan Cove did not provide any information regarding the source of this assumed temperature of cooling water. Nothing in the JPA or FERC filings appears to support the assertion that engine cooling water will be only 3 degrees C higher than the average ambient Coos Bay water temperatures of 50 degrees F. In fact, FERC's FEIS for the Bradwood LNG Project states that "cooling water discharged from a 150,000 m^3 steam powered LNG carrier could initially be 19.4 ^oF higher than ambient water temperatures" as compared to seasonally ranging ambient temperatures in the Columbia River of 42 to 68 ^oF. Bradwood LNG Project FEIS at 4-85 (2008). Oregon LNG, also proposed for the Columbia River, estimates that "according to industry sources, the water taken for cooling the vessel's machinery is warmed by 6 to 9 degrees Celsius at the point of discharge" and that the average for diesel-powered LNG vessels would be 8.9 ^oC above ambient water temperatures. Oregon LNG, CH2MHill Technical Memorandum, Appendix F Cooling Water Discharge Analysis, at 2 (Sept. 10, 2008). And according to EPA, cooling water can reach high temperatures with the "thermal difference between seawater intake and discharge typically ranging from 5 ^oC to 25 ^oC, with maximum temperatures reaching 140 ^oC." EPA, *Final 2013 Vessel General Permit Fact Sheet* at 133. Given these widely varying ranges of cooling water discharge temperatures, DEQ should at the very least require Jordan Cove to provide a worst case analysis of temperature increases from diesel and steam powered vessels. DEQ should also require that the applicants provide an accurate number of shipments that would occur using 148,000 cubic meter ships (the maximum size that would be allowed to transit Coos Bay) to export the full proposed natural gas export amounts (0.9 Bcf/d according to FERC, 1.2 Bcf/d according to DOE, 1.55 Bcf/d according to NEB and DOE).

Post-Construction Restoration at Stream Crossings

Several stream crossing methods are proposed for different types of streams. With the exception of some of the larger water body crossings, specific crossing methods for specific stream reaches have not been identified. One proposed method for the majority of identified waterbody crossings is an "open dry cut." In most cases the stream itself would not actually be dry and the process involves creating a temporary dam or flume, and pumping the water from that impoundment downstream of the work area. This process is anything but "dry" in reality if the stream contains any water at all. This type of crossing will have substantial turbidity impacts during the installation and removal of any temporary structures, also frequently discharging constant turbidity from muddy sump holes and from unavoidable seepage of surface or subsurface flow into the active work area and then downstream. Additionally, the methods do not

explain how streambeds will be restored to avoid impacts to water quality following re-watering of the streams. Lastly, how the impacts from removal of all riparian vegetation on both banks for 75' (the ROW is stated to neck down from 95' at stream crossings) at crossing sites will be addressed is not described.

Stormwater Management Plan

The applicants submitted a NPDES 1200-C application in 2010. DEQ notified the applicants that critical details of long-term stormwater management are required. Specifically, DEQ requested information related to runoff from all impervious areas at terminal and pipeline facilities, docks, structures, pavements, roadways, and access and storage areas. DEQ asked that information related to the final pipeline and associate roadways be included in the detailed stormwater management plan. The applicants have not provided a detailed stormwater management plan including specifications for proposed treatment facilities sized to handle runoff from all contributing impervious surfaces.

In addition, given the known and potential soil contamination at various locations that will be disturbed for site construction, a stormwater management plan must be individually developed for each construction location, accounting for contaminants at each site, and adopting measures to ensure that contaminants are not transported to the shoreline or released into the waters of Coos Bay and nearby wetlands. Finally, given the incredible scope of this project and the imperfect nature of BMPs (including even straw bales) the applicants' negative response on the JPA application form to "Will any construction debris, runoff, etc., enter a wetland or waterway?" defies credibility and must be evaluated in more detail. The DEIS specifically states "Silt fences are 90 to 95 percent efficient at trapping sediment," which would appear to indicate there would be some discharges to waterways.

Sources and Impacts of Hydrostatic Testing

DEQ requested information from the applicants regarding the sources and discharge of testing water. In its response, the applicants stated that, "the hydrotest water source will be potable and raw water from the existing CBNBWB water lines." (Response to DEQ, June 2013). This information appears incomplete when compared to information provided in the DEIS, which includes a list of 14 potential hydrostatic testing source locations. DEIS 4-395, 4-396. The DEIS states that approximately 62 million gallons of water would be required to test the pipeline, yet the sources and disposal of this water are not fully determined. DEIS at 4-395. The 62 million gallons would appear to be roughly sufficient to fill the entire pipeline only once for leak testing. Since no pipe welding is without leaks, the applicant must describe where additional water would come from for further testing after fixing leaks found in the first test, and how much water would be required. The DEIS provides only general information about the possible sources of water for testing, with no analysis of the impacts of proposed water withdrawals. Instead, the DEIS defers that analysis to a later time, stating that during any water rights permitting process, Oregon DEQ and ODFW could review water withdrawal applications to determine whether there are concerns about the impacts of water withdrawals on water resources. DEIS at 4-395.

The DEIS is equally vague in its discussion of the discharge of hydrostatic testing water:

> During the test, it may be necessary to discharge water at each of the section breaks; however, discharges would be minimized and water would be conserved as much as practical by cascading water between test sections when feasible (pumping from one segment to the next). When discharged the test water would be released adjacent to the construction right-of-way through an energy dissipating device and a straw bale filter or sediment bag. Test water would not be discharged directly into surface waters. Pacific Connector would apply for permission to discharge the hydrostatic test water with ODEQ.

DEIS at 4-396.

The DEIS also states, "[w]here possible, test water would be released within the same basin from which it was withdrawn. However, cascading water from one test section to another to minimize water withdrawal requirements may make it impractical to release water within the same basin where the water was withdrawn in all cases." DEIS at 4-397.

These descriptions do not make clear whether hydrostatic test water will reach waterways. In fact, the maps of the pipeline route included in the DEIS Appendix C show in several places apparent discharge points at or very near waterbodies. Numerous Federal and State environmental and natural resource protection agencies have raised alarms about the lack of information about discharges associated with hydrostatic testing. In its 2008 DEIS comments, NMFS stated:

> Discussion of hydrostatic test water within Section 2.4.2.1 explains that it will be discharged into upland settings. *However, the description implies that discharge water will run into waterbodies*. Explain whether this is true. *If water is allowed to flow out of the erosion control devices, across the ground and into waterbodies, adverse impacts to NMFS trust resources will be greatly increased and need to be detailed in the effects sections.* Furthermore, the applicant-prepared draft biological assessment explained that metallic cations, oil, and grease were often elevated in discharge water. Please address the following concerns: (1) Potential discharge of chemicals from inside the pipe; (2) potential of introducing non-native species from a different basin; (3) potential of causing changes in small stream channels due to the increased flow; and (4) fish stranding due to quickly ramping flows up and then down. Discharging water in a manner to allow it to fully infiltrate into the ground would eliminate most of these concerns.

NMFS 2008 DEIS comments at 2-3 (emphasis added).

In its 2008 DEIS comments, Oregon DEQ was even more pointed about the lack of information provided about the proposed hydrostatic testing:

> *The above passages are vague and contradictory about whether hydrostatic test water will reach the surface waters or not. If hydrostatic test water will reach surface waters, the DEIS should have a complete listing of all hydrostatic test*

> *discharge points with the name of the receiving stream and location on that stream.* The discharge of pollutants into a water quality limit waterbody would be very difficult if not impossible to permit. If the Total Maximum Daily Load (TMDL) has already been issued, the project would need to comply with the TMDL requirements.
>
> If hydrostatic test water will not reach surface waters, *the DEIS should have a complete listing of the infiltration areas. Such a list should include a location where the water would drain if it were released.*
>
> Hydrostatic test water cannot be discharged under the DEQ general storm water discharge permit.

State of Oregon 2008 DEIS comments at 67 (emphasis added).

This issue remains unresolved in the current DEIS. As noted by ODEQ in its 2015 comments,

> The discharge of hydrostatic test water from the storage tanks at the Jordan Cove site and the pipeline would not be covered by registration to NPDES general permit #1200-C…. If hydrostatic test water is to be discharged to waters of the state, WPCF or NPDES individual permits would be required. The maps provided are inadequate to identify each of the discharge points. This comment also applies to trench dewatering water.

State of Oregon 2015 DEIS comments at 24.

In many locations, for example Neil Creek in the Upper Rogue, the maps appear to show a hydrostatic discharge location directly into the creek (map sheet 41 of 62 from JPA). The applicants must clarify these types of site-specific issues where a permit would be required.

The applicants propose to withdraw water for hydrostatic testing that, in many cases, would come from streams already over-allocated for water withdrawals. One example is the North Fork of Little Butte Creek in the Upper Rogue. ODEQ should coordinate with OWRD and seek to clarify the availability of water for these withdrawal locations, and clarify the activities and discharge locations proposed by the applicant if they would be changed to conform water availability and Oregon's water rights laws.

For purposes of determining whether the proposed action complies with State water quality standards, the applicants have still not provided essential details of proposed hydrostatic testing requested by the Oregon DEQ, including a complete listing of all hydrostatic test discharge points with the name of the receiving stream and location on that stream and/or a complete listing of the infiltration areas, including the location where the water would drain if it were released. Therefore, the application fails to contain the mandatory minimum information required under OAR 340-048-0020(2)(c), (e) and (f) and must therefore be rejected as incomplete.[2]

[2] The DEIS mentions the existence of an incomplete draft Hydrostatic Testing Plan. The DEIS states that the plan, "includes measures to prevent the transfer of aquatic invasive species and pathogens from one watershed to another." DEIS at 4-397. However, this draft Hydrostatic Testing Plan has not been provided to the public.

Wastewater Treatment Facilities

The project includes proposed construction of a workers' camp in the City of North Bend. The camp would house up to 2,000 workers for the period of construction, over several years. Jordan Cove fails to explain how the existing wastewater treatment facility at North Bend will be able to handle the addition of wastewater produced at the workers' camp, or what alternative methods will be used to treat and manage wastewater from the camp. As the ODEQ noted in its comments on the DEIS, "there is insufficient information at this time to conclusively determine whether wastewater from the proposed project will contribute to exceedances of state water quality standards." State of Oregon 2015 DEIS comments at 24.

Extent and Impact of Channel Deepening Projects

Dredging has the potential to change the hydrodynamics of Coos Bay in the long-term. The application fails to evaluate the project in conjunction with other proposed dredging in Coos Bay. For instance, the Corps is considering a massive channel-deepening project for Coos Bay, and the State of Oregon commented that some level of channel deepening will be required to accommodate LNG tankers, particularly if the LNG terminal is allowed to use larger tankers in the future. The State of Oregon commented on the DEIS to FERC in 2008:

> Deepening of the existing federal navigation channel will be required to accommodate the vessels with capacities proposed to be received at the terminal. The significant volumes of material to be removed, the geomorphic adjustments to the bay and its tributaries precipitated by deepening the channel, and all the potential impacts to water quality and beneficial uses must be included in the analysis of dredging for this proposal, particularly with regard to projected ongoing maintenance dredging.

State of Oregon DEIS comments at 50, Dec. 4, 2008.

Similarly, Oregon Department of Fish and Wildlife ("ODFW") noted that these issues were not adequately resolved in the 2009 FEIS:

> In the FEIS, [Jordan Cove is] only considering the dredging at the slip and access channel into the slip as part of this project. ODFW continues to have concern over the potential ecological effects of future dredging (down to -51 feet mean lower low water and channel widening from 300 to 600 feet, plus widening the jetty opening) that is proposed to occur to further use the Port's facility ("Oregon Gateway Terminal"), even though the JCEP tenancy is not portrayed as associated with that level of dredging. Changes to salinity, ocean water exchange, water temperatures, flood/ebb rates, etc. may be expected to occur with additional deepening of the channel. Predictive modeling should be conducted to ascertain

---

Therefore, it cannot be a basis for supplying mandatory minimum information required under OAR 340-048-0020(2)(c), (e) and (f). Further, it does not appear from this brief description, that the draft plan includes the information related to discharge locations and dissipation measures necessary to evaluate the potential effects on water quality standards.

> the potential impacts to the estuarine ecology from the anticipated >10 feet of additional depth from the current situation.

State of Oregon FEIS comments at 37, ODFW section, May 29, 2009.

The current DEIS and JPA again fail to address issues related to channel deepening in Coos Bay. As discussed above, the Army Corps of Engineers specifically requested additional information about the channel deepening required and related to this project. Without addressing these deficiencies in the JPA, the 404 and 401 permits cannot be issued. ODEQ must evaluate related and reasonably foreseeable channel deepening projects that might contribute to the impacts of the Jordan Cove project.

Extent and Impact of Haynes Inlet Removal and Fill

The applicants propose to install the 36-inch-diameter concrete weighted pipeline beneath Haynes Inlet by digging an 8-foot deep trench below the mudline with a clamshell dredge, placing excavated material adjacent to the trench, and replacing the material in the trench as backfill after the pipe is installed. The JPA estimates a total volume of approximately 150,000 cubic yards of excavated material, and states that "all of the excavated sediment will be reused as backfill; sediment will not be removed from the water or the project site." (JPA Stand Alone Document 1-5 PDF page 158). The JPA fails to explain how the placement of sediment adjacent to the trench will not result in turbidity discharges in Haynes Inlet. Further, the JPA fails to explain how the full volume of excavated material can be replaced into the trench after installation of a 36-inch-diameter pipe that will occupy and displace a volume of approximately 0.26 cubic yards per foot of pipeline. With over two miles of pipeline crossing, this displacement leaves a considerable volume of excavated material that cannot be replaced in the trench. The JPA fails to address this inconsistency, or explain how or where this material will be disposed of.

Lack of Endangered Species Act Consultation

The Corps' regulations require it to consult with federal and state wildlife agencies "with a view to the conservation of wildlife resources by prevention of their direct and indirect loss and damage due to the activity proposed in a permit application." 40 C.F.R § 320.4(c). In addition, "the Army will give full consideration to the views of those agencies on fish and wildlife matters in deciding the issuance, denial, or conditioning of individual permits." *Id*. On February 24, 2015, the Biological Assessment was finally released, and formal consultation with NMFS and USFWS requested. Currently, the wildlife agencies have not yet had an opportunity to provide comments or assessments of the impacts of the current project proposal on listed species and critical habitat. DEQ should decline to move forward with the certification until the Corps completes its formal consultation with the wildlife agencies NMFS and USFWS.

In their review of the Biological Assessment for the previous iteration of this project, multiple agencies expressed concern regarding the lack of information provided. For instance, NMFS requested further information and consultation for green sturgeon based on potential dredging impacts. NMFS informed FERC: "Disturbance of substrate from project construction and biennial maintenance dredging, along with disposal at the Coos Bay ocean dredged material

disposal site (Site F), will modify habitat and reduce safe passage by causing direct adverse physical effects due to physical entrainment in the discharge plume." NMFS BA comments at 2.

Additionally, according to the DEIS, the project is likely to adversely affect the following species listed under the ESA:

- Threatened Marbled murrelet;
- Threatened Northern spotted owl;
- Threatened Coho salmon (SONCC);
- Threatened Coho salmon (Oregon Coast ESU);
- Threatened North American green sturgeon (Southern DPS);
- Endangered Lost River sucker;
- Endangered Shortnose sucker;
- Threatened Vernal pool fairy shrimp;
- Endangered Applegate's milk-vetch;
- Endangered Gentner's fritillary;
- Threatened Kincaid's lupine; and
- Endangered Rough Popcornflower.

DEIS at 4-628.

Again, this list is not the result of a final Biological Assessment or any formal consultation and review by the wildlife agencies NMFS and USFWS. As a result, the DEIS appears to conclude that the project is "Not Likely to Adversely Affect" several other listed species without adequate analysis or explanation of those conclusions. For example, the DEIS states that the project is not likely to adversely affect the endangered Grey wolf. This species has only recently reoccupied Oregon lands west of the Cascades, with a single male wolf (known as OR-7) now known to have mated and produced one litter of pups. The pack has now been named the "Rogue Pack" as it occupies areas of the Rogue River-Siskiyou National Forest in Douglas and Klamath counties. The DEIS acknowledges that the pipeline route would cross the area where OR-7 has become established. The DEIS also acknowledges that the territory size of a wolf pack can range up to 1,500 square miles and that individual wolves are known to disperse from packs sometimes more than 600 miles from a home range. DEIS at 4-629. The DEIS states that the pipeline would be located six miles from the OR-7 den location, but nevertheless concludes that its construction, clear-cutting, and permanent right of way will not adversely affect the species. This analysis fails to acknowledge the impact of road development and clearing on grey wolf habitat suitability, the increase in accessibility that the pipeline route and maintenance roads could have, increasing possible human-caused mortality or harassment of wolves. Human activity tends to create an avoidance response, which can interfere with necessary activities such as hunting and breeding. In addition, increased human presence also increases the risk of exposure to new diseases and parasites to wolf populations, such as heartworm, Parvo, and Lyme disease. The DEIS does not address these risks, but formal consultation with USFWS may reveal more specific impacts resulting in a "Likely to Adversely Affect" determination.

The lack of consultation for the project is also problematic because key mitigation measures for ESA-listed species have not been determined or vetted by key agencies, such as the NMFS. Information included in the JPA and DEIS fails to provide an adequate assessment of how

impacts of the project to key listed species will be avoided or minimized. For example, Coho salmon are ESA listed as a federally threatened species and face potential impacts from the LNG terminal and its tankers. Cooling water withdrawals for the project will require the intake of over 50 million gallons of Coos Bay water, presenting a significant risk of entrainment and impingement of salmonids that is not adequately addressed in the JPA or DEIS. Additionally, the DEIS includes incomplete and inadequate information regarding the discharge of cooling water for LNG tankers. These discharges could be as much as 19 degrees F higher than ambient temperatures, presenting a significant temperature stress risk to salmonids, however, the DEIS does not acknowledge this potential temperature increase or disclose the source of the assumed (much lower) temperature of discharged cooling water. Thus, the JPA does not offer an adequate analysis of impacts to ESA-listed species. Consultation for the project is clearly warranted, and until official consultation is initiated, it is impossible for the public to know what mitigation measures will be proposed and whether they will be effective.

The measures that Jordan Cove has proposed to deal with these problems are unproven and inadequate, as NMFS itself has noted in its comments for the prior DEIS and FEIS. NMFS used strong language to describe the inadequacies of the 2009 FEIS: "in reviewing the FEIS, NMFS has found that many of the December 1, 2008, DEIS comments have not been addressed" and further explained the nature of its comments:

> The comments are based on NMFS' special expertise and responsibility to manage, conserve, and protect marine and coastal living resources as provided under the Endangered Species Act (ESA), Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), Marine Mammal Protection Act (MMPA), and the Fish and Wildlife Coordination Act. In all cases, the comments have relevancy, either directly or indirectly, to NMFS' responsibilities under that legislation, and are consistent with the agency's regulatory obligation to its trust resources.

NMFS FEIS comments at 2, June 8, 2009.

NMFS specifically noted problems with the lack of fish screens to prevent entrainment of threatened and endangered species:

> Jordan Cove no longer proposes to include fish exclusion screens with a fixed water delivery system to the hulls of the ships. NMFS maintains that screening ballast and engine cooling water is the most effective method to minimize adverse effects to the aquatic resources. While the U.S. Coast Guard has identified some regulatory difficulties with the original screening design proposed in the DEIS, those difficulties do not preclude its implementation.

Id.

NMFS was also concerned with the inadequate analysis of stormwater pollution impacts in the FEIS:

> Stormwater from the Jordan Cove site will be discharged into Coos Bay. The FEIS says the water will be tested before being discharged, but does not say what

> contaminants will be tested for and what levels will be allowed to be discharged. There is no indication in the FEIS that FERC recognizes that stormwater carries heavy metals, petroleum products and brake chemicals and compounds that are deleterious to fish and fish habitat.

Id.

ODEQ cannot ignore the serious concerns of NMFS, an expert federal agency. Additional analysis is necessary to provide the agency and the public with adequate information about the fish exclusion technology to be used, complete with an analysis of the effectiveness of the plan, and the stormwater testing to be employed. Without addressing these issues, and without the many other missing studies, plans, and analyses pointed out by federal and state agencies, the Coalition, and other individuals and organizations in DEIS and FEIS comments, the JPA is wholly inadequate and legally insufficient. ODEQ cannot approve the application without consulting with NMFS. Given the fact that the applicants failed to submit a BA prior to the JPA and issuance of the DEIS, and given the significant concerns NMFS previously raised about inadequate information on the impacts of the current project configuration, the application should be denied as incomplete.

Extent of Road Construction

The JPA inadequately addresses the aquatic impacts from road use, road modifications (including but not limited to Key Watersheds), temporary extra work area (TEWA) construction, and temporary and permanent access roads. Roads contribute to the disruption of hydrologic function and increase sediment delivery to streams. Roads also provide access, and the activities that accompany access magnify their negative effects on aquatic habitats. Activities associated with roads include fishing, recreation, timber harvest, livestock grazing, and agriculture. Roads also provide avenues for stocking non-native fishes. The JPA fails to provide complete and accurate maps of roads (existing, proposed, and expanded), specific characterizations of impacts to waterways that would be impacted, details regarding types of roads and how they will be modified, or specific details on long-term maintenance proposed for roads in steep terrain areas.

Road construction has the potential to produce myriad impacts to waters of the U.S.:

- Soil erosion, compaction, loss of forest productivity;
- Pollution: sedimentation, thermal loading;
- Rapid water runoff: peak flows;
- Impaired floodplain function;
- Barrier to movement of wood and spawning gravel;
- Fragmentation: wildlife dispersal barrier;
- Human disturbance, weed vector, hunting pressure, loss of snags, litter, marbled murrelet nest predation, human fire ignition, etc.

