ATTACHMENT A & B

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February 4, 2019

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VIA EMAIL ONLY

Henry O. Hearley
Assistant Planner
Lane Council of Governments
859 Willamette Street
Suite 500
Eugene, OR 97401

Re: Concurrent Land Use Applications by Jordan Cove Energy Project L.P.
Coos Bay Estuary Navigation Reliability Improvements
City of Coos Bay File Nos. _____

Dear Henry:

As you are aware, this office represents Jordan Cove Energy Project L.P. ("JCEP"), the applicant requesting City of Coos Bay ("City") approval of concurrent land use applications ("Applications") to authorize navigation reliability improvements on approximately 3.3 acres in the 52-NA estuary zone. This letter and its enclosures respond to your December 20, 2018 letter, which requested additional information about the Applications.

Enclosed please find an amended and restated application submittal, which we request that the City and the Lane Council of Governments ("LCOG") accept in place of the original submittal. The amended and restated submittal includes the complete application filing, which has been revised to include a revised application form, a revised application narrative, additional pages in Exhibit 1, and new Exhibits 7, 8, and 9. For convenience, we have also included a "track changes" version of the narrative showing the changes from the original version.

Further, thank you for raising the numbered questions that you did in your December 20, 2018 letter. JCEP responds to these questions below. The letter includes your numbered questions in bold followed by JCEP's responses.

1. Narrative Page 6 - CBMC - 17.215.020

Please include an update in your narrative to reflect the "Type III - with Council approval" approach that the City has agreed to pursue on the application.

RESPONSE: JCEP has included this update at pp. 6-7 of the revised narrative.

2. Narrative Page 7 - Approval Criteria

Please address the (Economic Development) Policy 1.5 of the CBCP

RESPONSE: JCEP has addressed this policy at pp. 8-9 of the revised narrative.

Although the CBEMP contains the policy language for Estuarine Resources, please address consistency with the stated Goal of the Estuarine Resources Element of the CBCP.

RESPONSE: For two reasons, the City should find that the Goal of the Estuarine Resources Element of the Coos Bay Comprehensive Plan ("CBCP") is not applicable to the Applications. First, in general, consistency with the CBCP goals is not an approval criterion for a plan amendment. *See* Coos Bay Development Code 17.215.060(1) (requiring consistency with the applicable policies of the comprehensive plan). Second, the CBCP Estuarine Resources Goal is not applicable because it implements Statewide Planning Goal ("Goal") 16, and JCEP is requesting an exception to Goal 16 as part of the Applications. *See Friends of Marion County v. Marion County*, 59 Or LUBA 323, 350-351, *aff'd* 233 Or App 488, 227 P3d 198 (2010) ("[w]hen a goal exception is taken to facilitate proposed development, any comprehensive plan policies that implement the goal for which the exception is taken no longer govern that development").

Please address the Land Use Policies: LU.4, LU.5 and LU.7 of the CBCP.

RESPONSE: JCEP has addressed these policies at pp. 9-10.

3. Narrative Page 9 - Statewide Planning Goal 1: Citizen Involvement

Please include an update in your response to reflect the "Type III - with Council approval" approach that the City has agreed to pursue on the application.

RESPONSE: JCEP has updated this response at pp. 11-12 of the revised narrative.

4. Narrative Page 10 - Statewide Planning Goal 6: Air, Water Land Resources Quality

Please clarify the following response;

> ***"Applicant anticipates that completing the NRIs will have effects upon air, water and land resources in the City, but these effects will be temporary, insignificant, or both, and Applicant will construct the NRIs using methods to protect these resources."***

This language seems contradictory (i.e. does the applicant anticipate that effects could be non-temporary or significant?). Do you feel comfortable stating that the applicant anticipates that "these effects will be both temporary and insignificant"?

RESPONSE: JCEP has revised its response to Goal 6 at p. 13 of the revised narrative to remove the passage in question.

5. Narrative Page 22 - OAR 660-004-0022(8)

Please clarify your response to this criterion. Goal 16 exception clarity is required for the relevance of 660-004-0022(8)(b) to the proposal. The provision describes permitting the *"continuation of the present level of navigation."* The response identifies the proposal as the *"minimum amount necessary to provide…channel depth…for enhanced navigation."*

RESPONSE: JCEP has clarified its response to OAR 660-004-0022(8)(b) at pp. 25-26 of the revised narrative.

The narrative also calls out 660-004-0022(8)(e) as being applicable. Please elaborate on the Goal 16 Exception applicability of this provision.

RESPONSE: The reference to OAR 660-004-0022(8)(e) in the narrative was a typographical error. OAR 660-004-0022(8)(e) explains how to justify an exception to alter or expand an existing public non-water-dependent use or a nonsubstantial fill for a private non-water-dependent use. The Applications do not request an exception for

these uses/activities. Therefore, the City should find that OAR 660-004-0022(8)(e) is not applicable to the Applications.

6. Narrative Page 27 -

In the response at the very top of the page please clarify that, although prepared to address three NRIs, the application represented by the narrative addresses the approval of one NRI (Dredge Area 4).

RESPONSE: JCEP has made this clarification at p. 30 of the revised narrative.

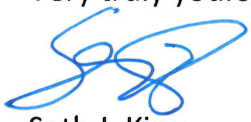
7. Narrative related to the Coos Bay Estuarine Management Plan (CBEMP) Pages 28 - 37.

Review of your submitted application narrative revealed inconsistencies between the language of the CBEMP that was provided to LCOG and specific language that you responded to. Policy #5: Estuarine Fill and Removal is an example of language that appears inconsistent. Attached is the latest adopted version of the CBEMP. Please provide criteria responses in your narrative consistent with this version.

RESPONSE: JCEP has included the current version of the relevant CBEMP policies, and where appropriate, has updated its responses to same at pp. 32-43 of the revised narrative.

Thank you for your attention to the points in this letter. Please feel free to contact me with any further questions.

Very truly yours,



Seth J. King

Encls.

cc: Carolyn Johnson, City of Coos Bay (via email) (w/encls.)
Jake Callister, LCOG (via email) (w/encls.)
Steve Pfeiffer, Perkins Coie LLP (via email) (w/encls.)
Client (via email) (w/encls.)

City of Coos Bay

Community Development · 500 Central Avenue · Coos Bay, Oregon 97420
Telephone 541.269.1181 · Fax 541.269.8916 · coosbay.org

LAND USE DEVELOPMENT REVIEW APPLICATION

For Office Use Only	
STAFF CONTACT	PROJECT NO(S).

Type of Review (Please check all that apply):

- [ ] Annexation
- [ ] Appeal and Review
- [ ] Architectural Design Review
- [ ] Conditional Use
- [ ] Cultural Resources
- [X] Estuarine Use/Activities
- [ ] Home Occupation
- [X] Legislative/Text Amendment
- [ ] Lot Line Adjustment
- [ ] Partition
- [ ] Planned Unit Development
- [ ] Site Plan and Architectural Review
- [ ] Subdivision
- [ ] Temporary Use
- [ ] Vacation
- [ ] Variance
- [ ] Zone Change
- [X] Other Plan amendment

Pre-Application applications require a different application form available on the City website or at City Hall.

Site Location/Address:	Assessor's Map No./Tax Lot(s):
Coos Bay Estuary	Zoning: Multiple
	Total Land Area:

Detailed Description of Proposal:

Navigation reliability improvements in Coos Bay:
(1) Map amendment for approximately 3.3 aces from 52-NA to DDNC-DA;
(2) Text amendment to City of Coos Bay Comprehensive Plan to take reasons exception to Statewide Planning Goal 16; and
(3) Estuarine and Coastal Shoreline Uses and Activities Permit to allow dredging in DDNC-DA; temporary pipeline in 52-NA, 53-CA, 54-DA, and 55-CA; and buoy in 52-NA.

Applicant/Owner Name: Jordan Cove Energy Project L.P. (please print) Phone:
Address: Attn: Meagan Masten, 111 SW 5th Avenue, Suite 1100 Email: mmasten@pembina.com
City State Zip: Portland, OR 97204

Applicant's Representative: Seth King (please print) Phone: 503.727.2024
Address: Perkins Coie LLP, 1120 NW Couch Street, Tenth Floor Email: sking@perkinscoie.com
City State Zip: Portland, OR 97209

1. Provide evidence that you are the owner or purchaser of the property or have the written permission of owner(s) to make an application.
2. Copy of the deed for the subject property.
3. Attach (a) a certified list of names and addresses of all owners of property within designated distance of the exterior boundaries of the subject property according to the latest adopted County tax role and (b) an assessor's map showing all lots and parcels of land within that area.
4. Address the Decision Criteria or Goals/Standards outlined in the Coos Bay Municipal Code chapter(s) related to your request.
5. Additional information: Date construction is expected to begin; estimated completion date of the total project and of individual segments; and anticipated future development.
6. Ten (10) complete hard-copy sets (single sided) of application & submitted documents must be included with this application.
   One (1) complete set of digital application materials must also be submitted electronically or on CD in Word format.
   Additional copies may be required as directed by the Coos Bay Director of Community Development.

The undersigned property owner(s) hereby authorizes the filing of this application, and authorizes on site review by authorized staff. I hereby agree to comply with all code requirements applicable to my application. Acceptance of this application does not infer a complete submittal. All amendments to the Coos Bay Development Code and to other regulations adopted after the application is approved shall be enforced where applicable. Approved applications and subsequent development is not vested under the provisions in place at the time of the initial application.

Natalie Eades — Applicant's signature
2/4/19 — Date
See application materials — Owner's signature ***(required)***
Date

BEFORE THE PLANNING COMMISSION AND

CITY COUNCIL OF THE CITY OF COOS BAY, OREGON

In the Matter of Requests to Improve the Navigation Efficiency and Reliability of the Coos Bay Deep Draft Navigation Channel Pursuant to the Following Applications: (1) Map Amendment to the Coos Bay Estuary Management Plan to Change the Designation of Approximately 3.3 Acres from 52-NA to DDNC-DA; (2) Text Amendment to the City of Coos Bay Comprehensive Plan to take a Reasons Exception to Statewide Planning Goal 16 to Authorize this Map Amendment; (3) Estuarine and Coastal Shoreline Uses and Activities Permit For "New And Maintenance Dredging" in the DDNC-DA Estuarine Zone; and (4) Estuarine and Coastal Shoreline Uses and Activities Permit to Allow an Accessory Temporary Dredge Transport Pipeline in the 52-NA, 53-CA, 54-DA, and 55-CA Estuarine Zones and an Accessory Buoy in the 52-NA Estuarine Zone.	**NARRATIVE IN SUPPORT OF THE APPLICATIONS FILED BY JORDAN COVE ENERGY PROJECT L.P.**

I. Land Use Requests.

Jordan Cove Energy Project L.P. ("JCEP") proposes to make navigation efficiency and reliability improvements to the City of Coos Bay ("City")-designated Coos Bay Deep-Draft Navigation Channel ("Channel") by dredging a submerged area lying adjacent to the existing Channel.[1] This dredging will allow for vessel transit under a broader

[1] JCEP is also proposing to widen and deepen the Channel in three additional locations, which are subject to the planning and zoning jurisdiction of Coos County. That request is outside the scope of this Application. JCEP is filing a separate land use application with Coos County to obtain authorization for the navigability enhancements at these other three locations.

weather window to enable JCEP to export the full capacity of the optimized design production of 7.8 metric tonnes per annum ("mtpa") from JCEP's liquefied natural gas ("LNG") terminal on the nearby North Spit.

JCEP submits the following concurrent applications (together, "Application") to the City to seek local land use authorization to complete these improvements to the Channel:

(1) Post-acknowledgment amendments to the Coos Bay Estuary Management Plan ("CBEMP") map to change the zoning designation of approximately 3.3 acres located approximately 2,700 feet from the end of the North Bend airport runway within the Coos Bay estuary ("Navigation Reliability Improvement Site" or "NRI Site") from 52-NA to DDNC-DA, as further depicted in Exhibit 1;

(2) A post-acknowledgment text amendment of the CBEMP, which is part of the City of Coos Bay Comprehensive Plan ("CBCP"), to take a reasons exception to Statewide Planning Goal ("Goal") 16 to authorize the rezone of the NRI Site to DDNC-DA;

(3) Estuarine and Coastal Shoreline Uses and Activities Permit in the DDNC-DA estuarine zone to allow new and maintenance dredging at the rezoned NRI Site. The activities at the NRI Site will be referred to in this narrative as the "NRIs;"

(4) Estuarine and Coastal Shoreline Uses and Activities Permit in the 52-NA, 53-CA, 54-DA, and 55-CA estuarine zones to allow a temporary pipeline to transport the dredge spoils from the NRI Site to approved disposal sites and a buoy as accessory uses to the primary dredging activity. JCEP is not seeking approval of the dredged materials disposal activity in conjunction with this Application.

This narrative provides the evidentiary basis and related analysis demonstrating how the Application satisfies the applicable approval criteria set forth in the Statewide Planning Goals ("Goals"), the Oregon Revised Statutes ("ORS"), the CBEMP, the CBCP, and the City of Coos Bay Development Code ("CBDC"). Based upon this evidence and argument, the City should approve the Application.

JCEP discussed this proposal with the City in a pre-application conference on February 2, 2017. A copy of the pre-application conference notes prepared by the City are included in Exhibit 2.

II. Description of Request.

A. Current Constraints on Utilizing the Channel.

The Channel serves a vital purpose because it provides the only safe vessel access to and from Coos Bay and the Pacific Ocean for marine terminals located along the Bayfront. The Channel was initially authorized in 1899 and since then has undergone ten modifications. Most recently, the Channel was expanded from -35 feet to -37 feet in 1997 to allow for the safe navigation and transit of Coos Bay for the size of ships prevalent during that time period. However, over the last 20 years the dimensions and tonnage of ships serving terminals in Coos Bay has increased. The size of vessels typically calling on Coos Bay terminals has increased from an average of 45,422 Metric Tonnes to an average of 52,894 Metric Tonnes with a projected near-term vessel size of 70,400 Metric Tonnes.

Currently, environmental conditions, including wind, fog, and currents, coupled with the increasing ship size explained above, have caused the Coos Bay Pilots Association[2] ("Pilots") to impose ever more limiting restrictions on when vessels may safely transit the Channel. These restrictions, in turn, cause significant delays and increased pressure on the Pilots to navigate ships through the Channel. Delays are measured in the total transit time, from the time the vessel arrives off the coast of Coos Bay until it returns offshore after calling at its local Coos Bay destination. These delays generally decrease the efficiency and competitiveness of maritime commerce on a global scale, thereby jeopardizing continued success for maritime commerce in Coos Bay. Minimizing delay is a pressing need because companies that utilize the port of Coos Bay have identified potential new customers in Asia that desire to export cargo using bulk carriers that are slightly larger than the ships typically calling today. Various marine terminal businesses within Coos Bay require assurances that terminals can efficiently accommodate larger dimension bulk carriers in the future.

B. How NRIs will Improve Navigation Efficiency and Reliability.

Dredging to complete the NRI Sites will increase the operational window to safely transit any vessel through the Channel. The NRIs, which are described in more detail

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[2] The Pilots, regulated and approved by the State of Oregon, are responsible for supporting deep sea vessel Masters in navigating their vessels into and out of the Channel. Pilotage is mandatory in Oregon. The Pilots serve a vital function for maritime commerce in Coos Bay because they safely and efficiently guide vessels through the Channel (known as pilotage) using visual aids, radar, and other means. The Channel provides the only safe vessel access to marine terminals within Coos Bay. Pilots are trained to navigate the Channel and therefore have detailed knowledge of its bathymetric conditions and visual layout.

below, are designed to increase the environmental operating windows for all ships entering Coos Bay by softening critical turns, relocate aids to navigation and reduce the required Channel directional changes. The NRIs are designed to reduce entry and departure delays and allow for more efficient vessel transits through the Channel for the size of vessels entering the Port today.

The NRIs will allow companies to secure emerging opportunities to export products with today's larger vessels, including bulk carriers of up to 299.9 meters (983.3 feet) in length and 49 meters (160.8 feet) in beam and 11.9 meters (39 feet) in draft. Although log export vessels serving the upper bay are smaller, the proposed enhancements also benefit these vessels by broadening the tidal and environmental windows for transiting the Channel, providing an enhanced margin of safety and improved efficiency in the loaded vessel departure schedule. Both Roseburg Forest Products and the Pilots have submitted letters of support for the NRIs. *See* Exhibit 3.

For JCEP and its LNG terminal, the NRIs will allow for transit of LNG vessels of similar overall dimensions to those listed in the July 1, 2008 United States Coast Guard ("USCG") Waterway Suitability Report, the USCG Letter of Recommendation dated May 10, 2018 and USCG letter confirmation dated November 7, 2018 *see* Exhibit 4, but under a broader range of weather conditions, specifically higher wind speeds. As a result, JCEP estimates that, upon completion of the NRIs, JCEP will be able to export the full capacity of the optimized design production of the LNG Terminal on a consistent annual basis.

C. Description of Channel NRIs.

Maps and cross-sections of the NRI Site are included in Exhibit 1. In the City, the specific navigation improvements at the NRI Site consist of the following:

- NRI #4 (NRI #1 - #3 are subject to Coos County jurisdiction): JCEP proposes to widen the turn from Lower Jarvis Range to Jarvis Turn Range channels from the current 500 feet to 600 feet at the apex of the turn from the current 1,125 feet to about 1,750 feet, which will allow vessels to commence their turn in this area sooner.

The NRI Site would be dredged to a -37-foot MLLW elevation to match the current depth of the Channel. Dredging of the NRIs would include a two-foot over-dredge allowance and a two-foot advanced maintenance allowance (total depth: -41-feet MLLW). Channel side slopes would be constructed at a 4:1 horizontal to vertical slope. Notably, these improvements have been identified by the USCG as a required navigation risk mitigation measure for the JCEP terminal operations. *See* Letter of Recommendation from USCG dated May 10, 2018 in Exhibit 4.

D. Proposed Dredging and Accessory Activities.

JCEP will accomplish the Channel enhancements by dredging at each of the NRI Sites. Dredging would be accomplished with mechanical or hydraulic methods. The specific characteristics of the dredging are described in the memorandum from David Evans & Associates ("DEA") included in Exhibit 5.

All work associated with the NRIs will take place during the approved in-water work period for Coos Bay (October 1 to February 15).

JCEP will place initial and future dredged material derived from the NRI Sites at the APCO 1 and 2 sites near the southern terminus of the U.S. Highway 101 McCullough Bridge. These sites are located in the City of North Bend; JCEP will file a separate application with that city to authorize disposal of these dredge spoils in these locations.

If dredging by hydraulic methods, JCEP will utilize a 24- to 36-inch temporary dredge pipeline to transport the dredged material to the disposal sites on the bottom or horizontal extent of the Channel to reduce potential conflicts with vessel navigation. The maximum distance from the NRIs to the APCO sites is approximately 8.3-miles. The dredge line is illustrated in Exhibit 6. Booster pumps would be required to move the material to the disposal sites through the pipeline. A segment of the temporary dredge line is located in the City of North Bend; JCEP will file a separate application with that city to authorize that segment of the line. In conjunction with and as a result of the dredging activity, JCEP will place a buoy on the south side of the Channel in the City. The general location of the buoy is illustrated in Exhibit 7.

III. Applicable Approval Criteria.

The Application complies with all applicable approval criteria, as follows.

A. Comprehensive Plan Map Amendment

1. CBDC - 17.215.010 Comprehensive plan amendment.

(1) The boundaries of the comprehensive plan map designations and the comprehensive plan text may be amended as provided in CBDC 17.215.020.

(2) The city may amend its comprehensive plan and/or plan map. The approval body shall consider the cumulative effects of the proposed comprehensive plan and/or map amendments on other zoning districts and uses within the general area. Cumulative effects include sufficiency

of capital facilities services, transportation, zone and location compatibility, and other issues related to public health and safety and welfare the decision making body determines to be relevant to the proposed amendment.

RESPONSE: This Application requests an amendment of the CBCP map to change the CBCP designation of the NRI Site from 52-NA to DDNC-DA. The cumulative effects of such an amendment would be to facilitate an increase in safety and efficiency of navigation in the Channel, as described in Section II. of this narrative above. Therefore, the cumulative effect of the Application is to augment transportation in the bay. The Application is compatible with the zone because new and maintenance dredging is allowed in the DDNC-DA district (and because this Application requests a comprehensive plan map amendment to render the NRI Site with a DDNC-DA designation). The Application will not have cumulative effects on the sufficiency of capital facilities services, or health and welfare. Therefore, the City can find that the Application satisfies this criterion.

CBDC - 17.215.020 Initiation of Amendment

Amendments of the comprehensive plan text or map, zoning map, or this title may be initiated by the following:

(1) A Type III application, CBDC 17.130.100, Type III procedure, by one or more owners of the property proposed to be changed or reclassified consistent with the adopted comprehensive plan; or

(2) A Type IV legislative process, CBDC 17.130.110, Type IV procedure, by motion of the planning commission and adoption by the city council.

RESPONSE: The underlying landowner of the NRI Site, the Department of State Lands, has authorized the submittal of the Application. *See* Exhibit 8. Subsection (1) permits the landowner to initiate a plan text or map or zoning map amendment. The City should find that the Application has been correctly initiated pursuant to subsection (1) above.

Subsection (1) directs the City to follow the Type III review and decision-making procedures of CBDC 17.130.100 when reviewing the Application. These procedures typically apply to quasi-judicial applications and thus provide greater procedural protections to JCEP and members of the public. The Application is quasi-judicial in nature because it involves a single landowner, a limited geographic area, is not City-initiated, and concerns the application of existing policies to a specific set of facts.

Therefore, subject to one modification explained below, the City should review and decide upon the Application pursuant to the City's Type III procedures.

The modification is appropriate in this case in order to comply with state law. CBDC 17.130.100 ("Type III procedure") provides that a Type III application "will be considered at one or more public hearings before the city's planning commission." A Type III application does not as a matter of course go before the City Council. *See* CBDC 17.130.130(5)(c) (providing for City Council consideration of a Type III application but only in event of appeal). State law requires the local governing body to take final action to approve any post-acknowledgment comprehensive plan amendment before it can become final. *Housing Land Advocates v. City of Happy Valley*, __ Or LUBA __ (LUBA No. 2016-031, May 23, 2016). The Application includes a request for an exception to Goal 16, which is a request for a plan text amendment. Therefore, pursuant to *Housing Land Advocates*, the City should schedule the Application for final action by the City Council after the Planning Commission's initial decision.

In sum, the City should apply its Type III process in CBDC 17.30.100 to review and decide upon the Application, subject to also providing for a hearing and final decision on the Application by the City Council.

CBDC - 17.215.060 Approval Criteria

1) For a Type III or Type IV review, the city council shall approve the proposal upon findings that:

(a) The proposed amendment is consistent with the applicable policies of the comprehensive plan or that a significant change in circumstances requires an amendment to the plan or map;

RESPONSE: This Application to change the CBCP designation of the NRI Site from 52-NA to DDNC-DA is consistent with the applicable policies of the comprehensive plan.