Roads have a particularly negative influence on aquatic and riparian ecosystems and organisms. Roads interfere with movement of materials and organisms in three dimensions:

upstream/downstream, channel/upland, and surface/subsurface.[3] Roads also act as conveyor belts for delivering chronic sediment to streams.[4]

Over the last few decades, studies in a variety of terrestrial and aquatic ecosystems have demonstrated that roads aggravate many of the most pervasive threats to biological diversity, including habitat destruction and fragmentation, edge effects, exotic species invasions, pollution, and overhunting. Roads have been implicated as mortality sinks for animals ranging from snakes to wolves; as displacement factors affecting animal distribution and movement patterns; as population fragmenting factors; as sources of sediments that clog streams and destroy fisheries; as sources of deleterious edge effects; and as access corridors that encourage development, logging and poaching of rare plants and animals. Road building in National Forests and other public lands threatens the existence of de facto wilderness and the species that depend on wilderness.[5]

From an intensive review of the literature, we conclude that increases in sedimentation are unavoidable even using the most cautious reading methods. Roads combined with wildfires accentuate the risk from sedimentation. The amount of sediment or hydrologic alteration from roads that streams can tolerate before there is a negative response is not well known. It is not fully known which causes greater risk to aquatic systems: building roads to reduce fire risk or realizing the potential risk of fire. More research is needed in this area.

U.S. EPA describes the impacts of roads as follows:

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

[3] Jim Doyle, Where the Water Meets the Road. Available at http://web.archive.org/web/20070325061623/http://www fsl.orst.edu/geowater/RRR/jim/aquahab/index.html.
[4] Michael Derrig. Road Improvements for Watershed Restoration. Available at http://www fsl.orst.edu/geowater/PEP/calfed/derrig/index html.
[5] Noss, Reed; The Ecological Effects of Roads. Available at http://www.wildlandscpr.org/ecological-effects-roads.

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

EPA 2012. Notice of Intent To Revise Stormwater Regulations Federal Register. May 23, 2012.[6]

Further, as ODEQ is aware, EPA and NOAA rejected the State of Oregon's coastal water quality control plan under CZARA. A particular area of deficiency is in Oregon's handling and regulation of forest practices, including roadways related to timber harvesting. Oregon's current Forest Practices Act is inadequate to protect water quality in the coastal zone.

Temporary roads present most of the same risks posed by permanent roads, although some may be of shorter duration. Many of these roads are designed to lower standards than permanent roads, are typically not maintained to the same standards. While temporary roads may be used temporarily, for periods ranging up to 10 years before decommissioning, their short- and long-term effects on aquatic species and habitats can be extensive. [7]

The JPA fails to disclose the full extent of the road network for pipeline construction or explain how these impacts could be adequately mitigated. The DEIS states that, "Pacific Connector has estimated that modifications of 60 miles of existing access roads may be required outside of the existing road bed … resulting in about 22 acres of disturbance." In addition, the DEIS states that 2.4 miles of new temporary access roads and 0.9 miles of new permanent access roads would be constructed. DEIS at 2-88. Appendix 8 Table 8A-1 of the JPA includes 31 pages of "Access Roads to and Major Roads Crossed by the PCGP Project," however, this is not the most recent or complete list of roads that will be used for the project. Significant changes have occurred in the location of access roads. *Compare* JPA Appendix 8 Table 8A-1 *with* DEIS Appendix D Table D-2. The application is incomplete and inaccurate without the most recent information.

In order to use heavy equipment on these roads, significant road modifications will be necessary, including blading/grading, widening, drainage improvements, and the construction of turnouts and roadside TEWAs. The JPA does not include detailed descriptions of what activities will be occurring that could impact wetlands, streams, and other waters. Rather, the JPA relies on blanket statements about the application of best management practices to avoid impacts to streams. By not specifying the location and nature of construction activities associated with all access roads, the JPA provides an inadequate description of the project.

Specifically, the JPA states that best management practices ("BMPs") will be used for culvert replacements. "Culvert replacements that may be required along existing access roads will be completed according to the exemptions specified under OAR 141-085-0020." However, such roadwork would not be exempt under the rules of OAR 141-085-0020, as this proposal does not

[6] Available at http://www.gpo.gov/fdsys/pkg/FR-2012-05-23/pdf/2012-12524.pdf.
[7] Roadless Area Conservation FEIS — Specialist Report for Terrestrial and Aquatic Habitats and Species prepared by Seona Brown and Ron Archuleta, EIS Team Biologists, Available at http://web.archive.org/web/20040515020554/http://roadless fs fed.us/documents/feis/specrep/xbio_spec_rpt.pdf

constitute maintenance or repair, but instead expansions and modifications to facilitate a major construction project with significant environmental impacts. The Corps, DLCD, and Oregon DEQ must all evaluate the impacts of all construction activities – including culvert replacements – arising from construction of the Pacific Connector pipeline. The current application lacks site-specific information on impacts to resources for both existing and new roads to be constructed, instead relying on broad statements regarding use of BMPs. It is impossible for the public to know which special aquatic sites will be impacted without a detailed and up-to-date description of road construction activities.

On steep slopes, particularly in rainy winter months, similar BMPs have failed in the past to prevent impacts to streams, creeks and ditches. Not only is road construction inadequately described, but also the measures to prevent significant sedimentation and turbidity in streams are neither site-specific nor reliable.

During construction of the 12-inch MasTec Coos County pipeline in 2003, covering terrain similar to the proposed PCGP, erosion and sedimentation control measures repeatedly failed, leading to both massive erosion and landslides. The DEIS and JPA give little specific information to justify the assumption that, particularly in steep areas, BMPs will be adequate to prevent impacts to streams, and result in zero discharge as stated in the JPA. Pictured above, a silt fence during construction of the Coos County pipeline in 2003 is overtopped by eroding soil, which is then deposited directly into a small tributary stream of the Coquille River. The second photo shows a bale of hay – an erosion control device – that has become lodged in a culvert, resulting in the stream cutting through the road itself.

ODEQ noted that the DEIS fails to, at a minimum, provide an explanation of the decision to pave/resurface 49 miles of road and analyze that increase of stormwater runoff resulting from those impervious surfaces, and to evaluate the thermal load increase from road construction related to the project. State of Oregon 2015 DEIS comments at 48.

Impacts, Risks, and Contingencies for Horizontal Directional Drilling

HDD crossings, when successful, have impacts in areas adjacent to rivers where staging and construction areas occur. HDDs also require the disposal of materials extracted from the drill hole. HDD attempts frequently fail, causing drastic impacts to water quality and fish habitat. According to Williams' own experience, large-diameter HDDs frequently fail. In recent history, many HDD attempts along the 12-inch Coos County pipeline failed, resulting in "frac-outs," situations in which large amounts of sediment and bentonite clay (used as a drilling lubricant)

were released into streams. Bentonite clay and sediment released through frac-outs can disrupt fish spawning habitat, increase turbidity, and potentially introduce other contaminants to impacted waterways. The 2009 FEIS states at 2-97: "…there are two problems that may occur during the use of an HDD. First, there may be an unintentional release of drilling mud, forcing its way to the surface through underground fissures. This situation is termed a 'frac-out.' Second, the drill may be blocked by unexpected substrata soils or geological conditions (such as gravel or boulders)." The current DEIS does not mention the second problem of blockage by unexpected substrata soils or geological conditions. DEIS at 4-387. The DEIS briefly discusses the possibility of frac-out.

The photographs above document a frac-out that led to sedimentation and a huge release of bentonite clay into the Coquille River during construction of the 12-inch Coos County pipeline. A similar HDD failure on the Rogue and Coos Rivers would severely impact water quality and salmon habitat. Bentonite clay is highly detrimental to salmon spawning habitat. In addition, the DEIS states that drilling mud "can include additional additives specific to each drilling operation" and "Pacific Connector would approve any additive compounds" but does not disclose what these additives might include. DEIS at 4-387.

ODFW described some of their concerns regarding frac-outs:

> Between August and October of 2003, MasTec North America Inc. was cited by DEQ for a series of water-quality violations which occurred between August and October of 2003. The violations were a result of frac-outs during the horizontal drilling work for the construction of a natural gas pipeline under the North Fork of the Coquille River in Coos County. If similar frac-out related turbidity discharge impacts were to occur at the proposed Rogue River crossing, they would likely impact last known significant spawning habitat for Spring-run Chinook salmon in the Rogue River Basin. This EIS should include analysis of the potential environmental impacts of a frac-out related turbidity discharge due to the proposed action and alternatives.

State of Oregon 2008 DEIS comments at 24.

> Pipeline crossings using HDD or other subsurface methodologies can be expected to cause frac-outs in Coos County geology and possibly throughout the project. The Applicant should be prepared for construction stoppages, cleanup, and remediation of damages caused by frac-outs.
>
> HDD and other subsurface boring or drilling crossing design locations should pro-actively address the risks associated with the potential for a "Frac out" or inadvertent loss of drilling fluid…

State of Oregon 2015 DEIS comments at 102.

ODEQ noted that the DEIS fails to disclose and analyze the likelihood and frequency of frac-out events. State of Oregon 2015 DEIS comments at 43 & 102. Without this information, ODEQ cannot evaluate whether the project is likely to degrade water quality below state standards.

Projected Erosion and Effectiveness of Controls Along Pipeline Route

Pacific Connector proposes to clear timber from along the pipeline route in fall 2015, with mainline construction to begin in 2016. The JPA does not provide an analysis of how cleared areas are to be managed during the winter of 2015-2016 in order to prevent significant erosion and sedimentation events during that time, or into the future. Without site-specific analysis relevant to this construction period, and the long-term management of a cleared ROW, the Corps, DEQ, and the public cannot meaningfully evaluate the effectiveness of measures to control erosion and sedimentation of waterways during this period.

ODEQ must evaluate both the short and long term discharges of turbidity and sediments from what is essentially a proposed new 230-mile dirt road for the lifetime of the project. The 2003 MasTec pipeline provides a much smaller example of similar the water quality risks. The turbidity and sediment discharges from the cleared ROW and pipeline installation should be evaluated for cumulative discharges over long term, and should include an analysis of how this may contribute to mercury pollution from elemental mercury found in soils.

Extent of Completed Work

The JPA states that no work has yet been completed on the proposed project. The JPA fails to note the prior excavation and testing programs that have already been completed on the project site, including pile testing and ground improvement evaluation that involved significant excavation and movement of material at the terminal and South Dunes power plant sites.

In sum, significant and necessary information about the project and its impacts on water quality is missing from the application. Without this necessary information, DEQ lacks the basis to determine whether the project could be undertaken in accordance with water quality standards. If the applicants are unable to provide the necessary data and information, DEQ must deny the certification request.

2. The Proposed Action would Cause or Contribute to Violations of Oregon State Water Quality Standards.

Oregon's water quality regulations are contained in OAR Chapter 340, Divisions 40 through 56 and 71. Division 41, "Water Quality Standards: Beneficial Uses, Policies, and Criteria for Oregon" is the most significant for the Section 401 certification evaluation of this project. The proposed action would cause or contribute to violations of Oregon State water quality standards.

2.1 The Proposed Action would Violate Oregon's Antidegradation Policy.

Oregon's antidegradation policy applies to all surface waters. It requires that water bodies that meet water quality standards maintain existing water quality. For water quality limited waters, water quality may not be lowered. Under OAR 340-041-0004:

> (1) Purpose. The purpose of the Antidegradation Policy is to guide decisions that affect water quality such that unnecessary further degradation from new or increased point and nonpoint sources of pollution is prevented, and to protect, maintain, and enhance existing surface water quality to ensure the full protection of all existing beneficial uses. The standards and policies set forth in OAR 340-041-0007 through 340-041-0350 are intended to supplement the Antidegradation Policy.
>
> (3) Nondegradation Discharges. The following new or increased discharges are subject to this Division. However, because they are not considered degradation of water quality, they are not required to undergo an antidegradation review under this rule:

> (c) Temperature. Insignificant temperature increases authorized under OAR 340-041-0028(11) and (12) are not considered a reduction in water quality.
>
> (d) Dissolved Oxygen. Up to a 0.1 mg/l decrease in dissolved oxygen from the upstream end of a stream reach to the downstream end of the reach is not considered a reduction in water quality so long as it has no adverse effects on threatened and endangered species
>
> (7) Water Quality Limited Waters Policy: Water quality limited waters may not be further degraded except in accordance with section (9)(a)(B), (C) and (D) of this rule.

The project will degrade water quality in many areas where water quality is already impaired, as well as in high quality waters that are meeting water quality standards. The 2009 FEIS stated:

> Clearing and grading of streambanks, removal of riparian vegetation, instream trenching, trench dewatering, and backfilling could result in streambank modification; increased sedimentation; turbidity; increase in temperature, decreased dissolved oxygen concentrations; releases of chemical and nutrient pollutants from sediments; and introduction of chemical contaminants, such as fuel and lubricants. An increase in soil compaction and vegetation clearing could potentially increase runoff and subsequent streamflow or peak flows. Surface waters could be impacted due to alteration of groundwater flow where the pipeline intersects waterbodies.

2009 FEIS at 4.3-31.

DEQ previously expressed strong concern that the proposed action would violate Oregon's antidegradation policy. In its 2008 DEIS comments, DEQ stated:

> The project proponent cannot be allowed to further degrade a water quality limited waterbody. According to Oregon Administrative Rule (OAR) 340-041-0004(7) 'Water quality limited waters may not be further degraded except in accordance with section (9)(a)(B), (C) and (D) of this rule.' Section (9)(a)(B), (C) and (D) specify very limited circumstances where further degradation can be allowed. It is unknown whether this project could qualify for any exception…
>
> The project cannot cause or contribute to water quality standard violations nor discharge pollutants to a stream that already is in violation. If a TMDL has been issued, the project needs to comply with all requirements of the TMDL. If they cannot comply with a TMDL, no discharge is possible and the project probably cannot go forward.

State of Oregon 2008 DEIS comments at 48.

ODEQ's 2015 comments reiterate this concern. *See* State of Oregon 2015 comments at 27.

ODEQ's Antidegradation Policy Implementation Internal Management Directive is primarily aimed at point source discharges regulated under NPDES permits. Although the IMD notes that the guidance could be applied to a 401 Certification process, the analysis set forth therein is not directly focused on the unique review and assessment required by Section 401. In conducting its antidegradation review, DEQ should ensure that the regulations set forth in the OARs guide the process. To the extent that the guidance set forth in the IMD can be scaled-up to address the enormous scope of this project, we expect that DEQ will do so. However, it is possible that because of the amount of water quality impacts and the overall scope of the project, DEQ may face some unique challenges in completing its antidegradation review.

In all waters, all existing uses of the waterway must be protected. 40 CFR 131.12(a)(1). The federal antidegradation policy provides for the maintenance and protection of existing uses, and the water quality necessary for their protection, whether they are designated beneficial uses or not. ODEQ's antidegradation analysis must begin with an identification of all existing uses on all 400 waterways impacted by the pipeline and terminal. The JPA fails to provide this information.

In many areas along the pipeline route, significant resources, both private and public, have been invested in the restoration and recovery of water quality and aquatic habitat. ODEQ must incorporate this information into its analysis of current conditions of the waterways in each basin as part of the antidegradation analysis.

Coos (HUC 17100304)

The State of Oregon has invested significant funds in restoration activities designed to benefit water quality and salmon species within the Coos subbasin. The Oregon Watershed Enhancement Board (OWEB) has distributed restoration funds to a number of organizations. As of this writing OWEB has invested $12,670,020[8] in activities including assessment work, watershed council support, education, technical assistance, monitoring and the hard costs of restoration work to restore the Coos subbasin.

Coquille (HUC 17100305)

The State of Oregon has invested significant funds in restoration activities designed to benefit water quality and salmon species within the Coquille subbasin. As of this writing OWEB has invested $7,131,049 in activities including assessment work, watershed council support, education, technical assistance, monitoring and the hard costs of restoration work to restore this subbasin. Additionally, ODEQ must consider that any impacts in the Coquille subbasin would affect Coos Bay and the success of other restoration work downstream.

South Umpqua (HUC 17100302)

The State of Oregon has invested significant funds in restoration activities designed to benefit water quality and salmon species within the South Umpqua subbasin. As of this writing OWEB has invested $6,086,437 in activities including assessment work, watershed council support,

[8] OWEB funding data for all subbasins retrieved from http://www.oregon.gov/oweb/docs/oitt.html by subbasin on 3/11/2015.

education, technical assistance, monitoring and the hard costs of restoration work to restore this subbasin. Additionally, ODEQ must consider that any impacts in the South Umpqua subbasin would affect the Umpqua River and the success of other restoration work downstream.

Upper Rogue (HUC 17100307)

The State of Oregon has invested significant funds in restoration activities designed to benefit water quality and salmon species within the Upper Rogue subbasin. As of this writing $803,548 has been granted by OWEB for restoration work either on the streams that would be impacted by the PCGP, or in areas downstream within this subbasin. In total OWEB has invested $2,749,320 in activities including assessment work, watershed council support, education, technical assistance, monitoring and the hard costs of restoration work to restore this subbasin. Additionally consider that any impacts in the Upper Rogue subbasin would affect the Rogue River and the success of other restoration work throughout the whole Rogue Basin.

In personal communications the Rogue River Watershed Council Executive Director expressed that in addition to past work, the Rogue River Watershed Council (RRWC) is hoping to initiate several watershed health restoration projects in waterbodies proposed to be crossed by the LNG pipeline route. The following table lists latitude and longitudes (approximate, WGS84 projection) and the types of projects being planned.

Waterbody	**Restoration Type**	**Lat**	**Long**
Salt Creek	Fish Passage	42.453278	-122.625944
Salt Creek	Fish Passage	42.458722	-122.622861
Salt Creek	Fish Passage	42.461972	-122.615556
Salt Creek	Fish Passage	42.467778	-122.607944
Salt Creek	Fish Passage	42.465689	-122.598611
West Fork Trail Creek	Flow	42.690811	-122.870694

Infrastructure development and maintenance is likely to increase sedimentation in streams. This sedimentation inhibits the success of salmon and steelhead spawning, and incubation and early life history survival. Vegetation along streams that is cleared for rights of way lead to increased stream temperatures; this also inhibits salmon survival and reproductive success. In streams where the RRWC hopes to actively work to increase salmon migration success and habitat characteristics for better survival, RRWC would like to limit development that leads to degraded water quality. It appears that in West Fork Trail Creek and Salt Creek, such degradation would occur from pipeline construction. RRWC would also be concerned about developments that increase the risk of turbidity / sediment routing to the North and South Forks of Little Butte Creek. These tributaries streams are very productive for all anadromous fishes (particularly the South Fork).

Upper Klamath (HUC 18010206)

The State of Oregon has invested significant funds in restoration activities designed to benefit water quality and salmon species within the Upper Klamath subbasin. Funds have been distributed to a number of organizations through OWEB. As of this writing OWEB has invested

$429,343 in activities including assessment work, watershed council support, education, technical assistance, monitoring and the hard costs of restoration work to restore this subbasin. Additionally consider that any impacts in the Upper Klamath subbasin would affect the Klamath River and the success of other restoration work downstream. Impacts to the Klamath River may also impact waterways in the State of California and the beneficial uses and restoration activities found downstream. Oregon should consult with the California State Water Resources Control Board regarding potential impacts to California waters.

Lost (HUC 18010204)

The State of Oregon has invested significant funds in restoration activities designed to benefit water quality and salmon species within the Lost subbasin. Funds have been distributed to a number of organizations through OWEB. As of this writing OWEB has invested $8,721,131 in activities including assessment work, watershed council support, education, technical assistance, monitoring and the hard costs of restoration work to restore this subbasin. Additionally consider that any impacts in the Lost subbasin would affect the Klamath River and the success of other restoration work downstream. Impacts to the Klamath River may also impact waterways in the State of California and the beneficial uses and restoration activities found downstream. Oregon should consult with the California State Water Resources Control Board regarding potential impacts to California waters.

Overall, it would appear that the proposed impacts from the pipeline undermine the Oregon Plan for Salmon and Watersheds that the State uses to restore wild salmon.

As discussed in detail in sections 2.1 through 2.9, below, the project would result in a lowering of water quality for at least the following parameters: Narrative Criteria, Biocriteria; Dissolved Oxygen; Temperature; Toxic Substances; and Turbidity. This lowering of water quality, together with loss of habitat and food sources, will adversely impact the existing designated beneficial uses of: Anadromous Fish Passage; Salmonid Fish Rearing; Salmonid Fish Spawning; Resident and Aquatic Life; Wildlife and Hunting; Fishing; and Aesthetic Quality in the various waterbodies impacted by the project. For example, the LNG terminal and pipeline fail to protect the designated use of aquatic life, including threatened salmonids, eulachon, and green sturgeon. The expansive acreage of dredging and filling in critical salmon habitat fails to protect salmon. The construction and operation of the terminal and pipeline, including removing riparian vegetation, tanker traffic, wastewater discharge, ballast water intake, pipeline stream crossings, and the risk of catastrophic damage due to a gas fire combine to create unacceptable harm to aquatic life. The fact that some of the aquatic wildlife species are on the brink of extinction makes the project even less acceptable.

DEQ has found very similar proposals for pipeline and gas export terminal infrastructure construction and operation would violate Oregon's antidegradation policies and denied 401 certification for Bradwood Landing. DEQ letter dated March 10, 2011 to James Holm and Kimberly D. Bose from Sally Puent.

Because several of the impacted waterways are already water quality limited, reversal of the impacts of these alterations would not be possible, and the applicants have not demonstrated that

mitigation would be adequate or achievable to meet water quality standards. Furthermore, waterbodies that are currently attaining water quality standards are also subject to antidegradation review. For these high quality waters, the lowering of water quality is allowed only if the action is necessary and benefits of the lowered water quality outweigh the environmental costs of the reduced water quality. The applicants have not demonstrated that the project is necessary or that the benefits of the impacts to water quality outweigh the environmental costs. Therefore, ODEQ should deny the 401 certification for the project.

2.1.1 Water Quality Limited Waters

The project would cross at least 35 waterbodies that are listed on the 303(d) list as Category 4 or 5, impaired for various parameters, including temperature, dissolved oxygen and sedimentation. Pacific Connector would cross 29 impaired waterways using "dry" or diverted open-cut methods, 5 waterways using boring, Direct Pipe or HDD methods, and one (Haynes Inlet) with wet open-cut trenching. The Coalition believes DEQ should use the most current data for 303(d) listing in its analysis.

In water quality limited waters, all water quality standards must be met. In other words, DEQ may not certify a project that would result in a lowering of water quality in a waterbody that is already impaired for one or more parameters. Where the project would result in a lowering of water quality on water quality limited waters, DEQ must determine whether there is a TMDL in place that demonstrates sufficient reserve capacity to assimilate the parameter impacted by the project. Where there is no TMDL in place, DEQ's current practice requires the application of numeric criteria and the human use allowances.