CBCP Policies

NRH.8 Coos Bay shall encourage the preservation and protection of riparian vegetation as an important fish and wildlife habitat and as a viable means of flood control by enactment of appropriate property development ordinances providing protection by establishing buffer strips along waterways, along designated HUD floodways, with the exception of navigable waterways. This strategy recognizes that such land use practices are necessary (1)

to preserve the area's natural resources, and (2) to eliminate unnecessary drainage and erosion problems often accompanying development.

RESPONSE: JCEP anticipates possible temporary, but not permanent, impacts to shoreline habitat, including to riparian vegetation, where JCEP plans to offload dredged material for processing. These temporary impacts would be limited to a corridor approximately 10 feet wide. Furthermore, JCEP would locate this corridor in the field (location by the dredging contractor) to minimize impacts to vegetation and aquatic resources. Regardless, NRH.8 does not affirmatively obligate JCEP to take any action, but rather obligates the City to "encourage" preservation of riparian vegetation "by placing buffer strips along waterways, along designated HUD floodways, with the exception of navigable waterways." JCEP will comply with any regulations the City has implemented in accordance with its obligation to so "encourage" preservation of riparian vegetation. Therefore, the City can find that the Application complies with NRH.8.

NRH.9 **Coos Bay shall cooperation with local, state, and federal agencies in conserving and protecting fish and wildlife habitat, open spaces, and aesthetic and scenic values encompassed by areas enclosed by the Coos Bay-North Bend Water Board, Empire Lakes, and Mingus Park. This strategy is not intended to prohibit development in these areas, but rather to ensure that if development occurs it takes into consideration the ability of the land to support such development, i.e., soils, topography, habitat, natural processes, etc. This strategy recognizes that these areas are particularly sensitive and valuable resources.**

RESPONSE: This policy creates no affirmative obligations for JCEP. Therefore, it does not apply to the Application.

7.5 ECONOMIC DEVELOPMENT

Goal 1, Policy 1.5 **Support and cooperate with community and regional partners to encourage economic growth.**

RESPONSE: The Application requests navigation reliability improvements for the Channel, which will primarily benefit large vessels that are navigating to and from the International Port of Coos Bay ("Port"). The Port is located outside the City limits but is an important regional entity that facilitates mass export and import of goods and commodities overseas and thus serves as a key driver of economic development

throughout southwest Oregon. As a result, approving the Application and facilitating the NRIs will support community and regional partners and encourage economic growth.

Goal 6, Policy 6.1, 6.2 **Maximize the potential uses and benefits the waterfront and deep-water port offers to the city and region as a whole; Support the Port of Coos Bay in its development efforts for transportation linkage and to develop a deep-draft channel to accommodate large cargo vessels and increase shipping activities and water-dependent uses.**

RESPONSE: The purpose of this Application is to allow the NRIs, which together with other improvements for which JCEP is seeking approval from Coos County, will facilitate increased navigational safety and efficiency for large vessels in the Channel, thereby maximizing the Channel's economic benefits for the City and region as a whole by allowing increased economic input and output. Therefore, the Application complies with these policies.

LU.4 **Coos Bay shall not make major revisions to this Comprehensive Plan more frequently than every two years, if at all possible. "Major revisions" are those that have widespread and immediate impact beyond the subject area under consideration. The city recognizes that wholesale approval of frequent major revisions could ruin the integrity of this Plan.**

RESPONSE: The Application does not request "major revisions" to the CBCP. The text amendment only directly affects the NRI Site, which is approximately 3.3 acres in size and is located at an isolated, undeveloped point adjacent to the Channel. Approval of the Application will not, from a land development/conservation perspective, have a widespread and immediate impact beyond the NRI Site. Therefore, the City should find that the Application complies with this policy.

LU.5 **Coos Bay may make minor changes to this Comprehensive Plan on an infrequent basis as need and justification arises. "Minor changes" are those which do not have significant impact beyond the immediate area of the property under consideration. The city recognizes that wholesale approval of frequent minor changes could ruin the integrity of this Plan.**

RESPONSE: The Application requests an exception to Goal 16 to facilitate navigation reliability improvements to an isolated, undeveloped area that is approximately 3.3 acres in size. From a land development perspective, approval of the Application will not, from a land development/conservation standpoint, have a widespread, immediate, or significant impact beyond the NRI Site, and it will not require additional changes to the Plan. Further, for the reasons explained in this narrative, the City should find that the need for the amendments has been justified. Therefore, the City should find that the Application requests "minor changes" to the CBCP.

LU.7 Coos Bay shall anticipate that conflicts may arise between the various plan implementation strategies contained in this plan when applying the policies to specific situations. To resolve these conflicts, if and when such may occur, Coos Bay shall consider the long term environmental, economic, social, and energy consequences expected to result from applying one strategy in place of others, then to select and apply the strategy that results in maximum public benefit as supported by findings of fact. This strategy is based on the recognition that a viable conflict resolution process is essential to the success of any comprehensive plan.

RESPONSE: Approval of the Application will not cause any conflicts between various CBCP implementation strategies. As explained in this narrative, the Application is consistent with all applicable policies of the CBCP and with the Goal exception criteria of the OAR. Therefore, the City should find that there is no need to resolve any conflicts in order to approve the Application.

For the above reasons, the City can find that the Application complies with the policies of the CBCP that apply to the Application.

(b) The proposed amendment is in the public interest; and

RESPONSE: The CBCP amendment that this Application seeks is in the public interest because it will result in increased navigational safety and efficiency for large vessels in the Channel, which will allow increased economic input and output to flow through the Channel, which in turn will be an economic boon to the City and the region. The Application complies with this criterion.

(c) Approval of the amendment will not result in a decrease in the level-of-service for capital facilities and services identified in the Coos Bay capital improvement plan(s).

RESPONSE: Approving this Application will not result in a decrease in the level-of-service for any identified capital facilities and/or services identified in the Coos Bay capital improvement plan. Therefore, the City can find that the Application complies with this criterion.

2. Statewide Planning Goals

Post-acknowledgment plan amendments must be in compliance with the Goals. ORS 197.175(2)(a); *1000 Friends of Oregon v. LCDC*, 301 Or 447, 724 P2d 268 (1986). The rezoning is a post-acknowledgment plan amendment. Therefore, the City's decision must explain why the rezoning is in compliance with the Goals. Alternatively, if a Goal is not applicable, the City must adopt findings explaining why that Goal is not applicable. *Davenport v. City of Tigard*, 22 Or LUBA 577, 586 (1992). The responses below provide findings explaining why the Application is in compliance with the Goals, or alternatively, why the Goals are not applicable to the Application.

Goal 1: Citizen Involvement.

To develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process.

RESPONSE: Goal 1 requires local governments to adopt and administer programs to ensure the opportunity for citizens to be involved in all phases of the planning process. The City has adopted such a program for PAPAs, and it is incorporated within the CBDC and has been acknowledged by LCDC. Among other things, the City's program requires notice to citizens, agencies, neighbors, and other interested parties followed by multiple public hearings before the City makes a decision on the Application. These procedures will provide ample opportunity for citizen involvement in all phases of the Application. The City should find that, upon compliance with its notice and hearing procedures, the City has reviewed the Application in a manner consistent with Goal 1. *See Wade v. Lane County*, 20 Or LUBA 369, 376 (1990) (Goal 1 is satisfied as long as the local government follows its acknowledged citizen involvement program).

In this case, as explained above in response to CBDC 17.215.020(1), the City would typically follow the Type III review and decision-making procedures of CBDC 17.130.100 when reviewing the Application. However, a modification to that process is appropriate in this case in order to comply with state law. CBDC 17.130.100 ("Type III procedure") provides that a Type III application "will be considered at one or more public hearings before the city's planning commission." The Application does not as a matter of course go before the City Council. *See* CBDC 17.130.130(5)(c) (providing for City Council consideration of a Type III application but only in event of appeal). The City

should find that state law requires the local governing body to take final action to approve any post-acknowledgment comprehensive plan amendment before it can become final. *Housing Land Advocates*, __ Or LUBA at __ (LUBA No. 2016-031, May 23, 2016). The Application includes a request for an exception to Goal 16, which is a request for a plan text amendment. Therefore, pursuant to *Housing Land Advocates*, the City should schedule the Application for final action by the City Council after the Planning Commission's initial recommendation.

In sum, the City should apply its Type III process in CBDC 17.30.100 to review and decide upon the Application, subject to also providing for a hearing and final decision on the Application by the City Council. Upon doing so, the City should find that it has complied with Goal 1.

Goal 2: Land Use Planning.

To establish a land use planning process and policy framework as a basis for all decisions and actions related to use of land and to assure an adequate factual base for such decisions and actions.

RESPONSE: Goal 2 requires establishing a land use planning process and policy framework as a basis for all land use decisions and requires an adequate factual base for all land use decisions. In the present case, the provisions of the CBDC and the ORS establish the land use planning process and policy framework for considering the Application. Further, the enclosed materials, including this narrative, demonstrate that the Application satisfies all applicable approval criteria. As such, there is an adequate factual base for the City's decision.

Additionally, Goal 2 requires that the City coordinate its review and decision on the Application with appropriate government agencies. In its review of the Application, the City has provided notice and an opportunity to comment to affected government agencies, including nearby cities and the State Departments of Land Conservation and Development and Transportation.

The City should find that the Application is consistent with Goal 2.

Goal 3: Agricultural Lands.

To maintain and preserve agricultural lands.

RESPONSE: Goal 3 concerns agricultural lands. The NRI Site does not include any agricultural lands, and approval of the amendments will not impact any agricultural lands. Therefore, the City should find that Goal 3 is not applicable to the Application.

Goal 4: Forest Lands.

To conserve forest lands by maintaining the forest land base and to protect the state's forest economy by making possible economically efficient forest practices that assure the continuous growing and harvesting of forest tree species as the leading use on forest land consistent with sound management of soil, air, water, and fish and wildlife resources and to provide for recreational opportunities and agriculture.

RESPONSE: Goal 4 protects forest lands. The NRI Site does not include any forest lands, and approval of the amendments will not impact any forest lands. Therefore, the City should find that Goal 4 is not applicable to the Application.

Goal 5: Natural Resources, Scenic and Historic Areas, and Open Spaces.

To protect natural resources and conserve scenic and historic areas and open spaces.

RESPONSE: Goal 5 protects certain types of inventoried resources. The NRI Site does not include any inventoried Goal 5 resources, and approval of the Application will not impact any Goal 5 inventoried resources. Therefore, the City should find that Goal 5 is not applicable to the Application.

Goal 6: Air, Water and Land Resources Quality.

To maintain and improve the quality of the air, water and land resources of the state.

RESPONSE: Goal 6 requires comprehensive plans to follow multiple guidelines to conserve the quality of air, water and land resources in the state. In a post-acknowledgment plan amendment proceeding, in order to satisfy Goal 6, the City is only required to find that it is reasonable to expect that federal and state environmental standards will be met in the future when permits for the dredging are sought. *Nicita v. City of Oregon City*, 74 Or LUBA 176 (2016). For two reasons, the City should find that it is reasonable to expect that JCEP's proposed dredging will satisfy federal and state environmental standards. First, JCEP has applied for state and federal approval of dredging activities at the NRI Site, and there is no indication that JCEP is precluded as a matter of law from obtaining approval of these applications. Second, the proposed map amendments do not alter existing City protections provided by the CBEMP restricting dredging activities, which protections have been previously deemed consistent with Goal 6, and are addressed later in this narrative.

For the above reasons, the Application complies with Goal 6.

Goal 7: Areas Subject to Natural Hazards.

To protect people and property from natural hazards.

RESPONSE: Goal 7 requires local governments to identify and plan for natural hazard areas and coordinate their natural hazard plans and programs with state agencies. This Application complies with Goal 7 because it will not increase the likelihood of damage to people or property within the City from natural hazards.

Goal 8: Recreational Needs.

To satisfy the recreational needs of the citizens of the state and visitors, and where appropriate, to provide for the siting of necessary recreational facilities including destination resorts.

RESPONSE: Goal 8 does not apply to the Application because it does not involve recreation or inventoried recreation areas, facilities, or opportunities.

Goal 9: Economic Development.

To provide adequate opportunities throughout the state for a variety of economic activities vital to the health, welfare, and prosperity of Oregon's citizens.

RESPONSE: The Application complies with Goal 9. The purpose of the Application is to complete the NRIs, which in turn will facilitate a broader operational window, and increase safety and efficiency of transit, in the Channel. This will be a boon to the economic prospects for the City and the state because it will make the Channel safer and more efficient for productive economic enterprises of the kind that provide opportunities to Oregonians.

Goal 10: Housing.

To provide for the housing needs of the citizens of the state.

RESPONSE: Goal 10 and its implementing rules require each local government to inventory the supply of buildable residential lands and to ensure that the supply of such buildable lands meets the local government's anticipated housing needs. The Application will not affect the supply of residential lands in the City. Therefore, the City should find that the Application is consistent with Goal 10, to the extent it is applicable.

Goal 11: Public Facilities and Services.

To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development.

RESPONSE: Goal 11 does not apply to the Application because the Application does not involve or affect public facilities and services as a framework for development.

Goal 12: Transportation.

To provide and encourage a safe, convenient and economic transportation system.

RESPONSE: The Application complies with Goal 12. Goal 12 directs local governments to plan transportation systems that consider all modes of transportation, including water, that facilitate the flow of goods and services so as to strengthen the local and regional economy, that conserve energy, and that avoid principal reliance on one mode of transportation. The Application furthers these goals by supporting safer and more efficient use of the Channel for water transportation. This safer and more efficient use of the Channel will conserve energy that is currently wasted when, outside the Channel's operational window, vessels wait outside the Channel, using fuel and adding time and expense to transit.

Goal 13: Energy Conservation.

To conserve energy.

RESPONSE: The Application complies with Goal 13. Goal 13 directs local governments to manage land use so as to maximize the conservation of all forms of energy. The Application will facilitate maximal energy conservation by increasing the safety and efficiency of vessel transit of the Channel, and by increasing the Channel's operational window. This will reduce the amount of time vessels spend waiting to enter and navigate the Channel, due to environmental conditions that exceed those required by the Pilots for a safe vessel transit, which will increase the efficiency of material transportation and reduce energy waste from inefficiency of transportation.

Goal 14: Urbanization.

To provide for an orderly and efficient transition from rural to urban land use.

RESPONSE: Goal 14 does not apply to the Application, which does not involve urban development on rural land.

Goal 15: Willamette River Greenway.

To protect, conserve, enhance and maintain the natural, scenic, historical, agricultural, economic and recreational qualities of lands along the Willamette River as the Willamette River Greenway.

RESPONSE: Goal 15 only applies to lands along the Willamette River. The Modification Sites are not located along the Willamette River or in the Willamette River Greenway. Approval of the amendments will not impact the Willamette River of the Willamette River Greenway. Therefore, the City should find that Goal 15 is not applicable to the Application.

Goal 16: Estuarine Resources.

To recognize and protect the unique environmental, economic, and social values of each estuary and associated wetlands; and to protect, maintain, where appropriate develop, and where appropriate restore the long-term environmental, economic, and social values, diversity and benefits of Oregon's estuaries.

…

MANAGEMENT UNITS

Diverse resources, values, and benefits shall be maintained by classifying the estuary into distinct water use management units. When classifying estuarine areas into management units, the following shall be considered in addition to the inventories:

1. Adjacent upland characteristics and existing land uses;

2. Compatibility with adjacent uses;

3. Energy costs and benefits; and

4. The extent to which the limited water surface area of the estuary shall be committed to different surface uses.

At a minimum, the following kinds of management units shall be established:

1. Natural -- in all estuaries, areas shall be designated to assure the protection of significant fish and wildlife habitats, of continued biological productivity within the estuary, and of scientific, research, and educational needs. These shall be managed to preserve the natural resources in recognition of dynamic, natural, geological, and evolutionary processes. Such areas shall include, at a minimum, all

major tracts of salt marsh, tideflats, and seagrass and algae beds. Permissible uses in natural management units shall include the following:

a. Undeveloped low-intensity, water-dependent recreation;

b. Research and educational observations;

c. Navigation aids, such as beacons and buoys;

d. Protection of habitat, nutrient, fish, wildlife, and aesthetic resources;

e. Passive restoration measures;

f. Dredging necessary for on-site maintenance of existing functional tidegates and associated drainage channels and bridge crossing support structures;

g. Riprap for protection of uses existing as of October 7, 1977, unique natural resources, historical and archaeological values; and public facilities; and

h. Bridge crossings.

Where consistent with the resource capabilities of the area and the purposes of this management unit the following uses may be allowed:

a. Aquaculture which does not involve dredge or fill or other estuarine alteration other than incidental dredging for harvest or benthic species or removable in-water structures such as stakes or racks;

b. Communication facilities;

c. Active restoration of fish and wildlife habitat or water quality and estuarine enhancement;

d. Boat ramps for public use where no dredging or fill for navigational access is needed; and

e. Pipelines, cables, and utility crossings, including incidental dredging necessary for their installation.

f. Installation of tidegates in existing functional dikes.

g. Temporary alterations.

h. Bridge crossing support structures and dredging necessary for their installation.

A use or activity is consistent with the resource capabilities of the area when either the impacts of the use on estuarine species, habitats, biological productivity and water quality are not significant or that the resources of the area are able to assimilate the use and activity and their effects and continue to function in a manner to protect significant wildlife habitats, natural biological productivity, and values for scientific research and education.

2. Conservation -- in all estuaries, except those in the overall Oregon Estuary Classification which are classed for preservation, areas shall be designated for long-term uses of renewable resources that do not require major alteration of the estuary, except for the purpose of restoration. These areas shall be managed to conserve the natural resources and benefits. These shall include areas needed for maintenance and enhancement of biological productivity, recreational and aesthetic uses, and aquaculture. They shall include tracts of significant habitat smaller or of less biological importance than those in (1) above, and recreational or commercial oyster and clam beds are not included in (1) above. Areas that are partially altered and adjacent to existing development of moderate intensity which do not possess the resource characteristics of natural or development units shall also be included in this classification. Permissible uses in conservation management units shall be all uses listed in (1) above except temporary alterations. Where consistent with the resource capabilities of the area and the purposes of this management unit the following uses may be allowed:

a. High-intensity water-dependent recreation, including boat ramps, marinas and new dredging for boat ramps and marinas;

b. Minor navigational improvements;

c. Mining and mineral extraction, including dredging necessary for mineral extraction;

d. Other water dependent uses requiring occupation of water surface area by means other than dredge or fill;

e. Aquaculture requiring dredge or fill or other alteration of the estuary;

f. Active restoration for purposes other than those listed in 1(d).

g. Temporary alterations.

A use or activity is consistent with the resource capabilities of the area when ether the impacts of the use on estuarine species, habitats, biological productivity, and water quality are not significant or that the resources of the area are able to assimilate the use and activity and their effects and continue to function in a manner which conserves long-term renewable resources, natural biologic productivity, recreational and aesthetic values and aquaculture.

3. Development -- in estuaries classified in the overall Oregon Estuary Classification for more intense development or alteration, areas shall be designated to provide for navigation and other identified needs for public, commercial, and industrial water-dependent uses, consistent with the level of development or alteration allowed by the overall Oregon Estuary Classification. Such areas shall include deep-water areas adjacent or in proximity to the shoreline, navigation channels, subtidal areas for in-water disposal of dredged material and areas of minimal biological significance needed for uses requiring alterations of the estuary not included in (1) and (2) above. Permissible uses in areas managed for water-dependent activities shall be navigation and water-dependent commercial and industrial uses. As appropriate the following uses shall also be permissible in development management units:

a. Dredge or fill, as allowed elsewhere in the goal;

b. Navigation and water-dependent commercial enterprises and activities;

c. Water transport channels where dredging may be necessary;

d. Flow-lane disposal of dredged material monitored to assure that estuarine sedimentation is consistent with the resource capabilities and purposes of affected natural and conservation management units.

e. Water storage areas where needed for products used in or resulting from industry, commerce, and recreation;

f. Marinas.

Where consistent with the purposes of this management unit and adjacent shorelands designated especially suited for water-dependent uses or designated for waterfront redevelopment, water-related and nondependent, nonrelated uses not requiring dredge or fill; mining and mineral extraction; and activities identified in (1) and (2) above shall also be appropriate. In designating areas for these uses, local

governments shall consider the potential for using upland sites to reduce or limit the commitment of the estuarine surface area for surface uses.

RESPONSE: Goal 16 requires that local governments divide all estuaries that Goal 16 protects into, at a minimum, the above "management units"--Natural, Conservation, and Development. The CBEMP complies with Goal 16 by creating and maintaining three "Aquatic Management Units" and seven "Shoreland Management Units" including the baseline Natural, Conservation, and Development management units that Goal 16 requires. The NRI Site is currently zoned 52-NA (a natural aquatic unit). This Application seeks to amend the CBEMP to apply the DDNC-DA (a development aquatic) management unit to the NRI Site in order to allow dredging necessary to complete the NRIs. Such dredging is not allowed in natural management units. Therefore, a Goal 16 exception is required to rezone the NRI Site to DDNC-DA.

Goal 17: Coastal Shorelands.

To conserve, protect, where appropriate, develop and where appropriate restore the resources and benefits of all coastal shorelands, recognizing their value for protection and maintenance of water quality, fish and wildlife habitat, water-dependent uses, economic resources and recreation and aesthetics. The management of these shoreland areas shall be compatible with the characteristics of the adjacent coastal waters; and

To reduce the hazard to human life and property, and the adverse effects upon water quality and fish and wildlife habitat, resulting from the use and enjoyment of Oregon's coastal shorelands.

RESPONSE: Goal 17 regulates coastal shorelands. The NRI Site does not include any designated coastal shorelands. Moreover, the proposed amendments will not impact any designated coastal shorelands. Therefore, the City should find that Goal 17 is not applicable to the Application.

Goal 18: Beaches and Dunes.

To conserve, protect, where appropriate develop, and where appropriate restore the resources and benefits of coastal beach and dune areas; and

To reduce the hazard to human life and property from natural or man-induced actions associated with these areas.

RESPONSE: Goal 18 concerns beaches and dunes. The NRI Site does not include any designated beaches or dunes. Moreover, the proposed amendments will not

impact any designated beaches or dunes. Thus, the City should find that Goal 18 is not applicable to the Application.

Goal 19: Ocean Resources.

To conserve marine resources and ecological functions for the purpose of providing long-term ecological, economic, and social value and benefits to future generations.

RESPONSE: Goal 19 calls for the conservation of ocean resources. The NRI Site does not include or abut any ocean resources, and the proposed amendments will not impact any ocean resources. Therefore, the City should find that Goal 19 is not applicable to the Application.

For the above reasons, the City can find that the Application complies with the Goals.

B. Goal 16 "Reasons" Exception:

ORS 197.732

(2) A local government may adopt an exception to a goal if:

…

(c) The following standards are met:

(A) Reasons justify why the state policy embodied in the applicable goals should not apply;

(B) Areas that do not require a new exception cannot reasonably accommodate the use;

(C) The long term environmental, economic, social and energy consequences resulting from the use at the proposed site with measures designed to reduce adverse impacts are not significantly more adverse than would typically result from the same proposal being located in areas requiring a goal exception other than the proposed site; and

(D) The proposed uses are compatible with other adjacent uses or will be so rendered through measures designed to reduce adverse impacts.

RESPONSE: The above criteria are duplicative with the same criteria set forth in OAR 660-004-0020, which implements ORS 197.732. Therefore, this Application responds to the above criteria in the section immediately below that is devoted to OAR 660-004-0020. For the reasons explained below, the proposed exception complies with the administrative rules, and compliance with these administrative rules will ensure compliance with these statutory provisions.

OAR 660-004-0020

(1) If a jurisdiction determines there are reasons consistent with OAR 660-004-0022 to use resource lands for uses not allowed by the applicable Goal or to allow public facilities or services not allowed by the applicable Goal, the justification shall be set forth in the comprehensive plan as an exception. As provided in OAR 660-004-0000(1), rules in other divisions may also apply.

RESPONSE: This Application presents "reasons" (as set forth in more detail below) consistent with OAR 660-004-0022 why Goal 16 should not apply to the NRI Site. This Application proposes that the City set forth in its comprehensive plan the justification for a Goal 16 exception at the NRI Site. Therefore, this Application satisfies this approval criterion.

(2) The four standards in Goal 2 Part II(c) required to be addressed when taking an exception to a goal are described in subsections (a) through (d) of this section, including general requirements applicable to each of the factors:

(a) "Reasons justify why the state policy embodied in the applicable goals should not apply." The exception shall set forth the facts and assumptions used as the basis for determining that a state policy embodied in a goal should not apply to specific properties or situations, including the amount of land for the use being planned and why the use requires a location on resource land;

RESPONSE: This standard requires identifying "reasons" why the state policy in Goal 16 should not apply to the NRI Site. OAR 660-004-0022 identifies the types of "reasons" that may be used to justify the exception. JCEP's responses to that rule below justify the proposed Goal 16 exception.

OAR 660-004-0022

An exception under Goal 2, Part II(c) may be taken for any use not allowed by the applicable goal(s) or for a use authorized by a statewide planning goal that cannot comply with the approval standards for that type of use. The types of reasons that may or may not be used to justify certain types of uses not allowed on resource lands are set forth in the following sections of this rule. Reasons that may allow an exception to Goal 11 to provide sewer service to rural lands are described in OAR 660-011-0060. Reasons that may allow transportation facilities and improvements that do not meet the requirements of OAR 660-012-0065 are provided in OAR 660-012-0070. Reasons that rural lands are irrevocably committed to urban levels of development are provided in OAR 660-014-0030. Reasons that may justify the establishment of new urban development on undeveloped rural land are provided in OAR 660-014-0040.

(1) For uses not specifically provided for in this division, or in OAR 660-011-0060, 660-012-0070, 660-014-0030 or 660-014-0040, the reasons shall justify why the state policy embodied in the applicable goals should not apply. Such reasons include but are not limited to the following:

(a) There is a demonstrated need for the proposed use or activity, based on one or more of the requirements of Goals 3 to 19; and either

(A) A resource upon which the proposed use or activity is dependent can be reasonably obtained only at the proposed exception site and the use or activity requires a location near the resource. An exception based on this paragraph must include analysis of the market area to be served by the proposed use or activity. That analysis must demonstrate that the proposed exception site is the only one within the market area at which the resource depended upon can be reasonably obtained; or

(B) The proposed use or activity has special features or qualities that necessitate its location on or near the proposed exception site.

RESPONSE: The Application must show a "demonstrated need" for the proposed use or activity based on the requirements of one or more of Goals 3 to 19. The "demonstrated need" for the NRIs is based primarily on Goals 9 and 12. As explained in

Section II. of this narrative above, structural restrictions on the Channel cause significant transit delays and unduly increase required directional changes during transit through the Channel. Delays are measured in the total transit time, from the time the vessel arrives off the coast of Coos Bay until it returns offshore after calling at its local Coos Bay destination. These delays decrease the efficiency and competitiveness of maritime commerce on a global scale, thereby jeopardizing continued success for maritime commerce in Coos Bay. Minimizing delay is a pressing need because companies that utilize the port of Coos Bay have identified potential new customers in Asia that desire to export cargo using bulk carriers that are slightly larger than the ships typically calling today. Various marine terminal businesses within Coos Bay require assurances that terminals can efficiently accommodate larger dimension bulk carriers in the future. The NRIs will allow companies to secure emerging opportunities to export products with today's larger vessels, including bulk carriers of up to 299.9 meters (983.3 feet) in length, 49 meters (160.8 feet) in beam, and 11.9 meters (39 feet) in draft. With respect to the Liquefied Natural Gas ("LNG") facility that JCEP proposes to develop in the lower bay, JCEP and the Pilots believe the NRIs are essential to achieve the required number of LNG vessel transits needed to lift the JCEP design annual LNG production volume. Excessive delays in LNG carrier transit in the Channel, to and from the LNG terminal, could result in a shore storage tank topping situation, requiring JCEP to curtail LNG production.

The JCEP estimate that dredging to complete navigation efficiency and reliability improvements at the NRI Sites will allow JCEP to export the full capacity of the optimized design production of 7.8 mtpa from JCEP's LNG terminal on the North Spit. To satisfy this need, JCEP proposes the NRIs to improve the navigation efficiency and reliability for vessels transiting the Channel by widening an extremely restrictive, unavoidable turn in the Channel. The NRIs will fulfill a demonstrated need for continued and enhanced shipping within the Bay; consistent with the Policy objectives of Goals 9 and 12.

The Application must also provide "reasons" that "justify why the state policy embodied in the applicable goals should not apply." OAR 660-004-0022(1)(a)(B) provides that a sufficient "reason" is that the "proposed use or activity has special features or qualities that necessitate its location on or near the proposed exception site." That is the case here. JCEP seeks to improve navigation in the Channel and to do so has selected the NRI Site that corresponds to the area of the Channel in the City that is most in need of improvement in order to facilitate safer and more efficient navigation. Therefore, this Application provides reasons why the "proposed use or activity has special features or qualities that necessitate its location on or near the proposed exception site."

(8) Goal 16 - Other Alterations or Uses: An exception to the requirement limiting dredge and fill or other reductions or degradations of natural values to water-dependent uses or to the natural and conservation management unit requirements limiting alterations and uses is justified, where consistent with ORS chapter 196, in any of the circumstances specified in subsections (a) through (e) of this section:

RESPONSE: The Application seeks an exception to the requirement limiting dredging in an area that is currently designated, in accordance with Goal 16, as a natural management unit. As explained below, the exception is justified because the Application will authorize dredging to maintain adequate depth to permit continuation of the present level of navigation as contemplated by OAR 660-004-0022(8)(b).

…

(b) Dredging to maintain adequate depth to permit continuation of the present level of navigation in the area to be dredged.

RESPONSE: The Application proposes dredging to maintain adequate depth to permit continuation of the presently authorized level of navigation at the NRI Site. As background, the Channel was initially authorized in 1899 and since then has undergone ten modifications. Most recently, the Channel was expanded from -35 feet to -37 feet in 1997 to allow for the safe navigation and transit of Coos Bay for the size of ships prevalent during that time period.

However, as explained above, environmental conditions, including wind, fog, and currents have caused the Pilots to impose ever more limiting restrictions on when vessels may safely transit the Channel. These restrictions, in turn, cause significant delays and thus prevent the Channel from operating at maximum efficiency. Minimizing delay is a pressing need because companies that utilize the International Port of Coos Bay have identified potential new customers in Asia that desire to export cargo using bulk carriers through the Channel. Various marine terminal businesses within Coos Bay require assurances that the Channel can efficiently accommodate bulk carriers.

Dredging to complete the NRI Sites will increase the operational window to safely transit any vessel through the Channel. The NRIs are designed to increase the environmental operating windows for all ships entering Coos Bay by softening critical turns, relocating aids to navigation, and reducing the required Channel directional changes. The NRIs are designed to reduce entry and departure delays and allow for more efficient vessel transits through the Channel for the size of vessels entering the Port today.

For JCEP and its LNG terminal, the NRI enhancements will allow for transit of LNG vessels of similar overall dimensions to those listed in the July 1, 2008 USCG Waterway Suitability Report, the USCG Letter of Recommendation dated May 10, 2018 and USCG letter confirmation dated November 7, 2018 *see* Exhibit 4, but under a broader range of weather conditions, specifically higher wind speeds. As a result, JCEP estimates that, upon completion of the NRIs, JCEP will be able to export the full capacity of the optimized design production of the LNG Terminal on a consistent annual basis.

For these reasons, the dredging associated with the NRIs will maintain adequate depth to permit continuation of the presently allowed level of navigation, yet allow that navigation to occur more efficiently, safely, and reliably. This standard is met.

(f) In each of the situations set forth in subsections (7)(a) to (e) of this rule, the exception must demonstrate that the proposed use and alteration (including, where applicable, disposal of dredged materials) will be carried out in a manner that minimizes adverse impacts upon the affected aquatic and shoreland areas and habitats.

RESPONSE: JCEP will complete its proposed NRIs in a manner that minimizes adverse impacts upon the affected aquatic and shoreland areas and habitats. To complete the NRIs, JCEP will dredge within the Channel and adjacent to the Channel at the NRI Sites. JCEP will minimize adverse impacts for the reasons explained below.

JCEP plans to perform capital and maintenance dredging during the ODFW-approved in-water work window (October 1 to February 15) to reduce impacts to sensitive life stages of fish in the bay.

JCEP will use various dredging methods to minimize the effects of the NRIs on water turbidity within the Bay. JCEP will use best management practices (including cutter head suction, clamshell, and hopper dredging) associated with dredging to reduce turbidity effects, and as a result of those methods JCEP expects increased water turbidity as a result of the NRIs to be temporary and limited to the immediate vicinity of dredging operations. Furthermore, JCEP does not anticipate oil spills or toxic discharges to occur when constructing the NRIs, and JCEP will use precautions to avoid either. Dredging and material transport vessels will carry small volumes of petroleum in comparison to large bulk carriers and Panamax vessels that regular traverse Coos Bay. JCEP will use best management practices to avoid and minimize spills or discharges during dredging operations and dredged material transport, including the implementation of spill containment plans.

Dredging equipment and material transport vessels related to the NRIs may generate temporary noise disturbances. However, the noise will be localized to the immediate dredging area. JCEP does not anticipate that noise levels will have more than temporary effects on the behavior of aquatic species in the area of the NRI Sites.

JCEP's environmental consultant has further evaluated potential adverse impacts associated with the dredging activities and describes ways by which JCEP will minimize such adverse impacts. *See* DEA memorandum in Exhibit 5.

For these reasons, the City should find that the Application satisfies this standard.

(b) "Areas that do not require a new exception cannot reasonably accommodate the use." The exception must meet the following requirements:

RESPONSE: The NRIs are location-specific. Their purpose is to improve safety and navigational efficiency in the Channel. There are no other areas that could accommodate the use. Therefore, "areas that do not require a new exception cannot reasonably accommodate the use." The Application satisfies this criterion.

(A) The exception shall indicate on a map or otherwise describe the location of possible alternative areas considered for the use that do not require a new exception. The area for which the exception is taken shall be identified;

RESPONSE: As explained above, the NRIs are location-specific and it would not be possible for JCEP to locate them anywhere that does not require a new exception. Exhibit 1 identifies the NRI Site, which is the area where JCEP proposes to locate the exception. The Application satisfies this criterion.

(B) To show why the particular site is justified, it is necessary to discuss why other areas that do not require a new exception cannot reasonably accommodate the proposed use. Economic factors may be considered along with other relevant factors in determining that the use cannot reasonably be accommodated in other areas. Under this test the following questions shall be addressed:

(i) Can the proposed use be reasonably accommodated on resource land that would not require an

exception, including the density of uses on nonresource land? If not, why not?

(ii) Can the proposed use be reasonably accommodated on resource land that is already irrevocably committed to nonresource uses not allowed by the applicable Goal, including resource land in existing unincorporated communities, or by increasing the density of uses on committed lands? If not, why not?

(iii) Can the proposed use be reasonably accommodated inside an urban growth boundary? If not, why not?

(iv) Can the proposed use be reasonably accommodated without the provision of a proposed public facility or service? If not, why not?

RESPONSE: As explained above, the NRIs are location-specific and it would not be possible for JCEP to locate them anywhere that does not require a new exception. Whether or not the NRIs can be accommodated inside a UGB, they still require a Goal 16 exception and they still must be located at the NRI sites, so this question is not applicable to an analysis of whether alternative areas that do not require an exception cannot accommodate the NRIs. Moreover, the NRIs relate to a public facility and will not require any additional public facilities or services to construct. The Application satisfies this criterion.

(C) The "alternative areas" standard in paragraph B may be met by a broad review of similar types of areas rather than a review of specific alternative sites. Initially, a local government adopting an exception need assess only whether those similar types of areas in the vicinity could not reasonably accommodate the proposed use. Site specific comparisons are not required of a local government taking an exception unless another party to the local proceeding describes specific sites that can more reasonably accommodate the proposed use. A detailed evaluation of specific alternative sites is thus not required unless such sites are specifically described, with facts to support the assertion that the sites are more reasonable, by another party during the local exceptions proceeding.

RESPONSE: As explained above, the NRIs are location-specific and so it is not possible for JCEP to locate them anywhere that does not require a new exception. There are no "alternative areas" that can accommodate the NRIs. The Application satisfies this criterion.

(c) "The long-term environmental, economic, social and energy consequences resulting from the use at the proposed site with measures designed to reduce adverse impacts are not significantly more adverse than would typically result from the same proposal being located in areas requiring a goal exception other than the proposed site." The exception shall describe: the characteristics of each alternative area considered by the jurisdiction in which an exception might be taken, the typical advantages and disadvantages of using the area for a use not allowed by the Goal, and the typical positive and negative consequences resulting from the use at the proposed site with measures designed to reduce adverse impacts. A detailed evaluation of specific alternative sites is not required unless such sites are specifically described with facts to support the assertion that the sites have significantly fewer adverse impacts during the local exceptions proceeding. The exception shall include the reasons why the consequences of the use at the chosen site are not significantly more adverse than would typically result from the same proposal being located in areas requiring a goal exception other than the proposed site. Such reasons shall include but are not limited to a description of: the facts used to determine which resource land is least productive, the ability to sustain resource uses near the proposed use, and the long-term economic impact on the general area caused by irreversible removal of the land from the resource base. Other possible impacts to be addressed include the effects of the proposed use on the water table, on the costs of improving roads and on the costs to special service districts.

RESPONSE: The NRI Site is the only possible site at which JCEP can make the improvements necessary to increase the safety and efficiency of vessel navigation in the Channel. The NRI Site is a location that JCEP identified where, as explained above, there is an extremely restrictive, unavoidable turn in the Channel. This turn is responsible for significant delays in vessel transit in the Channel. Although JCEP could widen other areas of the Channel to improve navigational efficiency, the NRI Site is the site most in need of improvement to achieve the results in improved efficiency and safety of navigation, that

is required within the Channel. Therefore, in order to improve the safety and efficiency of such transit, JCEP must widen the Channel at the locations of this turn (the NRI Site). There are no alternative sites requiring a Goal exception at which JCEP can make the necessary improvements. Moreover, the long-term economic, environmental, social and energy costs of widening other areas of the Channel that JCEP could feasibly widen (although doing so would not achieve the results in improved efficiency and safety of navigation that JCEP desires) are not materially different from the same consequences of making the NRIs at the NRI Site. All such areas are nearby each other and are within the Channel. Furthermore, the Channel itself is a fixed location that cannot be moved. Therefore, the City should find that the Application satisfies this criterion.

(d) "The proposed uses are compatible with other adjacent uses or will be so rendered through measures designed to reduce adverse impacts." The exception shall describe how the proposed use will be rendered compatible with adjacent land uses. The exception shall demonstrate that the proposed use is situated in such a manner as to be compatible with surrounding natural resources and resource management or production practices. "Compatible" is not intended as an absolute term meaning no interference or adverse impacts of any type with adjacent uses.

RESPONSE: The NRI Sites located immediately adjacent to the existing Channel. This criterion, therefore, requires JCEP to demonstrate that JCEP's proposal for the NRIs is designed to reduce adverse impacts on the waters of the Bay and the Channel, and to be compatible with the use of the Channel for transportation. The proposal is compatible with land uses in the Channel (including transit) because it involves dredging below the surface of the water for the purpose of increasing safety and efficiency in navigating the Channel. The proposal is compatible with land uses in the Channel because it is designed to make them easier and more effective. Furthermore, the proposal is designed to reduce adverse environmental impacts upon the waters of the bay and the Channel. *See* DEA memo included in Exhibit 5.

(3) If the exception involves more than one area for which the reasons and circumstances are the same, the areas may be considered as a group. Each of the areas shall be identified on a map, or their location otherwise described, and keyed to the appropriate findings.

RESPONSE: This Application seeks a Goal 16 exception for one NRI site in the City. The remaining NRI Sites are located outside of the City's jurisdiction. Exhibit 1 includes a map that identifies the NRI Sites.

(4) For the expansion of an unincorporated community described under OAR 660-022-0010, including an urban unincorporated community pursuant to OAR 660-022-0040(2), the reasons exception requirements necessary to address standards 2 through 4 of Goal 2, Part II(c), as described in of subsections (2)(b), (c) and (d) of this rule, are modified to also include the following:

(a) Prioritize land for expansion: First priority goes to exceptions lands in proximity to an unincorporated community boundary. Second priority goes to land designated as marginal land. Third priority goes to land designated in an acknowledged comprehensive plan for agriculture or forestry, or both. Higher priority is given to land of lower capability site class for agricultural land, or lower cubic foot site class for forest land; and

(b) Land of lower priority described in subsection (a) of this section may be included if land of higher priority is inadequate to accommodate the use for any of the following reasons:

(A) Specific types of identified land needs cannot be reasonably accommodated on higher priority land;

(B) Public facilities and services cannot reasonably be provided to the higher priority area due to topographic or other physical constraints; or

(C) Maximum efficiency of land uses with the unincorporated community requires inclusion of lower priority land in order to provide public facilities and services to higher priority land.

RESPONSE: This Application does not seek to expand an unincorporated community. Therefore, these approval criteria do not apply to the Application.

C. Approval For Estuarine and Coastal Shoreland Uses and Activities Permit

1. CBDC

CBDC - 17.370.010 General

Uses and activities permitted by the Coos Bay estuary management plan are subject to general and special conditions and policies to comply with statewide

planning goals and the Coos Bay Estuary Plan as adopted by the city of Coos Bay. Compliance with these conditions and policies must be verified; therefore, all uses and activities under jurisdiction of the Coos Bay estuary management plan must be reviewed.

RESPONSE: CBDC 17.370.010 makes the general and special conditions of the CBEMP approval criteria for this Application. The DDNC-DA CBEMP zone allows new and maintenance dredging, which this Application seeks approval for, subject to general conditions (CBEMP Policies #17 and #18) and a special condition (mitigation of adverse impacts - CBEMP Policy #5). As explained below, CBEMP Policy #5, in turn, triggers consideration of CBEMP Policies #4 and #4a. Therefore, this Application addresses these policies.

JCEP also requests approval of an accessory temporary dredge line in the 52-NA, 53-CA, 54-DA, and 55-CA CBEMP management units. The dredge line is described in the DEA memo included in Exhibit 5, and it is depicted in the figures included in Exhibit 6. Finally, JCEP requests approval of an accessory buoy in the 52-NA management unit. The buoy is located south of the Channel and is depicted in Exhibit 7.

DDNC-DA Zone - General Conditions For Approval of "New and Maintenance Dredging"

CBEMP Policy #17 - Protection of "Major Marshes" and "Significant Wildlife Habitat" in Coastal Shorelands

Local government shall protect major marshes, significant wildlife habitat, coastal headlands, and exceptional aesthetic resources located within the Coos Bay Coastal Shorelands Boundary and included in the Plan inventory, except where exceptions allow otherwise. Local government shall consider:

A. "major marshes" to include areas identified in the Goal #17 "Linkage Matrix" and the Shoreland Values Inventory map;

B. "significant wildlife habitats," coastal headlands and exceptional aesthetic resources to include those areas identified on the map "Shoreland Values."

This strategy shall be implemented through:

A. plan designations and use and activity matrices set forth elsewhere in this Plan that limit uses in these special areas to those that are consistent with protection of natural values; and

B. through use of the "Shoreland Values" map that identifies such special areas and restricts uses and activities therein to uses that are consistent with the protection of natural values. Such uses may include propagation and selective harvesting of forest products consistent with the Oregon Forest Practices Act, grazing, harvesting wild crops, and low-intensity water-dependent recreation.

This strategy recognizes that special protective consideration must be given to key resources in coastal shorelands over and above the protection afforded such resources elsewhere in this Plan.

RESPONSE: According to the Shoreland Values map, there are no inventoried resources at the NRI Site for which Policy #17 requires protection. Therefore, CBEMP Policy #17 does not apply to JCEP's request for approval to complete the NRIs.

CBEMP Policy #18 - Protection of Historical and Archaeological Sites Within Coastal Shorelands

Local government shall provide special protection to historic and archaeological sites located within the Coos Bay Coastal Shorelands Boundary, except where Exceptions allow otherwise. These sites are identified in the section entitled: "Coastal Shoreland Values Requiring Mandatory Protection" and on the "Special Considerations Map." Further, local government shall continue to refrain from widespread dissemination of site-specific information about identified archaeological sites.

This strategy shall be implemented by requiring review of all development proposals involving an archaeological or historical site to determine whether the project as proposed would protect the archaeological and historical values of the site.

The development proposal, when submitted, shall include a site development plan showing, at a minimum, all areas proposed for excavation, clearing and construction. Within three (3) working days of receipt of the development proposal, the local government shall notify the Coos, Siuslaw, Lower Umpqua Tribal Council in writing, together with a copy of the site development plan. The Tribal Council shall have the right to submit a written statement to the local government within ten (10) days of receipt of such notification, stating whether the project as proposed would protect the historical and archaeological values of the site, or if not, whether the project could be modified by appropriate measures to protect those values.

"Appropriate measures" may include, but shall not be limited to the following:

A. Retaining the historic structure in situ or moving it intact to another site; or

B. Paving over the site without disturbance of any human remains or cultural objects upon the written consent of the Tribal Council; or

C. Clustering development so as to avoid disturbing the site; or

D. Setting the site aside for non-impacting activities, such as storage; or

E. If permitted pursuant to the substantive and procedural requirements of ORS 97.750, contracting with a qualified archaeologist to excavate the site and remove any cultural objects and human remains, reinterring the human remains at the developer's expense; or

F. Using civil means to ensure adequate protection of the resources, such as acquisition of easements, public dedications, or transfer of title.