Impacts in the Rogue Basin

The 2008 Rogue TMDL covers temperature and bacteria that applies to all streams within the Upper Rogue subbasin. As discussed in more detail in Section 2.5 the proposed action would result in 'obvious stream heating.' The Rogue TMDL allocates reserve capacity to accommodate future growth as well as to provide an allocation to any existing source that may not have been identified during the development of the TMDL.

The Rogue TMDL for temperature describes the load allocated for nonpoint sources as:

> Load Allocations (Nonpoint Sources): The load allocation for nonpoint sources in the Rogue River basin consists of the sum of the natural background heat loads from solar radiation plus the heat load that corresponds to *0.04°C* of the Human Use Allowance (HUA) above the criteria at the point of maximum impact in the Rogue River. A heat load corresponding to the HUA has been allocated to nonpoint source activities along the Rogue River to address anthropogenic heat loads in excess of background rates due to existing structures, or altered landscape features that are unlikely to achieve system potential shade.

Rogue TMDL at 2-3, emphasis added.

The load allocated for non-point source increases in temperature is incredibly small due to the severity of the temperature problem in the Rogue. The applicant has not demonstrated that existing load targets have been met, or reserve capacity is available in the Rogue TMDL to make even some small portion of that 0.04ºC available for this project. The project must comply with TMDL requirements and the needs to consider anticipated growth and development of the Rogue Valley, one of the fastest growing areas in the state.

South Fork Little Butte Creek and Deer Creek are 303(d) listed as impaired for sedimentation. Road improvements, right of way construction and maintenance, and stream crossings would all serve to add additional sediment discharges into these already impaired waterways. ODEQ cannot certify any increase in water quality impacts. The 2008 Rogue TMDL states:

> At the time of the writing of this TMDL, there were insufficient data to address the Rogue River Basin dissolved oxygen listings ... DEQ intends to re-visit the Rogue River Basin dissolved oxygen impairments when the temperature and bacteria TMDLs are reviewed, on a 5 year basis.
>
> DEQ does however expect that improvements in dissolved oxygen levels will occur as a result of implementing the Temperature TMDL. Stream temperature has a significant impact on the dissolved oxygen level in a stream in two ways. As stream temperatures decrease, the amount of oxygen that can remain dissolved in water increases, and as temperatures decrease the amount of oxygen consumed by biological processes decreases.
>
> There are a number of causes of increased stream temperatures in the Rogue River Basin … It is anticipated that decreasing stream temperatures as required for nonpoint source heat load allocations in the Temperature TMDL will also reduce dissolved oxygen impairments. Surrogate measures to reduce nonpoint source heat loads include percent effective shade targets and hyporheic flow percentage targets. DEQ encourages the long-term monitoring of dissolved oxygen on the 303(d) listed streams in the Rogue River Basin.

2008 Rogue Basin TMDL, *available at* http://www.deq.state.or.us/WQ/TMDLs/rogue.htm#rb.

South Fork Little Butte Creek is also 303(d) listed as impaired for sedimentation. The 2008 Rogue TMDL states:

> At the time of the writing of this TMDL, DEQ is in the process of developing a sedimentation assessment methodology that could be used for implementing the narrative sedimentation standard. When the methodology and associated guidance is completed, the agency will establish sedimentation TMDLs for those waterways on the 303(d) list. DEQ also intends to re-visit the Rogue River Basin sedimentation impairments when the temperature and bacteria TMDLs are reviewed, on a 5-year basis.
>
> DEQ does however expect to see decreases in sedimentation as a result of implementing the Temperature TMDL … Sedimentation results from either

> stream channel or upland erosion. Disturbances that change riparian vegetation, increase the rate or amount of overland flow, or destabilize a stream bank may increase the rates of stream bank erosion and result in sedimentation increases. Disturbances in the uplands that remove vegetation, reduce soil stability on slopes, or channel runoff can increase sediment inputs (DEQ 2003, DEQ 2007). Sediment created from upland erosion is delivered to a stream channel through various erosional processes. Wide mature riparian vegetation buffers filter sediment from upslope sources as well as stabilize stream banks from erosion. System potential riparian vegetation measured by percent effective shade is a surrogate measure that has been used in other TMDLs to address sedimentation (DEQ 2003). Percent effective shade targets for the Rogue River Basin were set in the Temperature TMDL. DEQ encourages the long-term monitoring of sediment related parameters on the 303(d) listed streams in the Rogue River Basin.

Id.

North Fork Little Butte Creek is impaired for pH. Increased temperature such as from riparian clearing can cause fluctuations in pH levels.

With regard to peak flows in the Rogue Basin, the current DEIS states that streams already listed on the 303(d) list will be further impacted:

> The greatest forest clearing disturbance within the transient snow zone on a percentage basis would occur within the Spencer Creek Watershed. The pipeline would disturb a total of about 126 acres of forest within the 21,913-acre transient snow zone within the 54,242-acre watershed…. When considering forest vegetation disturbance within the transient snow zone, the pipeline would also have the highest percentage of forested disturbance within the Trail Creek Watershed, disturbing about 107 acres of forested vegetation types within the 30,107-acre transient snow zone in the 35,343-acre Trail Creek Watershed.
>
> The Little Butte Creek fifth-field watershed would have the largest area disturbance by the Project that is located within the transient snow zone with about 434 acres …"

2014 DEIS at 4-398.

These concerns carry over erosion issues from the prior project iteration. As the 2009 FEIS stated:

> Fluvial erosion represents potential hazard to the proposed pipeline where streams are capable of exposing the pipe as a result of channel migration, avulsion, widening, and/or streambed scour. The principal hazard resulting from channel migration and streambed scour is complete or partial exposure of the pipeline within the channel from streambed and bank erosion or within the floodplain from channel migration and/or avulsion…. two crossings were identified that require additional field reconnaissance; West Fork Trail Creek and North Fork Little Butte Creek.

2009 FEIS at 4.3-36.

The 2014 DEIS omits this analysis. It is unclear what, if any additional reconnaissance has been completed. In addition, the 2009 FEIS stated that, "the assessment recommended burial of the pipeline at least 5 feet below the surface at Indian Creek (MP 128.6) due to channel migration concerns." 2009 FEIS at 4.3-37. The JPA does not contain the recommended condition.

The Rogue River is on Oregon's proposed 303(d) list submitted to EPA on November 14, 2014, for mercury due to fish tissue samples exceeding Oregon's toxics criteria. The listing proposal is currently waiting approval by EPA and is expected to be approved soon. While a TMDL has not been completed yet, the mercury is largely thought to be from elemental mercury in the soils due to the regions geology. ODEQ should consider how any construction or maintenance activities of pipeline ROW or road access would mobilize sediment containing mercury in a manner that will lead to methylation and uptake into fish and other organisms within the Rogue River.

Impacts in the South Umpqua Basin

The Umpqua Basin has an area of 5,156 square miles. Three fourth field hydrologic units comprise the Umpqua Basin drainage: 1) the North Umpqua Subbasin, 2) the South Umpqua Subbasin, and 3) the Mainstem Umpqua/Smith Subbasin. The Umpqua Basin drainage lies almost entirely within Douglas County, with some overlap into Lane County to the north, and a very small portion in Coos County to the west. The headwaters of the North Umpqua River are located in the Umpqua National Forest. The River then flows generally west until it meets the South Umpqua River downstream from Roseburg.

The South Umpqua River also contains headwaters in the Umpqua National Forest. The River generally flows west. It flows north after its confluence with Cow Creek, a major tributary. After it flows through the Umpqua Valley, the South Umpqua meets the North Umpqua downstream from Roseburg. Downstream from the confluence is the Umpqua mainstem, which flows generally west until it meets the Smith River at the Umpqua-Smith estuary before emptying into the Pacific Ocean at Winchester Bay.

The South Umpqua Basin possesses hundreds of miles of impaired waterways. Overwhelmingly, these stream impairments relate to unsustainable land use management practices that have, individually and cumulatively, decreased local waterway resiliency and health. The South Umpqua Basin has several TMDL listings of direct relevance to the Project:

- Temperature Impairment – Rearing – 603 miles
- Temperature Impairment – Spawning – 65 miles
- pH Impairment – 163 miles
- Dissolved Oxygen Impairment – 78 miles
- Biological Criteria – 101 miles
- Aquatic Weeds/Algae – 57 miles
- Total Stream Miles with One or More Impairments – 728 miles

Historically, heavy logging has significantly reduced riparian vegetation. Logging and related activities have, in turn, affected tributaries by incising banks, speeding watercourses, and removing large woody debris. Similarly, spawning gravel and deep pools have been reduced in quantity and quality, limiting the natural stream habitat necessary for threatened species. Native fish of the basin include steelhead, Coho salmon, Chinook salmon, Chum salmon, Cutthroat trout, Western brook and Pacific lamprey, Umpqua dace, Redside shiner, Largescale sucker Umpqua pikeminnow and Umpqua chub.

The South Umpqua Watershed's TMDLs are of particular importance in characterizing the significance of the Project's impacts because pipeline construction and maintenance exacerbates existing impairments problems noted above. Indeed, further clearing of trees, removal or alteration of riparian buffers, and less woody debris, along with other resulting impacts of the Project, will increase temperatures, imbalances in pH and Dissolved Oxygen, and prompt super saturation of the water column with excess nutrients and sediment, exacerbating algal growth and other impairments inimical to supporting health fisheries or local water quality conditions.

It is important to note that designated uses in much of the South Umpqua Basin are geared towards protecting cold water fisheries, specifically salmon. The summer steelhead run of the South Umpqua is now extinct. The Chinook and Coho salmon runs as well as lamprey are on the brink of collapse. The entire South Umpqua basin is a key watershed under the Northwest Forest Plan and plays a strategic role in the Oregon Coastal Recovery Domain. In turn, the TMDLs noted above contain watershed restoration strategies that are tailored towards improving those waterways capacity to host healthy fisheries by limiting, contextually, the loading of certain pollutants and by addressing other impairments tied to local riparian land uses. Put another way, if the Project will cause or contribute to discharges of pollutants into, or destabilization of landscapes relevant to, TMDL waterways, then those Project actions are likely to violate antidegradation requirements and potentially each TMDL's load allocations.

We also note that the South Umpqua River Basin has a Water Quality Management Plan describing actions necessary to protecting and improving water quality in impaired waters. Key strategies relevant to understanding the Project's adverse impacts on local impaired waterways include:

- Identify stream reaches that may serve as "oases" for fish during the summer months, such as at the mouth of small or medium-sized tributaries. Protect or enhance these streams' riparian buffers and, when appropriate, improve instream conditions by placing logs and boulders within the active stream channel to create pools and collect gravel.
- In very warm streams or where pH is a problem, shade by encouraging wide riparian buffers and managing for full canopies.
- Where canopy cover is less than 50%, establish wide buffers of native trees (preferably conifers) and/or shrubs, depending upon local conditions. Priority areas are fish-bearing streams for which more than 50% canopy cover is possible.
- Identify riparian zones dominated by grass, brush, and blackberry and convert these areas to native trees (preferably conifers) and/or shrubs, depending on local conditions.
- Where riparian buffers are one tree wide or less, encourage buffer expansion by planting native trees (preferably conifers) and/or shrubs, depending on local conditions.

- Maintain riparian zones that are two or more trees wide and provide more than 50% cover.
- Limit wetland damage, such as off-channel watering, hardened crossings, livestock exclusion (part or all of the year), and providing stream shade.

The Management Plans contain several themes antithetical to the Project. First, protecting important fishery habitat such as small-medium tributaries' riparian buffers for the purposes of habitat, presence of woody debris, and temperature. Second, enhancing tree coverage and riparian bank integrity. Third, enhancing wetlands integrity and prevalence. Fourth, limiting disturbance of land and discharges of soil into waterways, especially as many soils in the Umpqua are phosphorus-rich and disproportionately contribute to the risk of eutrophication.

For example, in tributary Cow Creek, phosphorus waste load and load allocations are expected to meet the pH standard with existing land use practices only. Indeed, it is well recognized that nutrient enrichment is a primary underlying cause for many of the Umpqua Basin's 303(d) listings for dissolved oxygen, pH, phosphorus, chlorophyll a and aquatic weeds and algae. A detectable level of excess phosphorus fertilizer from project revegetation would violate the DO-pH TMDLs for the South Umpqua River.

Another example is the disconnect between the project's proposed landscape impacts – particularly tree clearing and waterway crossings – and the basin's need for *increased* prevalence of riparian buffers and mature trees. Clearing riparian zone vegetation, particularly culling timbers on small and medium sized tributaries, will likely violate temperature and biological criteria TMDLs in the basin. Similarly, the South Umpqua River is also impaired for excess sediment. 22 segments of the subbasin are Category 5 listed, with TMDLs needed for Biological Criteria. Fine sediment is a significant stressor in many of these segments. Land disturbance and waterway crossings associated with the project will discharge sediment into key headwater streams and, in so doing, likely violate sediment allocations under TMDLs.

Local citizen-based watershed councils have invested many volunteer hours and state-supported restoration funds to address manmade barriers of salmonid migrations to spawning grounds and smolt migrations to the estuary. Watershed volunteers have worked to replace large woody debris and stabilizing boulder structures to rebuild the complexity of aquatic habitat and retain spawning gravels. Landowners have planted in riparian areas to attract beavers and supply shade and large wood for the river system. As a result, landowners along the system report observing fish returning to the basin. Community members use Cow Creek water for irrigation and even drinking water supplies.

Because the Project involves several new discharges and disturbances of riparian landscapes in waterways of the South Umpqua Basin, particularly TMDL waterways, the project must undertake the required analyses and make the requisite showings that degradation will not occur and that TMDLs will be maintained. To be compliant with antidegradation, the project must demonstrate that discharges will maintain and protect existing quality of receiving surface waters. Here, the project only demonstrates that it will create significant, diverse impacts that will cause or contribute to further degradation of already impaired water quality, riparian and waterway habitat.

The project and DEIS have not conducted a lawful antidegradation analysis because they fail to adequately consider impacts to surface waters and fail to consider cumulative effects of the proposed actions on surface waters. In one example, the JPA indicates that turbidity standards will be violated for unknown periods of time at unknown levels at the South Umpqua crossing and possibly other crossings. The JPA does not adequately evaluate the amount and characteristic of fine sediment that the project would generate and impacts of that fine sediment on the aquatic life and habitat of the system. In addition, crossings in this basin including the East Fork Cow Creek crossing, are extremely steep areas. The JPA fails to evaluate and account for the additional risks and difficulties of crossings in steep ravines and valleys and the fine sediment and turbidity contributions associated with those activities. Indeed, the Project holds significant potential to negatively affect implementation of each of the TMDLs in the South Umpqua Basin.

Impacts in the Upper Klamath and Lost River Basins

The Klamath River Basin covers 10.5 million acres in southern Oregon and northern California. It is home to six federally-recognized tribes and many National Wildlife Refuges, National Parks, and National Forests. Past and current practices in the basin, including irrigation and forestry and the four dams along its reach, have led to contentious disputes over water allocation, water quality, and threats to aquatic species.

In the past, the Klamath was the third-largest west coast salmon run. In 2002, a massive die-off of more than 33,000 adult salmon on the Klamath raised awareness of the seriousness of the issues and the need to resolve and protect all beneficial uses of the water in the basin. In 2004, EPA, Oregon and California governors, and Secretaries of Interior, Commerce, and Agriculture signed onto the Klamath River Watershed Coordination Agreement to work on a basin-wide approach to address water quality and other environmental issues. Over the past decade, a broad coalition of stakeholders has come together to work towards a solution to the water allocation issues in the basin. The group, which includes ranchers, tribes, irrigators, federal and state government agencies, and other water users in the basin, recently reached a proposed settlement agreement. The agreement will increase stream flows into Upper Klamath Lake, provide more stability for irrigated agriculture in the upper basin, and improve and protect riparian habitat.

Water pollution originating in the Upper Klamath watershed on Bureau of Reclamation Klamath Project lands and elsewhere in the Upper Basin from irrigated agriculture, wetland reclaiming, timber harvest, grazing and other anthropogenic activities is an acknowledged problem and a recognized factor in problematic water quality conditions in the entire Klamath River watershed (National Research Council 2002, NCRWQCB 2009, ODEQ 2000).

Several waterbodies in the basin, including the Lost River, Klamath Straits Drain, and Klamath River are water quality impaired for many parameters including nutrients, pH, dissolved oxygen, ammonia, toxicity, and temperature. ODEQ has finalized its TMDL for the Upper Klamath and Lost subbasins. Under the June 2009 Memorandum of Agreement for Klamath River/Lost River TMDL Implementation, ODEQ has a duty to enforce implementation measures and programs to ensure consistent and effective achievement of water quality standards, coordinate water quality monitoring programs to assess progress towards meeting allocations, targets, and water quality

standards, and prevent potential conflicts and resolving actual conflicts between Oregon and California implementation measures associated with cross-boundary water bodies.

Due to the mainstem Klamath's severe water quality problems, complex ownership and management dynamics, and complex biology and hydrology, creating the TMDL has required considerable resources from multiple agencies. Implementation and enforcement of this TMDL has been challenging and has required publicly funded restoration projects and incentives to promote changes in land management practices and improve efficiency in water transportation. ODEQ should recognize that approving additional pollution sources to the Klamath watershed in the form of the Pacific Connector Pipeline, whose impacts could be considerable and long-term, could undermine the entire TMDL process.

The proposed pipeline would have negative impacts on numerous springs, wetlands or agricultural waterbodies in the Lost River subbasin whose ongoing function would be dependent on the efficacy of mitigation actions whose shortcomings are discussed under previous headings. Impacts from the pipeline construction will further degrade the Lost River's already compromised wetland function, and could problematize future efforts to restore wetland function in order to comply with TMDLs. Along with existing roads and railroads, the pipeline could create an additional "wall of compaction" hindering lateral subsurface water movement. The FEIS does not consider the hydrologic impacts of these disturbances in a cumulative context with existing impacts, though ODEQ will need to consider cumulative hydrologic function when implementing its Lost River TMDL.

The project proposes many crossings within the Klamath Basin, including the Klamath River near Klamath Falls. The Lost River, home of the endangered Lost River sucker and its critical habitat, would be impacted by the proposed crossing activities. Critical spawning habitat for Klamath River trout including Spencer and Clover Creeks and the Klamath River below Keno, would also be impacted by project activities. The "new or increased discharge load" will unacceptably threaten or impair recognized beneficial uses and will adversely affect threatened or endangered species. OAR 340-041-0004(9)(C). Even without frac-out or wet open-cut, crossing the Klamath with an LNG pipeline constitutes large scale industrial construction and is an inappropriate land use for a short reach of the Klamath that is already impacted by pollution loads from Link River and Upper Klamath Lake, Klamath Straits Drain and BOR lands, the city of Klamath Falls' stormwater, municipal and county sewage treatment facilities, as well as historical and current riverside industrial timber facilities. This location is among the most water quality compromised in the state of Oregon, and a locus for analyzing and evaluating Klamath River TMDL load allocations. Allowing further degradation would be an acute violation of Oregon's antidegradation policy.

The proposal to move tons of stream bottom sediment, trenching, and coffer dam construction within steep backcountry areas subject to seasonal high water flows raises serious concerns over impacts to water quality in these waterways. The permanent clearing of streamside vegetation for the right of way, as well as the additional "temporary" clearing for construction and work areas (TEWAs) will only exacerbate the thermal pollution already existing in many of these important aquatic habitat areas. Further degraded pollutant parameters associated with the proposed

pipeline are directly (i.e. sediment on Spencer Creek) and indirectly (numerous instances) related to 303(d) listed parameters. OAR 340-041-0004(9)(D)(i).

The applicants' dredging, vegetation clearing, and wastewater discharge will contribute to the exceedance of the temperature water quality standard of 68 degrees Fahrenheit for salmon rearing and migration. Because so many of the impacted waterways are already water quality limited, any contribution of heat from the project above the ambient water temperature causes or contributes to a violation of the temperature water quality standard. New dischargers such as Jordan Cove LNG may not add a pollutant into a water body that is water quality limited for that pollutant. *See Friends of Pinto Creek v. U.S. Environmental Protection Agency,* 504 F.3d 1007 (9th Cir. 2007). Neither TMDLs nor compliance plans have been established for any of the Klamath's 303(d) listed streams impacted by the proposed pipeline, and it is unknown whether sufficient assimilative reserve capacity exists for these listings since there are no numeric compliance plans and proposed loads are un-quantified. OAR 340-041-0004(9)(D)(ii).

Impacts in the South Coast Basin

The South Coast Basin totals over 1.9 million acres and includes, at the north end, the medium-sized Coos and Coquille Rivers headwater in the coast range and flow to the Pacific Ocean, and at the south end, smaller rivers including the Floras, Sixes, Elk, Chetco and Pistol rivers headwater in the Klamath Mountains. Primary threats to these waterways include loss of estuarine and low-gradient floodplains and wetlands, loss of riparian cover, invasive riparian species, sediment delivery from forestlands, lack of stream complexity, and high stream temperatures. The State of Oregon, through the Oregon Watershed Enhancement Board has invested millions of dollars in restoration of the south coast basin. For example, in 2009-2010 alone, OWEB invested more than $2.6 million in restoration activities within the basin.

The South Coast Basin is considered critical habitat for ESA listed species, Coho salmon and Green Sturgeon. ODFW has identified several areas of the basin as "core areas" for the recovery of coastal Coho salmon. The basin is comprised of two evolutionarily significant units (ESUs) for Coho including the Oregon Coast Coho ESU and the Oregon/Northern California ESU. Other species of concern that are found in the basin include Pacific Lamprey, Steelhead, Coastal Cutthroat Trout, and Chinook salmon.

Identified water quality impairments in the basin include temperature, dissolved oxygen, pH, bacteria (shellfish and recreational contact), biological criteria, aquatic weeds, and harmful algae blooms. Elevated temperatures adversely affect fish and other aquatic life throughout the basin. Basin-wide, 110 segments were listed for temperature impairment on the ODEQ's 2010 303(d) Assessment. Thermal pollutants include human-caused increases in solar radiation due to changes in riparian vegetation, stream channel widening, flow modifications, and the management of channelized streams for drainage purposes. Dissolved oxygen criteria exceedances were documented in 32 stream and estuary segments. Forest harvest practices within the basin have contributed to adverse impacts to riparian vegetation and stream channel stability. Effects of timber harvest on temperature and aquatic ecosystems in stream corridors are significant natural resource concerns in the basin.