If a previously unknown or unrecorded archaeological site is encountered in the development process, the above measures shall still apply. Land development activities which violate the intent of this strategy shall be subject to penalties prescribed in ORS 97.990(8) and (9). Upon receipt of the statement by the Tribal Council, or upon expiration of the Tribal Council's ten-day response period, the local government shall conduct an administrative review of the development proposal and shall:

A. approve the development proposal if no adverse impacts have been identified, as long as consistent with other portions of this plan, or

B. Approve the development proposal subject to appropriate measures agreed upon by the landowner and the Tribal Council, as well as any additional measures deemed necessary by the local government to protect the historical and archaeological values of the site. If the property owner and the Tribal Council cannot agree on the appropriate measures, then the governing body shall hold a quasi-judicial hearing to resolve the dispute. The hearing

shall be a public hearing at which the governing body shall determine by preponderance of the evidence whether the development project may be allowed to proceed, subject to any modifications deemed necessary by the governing body to protect the historical and archaeological values of the site.

This strategy recognizes that protection of historical and archaeological sites is not only a community's social responsibility, but is also legally required by Goal #17 and ORS 97.745. It also recognizes that historical and archaeological sites are non-renewable cultural resources.

RESPONSE: The City has not inventoried any historical, cultural, and archaeological resources in the area of proposed development. Therefore, there are no known inventoried resources in this location to consider under this policy.

Notwithstanding this fact, JCEP recognizes that, during the course of development consistent with the Application, there may be unanticipated discovery of cultural resources, remains, and/or objects. To address this possibility, JCEP has coordinated with the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians ("Tribes") to enter a memorandum of agreement ("MOA") addressing these circumstances, and more broadly, CBEMP Policy #18.

A copy of the signed MOA is included in Exhibit 9. The MOA incorporates a Cultural Resources Protection Agreement entered between JCEP and the Tribes ("CRPA"). The CRPA provides a process for the exchange of project-related information, confidentiality requirements, commitments to mitigation, monitoring agreements, agreements for the treatment of unanticipated discovery of cultural resources, site access agreements, and cost recovery agreements. The CRPA, in turn, incorporates an Unanticipated Discovery Plan ("UDP"), which provides procedures in the event of an unanticipated discovery of historic properties, archaeological objects, archaeological sites or human remains, funerary objects, sacred items, and items of cultural patrimony, during the construction and operation of the Pipeline. The CRPA and UDP are attached as exhibits to the MOA in Exhibit 9. In the MOA, JCEP and the Tribes expressly agreed that the CRPA and the UDP constitute appropriate measures under CBEMP Policy #18 that would protect the cultural, historical, and archaeological values of this development site. JCEP is willing to accept a condition of City approval of the Application requiring compliance with the MOA and its attachments.

Subject to the proposed condition, the City should find that the Application is consistent with CBEMP Policy #18.

DDNC-DA Zone - Special Condition For Approval of "New and Maintenance Dredging"

CBEMP Policy #5 - Estuarine Fill and Removal

Dredging and/or filling shall be allowed only:

A. If required for navigation or other water-dependent uses that requires an estuarine location or if specifically allowed by the applicable management unit requirements of this goal; and

B. If no feasible alternative upland location exists; and

C. If a public need (i.e., a substantial public benefit) is demonstrated and the use or alteration does not unreasonably interfere with public trust rights; and

D. If adverse impacts are minimized; and

E. The activity is consistent with the objectives of the Estuarine Resources Goal and with other requirements of state and federal law, specifically the conditions in ORS 541.615 and Section 404 of the Federal Water Pollution Control Act (P.L.92-500).

Other uses and activities which could alter the estuary shall only be allowed if the requirements in B, C, and D are met. All portions of these requirements may be applied at the time of plan development for actions identified in the Plan. Otherwise, they shall be applied at the time of permit review.

This strategy shall be implemented by the preparation of findings by local government documenting that such proposed actions are consistent with the Comprehensive Plan and with criteria "a" through "e" above. However, where goal exceptions are included within this plan, the findings in the exception shall be sufficient to satisfy criteria "a" through "c" above. Identification and minimization of adverse impacts as required in "d" above shall follow the procedure set forth in Policy #4a. The findings shall be developed in response to a "request for comment" by the Division of State Lands (DSL), which shall seek local government's determination regarding the appropriateness of a permit to allow the proposed action.

"Significant" as used in "other significant reduction or degradation of natural estuarine values", shall be determined by:

A. The U.S. Army Corps of Engineers through its Section 10 and 404 permit processes; or

B. The Department of Environmental Quality (DEQ) for approvals of <u>new</u> aquatic log storage areas only; or

C. The Department of Fish and Wildlife for <u>new</u> aquaculture proposals only.

This strategy recognizes that Goal #16 limits dredging, fill, and other estuarine degradation in order to protect the integrity of the estuary.

<u>RESPONSE</u>: JCEP's new and maintenance dredging activities must be consistent with CBEMP Policy #5. The DDNC-DA zone allows new and maintenance dredging. Furthermore, because the Application includes a Goal 16 exception, Policy #5 requires only that the Application comply with criteria D. and E. above, because, as expressly noted within the Policy, the findings for the Goal 16 exception suffice for this Application to comply with criteria A. - C.

Policy #5 directs that an applicant demonstrate compliance with criterion D. of Policy #5 (identification and minimization of adverse impacts) pursuant to the procedure set forth in CBEMP Policy #4a. Furthermore, Special Conditions for approval of new and maintenance dredging in the DDNC-DA zone provide that such dredging is allowed only "subject to finding that adverse impacts have been minimized." JCEP will minimize adverse impacts as summarized below, in response to CBEMP Policies #4 and #4a, and as further discussed in the DEA memo included in <u>Exhibit 5</u>.

JCEP will use various dredging methods to minimize the effects of the NRIs on water turbidity within the bay. JCEP will use best management practices (including cutter head suction, clamshell, and hopper dredging) associated with dredging to reduce turbidity effects, and as a result of those methods JCEP expects increased water turbidity as a result of the NRIs to be temporary and limited to the immediate vicinity of dredging operations. Furthermore, JCEP does not anticipate oil spills or toxic discharges to occur when constructing the NRIs, and JCEP will use precautions to avoid either. Dredging and material transport vessels will carry small volumes of petroleum in comparison to large bulk carriers and Panamax vessels that regular traverse Coos Bay. JCEP will use best management practices to avoid and minimize spills or discharges during dredging operations and dredged material transport, including the implementation of spill containment plans. JCEP plans to perform capital and maintenance dredging during the ODFW-approved in-water work window (October 1 to February 15) to reduce impacts to sensitive life stages of fish in the bay.

Criterion E. of Policy #5 requires that the NRIs are "consistent with the objectives of the Estuarine Resources Goal and with other requirements of state and federal law, specifically the conditions in ORS 541.615 and Section 404 of the Federal Water Pollution Control Act (P.L.92-500)." The NRIs are consistent with the objectives of Goal 16 (Estuarine Resources Goal) because they protect the economic values of the estuary while minimizing adverse impacts of the dredging activity. The Application is consistent with other requirements of state and federal law, including the conditions in ORS 541.615 and Section 404 of the Federal Water Pollution Control Act. ORS 541.615, which is now ORS 196.810, requires a permit from the Department of State Lands ("DSL") to remove any material from the beds or banks of waters of the state. JCEP acknowledges this obligation, and all necessary DSL and Federal Section 404 authorizations will be obtained as a condition precedent to dredging.

For these reasons, the City should find that JCEP's proposed new and maintenance dredging activities are consistent with CBEMP Policy #5.

Alternatively, the City should find that CBEMP Policy #5 is not applicable to the Application pursuant to state law. LUBA has held, and the Court of Appeals has affirmed, that "[w]hen a goal exception is taken to facilitate proposed development, any comprehensive plan policies that implement the goal for which the exception is taken no longer govern that development." *Friends of Marion County v. Marion County*, 59 Or LUBA 323, 350-351 (2009), *aff'd* 233 Or App 488, 227 P3d 198 (2010). The Application requests an exception to Goal 16 to facilitate dredging in a natural management unit. As the last sentence of CBEMP Policy #5 clearly states, the purpose of this policy is to implement Goal 16: "This strategy recognizes that Goal #16 limits dredging, fill, and other estuarine degradation in order to protect the integrity of the estuary." Accordingly, pursuant to the appellate decisions in *Friends of Marion County*, CBEMP Policy #5 is not applicable to the Application.

#4 Resource Capability Consistency and Impact Assessment

Local government concludes that all proposed actions (approved in this Plan) which would potentially alter the estuarine ecosystem have been based upon a full consideration of the impacts of the proposed alteration, except for the following uses and activities:

A. <u>Natural Management Units</u>

- Aquaculture
- Bridge crossings
- Log storage

B. <u>Conservation Management Units</u>

- Aquaculture
- Bulkheading
-Dike maintenance dredging
- High-intensity water-dependent recreation
- Log storage dredging
- Minor navigational improvements requiring dredging or fill
- New or expanded log storage
- Rip-rap
- Water intake or withdrawal and effluent discharge

C. <u>Development Management Units</u>

- Aquaculture
- Bulkheading (except for Aquatic Units #3-DA, 5DA, and 6DA)
- Dredging
- Fill
- Flow lane disposal of dredged material
- In-water structures
- Mining and mineral extraction
- New or expanded log storage
- Water-related and nondependent, nonrelated uses not requiring fill

D. Any other uses and activities which require the resource capability consistency test as a condition within a particular management unit or which could affect the estuary's physical processes or biological resources.

<u>Unless fully addressed during the development and adoption of comprehensive plans, actions which would potentially alter the estuarine ecosystem shall be preceded by a clear presentation of the impacts of the proposed alteration.</u>

For uses and activities requiring the resource capabilities test, a special condition is noted in the applicable management unit uses/activities matrix. A determination of <u>consistency with resource capability</u> and the purposes of the management unit shall be based on the following:

A. A description of resources identified in the plan inventory;

B. An evaluation of impacts on those resources by the proposed use (see impact assessment procedure, below); and

C. In a natural management unit, a use or activity is consistent with the resource capabilities of the area when either the impacts of the use on estuarine species, habitats, biological productivity and water quality are not significant or that the resources of the area are able to assimilate the use and activity and their effects and continue to function in a manner to protect significant wildlife habitats, natural biological productivity, and values for scientific research and education.

D. In a conservation management unit, a use or activity is consistent with the resource capabilities of the area when either the impacts of the use on estuarine species, habitats, biological productivity, and water quality are not significant or that the resources of the area are able to assimilate the use and activity and their effects and continue to function in a manner which conserves long-term renewal resources, natural biologic productivity, recreational and aesthetic values, and aquaculture.

An impact assessment need not be lengthy or complex, but it should enable reviewers to gain a clear understanding of the impacts to be expected. It shall include information on:

A. The type and extent of alterations expected;

B. The type of resource(s) affected;

C. The expected extent of impacts of the proposed alteration on water quality and other physical characteristics of the estuary, living resources, recreation and aesthetic use, navigation and other existing and potential uses of the estuary; and

D. The methods which could be employed to avoid or minimize adverse impacts.

This policy is based on the recognition that the need for and cumulative effects of estuarine developments were fully addressed during the preparation of this Plan and that, except as otherwise stated above, no additional findings are required to meet Implementation Requirement #1 of LCDC Goal 16.

RESPONSE: As required by CBEMP Policy #5, "[i]dentification and minimization of impacts shall follow the procedure set forth in Policy #4. JCEP has addressed the provisions of this policy in the DEA memo included in Exhibit 5. This memo is incorporated herein by reference.

Alternatively, the City should find that CBEMP Policy #4 is not applicable to the Application pursuant to state law. LUBA has held, and the Court of Appeals has affirmed, that "[w]hen a goal exception is taken to facilitate proposed development, any comprehensive plan policies that implement the goal for which the exception is taken no longer govern that development." *Friends of Marion County*, 59 Or LUBA at 350-351, *aff'd* 233 Or App at 488. The Application requests an exception to Goal 16 to facilitate dredging in a natural management unit. As the last sentence of CBEMP Policy #4 clearly states, the purpose of this policy is to implement Goal 16: "This policy is based on the recognition that the need for and cumulative effects of estuarine developments were fully addressed during the preparation of this Plan and that, except as otherwise stated above, no additional findings are required to meet Implementation Requirement #1 of LCDC Goal 16." Accordingly, pursuant to the appellate decisions in *Friends of Marion County*, CBEMP Policy #4 is not applicable to the Application.

#4a Deferral of (A) Resource Capability Consistency Findings and (B) Resource Impact Assessments

Local government shall defer, until the time of permit application, findings regarding consistency of the uses/activities listed in Policy #4 with the resource capabilities of the particular management unit.

Additionally, the impact assessment requirement for those uses/activities as specified in Policy #4 shall be performed concurrently with resource capability findings above at the time of permit application.

This strategy shall be implemented through an Administrative Conditional Use process that includes local cooperation with the appropriate state agencies such that:

A. Where aquaculture is proposed as a use, local government shall notify the Oregon Department of Fish & Wildlife (ODFW) in writing of the request, with a map of the proposed site;

B. Where log storage dredging is proposed as an activity, local government shall notify the Oregon Department of Environmental Quality (DEQ) in writing of the request, together with a map of the proposed site.

Within twenty (20) days of receipt of the notification, ODFW or DEQ, as appropriate, shall submit in writing to local government a statement as to whether the proposed use/activity will be consistent with the resource capabilities of the management segment, or if determined to be not consistent, whether the proposal can be made consistent through imposition of conditions on the permit. The

appropriate state agency shall also perform the impact assessment required in Policy #4. If no statement is received from the affected state agency by the expiration of the twenty (20) day period, local government shall presume consistency of the proposal with the resource capabilities of the management segment, shall make findings appropriate to the presumption, and shall perform the assessment of impacts required by Policy #4.

For all other uses/activities specified above, local government shall determine appropriate findings whether the proposed use/activity is consistent with the resource capabilities of the management segment and shall perform the assessment of impacts required by Policy #4.

This strategy recognizes:

A. that resource capability consistency findings and impact assessments as required by LCDC Goal #16 can only be made for the uses specified above at the time of permit application, and

B. that the specified state agencies have expertise appropriate to assist local government in making the required finding and assessments.

This strategy is based upon the recognition that the need for and cumulative effects of estuarine developments were fully addressed during development of this Plan and that no additional findings are required to meet Implementation Requirement #1 of Goal #16.

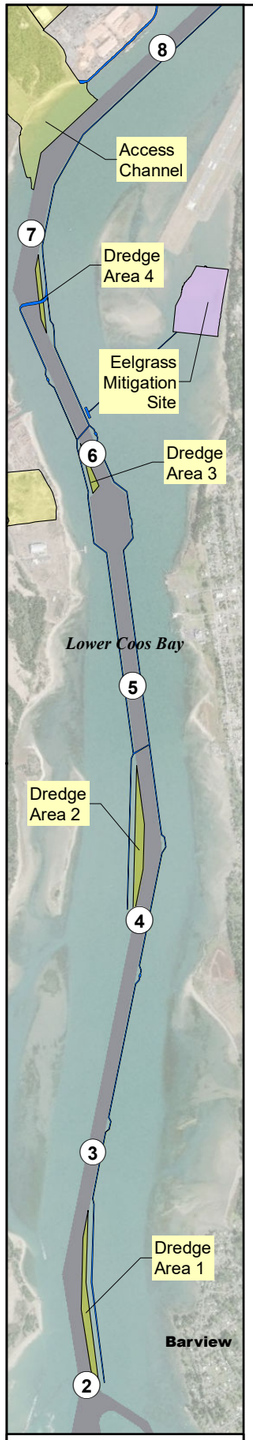
RESPONSE: As noted above, CBEMP Policy #4 requires findings demonstrating the public's need and gain that would warrant any modification or loss to the estuarine ecosystem, based upon a clear presentation of the impacts of the proposed alteration, as implemented in Policy #4a. None of the prerequisites to providing notice to state agencies under Policy #4a are triggered. Therefore, this policy requires the City to perform the impacts assessment consistent with CBEMP Policy #4. The City has completed that assessment above.

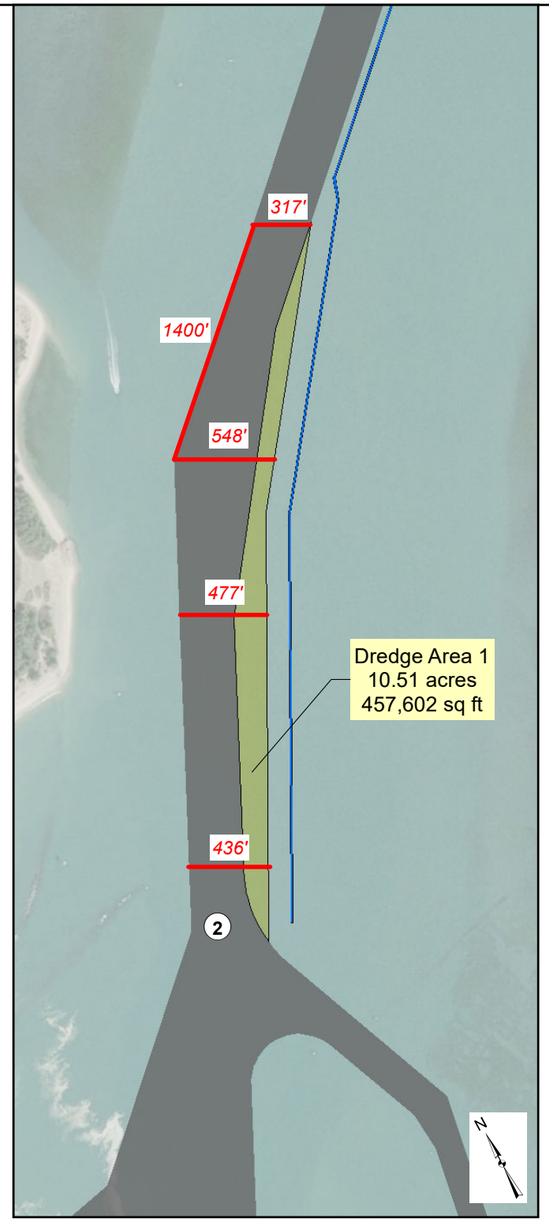
For an additional reason, the City should find that CBEMP Policy #4a is not applicable to the Application. LUBA has held, and the Court of Appeals has affirmed, that "[w]hen a goal exception is taken to facilitate proposed development, any comprehensive plan policies that implement the goal for which the exception is taken no longer govern that development." *Friends of Marion County*, 59 Or LUBA at 350-351, *aff'd* 233 Or App at 488. The Application requests an exception to Goal 16 to facilitate dredging in a natural management unit. As the last sentence of CBEMP Policy #4a

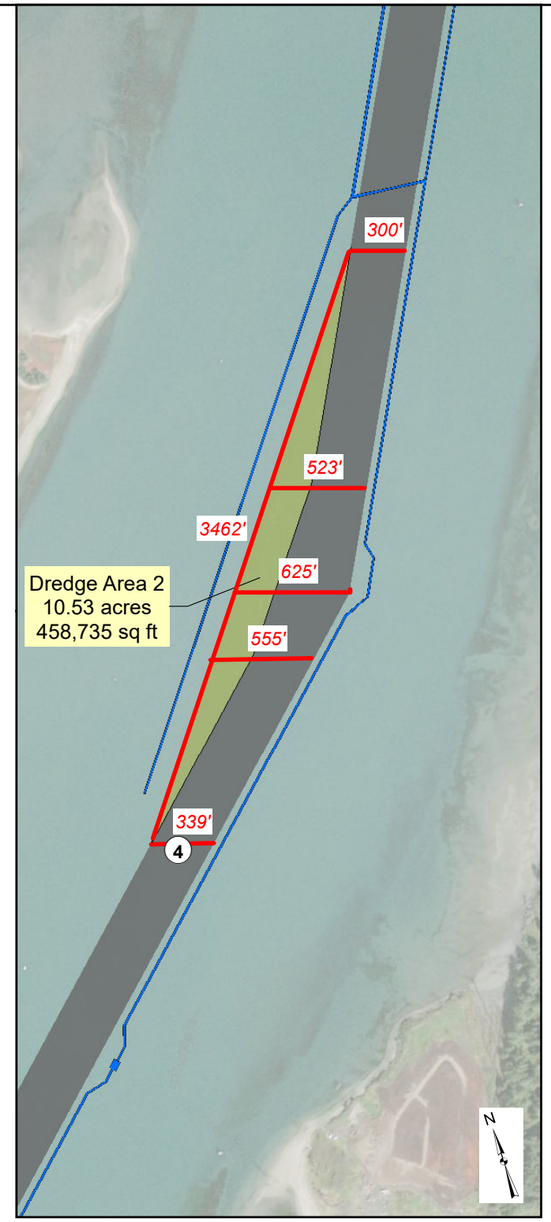
clearly states, the purpose of this policy is to implement Goal 16: "This strategy is based upon the recognition that the need for and cumulative effects of estuarine developments were fully addressed during development of this Plan and that no additional findings are required to meet Implementation Requirement #1 of Goal #16." Accordingly, pursuant to the appellate decisions in *Friends of Marion County*, CBEMP Policy #4a is not applicable to the Application.

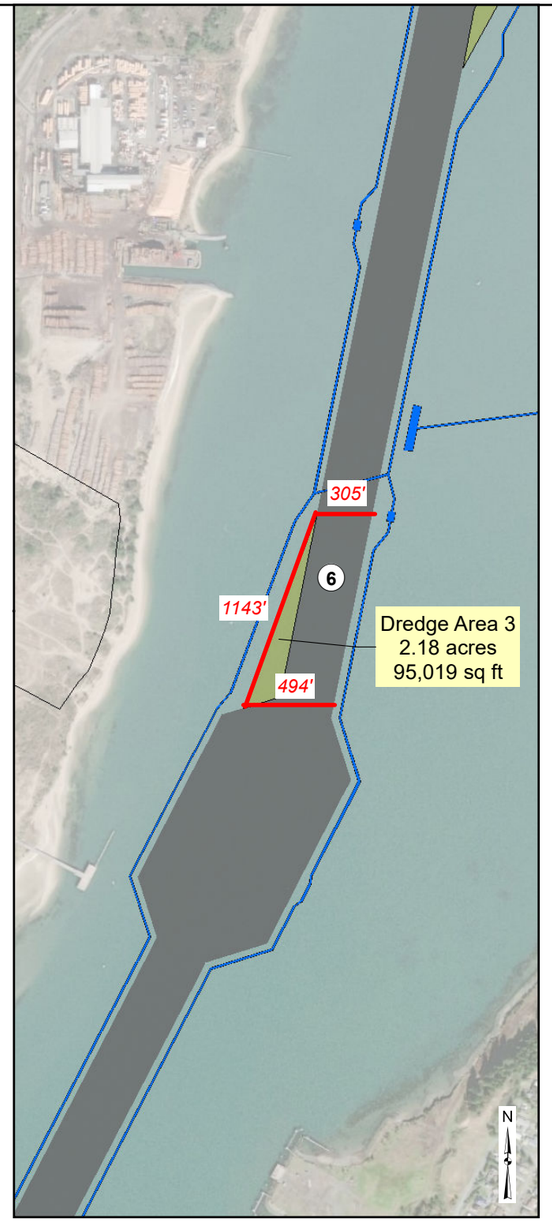
IV. Conclusion.