Within the Coos Subbasin, more than 30 stream segments are 303(d) listed and require a TMDL. The proposed project will impact many of those areas, including the Coos River, Haynes Inlet, Kentuck Slough, Willanch Slough, Catching Creek, Catching Slough, and Ross Slough. These stream reaches are impaired for temperature, biological criteria, dissolved oxygen, fecal coliform, and other parameters.[9]

The applicants propose to dredge millions of cubic yards of material from Coos Bay and Haynes Inlet. The applicants state that turbidity is seasonally elevated in Coos Bay. ODEQ has indicated that it will require direct measurements of turbidity, rather than surrogate measures such as TSS, in order to ensure the protection of water quality necessary to support beneficial uses. State of Oregon 2015 DEIS comments at 46. The Coalition supports this assessment. The Coalition also supports ODEQ's comment that the Sediment Evaluate Framework utilized by the applicant is not an appropriate tool for assessing Haynes Inlet sediments and contamination. *Id*. at 41. The applicants must assess the ecological effects of the proposed action including excavation and replacement of sediments in Haynes Inlet.

The JPA fails to adequately assess the impacts of trenching activities in Haynes Inlet on bacteria. Bacteria can adhere to suspended particles in water, causing an accumulation of bacteria in bottom sediments. Shellfish harvesting, an existing and identified beneficial use of Coos Bay, is especially sensitive to increases in bacteria and other potential pathogens. The JPA is unclear whether a silt curtain will be employed in trenching activities in the Bay. In either case, a silt curtain is not effective in controlling bacteria. The project is likely to further impair these waters for turbidity, bacteria and other parameters. In addition, the applicants propose mitigation activities in Isthmus and Kentuck Sloughs, both of which are 303(d) listed for fecal coliform and dissolved oxygen. Mitigation activities are likely to increase total organic carbon and biological oxygen demand, yet the JPA fails to analyze these impacts on dissolved oxygen in these waterways.

Contaminates in the tidal muds of the project area have not been fully evaluated for past industrial contaminates which are highly likely to be re-mobilized during dredging activities. This would make the already poor conditions of the Coos Estuary worse. The Jordan Cove FERC DEIS on page 4-359 states the following:

> The ODEQ's Integrated Report identified Coos Bay on the Section 303(d) list (in CWA) for not meeting the criteria for shellfish growing since 2004, due to elevated fecal coliform measurements. Coos Bay is listed as Category 5, water quality limited, and a Total Maximum Daily Load (TMDL) is needed (ODEQ 2012d).

2015 DEIS at 4-359.

The Clam Diggers Association of Oregon have already found high levels of contaminants in clams coming from the Coos Bay[10] and commercial oysters are currently not always able to be harvested due to elevated fecal coliform measurements within the Coos Bay.

[9] Much of the lower Coos Bay 303(d) listed segment meets fecal coliform water quality criteria, and are additionally subject to the antidegradation rule for high quality waters.

[10] Motion to Intervene Out-of-Time Clam Diggers Association of Oregon under CP13-483., et. al.: http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20140220-5201

The cumulative damage to the Coos Bay Estuary from the proposed JCEP project would be significant due to the extensive dredging, ballast water, invasive species and water quality impacts.[11] This would reduction in water quality violates Oregon's antidegradation policy, as well as the Coastal Zone Management Act and the Estuary Restoration Act of 2000.

The Coquille River is the longest river in the South Coast Basin, draining 1,058 square miles of watershed. The Coquille Subbasin includes more than 25 303(d) listed stream segments impaired for multiple parameters. Those impacted by the project include the North and East Forks of the Coquille River, Cunningham Creek, Middle Creek, Elk Creek, and Upper Rock Creek. Primary water quality concerns in the Coquille Subbasin are dissolved oxygen, bacteria, nutrients, and temperature. As discussed in detail below, the impacts of the project on dissolved oxygen and temperature in these waterways are likely to result in a lowering of water quality in these waters. In addition, proposed use of fertilizer for revegetation efforts may result in increased nutrient delivery to impaired waterways in the Coquille subbasin, including at crossings and TEWAs.

The Coquille subbasin contains over 187 stream miles with anadromous fish presence. Flow and habitat modification are particular concerns affecting water quality and fish habitat. Several of the identified stream crossings are through waterbodies that are water quality limited for habitat or flow modification including Cunningham Creek, North and East Forks of the Coquille River, and Upper Rock Creek. The DEIS acknowledges that pipeline crossings may affect streams impaired due to habitat modification. Human related impacts to habitat complexity influence stream temperature dynamics and increase diurnal variability in stream dissolved oxygen and pH.

The applicants have failed to prove the necessity of this project, and therefore ODEQ cannot determine that the benefits of the diminished water quality outweigh the environmental costs of the reduced water quality in those basins where TMDLs are in place. Furthermore, TMDLs have been deemed necessary but have not yet been developed for four of the impacted waterbodies and the sedimentation and dissolved oxygen parameters for the Rogue Basin. TMDLs for the Coos subbasin have not been completed. ODEQ cannot approve further impairment of these streams.

2.1.2 The Project Fails to Meet the Environmental Effects Criteria for WQLWs

ODEQ must evaluate the environmental and economic effects of the project. OAR 340-041-0004(9)(c). Under the environmental and economic effects criteria, the applicant must demonstrate that there are no alternatives to lowering water quality in the water quality limited waters, and that the economic benefits of lowering water quality are greater than other uses of the assimilative capacity of that waterway. *See* DEQ Antidegradation Internal Management Directive at 28. This analysis requires the consideration of reasonable alternatives and a technical analysis of socioeconomic benefits versus environmental costs.

[11] The proposed Jordan Cove LNG Export Project would dredge 5.6 million cubic yards of dredge material in order to build their LNG marine slip dock. The Pacific Connector Gas Pipeline would dredge an 8 foot by 3 foot trench for 2.4 miles in the Coos Estuary up into Haynes Inlet. The Port of Coos Bay has plans for an extensive deepening and widening of the shipping channel in the lower Coos Bay. Ballast water, invasive species and water quality impacts from the project could be significant.

The application fails to meet these criteria. First, Jordan Cove has not demonstrated a need for this project in Southern Oregon. Second, and related, the project seriously conflicts with the ecologic and economic health of the Coos Bay estuary, areas impacted by the pipeline, alternative locations, and economic viability of the larger United States. Third, as detailed below, the detrimental effects on protected aquatic resources, including threatened and endangered species, the economy, and public safety are significant and permanent.

The applicants ask DEQ to certify a proposal to allow the largest and most environmentally harmful project in the recent history of Southern Oregon. As noted in the DEIS, the project area "is vast; the 19 fifth-order watersheds crossed by the pipeline route include more than two million acres." DEIS at ES-14. The wide-scale degradation proposed by the applicants is inconsistent with the purpose of the Clean Water Act itself, "to restore and maintain the chemical, physical, and biological integrity of the waters of the United States through the control of discharges of dredged or fill material." 33 C.F.R § 230.1(a).

Reasonable Alternatives to the Proposed Action Exist that would Better Protect Water Quality.

These comments demonstrate the existence of multiple practicable alternatives that the agencies must consider. Because the LNG terminal and pipeline would destroy several acres of special aquatic sites, as described below, practicable alternatives are presumed to be available. The alternative analysis Jordan Cove and Pacific Connector submitted to the agencies does not even come close to demonstrating there are no practicable alternatives. In fact, multiple alternatives exist that satisfy the basic project purpose without disturbing special aquatic sites.[12]

The purpose of the terminal is to provide natural gas to Asian (as well as Hawaiian and Alaskan markets). A myriad of alternatives accomplish this purpose. The primary flaw with the applicant's alternatives arguments is Jordan Cove/Pacific Connector's contention that the projects must be located in Southern Oregon to meet the project's needs. According to Oregon's Department of State Lands ("DSL"), the project has failed to demonstrate that the proposed terminal and pipeline are necessary in Oregon:

> Per OAR 141-085-0029(3), "the Department must determine that the proposed removal fill activity will not be inconsistent with the protection, conservation and best use of the water resources of this state, and would not reasonably interfere with the paramount public policy of this state to preserve the use of its waters for navigation, fish and public recreation." If Oregon were not a target market, why would it need to come through this state and impact its waters, forests and agricultural lands?

State of Oregon 2009 FEIS comments at 15, DSL section, May 29, 2009.

This comment is even more telling now that the project has been converted to an export facility, with no demonstrated intention of serving Oregon markets. Not only is the project not a demonstrated necessity for Oregon, but the JPA's approach to the siting of the Jordan

[12]As FERC has recognized, the vast scope and complexity of the DEIS necessitate further time for public review. The Coalition will supplement these comments with comments to be provided to FERC addressing the DEIS alternatives analysis.

Cove/Pacific Connector project unduly ruled out other gas supply alternatives by defining the purpose so narrowly as to prevent alternatives from meeting that purpose. *See* section 1.1 *supra*. As a result, other possible alternative locations have not been adequately analyzed to demonstrate that the proposed project location will have the least adverse impact on the aquatic ecosystem.

Energy conservation and efficiency is a preferable practicable alternative that the application dismisses without justification. In addition, Australian LNG export companies are already serving the proposed markets, yet are completely ignored in the alternatives analysis. There are seven new LNG projects under construction in Australia, due for completion in the 2014-2018 timeframe. With these additional facilities, Australia is expected to overtake Qatar as the world's largest supplier of LNG by the end of the 2010s. Australia has plentiful gas reserves, existing LNG export operation, and relative proximity to the same Asian LNG markets that Jordan Cove's facility would serve.[13] In addition, Canada has 33 applications for LNG export terminals that have been placed before the Canadian NEB for approval. 11 of these proposals have obtained license approval.[14]

The JPA does not resolve the inexcusable lack of evaluation of relevant information regarding potential alternatives in domestic gas projects and gas storage. Jordan Cove's dismissal of these issues, which were raised by NMFS, the State of Oregon, and many individuals and organizations, is not based on thorough analysis, but rather, as noted by Oregon DLCD: "FERC staff makes *no attempt* to identify and evaluate the relative impacts of each project and determine whether any project is environmentally preferable." State of Oregon 2009 FEIS comments at 30 (emphasis added). This comment remains true and relevant to the current JPA alternatives analysis.

An applicant may not define a project in order to preclude the existence of any alternative sites. *Sylvester v. U.S. Army Corps of Engineers*, 882 F.2d 407, 409 (9th Cir. 1989). Here, the applicants have unreasonably narrowed the purpose and need analysis of the project in order to foreclose other alternatives, in violation of NEPA. The project's failure to both to identify a permissible purpose for the project and to adequately weigh alternatives violates the 404(b) and Section 401 requirements that the applicants demonstrate that no alternatives exist to the proposed project and its impacts.

The alternatives analysis presented in the JPA fail to assess important project design alternatives. For instance, the application should evaluate in detail a terminal design that involves a much smaller footprint, rather than assuming that the project must be sized for 1bcf/d and very large LNG tankers. Additionally, ODEQ should evaluate an alternative in detail that uses only the 12-inch Coos County pipeline (which would entail reducing the scale of the LNG project).

The JPA does not evaluate offshore design alternatives. The applicants should evaluate an offshore design in detail and describe why areas that regularly face harsh weather, such as

[13] *See* The Oxford Institute for Energy Studies, *The Future of Australian LNG Exports* (Sept. 2014), available at http://www.oxfordenergy.org/wpcms/wp-content/uploads/2014/09/NG-90.pdf
[14] *See* Canada National Energy Board, LNG Export License Applications, available at https://www neb-one.gc.ca/pplctnflng/mjrpp/lngxprtlcnc/index-eng.html

hurricanes, are successfully sited and built. NMFS argues in its previous comments that the analysis, and rejection of an offshore proposal as an alternative is inadequate "[g]iven existing or proposed terminals or other similar structures located in harsh environmental conditions elsewhere (e.g. Calypso LNG terminal off the eastern coast of Florida, Troll Natural Gas Fields in the North Sea with depths of 1,100 feet)." The applicants should explain further why the placement of terminals offshore is not feasible. Proposals currently exist to site wind and wave energy structures off the coast of Oregon and Washington. In fact, an offshore wind project is proposed for location approximately 15 nautical miles offshore from Coos Bay. The DEIS acknowledges and describes this Principle Power project. DEIS at 3-17. The JPA does not adequately address this potential alternative and fails to weigh the significant reduction in public safety risks and disturbance to the Coos Bay Estuary against potential added costs.

The LNG berth is proposed to handle LNG vessels as large as 217,000 m^3 despite the fact that the current navigation channel could only be used by vessels less than 148,000 m^3 capacity. DEIS at 3-15. The Corps has suggested that an alternative, smaller marine slip design be considered. The JPA should explain why the marine slip is being constructed to accommodate larger LNG tankers – tankers that cannot navigate the current shipping channel. The JPA should fully evaluate an alternative that incorporates a smaller berth.

The JPA does not provide an adequate analysis of dredging method alternatives and a clear indication of why the proposed methods will minimize impacts. The JPA indicates that both mechanical and hydraulic dredging may be used. Hydraulic pipeline dredging has the potential to impact aquatic species through entrainment and impingement. Additionally, other dredge methods will result in significant turbidity in Coos Bay. Although some specially designed hydraulic cutterhead dredges may reach 0.5 percent spillage, the JPA fails to disclose what kind of cutterhead dredge will be used for dredging. This is vitally important information for the public and the agencies to assess the veracity of the applicant's statements, because without knowing what type of cutterhead dredge will be used, the public cannot begin to evaluate what kind of sedimentation dredging activities will cause. Furthermore, any modeling conducted on behalf of the Project is suspect until a spillage rate can be determined. All cutterhead dredges are not the same. Studies indicate that conventional cutterhead dredging "can liberate considerable amounts of turbidity and associated contaminants to overlying water." Cooke, 2005.

Selection of the proper cutterhead for the type of sediment, in addition to correct rotational speed and hydraulic suction, to obtain reduced suspension rates of sediments is rarely achieved. Herbich, 2000. Therefore, knowing not just the type of dredge used but also the anticipated methods of using the dredging equipment are important factors that must be disclosed for the public and agencies to properly analyze the effects of dredging at the proposed project. ODEQ must make specific findings on the types of dredging equipment. The JPA should present an analysis of alternative methods in order for ODEQ to fully analyze the impacts dredging will have on turbidity and overall pollution. In addition the JPA does not discuss alternative locations for the disposal of dredged material.

The JPA does not evaluate alternatives to avoid impacts to estuarine oysters. The pipeline route across Haynes Inlet between MP 1.7 and 4.1 has the potential to significantly impact both native Olympia oysters and commercially grown Pacific oysters. The proposed route would be directly

adjacent to commercial oyster beds. The use of the open cut pipeline installation method in this area and the associated plumes in turbidity, as well as release of any existing contaminants in the bay muds, could have significant impacts on these oysters and the economic values they produce to the Coos Bay community. While Jordan Cove proposes to utilize turbidity curtains as practicable to prevent sediment transport, these measures cannot control release of bacteria or other contaminants that may be present. The JPA does not discuss alternatives to avoid impacting these oyster species or the economic impacts that could result from these activities.

The JPA fails to present a comprehensive description of alternative fish screen designs and their impacts. The current proposal appears to dismiss fish screening, totally ignoring ODFW's prior comments stating, the "Coast Guard's concerns should not be interpreted to mean that ballast and cooling water screening cannot occur. Screening can and should occur to reduce negative impacts to fish as a result of this project. Additional marine industry review and permitting may be necessary, but this has not eliminated the opportunity to develop and use fish screens." State of Oregon 2009 FEIS comments at 37. The JPA should evaluate clearly fish screen alternatives and the impacts of the proposed screening alternative, which would negatively impact ESA protected Coho salmon.

The JPA should also evaluate an alternative that evaluates a berth that does not involve the slip dock design. As originally proposed before 2007, LNG tankers would be docked alongside the shore (not perpendicular to it in a slip dock as is now proposed). Jordan Cove must justify why alternative designs – less impactful both in location and size – are impracticable in this project.

The application does not adequately evaluate alternatives in timing of construction activities. The DEIS states that "in general" construction of the pipeline would be timed to avoid periods of major juvenile or adult anadromous salmonid migrations in freshwater based on allowed in-water work periods, but notes that there may be modifications to the timing of construction. DEIS at 4-596. The application fails to justify why certain crossings will be constructed outside of in-water work windows.

The JPA also fails to provide adequate information regarding alternatives for stream crossings. The application does not justify the widespread use of open-cut crossings. Additionally, the application fails to adequately evaluate alternatives that will be necessary if HDD crossings fail. Mitigation measures for HDD failures are completely inadequate, and the Williams pipeline company's own data show that HDDs for 36-inch pipelines fail unacceptably often. *See* FLOW 2008 DEIS Comments at 102-103. In its own experience, recent HDDs for this size of pipeline have failed one out of every three attempts – that's a full 33% of the time. *See* Williams Sept. 2007 Presentation, Williams Sept. 2007 documentation of its HDD Experience. The JPA does not include adequate information on alternative measures that will be used if the proposed crossing methods are unsuccessful.

The HDD failure issue is particularly critical for the Rogue River HDD. The ODFW has repeatedly commented that the HDD contingency plan for the Rogue River crossing is inadequate, and that a wet open-cut crossing of the Rogue River is not currently permissible. The ODFW commented: "ODFW does not consider a wet open-cut to be an acceptable alternative due to the impacts to fish, fish habitat, the river, as well as impacts to the sport fishery and the

economy of upper river communities. ODFW strongly disagrees with the wet open-cut as an alternative crossing method on the Rogue River." State of Oregon 2009 FEIS comments at 40.

The JPA fails to provide an adequate analysis of mitigation alternatives. For instance, proposed mitigation measures to avoid and minimize sedimentation and erosion in stream crossings are inadequately site-specific and are generally outlined in the ECRP. FERC's analysis and the JPA indicate that details of mitigation would depend on the source of the problem. According to the State of Oregon's 2008 DEIS comments, the lack of detailed mitigation measures and alternatives is inadequate. "In order to be effective, a mitigation measure must be supported by analytical data demonstrating why it will constitute an adequate buffer against the negative impacts that may result from the authorized activity. The JPA's reliance on future modifications does not provide enough protection under this standard. The public must be able to review, in advance, how specific measures will bring projects into compliance with environmental standards." State of Oregon 2008 DEIS comments at 32. The JPA does not resolve this outstanding issue.

Given the lack of analysis on the efficacy of mitigation measures, it is also unclear whether the pipeline should have been rerouted or altered to avoid key resources. For instance, proposed measures may be inadequate to avoid increased turbidity, temperature discharges, erosion and sedimentation in the proposed crossing of the Coquille River and other streams and rivers. The JPA does not show that riparian clearing has been avoided and minimized in all areas. The ECRP includes general methods, but does not justify why limitations on construction activities in riparian areas cannot be increased. The State of Oregon noted that the 2008 DEIS did not include adequate analysis of avoiding impacts to waterbodies. "At some crossings, PC would reduce the construction ROW width to 75 feet at the crossing of forested and scrub shrub wetlands to minimize impacts to these resources. Alternative methods of crossings with less or no impact must be explored and presented. Boring underneath the forested wetlands could avoid impacts to high functioning wetlands." State of Oregon 2008 DEIS comments at 95. These issues remained unresolved in the current DEIS, and have not been adequately addressed in the alternatives analysis for stream crossings and mitigation measures in the JPA.

The JPA application does not provide adequate information to justify its route selection through Coos Bay. The selection of the route through Coos Bay unduly impacts the Coos Bay Estuary and Haynes Inlet, a sensitive area for both shellfish and fish habitat, as well as the economies that rely on those areas (such as oyster growers). The State of Oregon recommended, "Find another (upland) route to avoid impacts to the Coos Bay estuary to the maximum extent possible. This proposal maximizes impacts to waters of the state. More thorough alternatives analysis is required." State of Oregon 2008 DEIS comments at 94. The current proposal does not minimize impacts to the estuary. It also does not explain why an alternative involving a significantly reduced construction impact area would not be practicable.

In summary, the applicants do not provide sufficient reasoning or detail to justify its dismissal of many design and project alternatives that could have a less adverse impact on the aquatic ecosystem. In particular, little consideration of the relative costs, technologies, and logistics is present in the alternatives rejected or disregarded by the project proponents. The applicants provide cursory and inaccurate analysis of the impacts of its dredge/fill activities, and ODEQ

must find that practicable alternatives exist to severely degrading the Coos Bay Estuary, wetlands and rivers impacted by the terminal and pipeline. The alternatives analysis fails to address many alternatives, and some alternatives are given such cursory consideration that it is impossible to realistically conclude they are not practicable. This includes changes to terminal design, turning basin size and design, alternative LNG sites, and both major and minor route variations on the pipeline route.

The Project's Economic Benefits Do Not Outweigh the Environmental Costs.

The applicant has not demonstrated that the benefits of lowered water quality outweigh the costs of water quality impairment. Specifically, the proposal will increase domestic natural gas and electricity prices, which is not in the public interest.

The potential risk of increased domestic natural gas prices weighs strongly against the need for the project as higher gas prices will hurt public and private need for the project. First, larger export levels lead to larger domestic price increases, while rapid increases in export levels lead to large initial price increases that moderate somewhat in time. Even slower increases in export levels lead to price increases, just at a slower scale of price hikes. Second, natural gas markets in the U.S. will increase production to satisfy an estimated 60-70% of the increase in natural gas exports, with three-quarters of this increased production expected from shale resources. Third, the remaining deficit in energy supply correlated to price increases will likely be met by the electric sector, which the EIA anticipates coal-fired generation to primarily produce. Fourth and last, consumers will consume less but still see an increase in their natural gas and electricity costs if export is allowed under any scenario.[15] Increases in domestic natural gas prices, in shale gas production, and in coal-fired electricity production possess serious economic and environmental consequences for the greater public and as well as the West Coast's environmental economies that cast significant doubt on the benefits or need for Jordan Cove's export proposal.

Because price is a key component of the rationale behind LNG export, the following section explains EIA's conclusion that LNG export will cause gas price hikes and why those price increases weigh against the purpose and need for the Jordan Cove export proposal.

EIA projects that U.S. natural gas prices will rise over the long run, even before considering the possibility of additional exports, with projected pricing varying considerably depending on assumptions concerning supplies and economic growth.[16] However, increases in natural gas prices at the wellhead translate to similar absolute increases in delivered prices to customers under all scenarios and baseline cases. If exports proceed under the assumptions of Scenario 1, phasing in 6 Bcf/d of exports over six years, price impacts peak at about 14% in 2022. In contrast, rapid increases in export levels in Scenario 4, phasing in 12 Bcf/d of exports over 4 years, equates to a 36% price hike at the wellhead. Particularly troubling is the Low Shale EUR

[15] EIA, Effect of Increased Natural Gas Exports on Domestic Energy Markets 6, 10 (2012), available at http://www.eia.gov/analysis/requests/fe/pdf/fe_lng.pdf ("EIA Export Study"); see also, e.g., Deloitte MarketPoint, Analysis of Economic Impact of LNG Exports from the United States 16, available at http://www fossil.energy.gov/programs/gasregulation/authorizations/2013_applications/sc_exhibts_13_116_118/Ex._08_-_Deloitte_Analysis_for_Excelerat.pdf ("Deloitte Study").
[16] *Id.* at p. 6.

case, where the rapid introduction of 12 Bcf/d of exports results in a 54% increase in wellhead price by 2018. Although notably termed "pessimistic" by the EIA, this estimate is closely corroborated by current data showing how many LNG export authorizations are currently before DOE and FERC, and by the volumes requested in those applications. If all domestic LNG export applications are approved as written, Scenario 4 and the Low-Shale EUR case-study may very closely reflect reality where the public experiences a drastic hike in natural gas prices, an outcome that weighs strongly against the alleged benefits of Jordan Cove's application or the public's "need" for the project.

Further, the Export Report clearly corroborates higher gas prices with increased production, particularly in shale reserves. The baseline case anticipates total domestic natural gas production to grow from 22.4 Tcf in 2015 to 26.3 Tcf in 2035, averaging 24.2 Tcf for the 2015-2035 period, where increased export incites higher domestic pricing, reduced domestic consumption, and increased domestic production.[17] However, the Export Report does not provide a substantive analysis of new estimates of recoverable natural gas reserves, data that is crucial to an accurate assessment of whether Jordan Cove's export proposal is competitive or secure.

In addition to price and production impacts, a public interest analysis should examine the nexus between increased natural gas export, decrease in consumption in electric power sector, and an increase in other power generation for electricity needs. In scenarios 1-4, where there is natural gas export, most of the decrease in consumption occurs in the electrical power sector, where the tradeoff in sources is between natural gas and coal, especially in the short-term relative to the 25-year reference period.[18] The EIA estimates that increased coal-fired generation will account for approximately 65% of the decrease in natural gas-fired generation under reference case conditions, and likely an even higher percentage in a Low Shale EUR case.[19] The increased use of coal for power generation results in an average increase in coal production from 2015-2035 over reference case levels of between 2 and 4 percent across all export scenarios. In the words of the EIA: "[As natural gas exports increase, along with prices for electricity generation], [a]ccordingly, coal prices also increase slightly which, along with higher gas prices, drive up electricity prices."

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

Assessment of economic impacts in light of whether Jordan Cove's proposal satisfies the public interest should also consider productivity and its relation to an assessment of competitiveness in

[17] Export Report at p. 10.
[18] Export Report at p. 12.
[19] *Id.*

light of likely firm strategies responsive to profit opportunities. Given a limited number of drilling rigs, firms will certainly deploy them in those places where profits are most likely, where the question for an energy company is not whether a well is viable in terms of potentially recoverable gas, but whether it is *commercially* viable.[20] Production in shale plays is unpredictable and only a small number of wells may be able to produce commercial volumes of gas over time without costly re-fracking. Evidence from the Barnett and Haynesville shale plays indicates that high initial production rates may drop off rapidly, making it difficult for operators to cover costs. "Shale production is characterized by a steep decline curve early in its productive life. The more oil and/or gas that you can make up front the better the economics."[21]

Similarly, geologist and investment advisor Arthur Berman[22] states the following in regard to production trends across U.S. shale plays:

> ... most wells do not maintain the hyperbolic decline projection indicated from their first months or years of production. Production rates commonly exhibit abrupt, catastrophic departures from hyperbolic decline as early as 12-18 months into the production cycle but, more commonly, in the fourth or fifth years for the control group. Pressure is drawn down and hydraulically produced fractures close... Workovers and additional fracture stimulations may boost rates back to previous levels, but rarely restore a well to its initial decline trajectory. More often, a steep hyperbolic or exponential terminal decline follows attempts to remedy a well's deteriorating performance.

Christopherson notes the distinct possibility that "few wells will exhibit the hyperbolic production curves that are used to describe trends *across* wells in a shale play,"[23] such unpredictability demonstrated by the 2009 collapse in levels of production of drilling in the Jonah Field in Colorado, indicating the volatility and difficulty in accurate projects for long-term periods. Because shale plays may not produce the long-term results indicated by the hyperbolic curves used by industry, the HVHF boom in the US shows evidence of a speculative "bubble" undermining Jordan Cove's reliance thereon in support of its LNG export application.

In fact, recent significant drops in oil prices have major impacts on markets and pricing for LNG. Since June of 2014, oil prices have dropped by half. This change has undercut developers' assumptions that cheap U.S. LNG would be able to enter Asian energy markets, which relied on oil prices staying high to make the U.S. supply affordable. As a result, at least one proposed export facility has determined that its project no longer meets financial criteria necessary to move forward with capital investment. As reported by Reuters in December 2014, "[p]rices that LNG projects can charge for long-term supply are falling from historic highs as new producers crowd the market, which is already oversupplied due to slowing demand and rising output that

[20] Christopherson and Rightor, 2011. p.9.
[21] McFarland, Greg. 2010. "Shale Economics: Watch the Curve". *Oil & Gas Evaluation Report*. Website published by Obsidian Energy Company, LLC. March 17. Available at: http://www.oilandgasevaluationreport.com/tags/shale-play/.
[22] Berman, A. 2009. "Lessons from the Barnett Shale suggest caution in other shale plays." Available at: http://www.aspousa.org/index.php/2009/08/lessons-from-the-barnett-shale-suggest-caution- in-other-shale-plays/.
[23] Christopherson and Rightor, 2011. p.10.

has seen spot Asian LNG prices halve this year."[24] In addition, major consumers in Asia, including Japan, South Korea, and China, are seeking to release some of their long-term LNG supply commitments. Tony Regan, a consultant with Tri-Zen International in Singapore, was reported as stating, "In 2012 the differential between the two formulas was $7 per mBtu and we saw a surge of interest in trying to access 'cheap' LNG. With the differential now less than $2 per mBtu, that interest in the USA is waning."[25]

2.2 The Proposed Action would Create Conditions that are Deleterious to Fish or Other Aquatic Life in Contravention of Oregon's Statewide Narrative Criteria.

The purpose of Oregon's statewide narrative criteria is to prohibit degradation of water quality, particularly with respect to aesthetics. Under OAR 340-041-0007(10):

> The creation of … conditions that are deleterious to fish or other aquatic life … may not be allowed.

The proposed action would create many conditions that are deleterious to fish and/or other aquatic life that may not be allowed. Dredging millions of cubic yards of material from the Coos Bay estuary in salmon habitat and expansive wetland fill creates a condition deleterious to fish due to permanent loss of habitat. In addition, NMFS and DEQ raised as a major concern that LNG tankers will impinge and entrain juvenile salmon and other fish when the tankers take on cooling water. Additional deleterious conditions include: modification of river flow and hydrology of Coos Bay, wake stranding of juvenile fish, discharge of warm engine cooling water and ballast water, long-term piling driving and dredging, and destruction of riparian and upland habitat along entire pipeline.

2.2.1 Impacts to Threatened and Endangered Fish and Aquatic Species

Coho Salmon – Southern Oregon/Northern California Coast ESU

The project area includes two major river systems known to support SONCC Coho: the Rogue River and the Klamath River. The DEIS acknowledges that the project is likely to adversely affect SONCC Coho due to numerous impacts to feeding, juvenile exposure to elevated turbidity levels, potential swim bladder rupture due to blasting activities, injury and mortality during fish salvage, and long term habitat deterioration due to reductions in large woody debris. Stream crossing construction and removal of riparian vegetation are the two primary contributors to these impacts.

In addition, the DEIS admits that the project is likely to adversely impact critical habitat for SONCC Coho. The acknowledged impacts include loss of hatching and rearing habitat from substrate removal and turbidity at stream crossings, degraded water quality as a result of

[24] Oleg Vukmanovic, *Exclusive: Oil Price Crash Claims First U.S. LNG Project Casualty* (Dec. 30, 2014) available at http://www.reuters.com/article/2014/12/30/us-usa-lng-excelerate-idUSKBN0K81CP20141230
[25] Gregory Meyer, Ben McLannahan, and Neil Hume for Financial Times, *Oil's Dive Set to Transform LNG Market*, (Nov. 13, 2014), available at http://www ft.com/intl/cms/s/0/14a5df06-6af1-11e4-ae52-00144feabdc0 html#axzz3OA9Mzroe

turbidity caused by stream crossing construction, reduction in food sources, barriers to migration during stream crossing construction, and long term loss of native riparian vegetation.

The pipeline construction will disrupt fish passage by damming the streams during the trenching and pipeline placement. It is unclear how long fish passage would be interrupted. The mitigation of capturing and removing fish behind the dams is historically ineffective, and will result in the take of threatened salmonids. This is particularly troubling and unacceptable for large crossings proposed on the Coquille, Umpqua, and potential crossings of the Rogue and Coos if proposed HDDs fail. *See* discussion of HDD failure, *supra*. The DEIS fails to acknowledge the potentially severe impacts to SONCC Coho and its designated critical habitat as a result of HDD failure, and ODEQ should not rely on this faulty analysis.

Within the Rogue Basin, Trail Creek and Little Butte Creek have long been identified as major producers of SONCC coho (Vogt, 2001[26]). The proposed pipeline route would cross the West Fork of Trail Creek, the North and South Forks of Little Butte Creek, as well as numerous smaller tributaries within this watershed. Prevost et al. (1997)[27] highlighted upper South Fork Little Butte Creek and West Fork Trail Creek, as core areas in the Upper Rogue River watershed that are judged to be of critical importance to the survival of SONCC coho in the region.

The Upper Rogue section of the NMFS Recovery Plan lists stresses to coho salmon in this watershed as very high for impaired water quality and degraded riparian forest conditions and the threats to future coho survival are very high from roads and timber harvest (NMFS Coho Recovery Plan 2014). These stresses and threats would be increased by actions described in the JPA and DEIS.

Prevost et al. (1997)[28] highlighted upper South Fork Little Butte Creek and West Fork Trail Creek, as core areas in the Upper Rogue River watershed that are judged to be of critical importance to the survival of SONCC coho in the region.

See the below figure from the Final SONCC Recovery Plan issued by NMFS in 2014, the Little Butte Creek watershed and Trail Creek are both easily identified as some of the most significant streams in the region for coho.

[26] Vogt, J. 2001. Upper Rogue smolt trapping project, 2001. Oregon Department of Fish and Wildlife, Rogue Fish District, Central Point, OR.

[27] Prevost, M., R. Horton, J. MacLeod, and R.M. Davis. 1997. Southwest Oregon salmon restoration initiative phase 1: a plan to stabilize the native coho population from further decline. Prepared for the Rogue Basin Steering Committee, South Coast Coordinating Watershed Council and the Rogue Valley Council of Governments. Central Point, Oregon. 65 p.

[28] Prevost, M., R. Horton, J. MacLeod, and R.M. Davis. 1997. Southwest Oregon salmon restoration initiative phase 1: a plan to stabilize the native coho population from further decline. Prepared for the Rogue Basin Steering Committee, South Coast Coordinating Watershed Council and the Rogue Valley Council of Governments. Central Point, Oregon. 65 p.

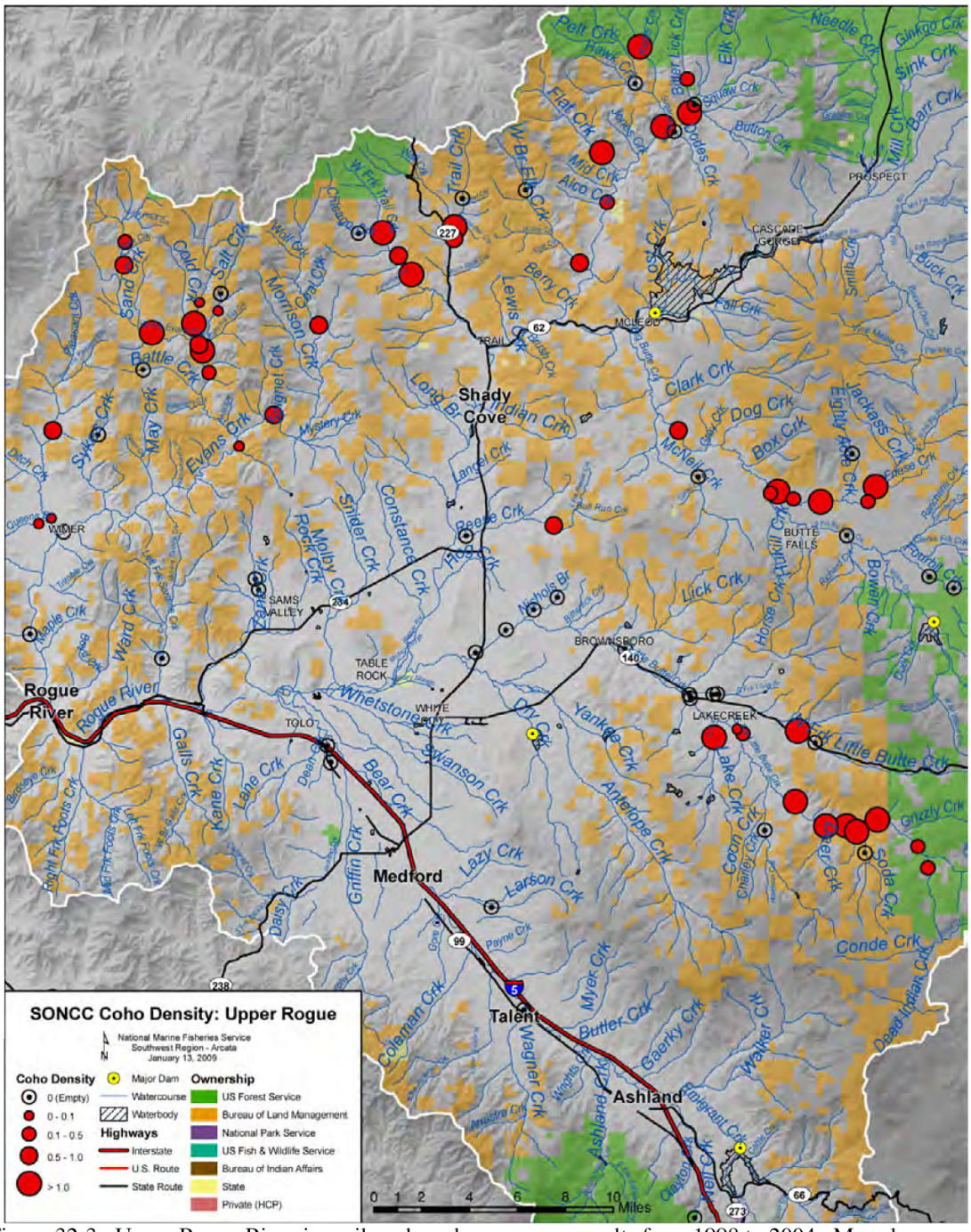

Figure 32-3. Upper Rogue River juvenile coho salmon survey results from 1998 to 2004. Map shows density of fish per square meter. The highest densities were located in upper watershed areas, and coho salmon were absent in lower reaches of all tributaries and at all stations in Bear Creek ODFW (2005a).

The pipeline crossings would also threaten SONCC recovery in the Klamath Basin. While the Upper Klamath Basin is currently unavailable to anadromous fish, resource agencies face a court mandate to restore fish passage to this area, whether or not PacifiCorp's mainstem dams on the Klamath are removed. Manual reintroduction of imperiled spring Chinook, and natural re-colonization of imperiled steelhead and ESA threatened Southern Oregon/Northern California Coast ESU (SONCC) coho, will occur in the Klamath Basin at an unknown time in the next 3 to 10 years. The DEIS does not address the need to coordinate construction through the Upper Basin with habitat used by returning anadromous fish as described in ODFW's *Plan for the Reintroduction of Anadromous Fish in the Upper Klamath Basin* (ODFW 2008) approved by the Oregon Fish and Wildlife Commission in July of 2008. The DEIS acknowledges that despite Pacific Connector's best management practices and mitigation measures, other effects to salmonid habitat elsewhere in the project area could include increased turbidity, frac-out from HDD, nutrient loading, decreased fish access, reduction of benthic organisms and LWD, and surface runoff. These impacts apply to reintroduced fish populations as well.

Spencer Creek is recognized as a tributary used by coho and spring Chinook before implementation of the Klamath Hydro Project (Hamilton et. al. 2004). As such, it is a likely site for natural re-colonization of these fish. ODEQ must recognize this resource value, as recolonizing endangered coho and imperiled spring Chinook will be part of the beneficial uses associated with Spencer Creek watershed and its TMDLs.

The mainstem Klamath will also be a migration corridor for returning anadromous fish. The DEIS does not address any impacts to these species though their return would either precede the proposed pipeline, accompany its construction, or come shortly thereafter (ODFW 2008). Therefore, the Coalition's comments in the follow section in regards to endangered sucker Critical Habitat also apply to imperiled spring Chinook, ESA threatened coho, and imperiled steelhead who may be using the mainstem Klamath by the time the proposed pipeline crosses it.

Coho Salmon – Oregon Coast ESU

The project area includes designated critical habitat for the Federally Threatened Oregon Coast Coho: the South Umpqua Subbasin, Coquille Subbasin, and the Coos Subbasin (which includes the Coos Bay estuary). The DEIS acknowledges that the project is likely to adversely affect Oregon Coast Coho and its critical habitat. DEIS at 4-644, 4-645.

Activities related to the marine terminal and north spit facilities, including discharge of maintenance dredging spoils causing turbidity plumes, LNG vessel wake strandings, engine cooling water intake entrainment, dredging of the access channel and construction of the pipeline across Hayes Inlet could all jeopardize the survival of this species. Moreover, cooling water intake is likely to entrain and impinge many food sources for Coho, such as juvenile stages of crab and shrimp, other zooplankton and eggs and larvae fish. Pipeline-related activities including stream crossing construction or failures of those operations, blasting, mortality during fish salvage operations, and loss of large woody debris for habitat also have the potential to cause jeopardy to the Oregon Coast Coho and adversely affect its designated critical habitat. DEIS at 4-645.

As noted by the Coos Watershed Association in 2008:

> This route crosses two significant streams (Kentuck Slough and Willanch Slough), both of which have high value for coho salmon. The area downstream from the proposed for the crossing at Willanch Slough is presently being considered for a Wetland Mitigation Bank, while the area upstream has had significant and successful riparian restoration projects. The route down Lilienthal Creek (T.25S.;R.12W., Sections 20 and 30) will cross the entirety of the Brunschmid Wetland Reserve Project (WRP) that has a perpetual easement held by the U.S.D.A. Farm Services Agency. This site has had significant restoration work during 2008 and will be completed in the winter of 2009.
>
> Juvenile coho salmon were found during fish surveys in this wetland. Across East Bay Drive, and hydrologically connected to the Brunschmid WRP are high quality tidal fringe wetlands (low and high salt marsh) adjacent to the Cooston Channel that have also been identified as having potential for longterm protection and enhancement. Additional details on watershed conditions in the proposed routes for this area can be found in the Coos Bay Lowlands Assessment and Action Plan on our website (www.cooswatershed.org/publications).
>
> 3. Once it crosses the Coos River the proposed pipeline route will traverse lowlands adjacent to Catching Slough and its tributaries (approximately MP 8.25 to MP 18). These areas provide some of the most significant current lowland habitat for coho and Chinook salmon rearing, potential wetland restoration opportunities, and needed riparian restoration to reduce summer stream water temperatures. Of particular importance are Stock Slough (MP 10.1), the crossing in lower Catching Slough (MP 11), and Boone Creek (MP 15.75). All these streams and sloughs are used by coho salmon, and the adjacent riparian areas provide resources for these fish and other aquatic life. Additional information on these resources is found in the recently completed Catching Slough Assessment and Action Plan in the Publications section of our website…."

2008 Comment of Coos Watershed Association.[29]

The DEIS does not address direct mortality impacts to listed fish from dredging in Coos Bay. As discussed *supra*, the proposed hydraulic cutterhead dredge method will entrain juvenile fish, including threatened salmonids, as well as benthic organisms critical to salmon diets. Mechanical dredging would not have the same fish entrainment impacts, but is not seriously considered as an alternative dredge method.

ODEQ must analyze the impacts of fish entrainment due to dredging. ODEQ must also consider the fact that the fish killed will include salmonids listed as threatened under the federal ESA and the Oregon ESA. ODEQ must also look to the effect cooling water entrainment would have on food sources for the threatened Coho salmon. ODEQ must consider cumulative impacts on

[29] Coos Watershed Association comments for Jordan Cove FERC/EIS under Docket #CP07-441-000, available at, http://elibrary ferc.gov/idmws/file_list.asp?accession_num=20081204-5103

aquatic life, including the impacts from dredging, terminal construction and operation, pipeline construction and operation, as well as the impact of the channel deepening dredging and maintenance dredging.

The proposed dredging is the antithesis of salmon recovery and restoring estuarine habitats, as described in every local, state, and federal management plan. Quite simply, we cannot recover threatened salmon while simultaneously permitting this huge dredging project. Jordan Cove is a prime example of an unacceptable project due to its size, scope, and location in critical salmon habitat.

North American Green Sturgeon – Southern Distinct Population Segment

Both Northern and Southern population segments of the North American Green Sturgeon are known to occur within Coos Bay for feeding, growth, and thermal refuge. The DEIS admits that the project is likely to adversely affect Green Sturgeon as a result of bottom disturbance and reduction of benthic food supply from construction and maintenance dredging as well as dredged spoils disposal, and the potential for dredged spoils disposal to bury subadult Green Sturgeon. DEIS at 4-647. Likewise, the project is likely to adversely affect critical habitat for the species. ODEQ must look at the effect dredging and dredged spoils disposal would have on food sources for the threatened green sturgeon.