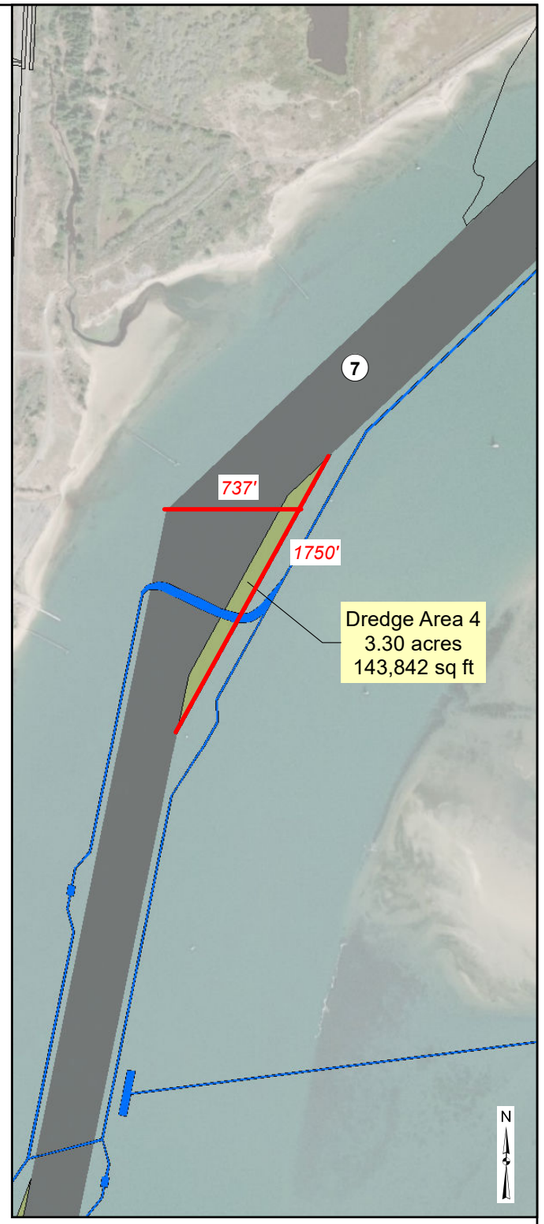
Based upon the above, the City should approve JCEP's requests: (1) to amend the CBEMP map to change the zoning designation of the NRI Site from 52-NA to DDNC-DA; (2) to amend the CBCP to take a reasons exception to Goal 16 to change the zoning designation of the NRI Site to DDNC-DA; (3) for Estuarine and Coastal Shoreline Uses and Activities Permit For "New And Maintenance Dredging" in the DDNC-DA estuarine zone; and (4) Estuarine and Coastal Shoreline Uses and Activities Permit to allow an accessory temporary dredge transport pipeline in the 52-NA, 53-CA, 54-DA, and 55-CA estuarine zones and an accessory buoy in the 52-NA estuarine zone.











Navigation Reliability Improvement (NRI) Areas
Temporary Dredge Line
JCEP Project Area
Eelgrass Mitigation Site
Federal Navigation Channel
(#) Channel Mile

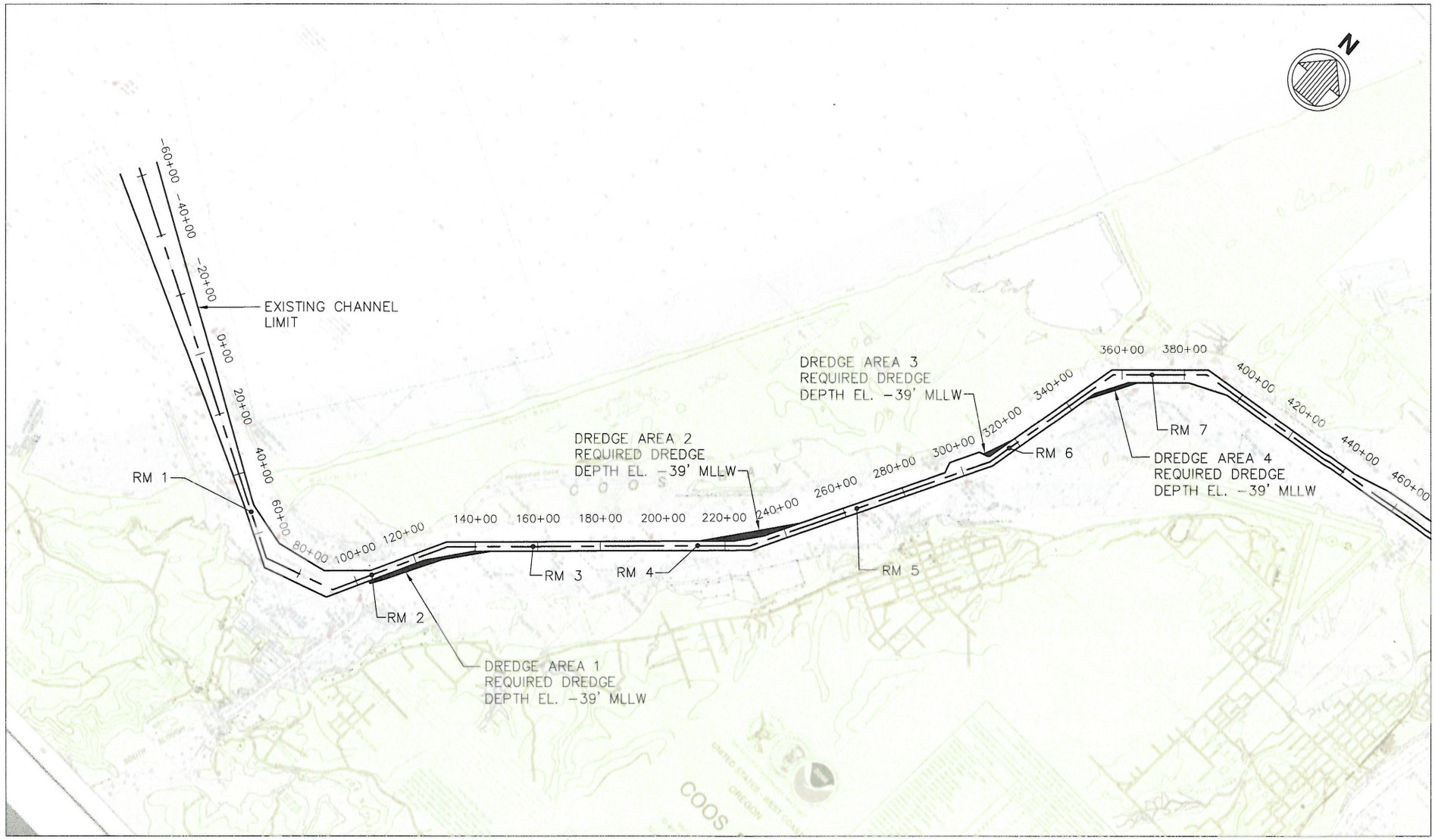
0 500 1,000 Feet

Jordan Cove Energy Project

Navigation Reliability Improvement (NRI) Areas

Jordan Cove LNG SM
A Pembina Company

1/21/2019



moffatt & nichol
SEATTLE, WASHINGTON

NAVIGATION RELIABILITY IMPROVEMENTS
FIGURE 1 OF 9

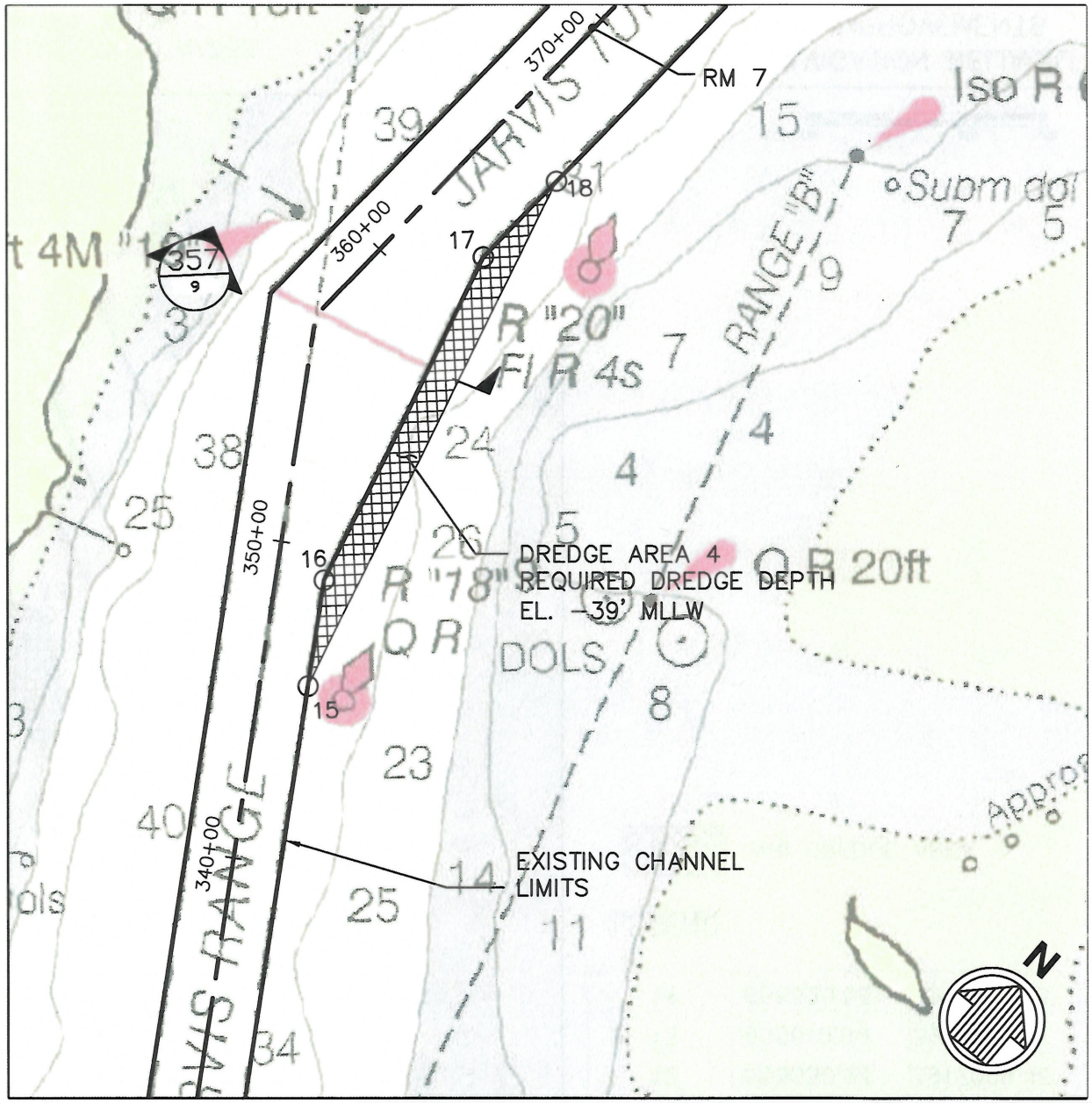
P:\9248\CADD\CGREENE\ACAD-MINORIMPROVEMENTS_161128_CGREENE-1A 9/1/2017 11:03 AM

PROPOSED DREDGE COORDINATE TABLE

POINT #	NORTHING	EASTING
15	659067.23	3918213.13
16	659392.65	3918278.77
17	660377.49	3918823.24
18	660603.73	3919062.58

LEGEND

NRI DREDGE AREA



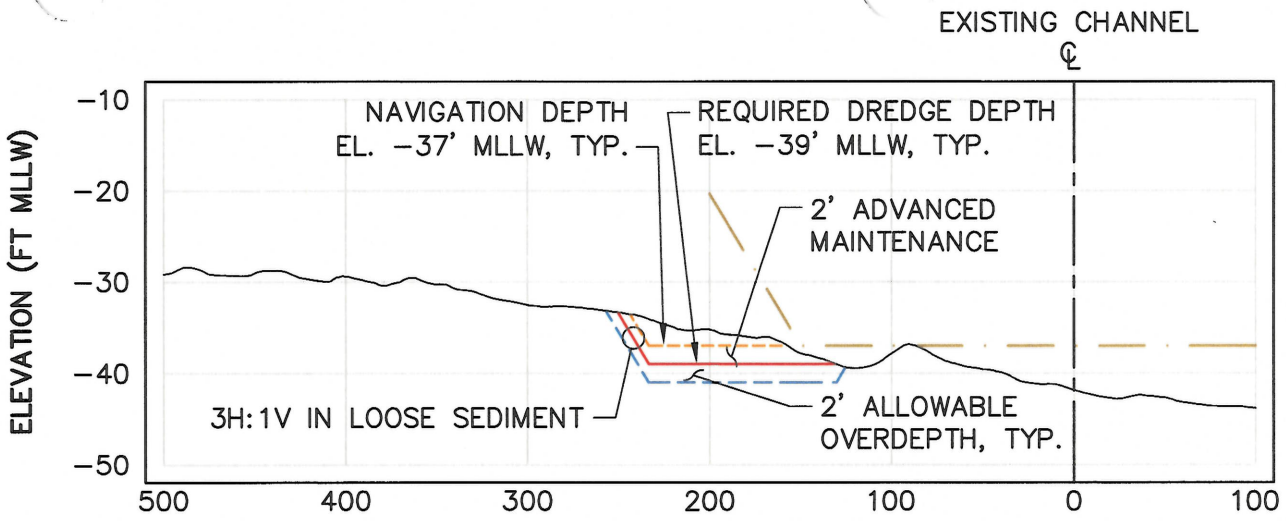
NOTES:
1. HORIZONTAL DATUM OREGON STATE PLANE SOUTH NAD83.
2. VERTICAL DATUM: MEAN LOWER LOW WATER (MLLW).

NRI = NAVIGATION RELIABILITY IMPROVEMENTS

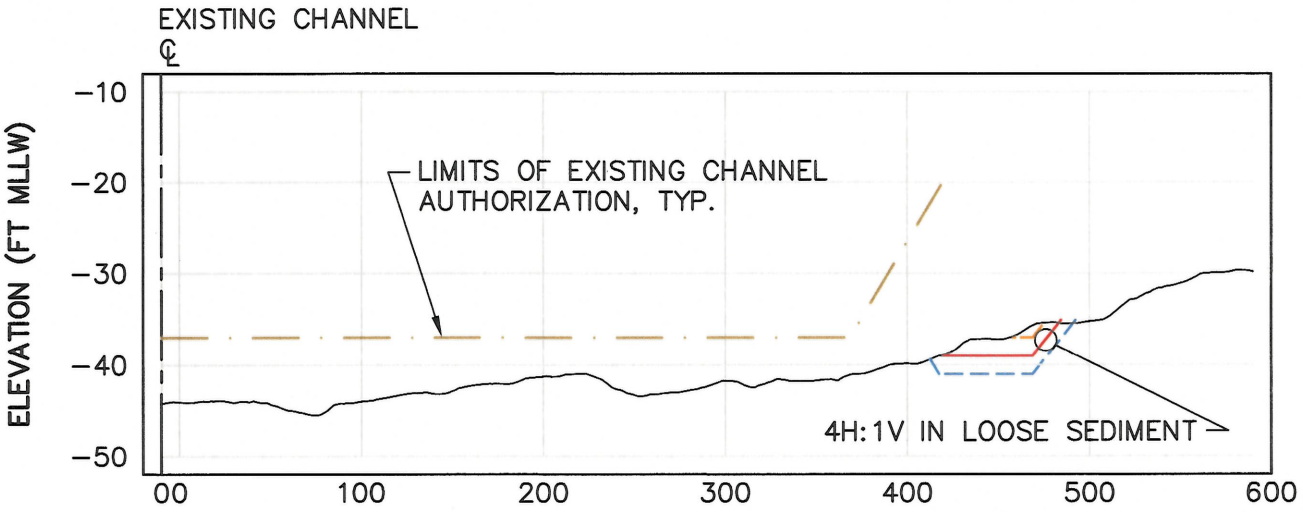
moffatt & nichol
SEATTLE, WASHINGTON

NAVIGATION RELIABILITY IMPROVEMENTS
FIGURE 6 OF 8

P:\9248\CADD\CGREENE\ACAD-MINORIMPROVEMENTS_161128_CGREENE-6A 9/1/2017 12:15 PM



315/5 AREA 3 STA 315+00 (RM 6.0)



357/6 AREA 4 STA 357+00 (RM 6.8)

NOTE: SECTION VIEWS FACE UPSTREAM.

LEGEND

- MUDLINE
- EXISTING CHANNEL
- NRI REQUIRED DREDGE DEPTH (−39' MLLW)
- NRI NAVIGATION DEPTH (−37' MLLW)
- NRI ALLOWABLE OVERDEPTH

NRI = NAVIGATION RELIABILITY IMPROVEMENTS

10' 0' 10' 20'
VERTICAL SCALE

50' 0' 50' 100'
HORIZONTAL SCALE

moffatt & nichol
SEATTLE, WASHINGTON

NAVIGATION RELIABILITY IMPROVEMENTS
FIGURE 9 OF 9

P:\9248\CADD\MinorImprovements_DMMP_170831.dwg | by:klandon | 9/5/2017

CITY OF COOS BAY
Community Development Department

500 Central
Avenue Coos
Bay, OR 97420

541.269.8918
www.coosbay.org

PRE-APPLICATION CONFERENCE NOTES

CASE FILE#:	**187-ZON17-006**
LOCATION:	**Coos Bay Estuary, approximately 2,700 feet northwest of the end of the North Bend airport runway**
TYPE OF REQUEST:	**Comprehensive Plan and Text Amendment**
CITY STAFF ATTENDING:	**Eric Day, Tom Dixon, and Debbie Erler**
COUNTY STAFF ATTENDING:	**Jill Rolfe**
DATE OF PRE-APPLICATION:	**February 2, 2017**

All Coos Bay code chapters referenced in this report are available on the City's website at http://www.codepublishing.com/or/coosbay/.

1. TYPE OF APPLICATION

Comprehensive Plan and Text Amendments (per CBMC 17.215)
Estuarine and Coastal Shoreline Uses and Activities (per CBMC 17.370)

2. PROCESS SUMMARY

The applicant will submit Comprehensive Plan Amendment and Text Amendment applications which require a Type IV review. Per the CBDC the hearing bodies will be the Planning Commission for a recommendation and the City Council for final decision.

Review Process:

- Pre-application conference (completed).
- Application submittal.
- Staff review for completeness (up to 30 days).
- When application is determined to be technically complete, the application is considered to be vested.
- Public notices are mailed/published and hearing dates are set before the Planning Commission and the City Council.
- Staff report is prepared and made available to the applicant at least seven days before the date of the Planning Commission public hearing.
- The Planning Commission will make a recommendation to the City Council for approval

or denial based upon the staff recommendation and the criteria found in the CBMC and the City's Comprehensive Plan.
- The City Council will make a final decision after a public hearing
- A Final Order and Ordinance is provided following the City Council decision

3. COMMUNITY DEVELOPMENT CODE AND COMPREHENSIVE PLAN

The applicant must address all standards of the applicable criteria for Plan Amendments and Zone Changes per CBMC 17.215.060. For the City of Coos Bay's review, the review is only for text and plan amendments but no zone change.

The applicant must address all application submittal requirements for the Estuarine and Coastal Shoreline Uses and Activities per CBMC 17.370.030.

The applicant must also describe proposed changes to estuary segments including both existing and proposed designations.

The applicant must address elements of the Coos Bay Comprehensive Plan pertaining to this project and address relevant State of Oregon Land Use Goals including Goal 6 – Air, Water and Land Resources Quality; Goal 9 – Economic Development; Goal 12 – Transportation; and Goal 16 Estuarine Resources.

4. ADDITIONAL REVIEW MATERIAL

The applicant should include supporting information including existing graphic portrayals of the channel section being considered, dredging cross sections of both width and depth profiles for areas of expansion or alteration, the quality and quantity of materials to be excavated, and final expected bathymetric contours for area of impact. In addition, information should be shared regarding potential impacts to the marine environment and how these impacts will be mitigated.

5. DOCUMENTATION REQUIRED FOR A COMPLETE APPLICATION

The following items are required to be submitted in only in a single form, along with a digital copy, for the main application:

- Application form signed by the owner and applicant, if applicable. In place of a signed application form the property owner may submit as a part of the application that they give the applicant permission to apply for the required land use applications in their place. This permission will not preclude the property owner from withdrawing consent at any time.
- Proof of ownership (Department of State Lands).

In addition, the following items are required to be submitted in ten collated sets in addition to a digital a copy:

- Application maps and narrative information as stipulated per CBMC 17.215.040 and 17.370.030,
- A narrative of the applicable State of Oregon Land Use Goals and Comprehensive Plan Goals and Policies, and
- Additional information that will provide reviewers and decision makers sufficient basis to weigh the criteria and render a decision.

5. APPLICATION FEES

Per the City fee resolution, the City will be collecting a $70.00/hr. fee for the review of this project as it

is believed that City staff time will far outweigh the outlined fee(s) in the resolution for this type of review. The City will collect a $7,000.00 fee up front at time of application submittal. Should any additional fees be required they will be requested at that time. Should the City not exhaust the initial fee the unused portion will be returned to the applicant after the review is finalized.

The City may retain an outside land use consultant/attorney to aid in the review of this application. Should the City elect this approach the consultants fees will be passed along to the applicant for payment.

6. TIME FRAME FOR REVIEW PROCESS

Per State law, staff has 30 days to review the application submittal for technical completeness. If incomplete, the applicant will have 180 days from the date of the incomplete letter to submit additional information. Once deemed complete the application review shall not exceed 120 days for a final decision, including appeals to the City Council. Appeals to LUBA fall outside the 120 day review process.

NOTICE TO APPLICANTS:
The standards noted in this checklist are those which staff believes may be applicable to your proposal. Additional standards may also be determined applicable at the time of a development submittal. The burden is upon the applicant to review all applicable City documents and address all the relevant standards. The applicant should verify the fees prior to submitting application.

Roseburg
A Forest Products Company

July 26, 2018

Via Electronic Mail

TO: Department of State Lands

FROM: Roseburg Forest Products Co.