Pacific Eulachon – Southern Distinct Population Segment

Pacific Eulachon (also known as candlefish) utilize Coos Bay for habitat, and may be present in the estuary during construction and operation of the project. Eulachon typically spend three to five years in saltwater before returning to freshwater to spawn in late winter through mid-spring. Eulachon are a small fish rich in calories and important to marine and freshwater food webs, as well as commercial and recreational fisheries and indigenous people from Northern California to Alaska. The JPA does not adequately assess potential impacts to this species as a result of the dredge and fill operations proposed in ocean waters, Coos Bay, and coastal tributaries.

Lost River Sucker

The Lost River Sucker is a federally listed endangered species that spawns in freshwater streams. The Pacific Connector Pipeline will cross the Lost River upstream of known spawning areas. The pipeline will also cross the Klamath River, another basin where Lost River suckers occur. The DEIS acknowledges that the project is likely to adversely affect Lost River sucker and its designated critical habitat due to injury or death during fish salvage or release of drilling muds from frac-out during HDD of the Klamath River. DEIS at 4-650.

Shortnose Sucker

The Shortnose sucker is another endangered fish species whose populations have been severely impacted by dam construction, water diversions, overfishing, water quality problems, loss of riparian vegetation, and agricultural practices. Shortnose sucker critical habitat includes the Klamath River within the project area. The DEIS states that the project is likely to adversely

affect shortnose suckers for the same reasons that the Lost River sucker is likely to be adversely affected. DEIS at 4-652.

Spencer Creek Redband Trout

Upper Klamath Basin redband trout are considered by the state of Oregon to be a "vulnerable" species, and are currently classified as "at risk" by the Oregon Department of Fish and Wildlife. Due to extensive dam building and habitat modification Spencer Creek is now the only known spawning area and source of juvenile recruitment in the upper Klamath River basin upstream of J.C. Boyle dam and is a highly productive spawning ground for the Lower Klamath population of redband trout who migrate to the Keno Reach of the Klamath River. Migratory and resident redband trout are known to use the mainstem of Spencer Creek and are also thought to use smaller tributaries including ephemeral streams (USFS 1995). Redband spawning in Spencer Creek is thought to occur from February through June and biologists have recorded counting in excess of 300 redds in Spencer Creek (Jacobs and Stacevich 2007). The DEIS does not provide sufficient guidance for construction timing in relation to redband trout spawning in Spencer Creek. Given that Spencer Creek's dominant land uses to date (grazing and logging) have degraded the watershed so heavily that it is listed for sediment and temperature pollution, additional industrial degradation plus undetermined longterm impacts to water quality and hydrology will only bring more harm to Spencer Creek's spawning and juvenile redband trout who require cold, clear streams for successful recruitment and maturation.

Marine Mammals and Sea Turtles

The LNG terminal and the tankers will harm marine mammals due to habitat destruction and vessel strikes. In addition, multiple ESA-listed mammals and turtles are also present, including the green turtle, leatherback, olive ridley, and loggerhead. In 2012, NMFS designated critical habitat for the leatherback, which includes nearshore areas around Coos Bay and areas part of the LNG tanker routes. 77 Fed Reg 4170 (Jan. 2012). All of these ESA-listed species, as well as the non-ESA-listed species, will be adversely affected by the proposed project.

The large increase in deep draft vessels due to the LNG terminal will increase the risk of vessel strikes of marine mammals and turtles. The NMFS' unpublished compiled data indicates nine whale vessel strikes were either reported in the region or detected during necropsy by the NW Marine Mammal Stranding Network between January 2002 and January 2007. Fin whales (6) were encountered most frequently, with individual strikes reported for blue, sei and humpback whales. Seven of the strikes were reported from Washington and two from Oregon, during the four-year period (start of 2002 through start of 2007). The closest strikes to the proposed action area involved a fin whale that came into the Port of Portland on the bow of a vessel in September 2002, and a blue whale that was reported struck and killed off Tillamook, Oregon, in January 2007. Far more actual strikes occur than are reported. ODEQ must assess the impact of these strikes to individuals and populations. ODEQ must fully understand the tanker route to Jordan Cove and the tanker routes in Oregon's Territorial Sea.

Marine mammals, especially pinnipeds, are sensitive to noise disturbances. Jordan Cove would install 112 steel piles for the LNG vessel berth and loading platform on the east side of the

marine slip. According to the applicant's modeling, sound levels greater than 65 dB will extend less than 0.25 mile from pile driving operations. Jordan Cove has not yet developed a plan to protect pinnipeds from noise impacts associated with the construction of the marine slip and berth. ODEQ should consider whether these potential impacts can be adequately addressed.

All of the impacts to listed aquatic species, marine mammals, and fish associated with the proposed action, within the meaning of 340-048-007 (11), conditions deleterious to fish or other aquatic life that may not be allowed.

2.2.2 Entrainment of Fish by LNG Vessels

The LNG vessels that would dock in the new marine slip under the proposed action would take in large amounts of bay water from the slip to cool vessel engines. Jordan Cove estimates that a 148,000 m^3 LNG vessel would take in approximately 6.1 million gallons of water for engine cooling while at the dock. DEIS at 4-572. Jordan Cove is not proposing any additional screening system other than that already employed on LNG vessels. The screens would not meet NMFS (1997a) screening criteria for juvenile salmonids. *Id*. As a result, fish at least up to fry and possibly larger juvenile salmonids, smaller marine and estuarine fish, juvenile stages of crab and shrimp, and other zooplankton and eggs and larvae fish could be entrained. The DEIS acknowledges that a high portion of juvenile larval stages of fish and invertebrates entrained or impinged would suffer mortality. DEIS at 4-573. Nevertheless, the DEIS concludes that entrainment impacts are minimal because "natural mortality of these early life stages is extremely high." *Id*. In other words, because many juvenile and larval aquatic organisms die, the additional mortality caused by entrainment is not significant. This logic flies in the face of standards for protection of water quality set forth in OAR 340-048-007(11). Simply because juvenile fish already suffer high mortality, that is not sufficient to discount the additional mortality caused by entrainment in LNG vessels via cooling water uptake. Furthermore, the DEIS fails to explain how the data regarding overall juvenile fish mortality is relevant to the specific conditions of Coos Bay and its ESA and EFH species and benthic communities.

In addition, the DEIS states that the overall abundance of organisms in the slip will be relatively low compared to the main channel. NMFS previously rejected this assumption:

> The NMFS knows of no literature to support this assumption. In fact, it is more likely that the abundance of organisms, including OC Coho salmon juveniles and southern DPS green sturgeon, especially smaller life stages, may be greater in the slip area as they use it for refuge from the higher velocities of the main channel. Secondly, the FERC analysis minimizes the potential for effects to resources based on the percentage of Coos Bay water that will be taken aboard ships. The analysis incorrectly assumes that resources are evenly distributed throughout the bay. Provide an effects analysis that incorporates the likely heterogeneity of resources in the estuarine environment.

NMFS 2008 DEIS comments at 2.

The unnecessarily high levels entrainment of fish and other aquatic life in engine cooling water for LNG vessels is, within the meaning of OAR 340-048-007(11), a condition deleterious to fish or other aquatic life that may not be allowed.

2.2.3 Strikes and Strandings by LNG Vessels

At least 90 LNG tankers will dock at Jordan Cove each year.[30] Movement of these massive vessels will injure fish and aquatic life by ship-animal collisions (vessel strikes) and beaching (stranding) of animals in the vessels' wakes. Wake stranding of juvenile salmon is common. Wake stranding will increase greatly due to the additional deep draft ships. Further, turning of the LNG tankers with high thrust tugs will increase wake stranding and disorientation of salmon.

The killing and injuring of whales, leatherback sea turtles, harbor seals and fish caused by strikes with vessels or wake stranding, is, within the meaning of OAR 340-048-007(11), a condition deleterious to fish or other aquatic life that may not be allowed.

2.2.4 Injury Caused by Noise from LNG Vessels and Marine Slip Construction

Increased noise from LNG ship traffic creates conditions that are deleterious to fish or other aquatic life. The noise emitted from LNG ships is above the NMFS's noise threshold for physical harm to fish. LNG ships are considered cargo vessels and cargo vessels are known to emit high levels of low frequency sound (6.8 to 7.7 hertz (Hz) at 181 to 190 dB, re: 1 µPa) capable of traveling long distances (Richardson et al., 1995). *See* Bradwood Landing LNG Terminal DEIS at 4-224. The NMFS' current noise thresholds for fish are a peak pressure of 180 dB re: 1 µPa for physical harm and an impulse pressure, or root mean square (rms), of 150 dBrms re: 1 µPa for behavioral disruption. Noise from LNG vessels can adversely affect whale behavior.

In addition, noise from construction of the marine slip (including pile driving) may adversely impact pinnipeds. Jordan Cove would install 112 steel piles for the LNG vessel berth on the east side of the marine slip. This pile driving could exceed NMFS noise criteria and cause adverse impacts to pinnipeds.

2.2.5 Permanent Loss of Coastal Riparian Vegetation

Removal of vegetation near the shorelines will adversely affect aquatic species by removing a source of food. Numerous studies have established that riparian vegetation provides a valuable food source for fish, especially juveniles. Wipfli, 1997. The food is the result of invertebrates in the detritus, understory, and canopy of riparian vegetation. Many of these invertebrates find their way into the water and are subsequently eaten by fish.

Clearing vegetation along the edge of Henderson Marsh and Coos Bay will destroy this habitat for invertebrates, thus destroying a valuable food source for fish along the stretches of these

[30] It appears that this number will actually be much higher based on the capacity of the vessels that could be accommodated at the terminal. *See* TRC, *Jordan Cove Energy Project, L.P. Evaluation of Emissions and Ambient Air Quality Impacts from LNG Vessels* (May 2009) (determining a maximum of 116 vessel calls per year), available at http://elibrary ferc.gov/idmws/file_list.asp?accession_num=20090605-5074.

waterbodies. The analysis of food source impacts due to removal of vegetation conducted in the DEIS is limited to possible increases in food in the form of microorganisms and aquatic invertebrates in the water due to increased temperatures. Any increases in food by increased production of microorganisms and aquatic invertebrates will further be offset by losses of invertebrates along the shoreline due to the removal of vegetation. The impacts to fish and other aquatic organisms resulting from the removal of a valuable food source, in the form of invertebrates, through the destruction of terrestrial vegetation along the shores of Coos Bay and Henderson Marsh, would be detrimental to resident biological communities.

2.2.6 Exotic and Invasive Species

Jordan Cove will introduce or allow the proliferation of invasive species to Coos Bay, the terminal site, and along the pipeline route. First, ships from foreign ports will transport exotic species on multiple surfaces and in water releases from ballast or engine cooling water. These species may harm the aquatic ecosystem. Second, the removal of vegetation, and long-term disturbances at the site will allow the introduction and proliferation of exotic species, which will harm native ecosystems and may require herbicides and pesticides to manage. Third, a large swath of clearing and ground disturbance across Oregon for the pipeline will create an ideal site for exotic species to thrive and harm native ecosystems, forestland, and farmland. These impacts will significantly affect fish, wildlife, and special aquatic sites.

2.3 The Project would Violate Oregon's Biocriteria Standard.

OAR 340-041-0011 provides that "Waters of the State shall be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities." DEQ's regulations define "without changes in the resident biological community" to mean "no loss of ecological integrity when compared to natural conditions at an appropriate reference site or region." OAR 340-041-0002. "Ecological integrity" means "the summation of chemical, physical and biological integrity capable of supporting and maintaining a balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of the natural habitat for the region." *Id.*

The Biocriteria standard is intended to assess total impact to a biological community, including multiple stressors and cumulative effects. In this way, the Biocriteria standards complement the other parameter-specific water quality standards. ODEQ noted that the DEIS does not address whether the pipeline construction and operation activities will achieve compliance with the biocriteria standard. State of Oregon 2015 DEIS comments at 60.

Present Conditions of Biocriteria

Historically, Native Olympic oysters were abundant in the Coos estuary, but became locally extinct as a result of basin-wide changes in sedimentation. The Coos Bay aquatic habitat has been degraded by cumulative effects of sedimentation, bark decay, dredging, diking, filling, domestic and industrial pollution and by colonization of non-indigenous aquatic species. Despite this habitat degradation, over the past two decades, water column and sediment have improved to a level that is conducive to recovery and re-establishment of O. conchaphila in the low intertidal and shallow subtidal zones of the Coos estuary.

A 2008 SEACOR (Shellfish and Estuarine Assessment of Coastal Oregon) study conducted by Marine Resources Program of ODFW sampled three areas in the Coos Bay estuary for clam species and distribution. Areas sampled include Clam Island, Pigeon Point, and South Slough. Butter clams were found in high densities in Coos Bay, particularly in areas with high sand bars and little algae. Cockle clam populations were considerably lower than butter clams and were found near the surface in areas with oxygenated sediment and abundant algae. Gaper clams were abundant in low tidal areas with eelgrass (zostera marina). Native littleneck clams were found infrequently and were present in low tide areas with eelgrass and oxygenated sediments.

A significant portion of the Coos estuary bottom is covered in beds of eelgrass (both native *Zostera marina,* and the introduced *Zostera japonica*). Eelgrass beds, along with deeper tidal channels in the estuary, provide habitat to a number of fish and invertebrate species including juvenile crab, juvenile ling cod, salmonids, starry flounder, and English sole. Eelgrass also provides attachment area for algae, planktonic larvae, and snails.

The DEIS notes that submerged aquatic vegetation (including eelgrass, macrophytic algae) as well as other food web components such as phytoplankton, zooplankton, detritus, and epiphyton, are all important in supplying habitat and food base for EFH species within Coos Bay.

> For example, submerged grasses or SAV are important habitat for small prey species of adult lingcod (in Appendix B-2 of PFMC 2008). Forage items that are habitat components for the managed species do depend to some extent on estuarine systems. Many species of groundfish and salmonids occupy inshore areas of the lower bay during juvenile stages (e.g., Chinook salmon, Coho salmon, English sole) where they feed on estuarine-dependent prey, including shrimp, small fishes, and crabs. As they mature and move offshore, their diets in many cases change to include fish, although estuarine-dependent species (e.g. shrimp, crabs) can still constitute an important dietary component.

DEIS at 4-562.

Permanent Loss of High-Quality Benthic Communities

A large and diverse invertebrate population exists in Coos Bay. The creation of the access channel and marine slip would modify approximately 28 acres of present-day subtidal and intertidal habitat to deep water habitat within Coos Bay. DEIS at 4-567.

> The dredging operation to create the access channel would change physical conditions of the bay bottom in this area, locally altering the bathymetry and potentially altering the morphology and water currents. About 15 acres of intertidal to shallow subtidal habitat, including approximately 3 acres of SAV eelgrass habitat and less than 1 acre of salt marsh, would be modified to primarily deep subtidal habitat during the dredging process of the deepened channel. *Increasing depth and removal of vegetation would reduce the quality of habitat for juvenile salmonids and other juvenile marine species.*

DEIS at 4-567 (emphasis added).

The DEIS further acknowledges direct impacts to benthic organisms from dredging activities:

> Jordan Cove's dredging would also directly remove benthic organisms (e.g., worms, clams, starfish, and vegetation) from the bay bottom within the access channel. Mobile organisms such as crabs, many shrimp, and fish could move away from the region during the process, although some could be entrained during dredging so that direct mortality or injury could occur. Based on 1978 maps of shellfish (Gaumer et al. 1978), shrimp, soft shell clams, bentnose clams, and cockles are located within the intertidal areas near the slop and within dredge areas (west of the Roseburg Forest Products Company site). ODFW captured Dungeness crab and red rock crab in this area during 2005 seining efforts. *These species could be injured or killed during dredging operations.*
>
> It is reported that benthic communities on mud substrate in Coos Bay, when disturbed by dredging, recovered to pre-dredging conditions in 4 weeks (Newell et al. 1998). Because of the large quantity being dredged, it may take a longer period relative to typical dredging and thus the benthic communities in the areas to be dredged may take a more varied length of time to recover. In addition, because the shallow area would be converted to deeper water habitat than what is currently there, some long-term reduction in benthic production would occur. Some of this loss would be offset by added annual benthic production from the newly formed 37-acre slip habitat, even though it would likely be of poor quality. We would also expect increased organic matter production to the Coos Bay system (at 3:1 habitat replacement) from Jordan Cove's proposed eelgrass and wetland mitigation sites.

DEIS at 4-569 to 4-570.

October is the height of the Olympia oyster reproductive cycle[31] and would be at greater risk of harm should dredging occur during this time. The 2014 DEIS states that eelgrass can be adversely affected by turbidity because the depth and distribution of eelgrass is strongly associated with water clarity and depth of light penetration (Dennison and Orth 1993; Thom et al. 1998) as well as nutrient availability (Short et al. 1995), salinity, and water temperatures (Thom et al. 2003). Based on the distribution mapping of eelgrass by Jordan Cove, construction along the pipeline route could temporarily remove about 1.0 acre of eelgrass (Ellis Ecological Services 2008). 2014 DEIS at 4-59. This would affect salmon smolts and other marine organisms that depend on these ecosystems remaining intact.

Sylvia Yamada, a marine ecologist who has studied native crabs and the European green crab in Oregon and Washington for over 20 years, submitted comments into the FERC record where she stated the following:

[31] "*Settlement Preference and the Timing of Settlement of the Olympia Oyster, Ostrea Lurida, In Coos Bay, Oregon"*, by Kristina M. Sawyer, A Thesis, Presented to the Department of Biology and the Graduate School of the University of Oregon in partial fulfillment of the requirements for the degree of Master of Science, September 2011.

> "Not only will the turbidity during the construction phase be of concern to the ecological community, the on-going dredging to maintain the berth and shipping channels will continue be a disturbance to the ecosystem. It will result in habitat loss for native species, including the valuable Dungeness crab. In one study between 45 to 85 % of the Dungeness crabs died during a simulated dredging operation (Chang and Levings, 1978). Marine habitat modification by construction of the Jordan Cove Energy Project could impact the important Oregon Dungeness fishery.[32]

The permanent loss of several acres of highly productive intertidal habitat that would be converted to low productive deep-water habitat and the loss of the biological community in that area is a violation of the Biocriteria standard under OAR 340-041-0011.

2.4 The Project would Violate Oregon's Standard for Dissolved Oxygen.

OAR 340-041-0016 sets out the State's water quality standard for Dissolved Oxygen (DO). Dissolved oxygen is essential for maintaining aquatic life. Depletion of DO in waterways is a significant pollution problem, affecting fish and aquatic species in a variety of ways at different life stages and life processes. DO levels can be influenced by several factors including pH changes, temperature increases, groundwater inflow and hyporheic exchange, decaying material or algae blooms, and sedimentation.

The proposed action involves dredging that will decrease dissolved oxygen in Coos Bay because dredging increases the oxygen demand by disturbing sediments and releasing oxygen-demanding materials (decomposing organic materials contained within the sediments). As explained in the DEIS, "[r]esuspension of sediments during dredging operations can be a significant source of turbidity." DEIS at 4-360. Although the DEIS apparently concludes that turbidity increases will not be significant, it admits that "the hydraulic cutterhead dredge to be used by Jordan Cove would generate TSS levels up to a maximum of 500 mg/l in the vicinity of the dredge" and "maintenance dredging may result in a turbidity plume for up to 1.9 miles from the dredging location at highest ebb or flood currents." DEIS at 4-361.

Oregon DEQ previously expressed strong concerns about lowered dissolved oxygen levels that the proposed action would cause. In its 2008 DEIS comments, DEQ stated:

> Total organic carbon, acid volatile sulfides, and nutrient sampling should be conducted to quantify the potential for adverse impact to oxygen levels caused by resuspension of sediments during dredging activities. Impacts should then be evaluated utilizing hydro dynamic modeling which can capture real time tidal conditions and simulate real time tidal exchanges during the period of the project.

State of Oregon 2008 DEIS comments at 63.

[32] Comments of Sylvia B Yamada, Ph.D. in FERC Docket for Jordan Cove CP13-483; available at, http://elibrary ferc.gov/idmws/file_list.asp?accession_num=20141208-5116

The current DEIS fails to incorporate or analyze the sampling that was recommended by DEQ. As noted in its comments on the 2014 DEIS, "these data should be utilized to quantify the potential for adverse impact to oxygen levels caused by re-suspension of sediments during dredging activities." State of Oregon 2015 DEIS comments at 42.

Dr. Thomas Ravens reviewed the applicant's sediment transport model prepared by Vladimir Shepsis, and found serious deficiencies in the methodology employed. The Coalition urges ODEQ to perform an independent sediment transport analysis consistent with actual conditions in the Coos Bay estuary.

Oregon DEQ must consider in deciding whether to certify the proposed action as complying with Oregon's water quality standards, that construction dredging lowers dissolved oxygen levels in estuarine waters not only by re-suspending sediment, but by deepening an estuarine channel where *hypoxic conditions can occur due to reduced circulation in deeper waters.* Once the dredging is completed, there also is the potential for reduced circulation in the deeper portions of the approach channel. In combination with other factors, reduced circulation has the potential to result in lower dissolved oxygen levels in the deeper waters. The applicants must prove that actual hydrodynamic conditions in Coos Bay would not result in a 0.1 mg/L decrease in dissolved oxygen levels caused by reduced circulation in the deeper channel.

2.5 The Project would Violate Oregon's Standard for Toxics.

Toxic substances may not be introduced above natural background levels in concentrations that may be harmful to aquatic life. OAR 340-041-0033(1). According to DEQ's Environmental Cleanup Site Information (ECSI) Database, both the Ingram Yard property (ECSI 4704) and the Weyerhaeuser North Bend Containerboard Mill (ECSI 1083) sites contain levels of potentially bioaccumulating chemicals and "must not be placed in waters of the state" and are both listed as "Partial No Further Action" as of 2006. The DEQ reports acknowledge that the recommendation for no further action is contingent upon there being no "new or previously undisclosed information" becoming available.

On December 16, 2014, Barbara Gimlin, former Environmental Inspector at the Jordan Cove LNG terminal site and employee of SHN Consulting, submitted testimony to FERC regarding discovery of contaminants at the site during a March 2014 exploratory test program. (Comments attached). Ms. Gimlin describes her knowledge of discovery of contaminated soils along the Jordan Cove shoreline during a September 2013 cultural resources survey by Southern Oregon University Laboratory of Anthropology. Ms. Gimlin then describes her personal observations of excavations at the site exposing potential contaminates including "black soils (north to south in Ingram Yard, including near the shoreline), bright yellow granulated/powder found in clumps of varying sizes, gray gummy material found in clumps (likely related to hydraulic drilling conducted by GRI), and the exposure of an underground concrete storage tank punched through by heavy equipment with unknown liquid inside." These exposures occurred during the March 2014 Kiewit test program.

The description of exposure and discovery of potential contaminants at the site as recently as April of 2014 should be investigated further. This information, provided by an individual with

personal knowledge and professional experience of the discovery of potential contaminants should be considered "new or previously undisclosed information" "which warrants further investigation." Given that the project calls for excavating and moving large amounts of soils from one area to another, to be used as fill for the South Dunes Power Plant location and other construction areas, the extent and condition of the contamination at these sites must be fully investigated and disclosed, so that it can be appropriately addressed to ensure contaminants do not reach waterways.

In addition to known contamination at the terminal site, there is a significant potential for toxic contaminant disturbance and release at the Klamath River crossing site. The proposed pipeline would cross the Klamath River, Hwy 97 and Southern Pacific Railroad, just after wrapping around a 660-acre industrial facility with known contamination. A frac-out during the HDD under the Klamath River would impact the riverbed immediately adjacent to the contaminated facility, exposing riverine sediment that could contain high levels of arsenic, chromium, copper, mercury, polycyclic aromatic hydrocarbons and/or petroleum from the Weyerhaeuser site or from other industrial facilities upstream. The DEIS and JPA do not include studies or test cores of potential contaminants at this HDD crossing. Further, the DEIS includes no discussion of what efforts, if any, would be made to analyze toxicity or properly dispose of fill removed through the HDD.

2.6 The Proposed Action would Violate Oregon's Statewide and Basin-Specific Water Quality Standards for Temperature.

Under OAR 340-041-0028 Temperature:

> (4) Biologically Based Numeric Criteria. Unless superseded by the natural conditions criteria described in section (8) of this rule, or by subsequently adopted site-specific criteria approved by EPA, the temperature criteria for State waters supporting salmonid fishes are as follows:
>
> (a) The seven-day-average maximum temperature of a stream identified as having salmon and steelhead spawning use on subbasin maps and tables set out in OAR 340-041-0101 to 340-041-0340: Tables 101B, and 121B, and Figures 130B, 151B, 160B, 170B, 220B, 230B, 271B, 286B, 300B, 310B, 320B, and 340B, may not exceed 13.0 degrees Celsius (55.4 degrees Fahrenheit) at the times indicated on these maps and tables;
>
> (b) The seven-day-average maximum temperature of a stream identified as having core cold water habitat use on subbasin maps set out in OAR 340-041-101 to 340-041-340: Figures 130A, 151A, 160A, 170A, 180A, 201A, 220A, 230A, 271A, 286A, 300A, 310A, 320A, and 340A, may not exceed 16.0 degrees Celsius (60.8 degrees Fahrenheit);
>
> (c) The seven-day-average maximum temperature of a stream identified as having salmon and trout rearing and migration use on subbasin maps set out at OAR 340-041-0101 to 340-041-0340: Figures 130A, 151A, 160A, 170A, 220A, 230A,

> 271A, 286A, 300A, 310A, 320A, and 340A, may not exceed 18.0 degrees Celsius (64.4 degrees Fahrenheit);
>
> (d) The seven-day-average maximum temperature of a stream identified as having a migration corridor use on subbasin maps and tables OAR 340-041-0101 to 340-041-0340: Tables 101B, and 121B, and Figures 151A, 170A, 300A, and 340A, may not exceed 20.0 degrees Celsius (68.0 degrees Fahrenheit). In addition, these water bodies must have coldwater refugia that are sufficiently distributed so as to allow salmon and steelhead migration without significant adverse effects from higher water temperatures elsewhere in the water body. Finally, the seasonal thermal pattern in Columbia and Snake Rivers must reflect the natural seasonal thermal pattern;

Furthermore, under OAR 340-041-0028(11):

> (a) Except as described in subsection (c) of this rule, waters of the State that have summer seven-day-average maximum ambient temperatures that are colder than the biologically based criteria in section (4) of this rule, may not be warmed by more than 0.3 degrees Celsius (0.5 degrees Fahrenheit) above the colder water ambient temperature. This provision applies to all sources taken together at the point of maximum impact where salmon, steelhead or bull trout are present. ….
>
> (c) The cold water protection narrative criteria in subsection (a) do not apply if: (A) There are no threatened or endangered salmonids currently inhabiting the water body; (B) The water body has not been designated as critical habitat; and (C) The colder water is not necessary to ensure that downstream temperatures achieve and maintain compliance with the applicable temperature criteria.

The proposed action would impact: 1) Streams identified as having salmon and steelhead spawning use in the Rogue Basin and South Coast Basin[33]; 2) Streams identified as having core cold water habitat use[34]; 3) Streams identified as having salmon and trout rearing and migration use[35]; and 4) Streams identified as having migration corridor use.[36]

The project would remove riparian vegetation in the right-of-way for all pipeline crossings. The DEIS states, "removal of vegetation that once shaded the stream may cause local and temporary (daily) increases in temperature during the hot summer months. This may or may not exceed the TMDL on temperature-impaired streams…" DEIS at 4-372.

The proposed action would result in 'obvious stream heating.' The temperature increases the proposed action would cause could not be authorized under OAR 340-041-0028(11) or (12).

[33] Subbasin maps and tables set out in OAR 340-041-0101 to 340-041-0340: Figure 271B (Rogue Basin) and Figure 300B (South Coast Basin)
[34] Subbasin maps and tables set out in OAR 340-041-0101 to 340-041-0340: Figure 300A (South Coast Basin).
[35] Subbasin maps and tables set out in OAR 340-041-0101 to 340-041-0340: Figure 271B (Rogue Basin) and Figure 300B (South Coast Basin)
[36] Subbasin maps and tables set out in OAR 340-041-0101 to 340-041-0340: Figure 300A (South Coast Basin).

Therefore, the temperature increases associated with the proposed project would constitute degradation that violates Oregon's antidegradation policy. Both U.S. EPA and DEQ expressed concern about the cumulative effect of stream heating in basins and waterways that will be impacted multiple times by the project. *See* EPA 2015 comments to FERC at 1; State of Oregon 2015 DEIS comments at 28. In addition, the thermal impacts of the activity include the TEWAs constructed in riparian areas, and will contribute further to exceedances of Oregon's standards.

In many instances, the proposed action would cause temperature increases that violate the standards contained in OAR 340-041-0028(4)(a)-(d). The proposed action would cause stream temperature increases by removing riparian vegetation across a wide construction easement. Removing riparian vegetation will increase water temperature by decreasing shade in numerous streams identified as having salmon and steelhead spawning use, having core cold water habitat use, having salmon and trout rearing and migration use, or having migration corridor use.

Numerous stream segments that would be impacted by the proposed action already suffer high temperatures that violate State water quality standards. Many of these streams are on the State's list of water quality limited waters under Section 303(d) of the Clean Water Act. *See* DEIS Table 4.4.2.2-3 (ODEQ Water Quality Limited Streams Crossed by the Pacific Connector Pipeline). Therefore, any temperature increases in these streams attributable to the proposed action would result in exacerbations of existing violations of state water quality standards. The Ninth Circuit Court of Appeals made clear that new dischargers may not add a pollutant into a water body that is water quality limited. *See Friends of Pinto Creek v. United States Environmental Protection Agency,* No. 05-70785 (9th Cir. Oct. 4, 2007).

Under OAR 340-048-0042(5):

> Upon completion of the department's evaluation, including consideration of public comment and, if applicable, coordination through a HART in accordance with OAR 340-048-0037, the Director must issue a decision approving or denying certification for the activity, containing:
>
> (g) If certification is approved, conditions the Director determines are necessary to assure compliance with applicable standards and requirements set forth in sections (2) through (4) of this rule for the duration of the federal license or permit.

The Coalition understands that DEQ will consider mitigation and possibly water quality trading to address violations of temperature standards. The Coalition believes that DEQ must require the details of any proposed mitigation be provided prior to any certification decision in order to ensure an adequate factual basis for the agency's analysis. However, there is no realistically achievable set of conditions that the Oregon DEQ could impose on the applicants to assure that the proposed action would be in compliance with numerical temperature limits specified in OAR 340-041-0028(4). Stream temperature increases cause *acute* stress that has an immediate impact on salmon and other temperature-dependent fish. The JPA only discusses what the applicants might be able to do to reduce the extent of stream heating *several years* after temperature

increases have occurred - well after the damage caused by stream temperature increases has occurred. At that point, the damage will be irreparable.

2.7 The Proposed Action would Violate Oregon's Statewide and Basin-Specific Water Quality Standards for Turbidity.

Under OAR 340-041-0036 (Turbidity):

> No more than a ten percent cumulative increase in natural stream turbidities may be allowed, as measured relative to a control point immediately upstream of the turbidity causing activity. However, limited duration activities necessary to address an emergency or to accommodate essential dredging, construction or other legitimate activities and which cause the standard to be exceeded may be authorized provided all practicable turbidity control techniques have been applied and one of the following has been granted:
>
> (1) Emergency activities: Approval coordinated by the Department with the Oregon Department of Fish and Wildlife under conditions they may prescribe to accommodate response to emergencies or to protect public health and welfare;
>
> (2) Dredging, Construction or other Legitimate Activities: Permit or certification authorized under terms of section 401 or 404 (Permits and Licenses, Federal Water Pollution Control Act) or OAR 14l-085-0100 et seq. (Removal and Fill Permits, Division of State Lands), with limitations and conditions governing the activity set forth in the permit or certificate.

Put more simply, a violation of Oregon's water quality standard for turbidity occurs when an activity causes a more than 10% increase in natural turbidity levels, unless the activity is necessary to accommodate essential dredging, construction or other legitimate activities *and* all practicable turbidity control techniques have been applied.

It is certain that the proposed action would cause a more than 10% increase in natural turbidity levels. According to the DEIS, background turbidity levels range seasonally from 5.7 to 45.7 milligrams per liter total suspended solids, and Jordan Cove's hydraulic cutterhead dredge would generate total suspended solids up to 500 mg/l. DEIS at 4-359.

JPA Stand Alone Document 1 contains the applicant's assessment of water quality impacts risks from the various stream crossing methods, and concludes that 272 crossings are at moderate risk for impacts from turbidity, 294 at moderate risk from nutrients, and 276 at moderate risk for impacts from metals. However, the report offers no analysis of practical effect of this conclusion, other than to assert that the use of BMPs "meet the standard in Oregon turbidity rules that require 'all practicable turbidity control techniques have been applied.'" (JPA Stand Alone Document 1 at 20). The analysis fails to address whether the projected increases in turbidity exceed the 10% increase standard in Oregon's narrative criteria, but instead simply asserts that the project complies with the Section 401 criteria because turbidity control techniques are proposed. This analysis fails to address cumulative effects within the watersheds or individual waterways and

does not explain how "moderate" risk of impacts from turbidity are consistent with Oregon's water quality standards.

In the event that the proposed HDD crossing fails at the proposed Klamath or Rogue Rivers, Pacific Connector's contingency crossing plans would be wet open-cut crossings at approximately the same location as the proposed HDD crossings. Wet open-cut methods produce more suspended sediments and turbidity that dry open-cut methods, as it would be completed in the flowing waterbody. Should either of these HDD crossings fail, Pacific Connector would be required to obtain all necessary permits and authorizations for in-water construction from the appropriate agencies prior to commencing an open cut crossing.

Even without a major HDD failure, there are many other potential sources of turbidity from this project that could result in long-term turbidity changes, beyond the "short-term" increase of the pipeline in-stream construction. For example, construction and re-surfacing of new and existing roads can be significant sources of turbidity for extended periods of time (see discussion of road impacts in Section 1, above). Furthermore, the JPA proposes road building and vegetation clearing along the route to occur full seasons ahead of actual pipeline construction. The exposed and disturbed landscape has the potential to contribute significant sediment to nearby waters of the state through erosion or landslides. Streamside roads are well known to contribute turbidity and sediment, as well as commonly increase the risk of landslides in watersheds that would be traversed by Pacific Connector (BLM and USFS 1997[37]). ODEQ should include an analysis both the immediate and cumulative effects of these turbidity and sediment impacts.

In addition, there are many areas along the pipeline route that include steep terrain and unstable land. The risk of landslides in these areas is high, particularly when disturbed by construction and other activities related to the project. A single landslide event could result in significant deposits of sediment into stream reaches, impacting fish habitat and water quality. Response and control of continued sediment deposition could be difficult and time consuming in remote areas of the pipeline route. These risks are exacerbated by wildfires, which leave soils exposed and without the complex structure necessary to withstand landslide events. Many commenters to FERC expressed concern over the absence of meaningful analysis of wildfires in the project area. ODEQ must consider the risk of landslides, based on current conditions and including wildfire events, as part of the activities of the project and their impacts on water quality.

Because it is certain that the proposed action would cause a more than 10% increase in natural turbidity levels, DEQ must find that the proposed action violates Oregon's water quality standard for turbidity unless the activity is necessary to accommodate essential dredging, construction or other legitimate activities *and* all practicable turbidity control techniques have been applied. Even if we grant that the proposed action were necessary to accommodate essential dredging, construction or other legitimate activities, the proposed action violates Oregon's water quality standard for turbidity because all practicable turbidity control techniques have not been applied. Under these circumstances, DEQ is required by OAR 340-041-0036 to find that the proposed action violates Oregon's water quality standard for turbidity.

[37] U.S. Bureau of Land Management (BLM) and U.S. Forest Service (USFS). 1997. Little Butte Creek Watershed Analysis Version 1.2. Medford District, Ashland Resource Area. Medford, Oregon. 301 p.

2.8 The Proposed Action would Impair Existing and Beneficial Uses to be Protected in the Rogue, Umpqua, Klamath, and South Coast Basins.

The Clean Water Act and Oregon's laws require that water quality be protected and maintained in order to not impair existing and potential beneficial uses of public waters.

Under OAR 340-041-0271: Beneficial Uses to be protected in the Rogue Basin, water quality in the Rogue Basin must be managed to protect the designated beneficial uses, which can be found at http://www.deq.state.or.us/wq/rules/div041tblsfigs.htm#t1. Designated beneficial uses include domestic water supply, fish and aquatic life, wildlife and hunting, fishing, water contact recreation and aesthetic quality. Designated fish uses to be protected in the Rogue Basin are shown in Figures 271A and 271B.

Under OAR 340-041-0320: Beneficial Uses to be protected in the Umpqua Basin, water quality in the Umpqua Basin must be managed to protect the designated beneficial uses, which can be found at http://www.deq.state.or.us/wq/rules/div041tblsfigs.htm#t1. Designated beneficial uses include domestic water supply, fish and aquatic life, wildlife and hunting, fishing, water contact recreation and aesthetic quality. Designated fish uses to be protected in the Umpqua Basin are shown in Figures 320A and 320B.

Under OAR 340-041-0180: Beneficial Uses to be protected in the Klamath Basin, water quality in the Klamath Basin must be managed to protect the beneficial uses shown in Table 180A (August 2006). Designated beneficial uses include domestic water supply, fish and aquatic life, wildlife and hunting, fishing, boating, water contact recreation, livestock watering, irrigation, and aesthetic quality. Designated fish uses to be protected in the Klamath Basin are shown in Figures 108B (November 2003).

Under OAR 340-041-0300: Beneficial Uses to be protected in the South Coast Basin, water quality in the South Coast Basin must be managed to protect the designated beneficial uses, which can be found at http://www.deq.state.or.us/wq/rules/div041tblsfigs.htm#t1. Designated beneficial uses include fish and aquatic life, fishing, boating and aesthetic quality. Designated fish uses to be protected in the South Coast Basin are shown in Figures 300A and 300B.

The Coos Bay Estuary consists of about 14,000 acres of varied intertidal and subtidal substrate habitat conditions including algae beds, eelgrass sites, marshlands, and mostly unconsolidated substrate. The upper Coos Bay estuarine habitat contains important rearing habitat supplied by estuarine wetlands, algae, and eelgrass beds, which are important conditions for estuarine fish and migratory salmon, as well as commercial oyster beds. The South Slough is the southwestern arm of the larger Coos estuary. The South Slough Reserve contains upland forests, freshwater wetlands and ponds, salt marshes, mud flats, eelgrass meadows and open water habitats.

The Coos Bay currently supports many different types of industries such as fishing, crabbing, clamming, oyster growing, wildlife observation, shipping of wood and other products, recreation, tourism, etc. These all work in conjunction with one another. A report prepared for the Oregon

Department of Fish and Wildlife listed the following estimates of expenditures for Fishing, Hunting, Wildlife Viewing, and Shellfishing in Coos County and Oregon in 2009[38]:

Coos County Local Recreation Expenditures, 2008

Category	Value	% of State Total*	% of All Travel**
Hunting	$904,977	2.90%	N/A
Fishing	$2,551,433	3.30%	N/A
Wildlife Viewing	$1,637,158	4.90%	N/A
Shellfishing	$1,080,963	20.60%	N/A
Total	$6,174,531	4.20%	N/A

Coos County Travel-Generated Expenditures, 2008

Category	Value	% of State Total*	% of All Travel**
Hunting	$2,534,940	2.40%	1.40%
Fishing	$12,253,254	4.60%	6.70%
Wildlife Viewing	$14,110,950	3.10%	7.70%
Shellfishing	$4,552,379	14.70%	2.50%
Total	$33,451,523	3.90%	18.30%

The Coos Bay is the largest commercial producer of shellfish in the state of Oregon. Oysters are commercially raised in the mudflats of South Slough and Haynes Inlet. The proposed Pacific Connector pipeline route through Haynes Inlet would have negative impacts to highly productive silver point oyster beds between MPs 1.9 and 2.5. Both Clausen Oysters[39] and Coos Bay Oyster Company[40] have expressed concerns about the potential for turbidity and loss of their commercial oysters from pipeline installation in the bay between MPs 1.7 and 4.1 along the proposed route. Commercial oysters would be at risk as well as populations of Olympia oysters, which are not harvested. The DIES states on page 2-113 that construction in the Coos Bay would occur between October 1st and February 15th. October is the height of the Olympia oyster reproductive cycle and would mean that massive die off of Olympia oyster spat would occur.

Elements of the project that will be detrimental to these beneficial uses include, but are not limited to:

- Blasting for pipeline construction;
- Construction outside ODFW in-water work periods;
- Loss of forested wetlands;
- Release of contaminants to the water column;

[38] "Fishing, Hunting, Wildlife Viewing, and Shellfishing in Oregon - *2008 State and County Expenditure Estimates*"; Prepared for the Oregon Department of Fish and Wildlife - Travel Oregon; Dean Runyan Associates; May 2009, available at http://www.dfw.state.or.us/agency/docs/Report_5_6_09--Final%20%282%29.pdf
[39] FERC Motion to Intervene Out-of-Time of Clausen Oysters and Lilli Clausen, as in individual and owner, under CP13-483, *et al.*: http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20141015-5087
[40] FERC Motion to Intervene and update Contact Information of Coos Bay Oyster Company / Jack Hampel under CP13-483, *et al.*: http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20150302-5065

- Reduction in flows from test water withdrawals;
- Loss of benthic habitat in Coos Bay;
- Siltation of fish spawning and rearing habitat;
- Temperature increases in fish-bearing streams and rivers; and,
- USFS LRMP amendments.

Impacts to the water quality in these basins are discussed in detail in Section 2.1 above. The water quality impacts that will result from the project will not protect designated beneficial uses in each impacted basin. The cumulative impacts of this project on Coho and other salmon further threaten fishery resources that are already in severe decline in all targeted watersheds. Fishing, both commercial and recreational, are designated beneficial uses for estuaries and adjacent marine waters in the South Coast Basin. Both would be negatively impacted by this development.

These serious, long-term, and cumulatively devastating impacts demonstrate that the any supposed benefits of the project do not outweigh the significant harms. DEQ simply cannot issue a 401 certificate for this misguided project.

2.9 The Applicants Failed to Adequately Identify and Explain Mitigation Plans.

The JPA does not adequately describe or explain proposed minimization and mitigation measures. Notably, two different compensatory wetland mitigation plans are included in the full JPA. Both are dated October 2014, but it is not clear which is the final plan. In addition, two additional CWM plans were submitted to the Oregon Department of State Lands. ODEQ and the public must be able to identify the final plan for mitigation in order to evaluate its components. The JPA also contains misleading statements and missing information. For example, the JPA states that the former Mill Site (which includes Ingram Yard) was "used only for dredge spoil disposal." This is incorrect and misleading. The site is listed as a clean up site by Oregon DEQ due to previous disposal of mill wastes on the property. The full extent of the wastes and contamination on the property is not yet known. In addition, the JPA mitigation plans lack specificity and detail to demonstrate compliance with ODEQ standards. For example, the JPA references the erosion control plan contained Resource Report 2 as a measure to minimize impacts. This plan is not site specific and fails to disclose specific information for adequate evaluation of the mitigation designs and procedures to be used mitigating these environmental impacts. ODEQ and the public cannot possibly evaluate the effectiveness of any mitigation plans proposed by Jordan Cove without the specifics of the plans. Simply stating that Best Management Practices ("BMPs") will be used is insufficient for evaluation of mitigation measures specific to each site. This listing of BMPs to be used is inadequate for a proper analysis of the effectiveness of the proposed sediment control measures.

The mitigation plans lack, among other things:

- Specific information regarding the water quality and habitat impacts of the improvements to roads;
- Design specifics used to justify the incomplete ESC;

- An assessment of increase in impervious surfaces resulting from road improvements, and how surface flow runoff will be affected by said road improvements. ODEQ should evaluate the effects of greater impervious areas and changes in storm water drainage dynamics resulting from road widening and construction, and also evaluate the potential from increased pollutants entering Henderson Marsh and Coos Bay from resulting increased storm water runoff;
- Analysis of the potential for releasing contaminants from the soil during road construction. ODEQ should require Jordan Cove to provide a plan on dealing with any soil contaminants encountered during road construction activities and analyze the possible environmental effects from the release of any such contaminants.

The description of a general BMP without site-specific considerations is worthless to the public, and ODEQ, for proper evaluation of the measures to be used for mitigation of environmental impacts caused by construction activities.