RE: **Letter of Support for the JCEP Navigation Reliability Improvements**

To whom it may concern,

Roseburg Forest Products Co. ("Roseburg") wishes to express its support for the excavation and widening of four submerged areas adjacent to the federally authorized Coos Bay Navigation Channel ("Channel"). These areas are collectively referred to by the Jordan Cove Energy Project ("JCEP") as the Navigation Reliability Improvements ("NRIs"). Roseburg supports this proposal because the NRIs will provide navigation enhancements that will increase the margin of safety available not only for vessels serving the proposed JCEP LNG Terminal, but for vessels serving Roseburg's terminal and other marine terminal facilities in Coos Bay.

The proposed NRIs will increase the operational window for safe vessel transit by approximately 20% according to analysis conducted by JCEP. The improvements are designed to reduce entry and departure delays which will allow for more efficient vessel transits through the Channel for the size of vessels calling at the Port of Coos Bay today as well as for vessels calling in the future. Minimizing delay is a pressing concern because Roseburg has identified potential new wood chip customers in Asia which will require using bulk carriers that are slightly larger than the ships typically calling today.

Upon completion of the proposed NRIs, the Channel will operate more efficiently and with an increased operational margin of safety. Without the proposed improvements, shipping commerce will be delayed or otherwise compromised. The potential for growth in shipping commerce in Coos Bay via larger ships will also be in jeopardy. Implementing the proposed improvements will help to ensure safe and efficient navigation for vessels calling at Roseburg's terminal and all other vessels transiting the Coos Bay Channel. The proposed NRIs are needed to ensure the current and future viability of maritime commerce in Coos Bay. Roseburg respectfully urges that these navigation improvements be granted favorable consideration.

Sincerely,

Richard Lytle

Roseburg Forest Products Co.

P.O. Box 426 • North Bend, OR 97459 • Office: 541.756.4307 • Toll Free: 800.245.1115 • Fax: 541.756.2506 • www.Roseburg.com

Coos Bay Pilots Association

686 N. Front Street
Coos Bay, Oregon 97420
Tel. 541-267-6555

July 25, 2018

RE: Letter of Support from the Coos Bay Pilots Association for the Jordan Cove Energy Project's Navigation Reliability Improvements

To whom it may concern,

The Jordan Cove Energy Project ("JCEP") proposes to excavate and widen four submerged areas adjacent to the federally authorized Coos Bay Navigation Channel ("Channel"), collectively known as the Navigation Reliability Improvements (NRIs). The Coos Bay Pilots Association ("Pilots") supports this proposal because it provides navigation enhancements necessary to increase the margin of safety available to the Pilots and the vessel Master, in turn improving the efficiency and navigability of the Channel.

The Pilots, regulated and approved by the State of Oregon, are responsible for supporting deep sea vessel Masters in navigating their vessels into and out of the Channel. The Pilots serve a vital function for maritime commerce in Coos Bay by safely and efficiently guiding vessels through the Channel (known as pilotage) using visual aids, radar, and other means. The Channel provides the only safe vessel access to marine terminals located within Coos Bay. Pilots are specifically trained to navigate the Channel, possessing detailed local knowledge of its unique bathymetric conditions and visual references. Pilotage is mandatory in Oregon.

Marine terminal facilities in Coos Bay are grouped into two categories: 1) the lower bay terminals from the entrance up to River Mile ("RM") 9.0 and 2) the upper bay terminals upstream of RM 9.0. The railroad swing bridge at RM 9.0 limits the size of vessels that can pass through the bridge opening. Four terminals are currently in operation in the lower bay. The proposed JCEP LNG terminal site is also in the lower bay. Ten terminal and dock facilities are located in the upper bay. Currently, three of the terminals in the upper bay and one terminal in the lower bay can handle deep draft vessels.

The Channel was initially authorized in 1899 and has undergone ten subsequent modifications. Most recently, the Channel was deepened from -35 feet to -37 feet in 1997 to allow for safe navigation and transit by the size of ships prevalent at that time. Over the past 20 years, the dimensions and tonnage of ships serving terminals in Coos Bay have increased. Specifically, the size of vessels calling on Coos Bay terminals has increased from an average of 45,422 metric tonnes to an average of 52,894 metric tonnes with a projected near-term vessel size of up to 70,400 metric tonnes. Safety margin considerations due to environmental conditions, including wind, fog, tides, and currents, coupled with increasing ship size, have caused the Pilots to impose restrictions on when vessels may safely transit the Channel. These restrictions in turn cause significant delays and increase pressure on the Pilots. These types of delays decrease the efficiency and competitiveness

of maritime commerce on a global scale, and jeopardize the continued success of maritime commerce in Coos Bay.

The Pilots believe the proposed NRIs are essential for achieving the required number of LNG vessel transits needed to lift the JCEP design annual LNG production volume. JCEP has informed the Pilots that excessive delays in LNG Carrier transits to and from the LNG terminal could result in a shore storage tank topping situation, requiring the project to curtail production of LNG. The Pilots also believe that, in addition to the JCEP LNG terminal, the NRIs will directly benefit other marine terminals in Coos Bay that currently handle deep draft vessels. Further, the NRIs have the potential to benefit any future marine terminal that may be constructed in the Port.

The Pilots estimate that completion of the proposed NRIs will increase the operational window for safe vessel transit by approximately 20%. Minimizing delay is a pressing concern because companies that utilize the port of Coos Bay have identified potential new customers in Asia that desire to export cargo using bulk carriers that are slightly larger than the ships typically calling today. Various marine terminal businesses, within Coos Bay, require enhanced assurances that terminals will be able to efficiently accommodate larger dimension bulk carriers in the near term.

The proposed NRIs are designed to reduce entry and departure delays and to allow for more efficient vessel transits through the Channel for the size of vessels entering the Port today. Although log export vessels serving the upper bay are smaller, the proposed enhancements also benefit these vessels by broadening the tidal and environmental windows for transiting the Channel, providing an enhanced margin of safety and improved efficiency in the loaded vessel departure schedule. The proposed actions are needed to ensure the current and future viability of maritime commerce in Coos Bay. The NRIs will allow companies to engage in emerging opportunities to export products with today's larger vessels, including bulk carriers of up to 223 meters (732 feet) in length and 40 meters (131 feet) in beam with a cargo carrying capacity up to 70,400 deadweight tonnes.

Upon completion of the proposed NRIs, the Channel will operate more efficiently and with an increased operational margin for vessels calling today as well as for JCEP LNG carriers and other vessels calling in the future. Without the proposed improvements, shipping commerce will continue to operate with the same narrow weather and tidal windows. Implementing the proposed improvements will help to ensure that the Pilots can continue to serve their role of providing safe and efficient navigation for all vessels transiting the Coos Bay Channel.

Respectfully,

Captain George Wales
Coos Bay Pilots Association

Oregon's Seaport... Port of Coos Bay

OREGON INTERNATIONAL
Port of Coos Bay

October 30, 2018

via email

Mr. Robert Lobdell
Aquatic Resource Coordinator
Oregon Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279

Re: Jordan Cove Energy - Navigation Reliability Improvements Project

Dear Mr. Lobdell:

On behalf of the Oregon International Port of Coos Bay ("OIPCB"), I would like to take the opportunity to offer our support for the proposal by the Jordan Cove Energy Project ("JCEP") to deepen and widen four submerged areas adjacent to the federally authorized Coos Bay Navigation Channel ("Channel").

We understand that JCEP is seeking local, state and federal authorizations to undertake this work, which is collectively referred to as the Navigation Reliability Improvements ("NRI"), including Removal-Fill authorization from the Department of State Lands. Specifically, the improvements are designed to reduce entry and departure delays to facilitate more efficient vessel transits through the Channel for the size of vessels calling at the Port of Coos Bay today as well as for likely larger vessels served by the Port in the future. Upon completion of the proposed NRIs, the Channel will operate more efficiently and with an increased operational margin of safety, which is necessary to ensure the current and future viability of maritime commerce in Coos Bay. The OIPCB supports these proposed Channel improvements because the navigation enhancements will increase the margin of safety available not only for vessels serving the proposed JCEP LNG Terminal, but, of equal importance to the Port, for vessels serving existing and future marine terminal facilities in Coos Bay.

For these reasons, the OIPCB respectfully urges that these navigation improvements be granted favorable consideration.

Sincerely,

Mr. John Burns
Chief Executive Officer
Oregon International Port of Coos Bay

125 West Central Avenue, Suite 300 | P.O. Box 1215 | Coos Bay, Oregon 97420-0311
Phone: 541-267-7678 | Fax: 541-269-1475 | email: portcoos@portofcoosbay.com | web: www.portofcoosbay.com

State of Oregon Representatives Offices:
Tokyo, Japan – Oregon Japan Representative | Phone: 81-3-5430-0771 | Fax: 81-3-5430-0775
Seoul, Korea – Korea Representative Office | Phone: 82-2-753-1349 | Fax: 82-2-753-5154

U.S. Department of Homeland Security

United States Coast Guard

Captain of the Port
U. S. Coast Guard
Sector Columbia River

2185 SE 12th Place
Warrenton, Oregon 97146-9693
Staff Symbol: s
Phone: (503) 861-6211

16611
May 10, 2018

Director of Gas Environment and Engineering, PJ 11
Attn: Mr. Rich McGuire
Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

Dear Mr. McGuire:

This Letter of Recommendation (LOR) is issued pursuant to 33 Code of Federal Regulations (CFR) 127.009 in response to the Letter of Intent submitted by Jordan Cove Energy Project. L.P. (Jordan Cove) on January 9, 2017. Jordan Cove proposes to construct and operate the Jordan Cove LNG facility in Coos Bay, Oregon from which Liquefied Natural Gas (LNG) is proposed to be transferred in bulk to a vessel for export. This LOR conveys the Coast Guard's recommendation on the suitability of the Coos Bay Channel for LNG marine traffic as it relates to safety and security. In addition to meeting the requirements of 33 CFR 127.009, this LOR fulfills the Coast Guard's commitment for providing information to your agency under the Interagency Agreement signed in February 2004.

After reviewing the information in the applicant's Letter of Intent (LOI) and Waterway Suitability Assessment (WSA) with subsequent annual updates and completing an evaluation of the waterway in consultation with a variety of state and local port stakeholders, I recommend that the Coos Bay Channel be considered suitable for LNG marine traffic. My recommendation is based on review of the factors listed in 33 CFR 127.007 and 33 CFR 127.009. The reasons supporting my recommendation are outlined below.

On November 1, 2017, I completed a review of the WSA for the Jordan Cove Energy Project, submitted to the Coast Guard by KSEAS Consulting on behalf of Jordan Cove in February 2007. This review was conducted following the guidance provided in U.S. Coast Guard Navigation and Vessel Inspection Circular (NVIC) 01-2011, dated January 24, 2011. In conducting this review and analysis, I focused on the navigation safety and maritime security aspects of LNG vessel transits along the affected waterway. My analysis included an assessment of the risks posed by these transits and validation of the risk management measures proposed by the applicant in the WSA. During the review, I consulted a variety of stakeholders including the Area Maritime Security Committees, Harbor Safety Committees, State representatives, Pilot Organizations, and local emergency responders.

Based upon a comprehensive review of Jordan Cove's WSA, and after consultation with State and Local port stakeholders, I recommend that the Coos Bay Channel be considered suitable for accommodating the type and frequency of LNG marine traffic associated with this project.

The attached LOR Analysis contains a detailed summary of the WSA review process that has guided this recommendation. It documents the assumptions made during the analysis of Jordan Cove's WSA. It discusses details of potential vulnerabilities and operational safety and security measures that were analyzed during the review. The portion of the LOR Analysis which

addresses matters that affect maritime security is marked as Sensitive Security Information and is withheld from distribution.[1] The LOR Analysis sets forth the navigational safety and maritime security resource gaps that currently exist in, on, and adjacent to the waterway, including the marine transfer area of the proposed facility, and which, to the extent allowable under FERC's existing legal authority, may be addressed in its Commission Order if one is issued. To the extent implementation of specific mitigation measures fall outside the scope of FERC's legal authority, the applicant is expected to examine the feasibility of implementing such mitigation measures, in consultation with the Coast Guard and State and Local agencies as applicable.

This recommendation is provided to assist in the Commission's determination of whether the proposed facility should be authorized. This Letter of Recommendation is not an enforceable order, permit, or authorization that allows any party, including the applicant, to operate a facility or a vessel on the affected waterway. Similarly, it does not impose any legally enforceable obligations on any party to undertake any future action be it on the waterway or at the proposed facility. It does not authorize, nor in any way restrict, the possible future transit of properly certificated vessels on the Coos Bay Channel. As with all issues related to waterway safety and security, I will assess each vessel transit on a case by case basis to identify what, if any, safety and security measures are necessary to safeguard the public health and welfare, critical marine infrastructure and key resources, the port, the marine environment, and vessels. In the event the facility begins operation and LNG vessel transits commence, if matters arise concerning the safety or security of any aspect of the proposed operation, a Captain of the Port Order could be issued pursuant to my authority under the Ports and Waterways Safety Act of 1972, as amended by the Port and Tanker Safety Act of 1978, 33 U.S.C. § 1221 – 1232, among other authorities, to address those matters.

Please note that Enclosures (4) is Sensitive Security Information (SSI) and shall be disseminated, handled and safeguarded in accordance with 49 CFR Part 1520, "Protection of Sensitive Security Information."

If you have any questions on this recommendation, my point of contact is Lieutenant Commander Laura Springer. She can be reached at the address listed above, by phone at (503) 209-2468, or by email at Laura.M.Springer@uscg.mil.

Sincerely,

W. R. TIMMONS,
Captain, U. S. Coast Guard
Captain of the Port, Sector Columbia River

Enclosure (1) LOR Analysis
(2) LOR issued by Sector Portland on April 24, 2009
(3) U.S.C.G.'s Waterway Suitability Report for the Jordan Cove Energy Project
(4) LOR Analysis (SSI Portion)

[1] Documents containing SSI may be made available upon certification that the requestor has a need to know and appropriate document handling and non-disclosure protocols have been established.

Copy: Commander, Coast Guard District Thirteen (dp)
Commander, Pacific Area (PAC-54)
Commandant (CG-OES), (CG-ODO), (CG-FAC), (CG-741), (CG-CVC), (CG-ENG), (LNGNCOE)
Marine Safety Center (CG MSC)
Jordan Cove

UNITED STATES COAST GUARD

Jordan Cove LNG

ANALYSIS SUPPORTING THE LETTER OF RECOMMENDATION ISSUED BY COTP SECTOR COLUMBIA RIVER ON MAY 10, 2018

Introduction

1. This analysis is a supplement to my Letter of Recommendation (LOR) dated May 10, 2018, that conveys my recommendation on the suitability of the Coos Bay Ship Channel for liquefied natural gas (LNG) marine traffic associated with the Jordan Cove LNG (JCLNG) export terminal project Coos Bay, Oregon. It documents the processes followed in analyzing JCLNG's Waterway Suitability Assessment (WSA) and the suitability of the waterway for LNG marine traffic.

2. For the purposes of this analysis, the following assumptions were made:

    a. The applicant is fully capable of, and would fully implement, any and all risk management measures identified in their WSA.
    b. The conditions of the port identified in the WSA fully and accurately describe the actual conditions of the port at the time of the WSA submission.
    c. The conditions of the port have not changed substantially during the analysis process.
    d. The applicant will fully meet all regulatory requirements including the development and submission of a Facility Security Plan, Emergency Manual, and Operations Manual.

3. The Port of Coos Bay is a deepwater port located in Coos Bay, Oregon on the Pacific Coast of the United States. The Port of Coos Bay offers easy access to Asian markets and facilitates the international movement of goods between the United States and Asia. The Port of Coos Bay is managed under the jurisdiction of the Portland Navigation District and has an authorized channel depth of 37 feet. The channel width is 300 nominal feet. The principal exports are logs, wood chips, lumber, and plywood. The Port of Coos Bay is currently conducting a feasibility study to examine widening and deepening its ship channel.

4. The Port of Coos Bay is approximately 173 nautical miles south of the Columbia River and 367 miles north of the entrance to San Francisco Bay. The Port has seen declining arrivals and is not currently heavily trafficked.

5. Inbound and outbound traffic density in the Port of Coos Bay is currently minimal. In the summer months and during fishing season there are a number of commercial fishing vessels working in the region. The maximum anticipated LNG Carrier port calls per year is expected to be around 120. These projections are based on a maximum nominal LNG output of 7.8 MTPA. Other traffic transiting through the Port of Coos Bay include fishing vessels, recreational vessels, and towing vessels.

6. The Terminal will be sited at the north end of the Coos Bay Channel near Jordan Cove. All Terminal facilities will be located within an approximately 200-acre parcel of land. The approximate locations of the coordinates of the facility are: 43 degrees-25.5' North and 124 degrees 15.7' West.

7. The U.S. Coast Guard regulates the port under the Maritime Transportation Security Act (MTSA), Security and Accountability for Every Port Act (SAFE Port Act), Ports and Waterways Safety Act (PWSA) and other laws applicable to maritime safety and security. U.S. Coast Guard regulated facilities in the area include chip terminals and fuel transfer facilities.

8. Ships entering or departing Coos Bay require a pilot. The Coos Bay Pilots are state licensed Oregon pilots responsible for ensuring the safe transit of vessels transiting through the Port of Coos Bay. They handle approximately 50 vessel transits through the Port of Coos Bay each year.

9. In order to support operations associated with the facility, the applicant will provide additional towing vessels as outlined in their WSA. All tractor tugs must be at least 80 Ton Astern Bollard or larger and equipped with Class 1 Fire Fighting equipment.

10. The applicant established an emergency response planning group in preparation for facility construction and operation in 2006. This group is tasked with education and preparedness concerning this facility. It must be noted that there are schools located in the zones of concern.

Impact to Coast Guard Operations

1. The U.S. Coast Guard is responsible for screening LNG Carriers transiting from foreign ports prior to arrival and will screen all vessels in accordance with existing policies and procedures. The vessels calling on the facility will be foreign flagged and the flag state is yet to be determined. I do not intend to require additional government conducted safety inspections beyond those which already apply to deep draft LNG vessels.

2. Facility and vessel inspection activities will be supported by Marine Safety Unit Portland personnel.

3. Limited access areas (LAA) associated with the project have yet to be established. Sector Columbia River will use risk based decision making and work with existing policy to determine the appropriate LAAs. The proposed LAA in enclosure (3) was not put out for regulatory review and is not in effect.

4. LNG is not considered oil and all vessels calling on the facility will be required to comply with non-tank vessel response plan requirements. The applicant is highly encouraged to work with the Area Committees established under the National Contingency Plan to address issues associated with response in Coos Bay.

5. The Facility will be in the Sector Columbia River Captain of the Port Zone and falls under the purview of the Federal Maritime Security Coordinator who is also the Sector Columbia River Captain of the Port. Specific issues related to this are outlined in Enclosure (4).

Figure 1. Jordan Cove Conceptual rendering of facility

Decision Making Process

1. The following factors regarding the condition of the waterway, vessel traffic, and facilities upon the waterway, were taken into consideration during the LOR process. The processes used are detailed in this section.

2. To ensure all regulatory processes were met, Sector Columbia River took a systematic approach in the WSA validation process. To streamline and ensure transparency, Sector Columbia River worked with Jordan Cove, the Consulting Group KSEAS, and port partners though a series of ad hoc meetings and a one day workshop.

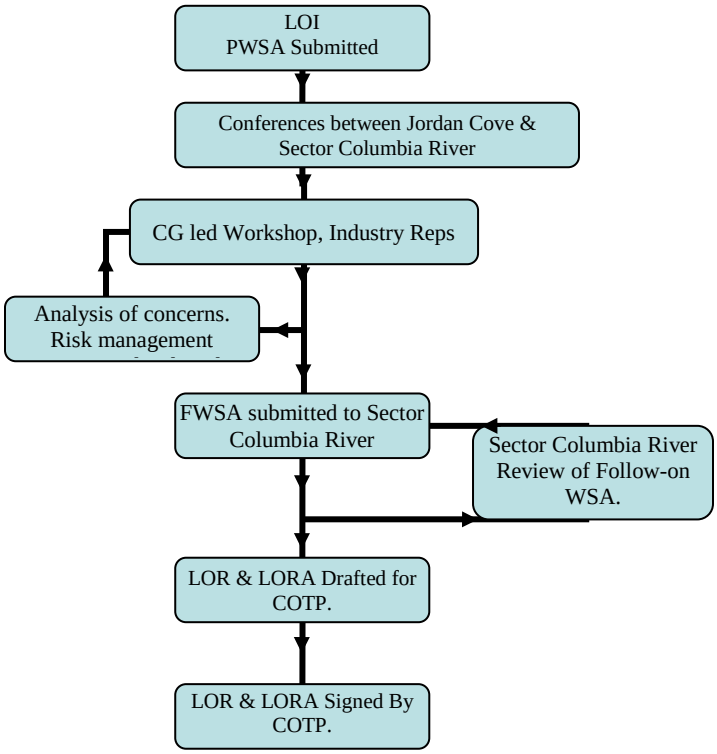


Figure 2 - LNG LOR Process (Sector Columbia River)

3. NVIC 01-2011 provides guidance on the review and validation of a WSA. Applying NVIC 01-2011's procedural framework, my staff held several in-house reviews of the WSA, and facilitated discussions during a workshop held in Coos Bay, OR on October 16, 2017. The workshop included a wide range of participants, including representatives from; the USCG; Coos Bay Pilots Association; Port Authorities, the State of Oregon and law enforcement agencies.

Members	**Position/Role**
LCDR Laura Springer	Waterways Management Division Chief, MSU Portland
LCDR Ben Crowell	Surface Operations, Sector North Bend
LCDR Andrew Madjeska	Incident Management Division Chief, Sector Columbia River
LCDR Xochitl Castaneda	District Thirteen Prevention
Ms. Deanna Henry	Oregon Department of Energy
George Wales	Coos Bay Pilots
Richard Dybevik	Roseburg Forest Products
Doug Strain	Coos Bay Sheriff
Jim Brown	North Bend Fire Department
Doug Eberlein	Coos Bay Response Co-op (CBRC)
LT Ethan Lewallen	USCG LNG NCOE

Table 1 – Jordan Cove WSA Team 1 Nov 2017 (Port of Coos Bay)

4. The participants of this "ad-hoc" workshop, recommended by NVIC 01-2011, utilized their expertise on the physical characteristics and traffic patterns of the waterway, as well as their respective specialty knowledge of the marine environment, LNG, safety, security, and facility operations, to analyze the suitability of the waterway to support LNG marine traffic associated with JCLNG.

5. Participants considered the changes in the area's safety and security dynamics which may result from the introduction of LNG ship traffic associated with the JCLNG Project. Jordan Cove used the American National Standards Institute (ANSI)/American Petroleum Institute (API) Standard 780 Security Risk Assessment (SRA) Methodology, as the basic approach for assessing risk. The standard was published in June of 2013 as a U. S. standard for security risk assessments on petroleum and petrochemical facilities. The standard is a tool used to evaluate all security risks associated with petroleum and petrochemical infrastructure and operations, and assists owners and operators through the process of conducting thorough and consistent SRAs. For security purposes, participants considered potential threats and consequences of intentional act of aggression to the facility and developed security measures to mitigate the risks.

    a. Please see Enclosure (4) if you have a need to know concerning the results of this

6. During the above mentioned workshop held in Coos Bay, OR on October 16, 2017, the ad-hoc working group also evaluated safety factors including the potential impacts of groundings, collisions, and allisions and thoroughly examined the simulator data presented in the WSA.

7. Each of the recommended risk management measures from enclosure (7) of NVIC 01-2011 were considered. In the WSA workshop, additional risks and recommendations were discussed related to a Cascadia Subduction Zone Earthquake and associated implications for the facility and region if a laden vessel was tied up at the layberth.

8. The ad-hoc working group considered each scenario along each transit segment and evaluated the causes of accidental or intentional events. The workshop analyzed the contributing factors for each scenario and their likelihood of occurrence given the adequacy of safety and security layers.

9. Sector Columbia River followed the checklist found in NVIC 01-2011 during the review. Through this review, Sector Columbia River clarified certain points in the WSA to ensure that the document contained accurate information and that references were applicable. With the 2017 update to the WSA, Jordan Cove has satisfied the requirements of the LOR process.

10. Based on my review of the WSA completed on November 1, 2017, and input from state and local port stakeholders, and taking into account previously reviewed expansion projects, I recommend to the Federal Energy Regulatory Commission

that the waterway in its current state be considered suitable for the LNG marine traffic associated with the proposed project.

11. This recommendation is contingent upon the applicant completing all actions outlined in the Waterways Suitability Assessment as submitted, and actions associated with subsequent annual updates, and completing all actions outlined in the most current WSA and actions under the control of the applicant from the July 1, 2008, Waterway Suitability Report.

Waterway Conditions Adjacent to the Facility

1. **Depth of Water**. The channel is currently maintained at a 37' depth.
2. **Tidal Range**. The tides of Coos Bay are of the mixed semi-diurnal type with paired highs and lows of unequal duration and amplitude. The tidal range increases upstream to the City of Coos Bay and the time difference between peak tides at the entrance and City of Coos Bay is about 40-90 minutes, depending on the location. The head of the tide is located at River Mile 27 on both the Millicoma and South Fork Coos Rivers. The tidal range is 7.5 feet near the open sea channel and 6.7 feet at the entrance to Charleston Harbor.

Table 2 Tidal Datums, Coos Bay, OR NOAA Tide Stations 9432895, 9432879, and 9432780

Tide Level	Abbreviation	Tide Level (ft) North Bend	Tide Level (ft) Empire	Tide Level (ft) Charleston
Tide Station ID #		9432895	9432879	9432780
Latitude		43° 24.6'N	43° 22.6'N	43° 20.7'N
Longitude		124° 13.1'W	124° 17.8'W	124° 19.3'W
Extreme High Water	EHW	-	-	+10.5
Mean Higher High Water	MHHW	+8.4	+7.7	+7.6
Mean High Water	MHW	+7.8	+7.1	+7.0
Mean Sea Level	MSL	+4.7	+4.2	+4.1
Mean Low Water	MLW	+1.3	+1.3	+1.3
Mean Lower Low Water	MLLW	+0.0	+0.0	+0.0
Extreme Low Water	ELW	-	-	-3.0

3. **Protection from High Seas**. The entrance to Coos Bay is similar to most harbors along the Pacific Coastline of Northern California, Oregon, and Washington. Strong winds are often experienced at North Bend on Coos Bay during the months of June, July, and August. These winds blow at 17 knots or greater 15-20 percent of the time and at 28 knots or greater 1 to 2 percent of the time. The harbor consists of a river estuary at the mouth of the Coos River. Sand and silt

from the river are carried out to the sea from this entrance. As a result of this material meeting the predominantly westerly seas and swells of the Pacific, a sandy ridge bar is formed at the mouth. This sand ridge causes the channel to be known as "a Bar Channel". As such, a breaking bar does occur in this port.

4. **Natural Hazards**. The navigational hazards in the vicinity of the project site are rock jetties on either side of the channel entrance extending into the Pacific Ocean, and a submerged jetty which extends 50 yards off the east shore of Coos Bay. Discussions and simulations with the Coos Bay Pilots Association have shown that these hazards will not interfere with normal navigation and mooring operations and the applicant has developed transit mitigations to address this issue such as not bringing vessels in or leaving them at the lay berth during conditions that are not conducive to safe navigation i.e. restricted visibility, severe weather and and/or low tides.

5. **Fishing Vessels**. Heavy concentrations of fishing gear may be expected between December 1 and August 15, from shore to about 30 fathoms.

6. **Underwater Pipelines and Cables**. Based on current pipeline charts that are available, there are three cables which are submerged approximately 20 feet running across/underneath the channel in the vicinity of the town of Empire which is on the LNG Carrier transit route.

7. **Maximum Vessel Size by Dock**. The primary dock can accommodate a vessel with a maximum length of 300 meters, 52 meters in breadth, and a draft which can be accommodated by the existing channel. Although the facility dock is able to accommodate vessels drafting up to 12m (39ft), current channel draft is 11m (37ft) with future plans to dredge the channel to accommodate larger deep draft vessels. Jordan Cove Energy Project and the local pilots must ensure transiting LNG vessels are able to maintain 10% under keel clearance as required by JCEP's LNG Transit Management Plan.

    a. The dock must be able to accommodate all vessels calling on the facility.
    b. It must be equipped with adequate numbers of mooring hooks, fendering, and mooring dolphins.
    c. The mooring arrangement must also be able to accommodate safe working loads.
    d. In coordination with appropriate stakeholders, JCLNG must develop and implement vessel mooring/unmooring procedures to ensure safe and environmentally protective operations for LNG Carriers arriving and departing the JCLNG facility.

8. **Vessel Routing**. Included in the WSA, was a plan to divide the LNG Carrier transit route into five (5) inbound, one (1) loading at berth, and five (5) outbound segments. The total inbound transit from the Sea Buoy (pilot boarding area) to the terminal berth is approximately eight (8) miles and will take between 1.5 and 2.0

hours to berth, pilots will be transiting at around 4.5 knots. The route has been divided into segments in order to manage vessel traffic and increase the safety of LNG carrier transits. This was done in conjunction with the Coos Bay Pilots Association.

The route is reversed for outbound LNG Carrier transits with the exception of the turning/maneuvering basin which is bypassed on the outbound transit where the LNG Carrier is moved directly into the Coos Bay Ship Channel. The route and segments are shown in Figure 3.

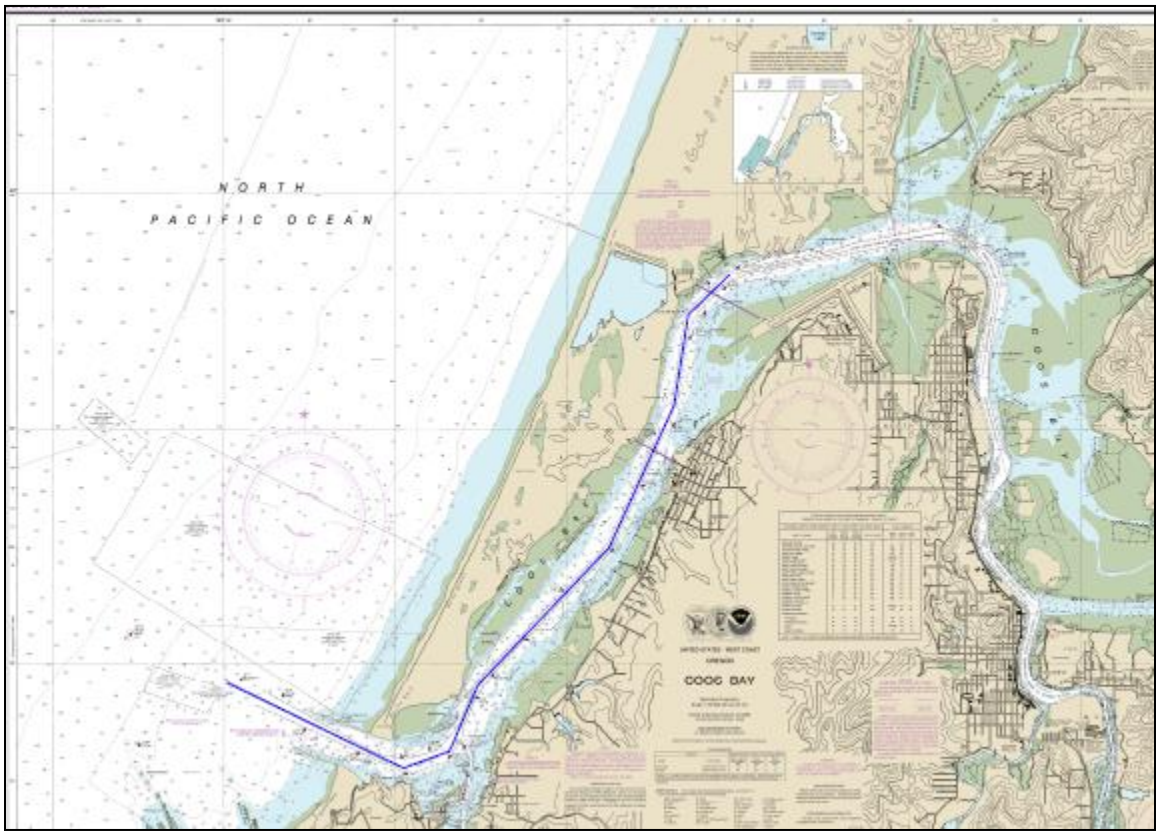


Figure 3. Overview of LNG Carrier Transit Route

9. **Vessel Operations –**LNG vessels will load cargo at the facility. 110-120 arrivals are expected at the facility annually with a dedicated fleet of LNG Carriers conducting cargo operations at the facility. A lay berth will be constructed to accommodate delays, repairs, and maintenance issues associated with Trans-Pacific Trade. Cargo operations will not be permitted at the lay berth and the applicant will outline procedures for the lay berth after the permitting process is complete.

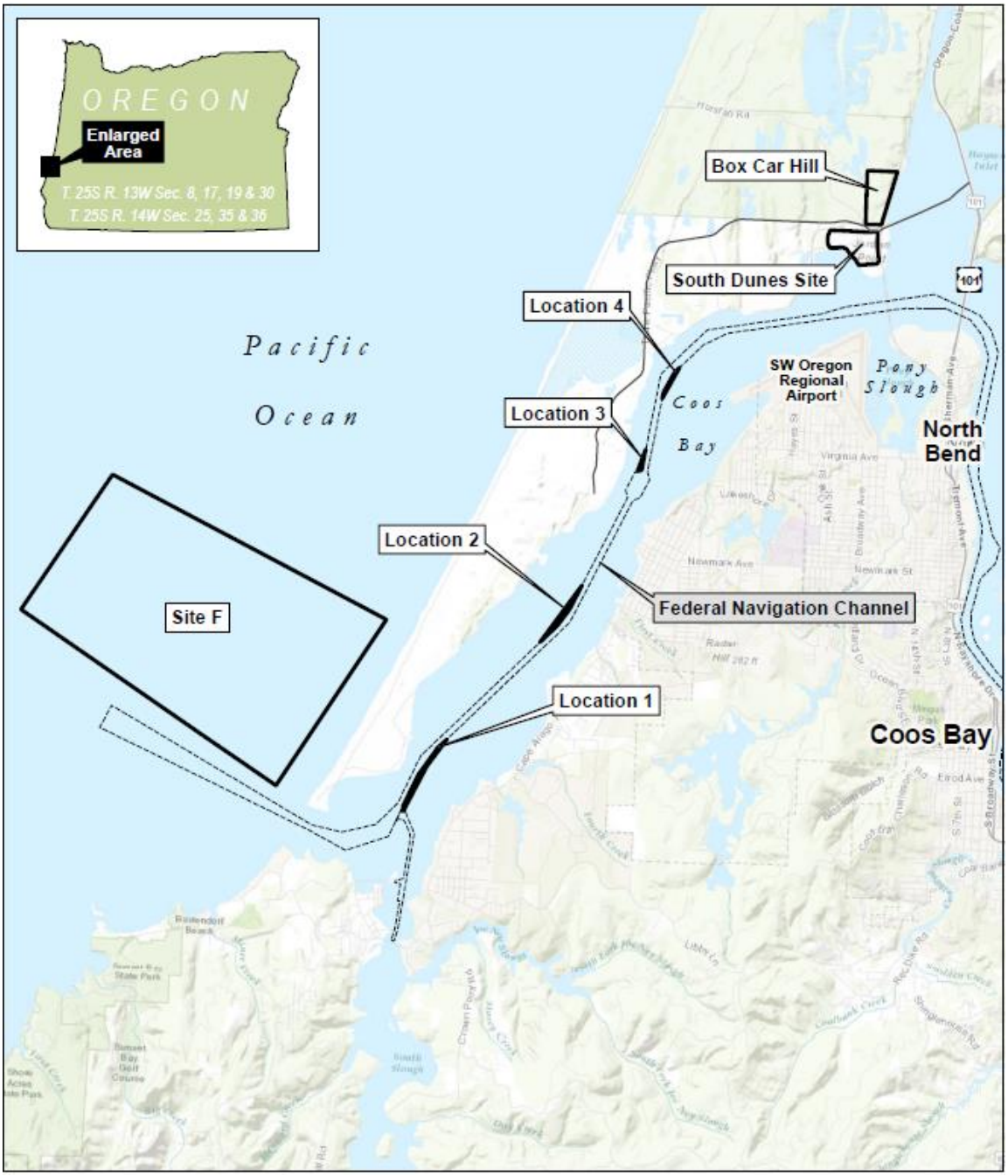


Figure 4. Channel Improvements

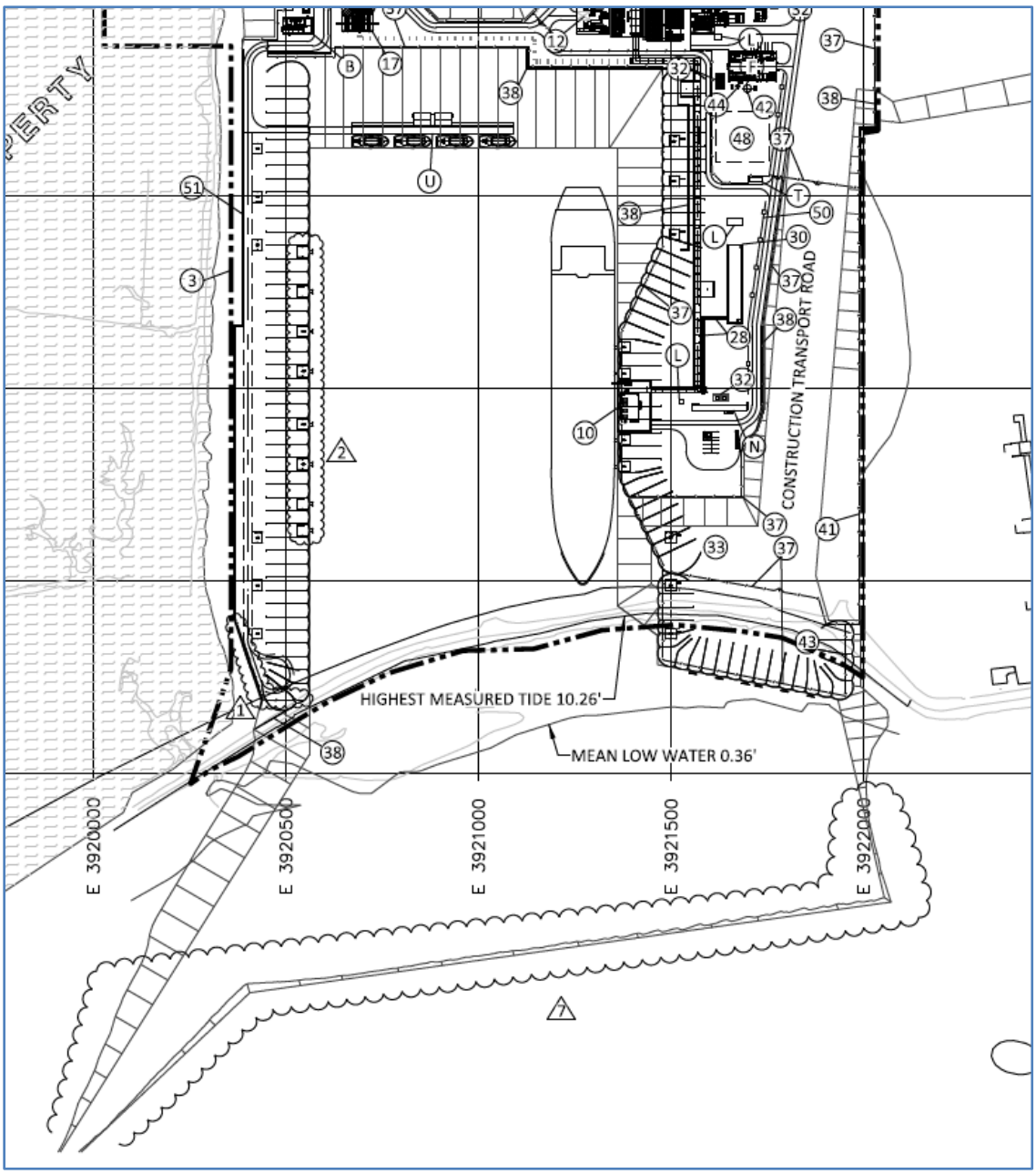


Figure 5. Dredging at the berth

U.S. Department of Homeland Security
United States Coast Guard

Captain of the Port
United States Coast Guard
Sector Columbia River

2185 SE 12th Place
Warrenton, OR 97146-9693
Staff Symbol: s
Phone: (503) 861-6206
Fax: (503) 861-6355

16611

NOV 07 2018

Tony Diocee, Vice President, Projects
Jordan Cove Energy Project, L. P.
5615 Kirby, Suite 500
Houston, TX 77005

Dear Mr Diocee:

The USCG Waterways Suitability Report provided to the Federal Energy Regulatory Commission (FERC) on July 1, 2008 and a subsequent Letter of Recommendation provided to FERC on May 10, 2018 required the applicant, Jordon Cove Energy Project, L.P. (JCEP), to conduct additional ship transit simulator studies for liquid natural gas (LNG) carriers that exceed a 148,000 m^3 spherical containment class vessel or for any increase in physical dimensions.

Since the initial Waterway Suitability Analysis was submitted to the USCG in 2007 LNG Tanker technology has improved and tanker sizes and capacities have changed. As a result, additional simulator studies were required. In response, JCEP conducted additional vessel transit simulations during September 26-27, 2018 using modern ship design and carrying capacities.

The simulated transits were piloted by the Coos Bay Pilots and witnessed by the USCG. They were conducted at California Maritime Academy in Vallejo, CA using a Transas Simulator. They were conducted to demonstrate that the Coos Bay Pilots can safely and successfully maneuver LNG carriers up to 299.9 x 49m x 11.9m dimensionally while transiting the channel.

These successful simulations expand the ability for Jordan Cove LNG to use any class of LNG carrier (membrane, Moss, or SBT) with physical dimensions equal to or smaller than observed during the simulated transits. JCEP will continue development of the Transit Management Plan and work with the Coos Bay Pilots in establishing any other operating parameters.

Sincerely,

J. C. SMITH
Commander, Sector Columbia River
Captain of the Port
Captain, U. S. Coast Guard

Enclosure: 1) Jordon Cove LNG Terminal Simulation Plan, September 2018
2) TRANSAS Simulation Printouts

Copy: FERC
Commander, Coast Guard District Thirteen (dp)
Commander, Pacific Area (PAC-54)
Commandant (CG-OES), (CG-ODO), (CG-FAC), (CG-741), (CG-CVC), (CG-ENG), (LNGNCOE)
Marine Safety Center (CG MSC)

DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE: March 12, 2019

TO: Seth King, Steve Pfeiffer
Perkins Coie LLP
1120 N.W. Couch Street Tenth Floor
Portland OR 97209-4128

FROM: Gigi Cooper

SUBJECT: Federal Navigation Channel Dredge Area 4 – City of Coos Bay Land Use Permit Support

PROJECT: JLNG0003 112DE
Jordan Cove Energy Project – Regulatory Permitting

CC: Derik Vowels, Jordan Cove LNG

Perkins Coie LLP requested the following two work products from DEA to support the land use applications for the JCEP NRI #4:

- Explanation of how the NRI dredging work will be completed (timing, duration, equipment, materials) and how that work will affect users of the Bay; and

DEA response: Please see Attachment 1: Description of Dredging Work.

- Explanation of the environmental impacts of the NRI #4 by addressing the highlighted aspects of Coos Bay Estuary Management Plan Policies 4 and 5 (starting with 5 because it includes the cross-reference to 4, which, in turn, cross-references 4a).

DEA response: Please see Attachment 2: Responses to CBEMP Policies 4 and 5.

Please let me know if you have any questions.

Attachments/Enclosures: Attachment 1: Description of Dredging Work; Attachment 2: Responses to CBEMP Policies 4, 4a, 5

File Path: Document2

DEA Task:

- Explanation of how the NRI dredging work will be completed (timing, duration, equipment, materials) and how that work will affect users of the Bay.

Sources:

- Bill Gerken, PE, Moffatt & Nichol; Terry Stones, PE, David Evans and Associates, Inc.; and Pilots' Enhancement Narrative, April 20, 2017

DEA response:

Hydraulic dredging, the technique that would most likely be used, will employ a cutter suction dredge, in which material is loosened from its *in situ* state and lifted in suspension through a pipe system connected to a centrifugal pump that removes the material and pumps the slurry through a discharge pipeline. A rotating cutting apparatus (cutter head) is used around/ahead of the intake of a suction pipe to break up or loosen bottom material. The temporary dredge line for disposal will run up to approximately seven miles from the farthest location adjacent to but outside the Federal Navigation Channel (FNC). The pipeline would land at the north side of the upland confined disposal site denoted as APCO 2, in the City of North Bend, at approximately River Mile (RM) 9 of the FNC, near the southern terminus of the U.S. Highway 101 McCullough Bridge. The temporary dredge line would be approximately 24 to 30 inches in diameter and would be placed within a corridor of up to 50 feet in width. Corridors are designed to be wider than the dredge line to accommodate for inaccuracies and flexibility in dredge line placement, any shifting/settling of pipeline, and ability to accommodate variations in bathymetry. At the APCO disposal site, the material would be pumped onto the site in a slurry, decanted and dried within a containment dike system, and permanently stockpiled.

Construction of the temporary dredge line and dredging will occur during the ODFW in-water work window (IWWW) which occurs between October 1 and February 15, for three consecutive years. The duration over several years is required for material handling and dredge water decanting at the APCO 2 disposal site. Weather delays and/or equipment failures are not factored into the production rates and construction durations. Following completion of dredging, all in water pipelines, dredge equipment, and off-loading facilities if used, will be removed prior to the end of the IWWW in mid-February.