Even if Jordan Cove were properly avoiding adverse impacts, the mitigation does not adequately compensate for the damage. The 76 acres of prime estuarine salmon habitat that would be destroyed are irreplaceable. In addition, adequate mitigation must replace habitat values with "in-kind" and "in-place" habitat. The MOA states:

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

MOA, 1990.

There are multiple problems and deficiencies in the mitigation proposed for Coos Bay. Kentuck Slough, the site of proposed intertidal flats mitigation, contains obstacles to successful mitigation that have not been addressed in the JPA. Kentuck Slough was historically a five-mile tidal inlet that was filled to create a golf course and other land uses over time. Recently in 2007, the Kentuck Slough Bridge was replaced, and a new tide gate was installed. The tide gate replacement was designed to prevent additional intrusion of salt water into the adjacent land via groundwater flow. Saltwater intrusion had been negatively affecting the quality of soil during summer months, when limited freshwater inflow failed to adequately dilute the salt water from the bay. The tide gate replacement was the result of special hydraulic design to understand the hydrologic conditions and tidal flow. According to the mitigation plan, that new bridge and tide gate would be removed. The mitigation plan does not address the issue of saltwater intrusion to adjacent lands and soils via groundwater. The mitigation plan likewise does not address flooding issues, impacts to private property, or potential increases in mosquito populations related to the proposed mitigation at this site. Already, farms and homes to the north and west of the Kentuck Slough channel frequently flood during heavy rains. These flood impacts, including stage, velocity, and duration, have not been addressed in the mitigation plan. These flooding impacts should be evaluated including increasing sea level and storm surge projections for the area.

In addition, current and historical land uses in the area may have created conditions detrimental to successful recreation of this estuarine habitat. For example, the former golf course at this site likely used fertilizers, pesticides and herbicides, and other chemical additives that would likely be mobilized by the restoration project. These potential contaminants have not been addressed in the mitigation plan. In addition, an existing quarry located upstream of the mitigation site (Main Rock Products, Inc.) has been filling wetlands along the channel, that would limit the effectiveness of the project's intent to reconnect estuarine and freshwater habitat. The JPA fails to address or explain how these features are likely to impact the proposed mitigation at this site.

The reopening of the Kentuck channels is likely to cause complex and dynamic flow pattern alterations. The plan design must account for increased flows, tidal channels, and flooding impacts. ODEQ should require the applicants to prepare a hydrodynamic model that clearly researches and addresses the capacity and flow dynamics likely to occur as a result of the proposed channel restoration. This should include monitoring upstream of the proposed mitigation site and be based, at minimum, on tidal data, storm surge, stream velocity, flow capacity and projected long-term sea level rise. The explanation of existing hydrology does not include adequate data to support its conclusions about inundation occurrences and conditions.

The applicants also propose creation of new eelgrass habitat to compensate for the loss of high quality benthic habitat at the terminal site. The JPA fails to adequately evaluate and explain the likelihood of successful eelgrass habitat creation at the proposed mitigation site. For example, siltation and sedimentation can greatly impact the effectiveness and longevity of eelgrass restoration projects. The applicants have not evaluated the conditions of the chosen site for likelihood of long-term success.

As discussed above, the applicants filed a Biological Assessment and formal consultation request with NMFS months after FERC issued the DEIS, and consultation has not yet been completed. Previously, NMFS highlighted the inadequacies of the 2008 Draft Compensatory Mitigation Plan:

> The compensatory mitigation plan is a draft document that will need to be negotiated and approved by multiple entities. It is reasonably likely that the final approved plan will be significantly different from the draft supplied in the BA. Until the plan is finalized, the effects of the mitigation actions, both adverse and beneficial, cannot be accurately assessed in the BA or analyzed by NMFS in a biological opinion. In the absence of a final mitigation plan that identifies non-discretionary commitments for mitigation, NMFS cannot assume mitigation will occur. Provide a final mitigation plan.

NMFS 2009 BA comments at 5.

Without an approved BA to review, let alone a final mitigation plan, ODEQ, other reviewing agencies, and the public cannot assume mitigation will occur.

When discussing the total acres of wetlands that would be permanently filled by the Pacific Connector, the numbers in the Compensatory Wetland Mitigation Plan (CWMP) do not match

those detailed in the JPA. The JPA states that 1.48 acres will be destroyed, yet the CWMP proposes to mitigate for only 1.42 acres.

The CWMP is only proposing mitigation for what the applicants consider permanent impacts of the Pacific Connector (either 1.48 or 1.42 acres depending on the source). There remains an additional 238.96 acres of wetlands to be impacted in a temporary fashion. Given the sheer number of acres to be impacted and the various Cowardin classes affected, there are concerns that some of the temporary impacts may cause permanent removal of vegetation to cause a shift of these wetlands Cowardin class and thus to their functions and values.

The proposed mitigation site detailed in the Pacific Connector CWMP is well outside the watershed of many of the wetland areas that would be permanently destroyed by the project. The proposed mitigation site is located within the Coos subbasin (HUC 17100304) between Glasgow and Cooston. However, many of the impacts would be located not only in Coos but also in Coquille (HUC 17100305), South Umpqua (HUC 17100302), Upper Rogue (HUC 17100307), Upper Klamath (HUC 18010206) and Lost (HUC 18010204) sub basins.

33 C.F.R § 332.3 (b)(1) and other portions of part 332.3 direct that, "the *required compensatory mitigation should be located within the same watershed as the impact site*, and should be located where it is most likely to successfully replace lost functions and services, taking into account such watershed scale features as aquatic habitat diversity, habitat connectivity, relationships to hydrologic sources…" (emphasis added). The proposed mitigation site is located well outside the watershed for many impacted site, and can not reasonably replace those lost functions and values in the watershed.

To further alter the functions and values that would be provided by the mitigation site, the mitigation site may transition to salt water marsh in the future. The CWMP states in section 4.5 "Essentially, since the mitigation site is believed to occur at a transition zone between salt marsh and freshwater wetland, it would be acceptable if portions of the vegetation in the freshwater site proposed in this CWM are altered by future salt marsh restoration. These natural adjustments would mimic historic conditions, would provide good habitat for wildlife, and would not be counted against the CWM Plan Objectives following the initial five -year establishment period." While it may mimic historic conditions at the mitigation site before conversion to a golf course, it would in no way mimic conditions at the sites this is intended as mitigation for along the proposed pipeline route in upstream freshwater habitats in other watersheds.

Watersheds to be affected contain species found in some, but not in others that have relationships to wetlands or the waterways they are connected to. In the case of SONCC Coho salmon, or the Lost River Sucker, neither is found in the Coos subbasin, nor would the freshwater components of their resident subbasins be effectively replaced by mitigation in the Coos subbasin, nor with saltwater marsh.

33 C.F.R § 332.3 states that not only should the mitigation site provide desired functions, but should specifically consider ESA listed species and the relative locations of mitigation and impact sites in a stream network. "The compensatory mitigation project site must be ecologically

suitable for providing the desired aquatic resource functions. … the district engineer must consider, to the extent practicable, the following factors:

> (v) Reasonably foreseeable effects the compensatory mitigation project will have on ecologically important aquatic or terrestrial resources (e.g., shallow sub-tidal habitat, mature forests), cultural sites, or *habitat for federally- or state-listed threatened and endangered species*; and
>
> (vi) Other relevant factors including, but not limited to, development trends, anticipated land use changes, habitat status and trends, *the relative locations of the impact and mitigation sites in the stream network*, local or regional goals for the restoration or protection of particular habitat types or functions (e.g., re-establishment of habitat corridors or *habitat for species of concern*), water quality goals, floodplain management goals, and the relative potential for chemical contamination of the aquatic resources."

33 C.F.R. § 332.3(d)(1) (emphasis added).

Due to the extremely large quantity of supposedly temporary impacts (238.96 acres), it would be more than appropriate for the district engineer to require both additional mitigation, and the start of mitigation before project construction to offset temporal impacts due to the loss of wetlands during construction and the recovery period. "Implementation of the compensatory mitigation project shall be, to the maximum extent practicable, *in advance of* or concurrent with the activity causing the authorized impacts. The district engineer shall require, to the extent appropriate and practicable, *additional compensatory mitigation to offset temporal losses* of aquatic functions that will result from the permitted activity" 33 C.F.R § 332.3(m) (emphasis added). At the very least, ODEQ must have more information about the impacts of the proposed mitigation in order to assess the impacts to state water quality standards.

3. The Project Entails Adverse Direct, Indirect, and Cumulative Impacts that Outweigh its Benefits.

In considering the certification request, ODEQ must consider the direct and indirect impacts of the proposal, over the lifetime of the project. The Supreme Court of the United States has stated, "activities—not merely discharges—must comply with state water quality standards." *Jefferson County PUD v. Washington Dept. of Ecology*, 511 U.S. 700, 712 (1994). ODEQ's analysis, therefore, is not limited to the region directly adjacent to the terminal and pipeline. Nor is the review limited to short-term impacts, but it must consider the long-term impacts on the estuary and the entire length of the pipeline. The terminal, along with the proposed pipeline and potential lateral pipelines, will have a tremendous adverse impact on each of the factors listed above.

ODEQ must adequately accord weight to important past, ongoing, and future actions that will create significant adverse impacts for local and regional ecosystems, as well as negatively affect the recovery of sensitive wildlife, fish, and their habitats. ODEQ must likewise accord weigh to significant upstream disturbances, particularly road-building and the long-term use of access and logging roads, have and will have in National Forests. The proposed pipeline will also disturb

upstream forestland; ODEQ must consider the cumulative effects on headwater, riparian, and wetland areas within contemplated and reasonably foreseeable pipeline construction areas.

As part of the cumulative effects analysis, ODEQ should specifically consider the project's degradation of fish habitat in light of the already tenuous state of salmon, sturgeon and groundfish in the Pacific Northwest. First, the wetland and shallow water habitat in Coos Bay has been significantly degraded over the last century. The remaining habitat, therefore, takes on added importance. The proposed massive channel deepening will fundamentally alter the Bay, further eroding and undermining the integrity of shallow water habitats. In addition, ODEQ should consider the cumulative economic effect of the project on the fishing and oyster industry and communities dependent upon fishing and shellfish revenue. The direct harm to the Bay will harm the fishing and shellfish industries, as will the lack of access to traditional fishing areas.

Forests play an essential role in water purification.[41] Scientific literature clearly establishes the link between percent forest cover and water quality; for example, reductions in forest cover are directly correlated with negative changes in water chemistry, such as increased levels of nitrogen, phosphorus, sodium, chlorides, and sulfates as well as reduced levels of macroinvertebrate diversity.[42] Reducing forest cover decreases areas available for aquifer recharge, increases erosion, stormwater runoff, and flooding, and adversely affects aquatic habitats.[43] Already in Pennsylvania, researchers have correlated areas of high natural gas well density with decreased water quality, as indicated by lower macroinvertebrate density and higher levels of specific conductivity and total dissolved solids.[44]

Both deforestation and pipeline construction and operation lead to greatly increased levels of erosion, sedimentation, and stormwater runoff affecting surface water quality. Excess sedimentation is associated with a number of detrimental effects on water quality, stream morphology, and aquatic life, and has been identified by the EPA as one of the primary threats to U.S. surface waters.[45] Furthermore, heavy truck traffic on rural roads, especially unpaved roads, that were not built to withstand hundreds or thousands of truck trips also leads to significant erosion and sedimentation problems.[46] The prospect of industrial equipment and trucks are required to not only construct necessary pipeline roads, but also to maintain such. Ditches and natural watercourses along rural roads are the primary pathways for the conveyance of polluted

[41] Robert A. Smail & David J. Lewis, Forest Service, U.S. Dep't of Agric., Forest Land Conversion, Ecosystem Services, and Economic Issues for Policy: A Review 12 (2009), available at http://www fs.fed.us/openspace/fote/pnw-gtr797.pdf
[42] Jackson, J.K. & Sweeney, B.W., "Expert Report on the Relationship Between Land Use and Stream Condition (as Measured by Water Chemistry and Aquatic Macroinvertebrates) in the Delaware River Basin," Stroud Water Research Center, Avondale, PA, available at http://www.state.nj.us/drbc/Sweeney-Jackson.pdf
[43] State of N.J. Highlands Water Prot. and Planning Council, Ecosystem Management Technical Report 39 (2008).
[44] Academy of Natural Sciences of Drexel University, "A Preliminary Study of the Impact of Marcellus Shale Drilling on Headwater Streams," available at http://www.ansp.org/research/pcer/projects/marcellus-shale-prelim/index.php
[45] Entrekin, S. *et al*., "Rapid expansion of natural gas development poses a threat to surface waters," Frontiers in Ecology and Environment 2011, 9(9), 503-11 (Oct. 6, 2011), at 507, 509, available at http://www.esajournals.org/doi/abs/10.1890/110053
[46] *See* C.J. Randall, Hammer Down: A Guide to Protecting Local Roads Impacted by the Marcellus Shale (Dec. 2010), available at http://www.greenchoices.cornell.edu/downloads/development/marcellus/Marcellus_Randall.pdf

runoff bearing sediments and nutrients to streams, and increase runoff volume and energy as well, contributing to flooding.[47] In addition, access roads constructed or modified to enter gas exploration or extraction facilities contribute significantly to sedimentation and surface water quality degradation.

Pipeline construction and right-of-way maintenance creates significant land use impacts. Pipelines also create significant erosion and sedimentation problems during construction as well as over the decades-long maintenance of cleared rights-of-way. In joining well pads to transmission infrastructure, a single gathering line may cross numerous streams and rivers, especially in states such as Pennsylvania with a high density of stream mileage per unit of land. Stream and wetland pipeline crossings cause erosion and sedimentation whether implemented through dry ditch or wet ditch crossings.[48] Though erosion and sediment control permits may be required for stream crossings—indeed, in practice permit requirements are routinely violated.[49] Both dry and wet ditch crossings necessitate the clearing of area stream banks. Because riparian vegetation functions as a natural barrier along the stream edge, both removing sediment and other pollutants from surface runoff and stabilizing stream banks,[50] its clearing necessarily increases a stream's susceptibility to erosion events. Cumulatively, the construction of numerous crossings across a single watercourse may significantly degrade the quality and flow rate of the water body.[51] Erosion and sedimentation problems are often exacerbated by the staging of construction, during which soils are exposed for long periods and over long distances by clearing, grading, and trench cutting before final pipeline installation and revegetation.[52]

ODEQ must also consider cumulative impacts to conservation, aesthetics, and environmental concerns. These include the cumulative impacts to wetlands, fish and wildlife values, flood hazards, floodplain values, water supply and conservation, and water quality. As discussed above, the proposed project will have significant and far-reaching impacts on all of these values, throughout southern Oregon and beyond.

---

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

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

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

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

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

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

Conclusion

For the foregoing reasons, the Coalition urges the Oregon DEQ to deem the JPA legally and factually insufficient and deny the 401 Certification request for this misguided and destructive project.

Dated this 13th day of March, 2015

Courtney Johnson
Staff Attorney
Crag Law Center
917 SW Oak St., Suite 417
Portland, OR 97205
(503) 525-2728
courtney@crag.org

On behalf of:

Phillip Johnson
Executive Director
Oregon Shores Conservation Coalition
P.O. Box 33
Seal Rock, OR 97376
(503) 754-9303
phillip@oregonshores.org

Susan Jane M Brown
Staff Attorney
Western Environmental Law Center
1216 Lincoln
Eugene, OR 97401
(503) 914-1323
brown@westernlaw.org

Jared M. Margolis
Staff Attorney
Endangered Species Program
Center for Biological Diversity
2852 Willamette St. #171
Eugene, OR 97405
(971) 717-6404
jmargolis@biologicaldiversity.org

Cameron La Follette
Executive Director
Oregon Coast Alliance
P.O. Box 857
Astoria, OR 97103
(503) 391-0210
cameron@oregoncoastalliance.org

Bob Barker
Affected Landowner
2724 Old Ferry Road
Shady Cove, OR 97539
(541) 878-5371
bobandgail@embarqmail.com

Francis Eatherington
Conservation Director
Cascadia Wildlands
PO Box 10455 Eugene, OR 9744
(541) 643-1309
francis@cascwild.org

Katy Eymann, President
Jody McCaffree, Executive Director
Citizens Against LNG
P.O. Box 1113
North Bend, OR 97459
citizensagainstlng@gmail.com

Forrest English
Program Director
Rogue Riverkeeper
P.O. Box 102
Ashland, OR 97520
(541) 488-9831
forrest@rogueriverkeeper.org

Clarence Adams
President
Landowners United
2039 Ireland Road
Winston, Oregon 97496
adams@mcsi.net

Doug Heiken
Oregon Wild
PO Box 11648
Eugene, OR 97440
(541) 344-0675
dh@oregonwild.org

Deb McGee, Patty Hine, Mary DeMocker
Co-Founders
350 Eugene
29755 Lusk Rd.
Eugene, OR 97405
350eug@riseup.net

John Ward
Board Member
Rogue Flyfishers
Medford, OR
e_john_ward@msn.com

Joseph Vaile
Executive Director
KS Wild
P.O. Box 102
Ashland, OR 97520
(541) 488-5789
joseph@kswild.org

Konrad Fisher
Executive Director
Klamath Riverkeeper
P.O. Box 751
Somes Bar, CA 95568
(530) 627-3311
konrad@klamathriver.org

Stanley Petrowski
President/Director
South Umpqua Rural Community
Partnership
34620 Tiller Trail Hwy.
Tiller, OR 97484
(541) 825-3070

Julia DeGraw
Northwest Organizer
Food & Water Watch
917 SW Oak St. Ste. 404
Portland, OR 97205
(971) 266-4528
jdegraw@fwwatch.org

Marla Nelson
Staff Attorney
Northwest Environmental Defense Center
10015 SW Terwilliger Blvd.
Portland, OR 97219
(503) 768-6726
msnelson@nedc.org

Tom Wolf
Chair/Executive Director
Oregon Council Trout Unlimited
22875 NW Chestnut Street
Hillsboro, OR 97124

Joe Serres
Friends of Living Oregon Waters (FLOW)
P.O. Box 2478
Grants Pass, OR 97528
(541) 941-5744
jserres@oregonwaters.org

Lauren Goldberg
Staff Attorney
Columbia Riverkeeper
111 Third St.
Hood River, OR 97031
(541) 965-0985
lauren@columbiariverkeeper.org

Joseph Patrick Quinn
Conservation Chair
Umpqua Watersheds, Inc.
P.O. Box 101
Roseburg, OR 97416
jquinn@mydfn.net

Lesley Adams
Western Regional Coordinator
Waterkeeper Alliance
PO Box 240
Talent, Oregon 97540
541-897-0208
ladams@waterkeeper.org

Glen H. Spain
Northwest Regional Director
Pacific Coast Federation of Fishermen's Associations (PCFFA)
and the Institute for Fisheries Resources (IFR)
PO Box 11170
Eugene, OR 97440-3370
(541) 689-2000
fish1ifr@aol.com

Nathan Matthews
Staff Attorney
Sierra Club Environmental Law
Program
85 2nd St., Second Floor
San Francisco, CA 94105
(415) 977-5695
Nathan.Matthews@sierraclub.org

Stacey McLaughlin
Pipeline Awareness Southern Oregon
34620 Tiller Trail Hwy
Tiller, OR 97484
stacey@mountaintopinsight.com

Hannah Sohl
Director
Rogue Climate
P.O. Box 1980
Phoenix, OR 97535
(541) 840-1065

Exhibit List

1	Coalition Comments 2008 Draft Environmental Impact Statement (Dec. 4, 2008)
2	Coalition Comments 2009 Final Environmental Impact Statement (June 23, 2009)
3	Coalition Scoping Comments to FERC (Oct. 26, 2012)
4	U.S. EPA Scoping Comments to FERC (Oct. 29, 2012)
5	Coalition CWA Section 404/401 Comments (Dec. 24, 2009)
6	WELC Comments Pacific Connector Conditional Use (June 8, 2010)
7	Coalition Comments Gateway Terminal (Jan. 3, 2010)
8	NOAA FEIS Comments to FERC (June 5, 2009)
9	NOAA BA Comments (June 24, 2009)
10	Chernaik critique of BiOp (Aug. 19, 2010)
11	Williams Pipeline Website (July 21, 2009)
12	Groth, History of Olympia Oysters in Oregon Estuaries (2009)
13	Barbara Gimlin, DEIS Comment to FERC (Dec. 16, 2014)
14	Sierra Club, Look Before the LNG Leap
15	NERA Economic Consulting, LNG Report (Dec. 3, 2012)
16	Oregon DEQ ECSI Database Summary Report – Ingram Yard
17	Oregon DEQ ECSI Database Summary Report – Weyerhaeuser North Bend Mill
18	Sierra Club, Reply to NERA Study (Feb. 25, 2013)
19	EIA, Effect of Increased Natural Gas Exports on Domestic Energy Markets (Jan. 2012)
20	Wild Earth Guardians, The Ecological Effects of Roads
21	EPA Notice of Intent to Amend Stormwater Regulations, 77 Fed Reg 30473 (May 23, 2012)
22	Forest Service Roadless Area Conservation FEIS Specialist Report for Terrestrial and Aquatic Habitats and Species (Nov. 2000)
23	EPA, Wetlands Compensatory Mitigation (EPA-843-F-08-002)
24	EPA-Dept of Army, Memorandum of Agreement (1990)
25	Smail & Lewis, Forest Land Conversion, Ecosystem Services, and Economic Issues for Policy: A Review (USDA Report PNW-GTR-797) (Aug. 2009)
26	Johnson, Gagnolet, Ralls, Stevens, Natural Gas Pipelines (The Nature Conservancy, Dec. 16, 2011)
27	Pocono Record, Pike Conservation Official Fed Up with Gas Company's Violations (Sept. 20, 2011)
28	Tom Ravens, Limitations of the Haynes Inlet Sediment Transport Study (Nov. 13, 2011)
29	Letter to Coos County Planning Dept. from Tom Ravens (Oct. 14, 2011)
30	ODFW, *A Plan for the Reintroduction of Anadromous Fish in the Upper Klamath Basin* (Draft March 2008).
31	Oregon Native Fish Status Report, *Upper Klamath Basin Redband Trout SMU*, at 96-97.
32	Email from Tyler Krug, Army Corps of Engineers Portland District (Feb. 25, 2015).