DEA Task:

- Explanation of the environmental impacts of the Dredge Area 4 by addressing the highlighted aspects of Coos Bay Estuary Management Plan Policies 4 and 5 below (starting with 5 because it includes the cross-reference to 4).

Sources:

- City of Coos Bay. No date. Coos Bay Estuary Management Plan, Management Framework: Definitions, Policies and Standards, and Plan Provisions. http://coosbay.org/uploads/PDF/Plans/Estuary_Plan_-_Vol_3.pdf
- David Evans and Associates, Inc., Coos Bay Pilots Association Navigation Efficiency Improvement Project Draft Biological Assessment, April 2017
- David Evans and Associates, Inc., Coos Bay Pilots Association Safety Enhancements Project Draft Biological Assessment, January 2017
- David Evans and Associates, Inc., FERC Resource Report 8: Land Use, Recreation, and Aesthetics, September 28, 2017
- David Evans and Associates, Inc., Visual Impact Assessment Report (Appendix to FERC Resource Report 8: Land Use, Recreation, and Aesthetics), September 14, 2017
- David Evans and Associates, Inc., USACE/DSL Joint Permit Application Removal-Fill for the Navigation Reliability Improvements, Box 4, #3, Recreation, October 2017
- King, Seth, Perkins Coie LLC, Draft narrative in support of the application (mainly for Derik Vowels' comments on consistency with the project removal/fill application)
- Moffatt & Nichol, Inc. 2016. Draft Technical Memorandum – Safety Enhancements to the Coos Bay Navigation Channel, Task 5 Turbidity Study Technical Memorandum.
- Oregon Department of Environmental Quality (ODEQ).2017b. ODEQ website for Total Maximum Daily Loads, South Coast Basin. Available online at: http://www.oregon.gov/deq/wq/tmdls/Pages/TMDLs-South-Coast-Basin.aspx. Accessed on September 7, 2017
- Oregon Department of Fish and Wildlife. 1979. Natural Resources of Coos Bay Estuary: Estuary Inventory Report. Vol. 2, No. 6., for Oregon Land Conservation and Development Commission.
- Pfeiffer, Steven L., Perkins Coie LLC, Purpose and Need Statement for Safety Enhancements to the Coos Bay Navigation Channel, May 2, 2016

DEA response:

Text from the City of Coos Bay's Coos Bay Estuary Management Plan, 3. Management Framework: Definitions, Policies and Standards, and Plan Provisions, Section 3.3 – Bay-Wide Policies, is shown in *italics*. Provisions that Perkins Coie requested a response from DEA are in black font; other provisions are shown in grey font.

#5 Estuarine Fill and Removal

Dredging and/or filling shall be allowed only:

A. If required for navigation or other water-dependent uses that require an estuarine location or if specifically allowed by the applicable management unit requirements of this goal; and

Response: The proposed activity, dredging one 3.3-acre area, is required for navigation. The purpose of the proposed action is to improve reliability and efficiency of navigation for existing deep draft vessels by reducing the existing navigation constraints at the key turn ("Dredge Area") in the Federal Navigation Channel (FNC). The proposed activity does not include fills for non-water-dependent uses.

B. If no feasible alternative upland location exists; and

C. If a pubic need (i.e., a substantial public benefit) is demonstrated and the use or alteration does not unreasonably interfere with public trust rights; and

D. If adverse impacts are minimized; and

Response: Please see responses to Policy #4, D.

E. The activity is consistent with the objectives of the Estuarine Resources Goal and with other requirements of state and federal law, specifically the conditions in ORS541.615 and Section 404 of the Federal Water Pollution Control Act (P.L. 92-500).

Other uses and activities which could alter the estuary shall only be allowed if the requirements in B, C, and D are met. All portions of these requirements may be applied at the time of plan development for actions identified in the Plan. Otherwise, they shall be applied at the time of permit review.

This strategy shall be implemented by the preparation of findings by local government documenting that such proposed actions are consistent with the Comprehensive Plan, and with criteria "a" through "e" above. However, where goal exceptions are included within this plan, the findings in the exception shall be sufficient to satisfy criteria "a" through "c" above. Identification and minimization of adverse impacts as required in "d" above shall follow the procedure set forth in Policy #4a. The findings shall be developed in response to a "request for comment" by the Division of State Lands, which shall seek local government's determination regarding the appropriateness of a permit to allow the proposed action.

Response: Please see responses to Policy #4, the following section D., below.

"Significant," as used in "other significant reduction or degradation of natural estuarine values," shall be determined by:

A. The U.S. Army Corps of Engineers through its Section 10 and 404 permit processes; or

B. The Department of Environmental Quality for approvals of new aquatic log storage areas only; or

C. The Department of Fish & Wildlife for new aquaculture proposals only.

This strategy recognizes that Goal #16 limits dredge, fill and other estuarine degradation in order to protect the integrity of the estuary.

4. RESOURCE CAPABILITY CONSISTENCY AND IMPACT ASSESSMENT

Local government concludes that all proposed actions (approved in this Plan) which would alter or potentially alter the estuarine ecosystem have been based upon a full consideration of the impacts of the proposed alteration, except for the following uses and activities:

[EXCERPT OMITTED because these proposed project actions do not fall under any of these exceptions, a through d]

D. Any other uses and activities which require the resource capability consistency test as a condition within a particular management unit or which could affect the estuary's physical processes or biological resources.

Response: Please see responses to 4. A. through D., immediately below.

Unless fully addressed during the development and adoption of comprehensive plans, actions, which would potentially alter the estuarine ecosystem shall be preceded by a clear presentation of the impacts of the proposed alteration.

For uses and activities requiring the resource capabilities test, a special condition is noted in the applicable management unit uses/activities matrix. A determination of consistency with resource capability and the purposes of the management unit shall be based on the following:

A. A description of resources identified in the plan inventory;

Response: Dredge Area 4 is designated 52-NA. The temporary dredge lines from Dredge Area 4 are in City of Coos Bay CBEMP designation 52-NA and DDNC. In 52-NA, temporary alterations may be allowed subject to "Special Conditions" presented following the use and activity matrix. A few of the special conditions are non-discretionary, but most require local judgment and discretion and that development of findings to support any final decision about whether or not to allow the use or activity. In DDNC, temporary alterations are permitted outright.

The Oregon Department of Fish and Wildlife Natural Resources of Coos Bay Estuary: Estuary Inventory Report (1979), describes the area:

> *Although the sandy shore between RM 6 and 8 on the western side of the bay appears unproductive because it does not have attached vegetation, it is a valuable habitat for certain species of fish. Any development occurring there should preserve the sandy substrate and water quality of the area. Use of pilings may be appropriate in the area unless subsequent reduction in current velocity changes the quality of the substrate.*

Significant Habitat of Major Importance and other inventory maps. The Shoreland Values Requiring Mandatory Protection map (June 14, 1982) shows three categories of Significant Wildlife Habitat: freshwater wetlands, snowy plover habitat, and heron rookery. All of the mapped resources are on land. As these three categories of Significant Wildlife Habitat are all terrestrial, and this dredging project solely would occur within the waters of Coos Bay, the proposed project would not disturb any Significant Habitat of Major Importance that are Shoreland Values Requiring Mandatory Protection. Other mapped shoreland values are major marsh, archaeological sites, historical sites, and coastal headlands, which likewise are terrestrial and would not be disturbed.

The Significant Habitat of "Major" Importance Qualifying as Natural Management Units Under Estuarine Resources Goal (June 11, 1982), maps major salt marsh, seagrass and algae beds, intertidal flats, seagrass/algae beds and intertidal flats, and other significant habitat. These are terrestrial, not

within the waters of Coos Bay, and eelgrass is to the east of Dredge Area 4, and none would be disturbed by this proposed project.

The Fish & Wildlife Habitats Map I shows anadromous fish distribution (salmon, steelhead, and cutthroat trout) throughout Coos Bay. It indicates a snowy plover nest site and a blue heron nest site on the North Spit, but neither are near, or would be affected by, the dredging project at Dredge Area 4. The Fish & Wildlife Habitats Map II (1980) shows elk and deer big game range and wetlands, all of which are terrestrial only.

The Crustacean Habitats map delineates areas of amphipod (*Corophium sp*.), ghost shrimp (*Neotrypaea californiensis*), and mud shrimp (*Upogebia pugettensis*). The Dredge Area 4 is not in a mapped crustacean habitat. Dredge Area 4 is near an amphipod habitat area on the North Spit, but dredging activities would not disturb it.

The Clam Beds and Oyster Leases map (August 5, 1981) shows clam beds on both sides of the FNC. Beds between RM 6 and RM 8 are directly adjacent to the existing FNC, but on the other side of it from Dredge Area 4. The Clam Species in the Coos Bay Estuary map indicates that these primarily are gaper (*Tresus capax*) clams.

The inventory document is from July 1984 and the maps are from 1980 and 1981, based on sources from the 1970s. At that time, few resource-specific inventories had been done, and conditions in the Bay have changed in the past 35 and 45 years. Therefore, the information in the inventory is not as useful as studies conducted specifically for the Jordan Cove project, including Dredge Area 4, within the past decade.

B. An evaluation of impacts on those resources by the proposed use (see impact assessment procedure, below); and

Response: Please see the responses to Policy #4, the following section, C., below.

C. In a natural management unit, a use or activity is consistent with the resource capabilities of the area when either the impacts of the use on estuarine species, habitats, biological productivity and water quality are not significant or that the resources of the area are able to assimilate the use and activity and their effects and continue to function in a manner to protect significant wildlife habitats, natural biological productivity, and values for scientific research and education.

D. *In a conservation management unit a use or activity is consistent with the resource capabilities of the area when either the impacts of the use on estuarine species, habitats, biological productivity and water quality are not significant or that the resources of the area are able to assimilate the use and activity and their effects and continue to function in a manner which conserves long-term renewable resources, natural biologic productivity, recreational and aesthetic values and aquaculture.*

The impact assessment need not be lengthy or complex, but it should enable reviewers to gain a clear understanding of the impacts to be expected. It shall include information on:

A. The type and extent of alterations expected;

Response: Dredge Area 4 Is the turn from Lower Jarvis Range to Jarvis Turn Range channels: JCEP proposes to widen the turn area here from the current 500 feet to 600 feet at the apex of the turn and lengthen to total corner cutoff area of the turn from the current 1,125 feet to about 1,750 feet

thereby allowing vessels to begin their turn in this area earlier. A dredge material pipeline would carry dredge material from Dredge Area 4 to the APCO 2 disposal site, outside of City of Coos Bay jurisdiction.

B. The type of resource(s) affected;

Response: The resources evaluated are water quality including turbidity and discharges, physical characteristics including shoaling and shoreline erosion, noise, deep subtidal area, living resources, recreation, aesthetics, and navigation. The only affected resource would be the temporary disturbance for the removal of approximately 3.3 acres of deep subtidal area. Dredging would take place in deep subtidal habitat, which also provides habitat for benthic organisms such as worms, crustaceans, and mollusks. These activities would temporarily affect the macroinvertebrates that live within the substrate in these areas and move, rest, find shelter, and feed on the substrate and organic material. Additionally, the fish species that utilize these habitats could be temporarily affected. Dredging would result in increased turbidity within the estuarine analysis area. The restriction of construction activities to the in-water work window of October 1 through February 15, when salmonid species abundance is lower, would reduce the likelihood of impacts to these species. The substrate in these areas consists primarily of unvegetated sand and rock, and is therefore of low ecological value. The dredging project would temporarily increase water turbidity. It would be temporarily visible and may be audible.

C. The expected extent of impacts of the proposed alteration on water quality and other physical characteristics of the estuary, living resources, recreation and aesthetic use, navigation and other existing and potential uses of the estuary; and

Response:

Water quality. The Oregon Department of Environmental Quality's (ODEQ) Ambient Water Quality Monitoring Program and the Oregon Beach Monitoring Program (OBMP) monitor water quality. ODEQ has designated CWA Section 303(d) water quality limited segments within the Coos Bay watershed. The ODEQ is currently in the initial scoping and data collection phase for the preparation of a total maximum daily load (TMDL) limit for fecal coliform in the watershed. A TMDL is a planning tool that assesses the various sources of a constituent into a watershed and places achievable limits on those sources in order to accomplish water quality goals. The 2012 ODEQ Priorities and Schedule list targets year 2015 to start work on the Coos sub-basin TMDL (ODEQ 2014). The ODEQ website notes that a TMDL for the Coos Subbasin has been initiated, and is in the initial scoping and data collection phase (ODEQ 2017b).

Coos Bay from River Mile 0 to 7.8 is water quality limited for fecal coliform and shellfish growing is listed as a beneficial use, and a TMDL is needed (Category 5) (ODEQ 2016).

Mobilization of suspended sediment as a result of dredging operations can result in a reduction in light penetration and, consequently, a reduction in primary production within the affected area. Increases in suspended sediment can also affect the feeding patterns of benthic filter feeding organisms and the behavior of fish, while the settling of suspended particles can result in the burial of organisms and modifications to benthic substrate (FERC 2015).

Turbidity has not been identified as a water quality concern in Coos Bay. Within Coos Bay, ambient background turbidity levels taken at the Charleston Bridge station between April 2002 and December 2004 range between 10 milligram per liter and 27.3 milligram per liter during summer

and winter, respectively (Moffatt & Nichol 2017). More recently, hourly turbidity readings taken at the North Spit-BLM boat ramp gauge were compiled between August 2013 and January 2015. Based on these data, the average natural turbidity level was calculated to be 40 mg/L at the North Spit-BLM boat ramp gauge (M&N 2016). JCEP expects increased water turbidity as a result of the Dredge Area improvements and during the driving of the temporary piles that will support the steel cradle and slurry pipeline spanning the eelgrass beds to be temporary and limited to the immediate vicinity of operations. Within 200 feet of dredging operations, turbidity levels decrease to ambient background levels (FERC 2015).

JCEP does not anticipate oil spills or toxic discharges to occur when constructing the Dredge Area improvements. The potential for spills and toxic discharges always exists when using dredging equipment. Any accidental spill or leak of petroleum products or other toxic discharges from dredging equipment or vessels could result in impacts to water quality and aquatic species in the short-term. However, the dredging vessels will be carrying relatively small volumes of petroleum (1,500 to 25,000 gallons) in comparison to the large bulk carriers and Panamax vessels (1.5 to 2 million gallons [NOAA 2016]) that regularly travel through Coos Bay. The fuel carried onboard the dredging vessels is low sulphur diesel, which is relatively light and will evaporate over time if spilled on the water. The bulk carrier vessels carry both low sulphur diesel and heavy fuel oil, the latter of which would have a much greater pollution impact if spilled on water. Given the low probability of a spill, preventive measures such as the implementation of a spill prevention plan, and the relatively small volume of fuel on board vessels utilized by the Project, large-scale or long-term negative impact are not anticipated from spills and/or toxic discharges.

Physical characteristics. According to sediment transport modeling of the proposed Dredge Area, shoaling in the dredged areas is not expected to differ from current shoaling totals for the existing FNC. Total shoaling was analyzed through existing conditions versus incorporating the proposed enhancements, and the difference in shoaling amounts after one and three years were negligible (Moffat and Nichol 2017). Thus, indirect effects to listed species and/or critical habitat are not expected to occur as a result of sediment transport or shoaling in Dredge Area 4. The dredging activity would not cause any shoreline erosion beyond natural waves, which is minimal.

Noise. Dredging equipment and material transport vessels related to the Dredge Area improvements may generate temporary noise disturbances. However, the noise will be localized to the immediate dredging area. While the noise temporarily could affect the behavior of aquatic species in the immediate vicinity and result in the displacement of noise-sensitive species during hours of operation, it is anticipated that any displaced species would resume their typical behavior patterns once dredging has ceased.

There could be potential temporary and short-term impacts from construction noise to people recreating on the North Spit, but distance, topography, coastal wind, and vegetation would help to minimize the noise from the dredging. City of Coos Bay does not have a noise ordinance.

Deep subtidal area. The entire 3.3-acre footprint of Dredge Area 4 is located in deep subtidal habitat. Deep subtidal habitats are not defined by any regulations (e.g., Clean Water Act Section 404 or Oregon Removal-Fill Law), but are cited in Roye (1979) and CBEAC (1984) as occurring below -15 feet MLLW and being generally less productive than shallower habitats in the Coos Bay estuary). The habitat in these locations is classified as deep subtidal, estuarine, unconsolidated bottom based on the Cowardin classification system (Cowardin et al. 1979). Deep subtidal habitat is classified as

Category 3 under ODFW's habitat categories, because it is "essential" to wildlife but is not "limited." This habitat is disturbed on an annual basis as part of USACE's maintenance dredging of the FNC.

A total of 846 acres of mapped deep subtidal habitat is located within lower Coos Bay. Permanent removal from Dredge Area 4 would be approximately 3.3 acres, or approximately 0.3 percent. The substrate in this area consists primarily of unvegetated sand and rock, and is therefore of low ecological value. In addition, the dredge lines would temporarily affect approximately 13 acres of deep subtidal habitat.

The dredging volumes in cubic yards (CY) for Dredge Area 4 are:

Location	Rock Volume (CY)	Sand Volume (CY)	Total Volume (CY)
Dredge Area 4 (RM ~7, Jarvis Turn)	0	24,900	24,900

(Moffatt & Nichol 2017)

Living resources. Dredging will remove sand in deep subtidal habitat, resulting in direct impacts to benthic organisms occupying the substrate, such as worms, mollusks, echinoderms and crustaceans, as well as organisms that feed on them. Removal of larvae and juvenile life stages of various species, including crustaceans, mussels and gastropods, is also anticipated. While these benthic organisms are not listed as threatened or endangered under the federal Endangered Species Act, they are an important food source for listed species. However, the effects to aquatic organisms would be temporary and localized, and will not have population-level effects. Recovery of benthic organisms to pre-dredging conditions can occur as quickly as one month post-dredging, but could take up to a year (FERC 2015).

The following protected species were identified as potentially occurring in the Coos Bay in the vicinity of Dredge Area 4:

Common name	Scientific name	Status
Protected fish species		
Eulachon – Southern Distinct Population Segment (DPS)	*Thaleichthys pacificus*	threatened
Green Sturgeon – Southern DPS	*Acipenser medirostris*	threatened
Oregon Coast Evolutionary Significant Unit (ESU) Coho Salmon	*Oncorhynchus kisutch*	threatened
Protected bird species		
Marbled murrelets	*Brachyramphus marmoratus*	threatened
Pacific Coast population of western snowy plover	*Charadrius alexandrinus nivosus*	threatened
Marine mammal species Protected under the MMPA but not federally listed		
Harbor seals	*Phoca vitulina*	N/A
California sea lions	*Zalophus californianus*	N/A
The eastern DPS of Steller sea lion	*Eumetopias jubatus*)	N/A
Northern elephant seals	*Mirounga angustirostris*	N/A
Harbor porpoises	*Phocoena*	N/A
Killer whale Eastern North Pacific Transient stock and Eastern North Pacific Offshore stock	*Orcinus orca*	N/A

The proposed dredging project has the potential to affect the ESA-listed fish and bird species identified in the table above. Dredging is expected to create localized, short-term spikes of high to moderate TSS and turbidity. Turbidity may affect marbled murrelet forage/prey species and their habitat. Effects to listed fish are expected to be slight due to the limited area affected in the bay and limitations on construction periods. While impacts such as behavioral and foraging changes are anticipated, these impacts will be limited to the immediate location of dredging activities and will be temporary in nature. Direct mortality of juvenile and adult life stages of ESA-listed fish is not anticipated, as they will likely be able to avoid areas being actively dredged and dredging would occur during the in-water work window when these species are less abundant. While foraging for benthic organisms in dredged areas will be affected, deep subtidal foraging habitat is not limited in Coos Bay and these areas are expected to recolonize and recover within a year of dredging. Dredging activities impacts to ESA-listed fish and birds would be temporary in nature and are not expected to adversely affect these species or their designated critical habitat.

The proposed dredging project has the potential to affect the marine mammals identified in the table above. Turbidity associated with dredging activities may temporarily affect behavior and foraging within the immediate vicinity of the dredge area.

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended, requires that proposed projects with a federal nexus evaluate their impacts on habitat of commercially managed fish populations. Essential Fish Habitat (EFH) is identified and described based on areas where various life stages of each managed species commonly occur. EFH has been defined as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity” (16 USC 1802(10)). Coos Bay is designated as EFH for several Coastal Pelagic Species (CPS—includes Pacific sardine, northern anchovy, market squid, Pacific mackerel, and jack mackerel), West Coast Groundfish (includes more than 80 species of rockfish, flatfish, groundfish, sharks and skates), and two Pacific Salmon (Chinook, and coho). Dredging may adversely affect EFH for juvenile and adult fish from the three groups. This is based on the predicted levels of turbidity from dredging in Coos Bay relative to background levels, the short-term, localized, but ongoing exposure of fish to such conditions during up to four in-water work windows; and the periodic disturbance of benthic communities for about a year each dredge cycle.

Recreation. The USACE manages 245 acres on the North Spit, including the North Jetty at the mouth of Coos Bay. The BLM administers 1,864 acres on the North Spit, with 725 acres classified as an Area of Critical Environmental Concern and the remainder designated as a Special Recreation Management Area (SRMA), in recognition of the value of the area for outdoor recreation. The BLM boat launch facility and courtesy dock, which provide access to the Coos Bay estuary and are within the SRMA (BLM 2016). The primary recreational activities taking place within the Coos Bay estuary include boating, fishing, waterfowl hunting, wildlife viewing and bird watching, clamming, and crabbing.

Recreational boating takes place throughout Coos Bay, although most originates primarily near the towns of Charleston and Empire, where there are boat ramps. There is also a marina complex in Charleston and access points for canoeists and kayakers to the northeast in Haynes Inlet and North Slough. In addition to the Charleston boat ramp and Empire boat ramp, recreational boaters use the BLM North Spit boat ramp to access the bay. All three boat ramps would remain open during

dredging. Dredging and dredge material transport will be limited in extent and avoidable by recreational craft participating in the fishery. Dredge operations and submerged temporary dredge line are not expected to impact recreational craft transit to upstream or downstream areas of Coos Bay or limit fishing except where work is actively occurring and in the associated safety area around work areas. Dredging activities will be announced to the boating community via a local notice to mariners provided through notification to the USCG. There would be no significant impact on recreational boating because dredging activities would be in a limited area, short-term, and temporary.

The main recreational catch species of fish in and around Coos Bay include coho and Chinook salmon. Other recreational catch species include American shad, shiner perch, redtail surf perch, striped sea perch, white sea perch, pile perch, black rockfish, lingcod, Cabezon, red Irish lord, Pacific staghorn sculpin, surf smelt, Pacific herring, Pacific tomcod, kelp and rock greenling, blue and cooper rockfish, halibut, and white sturgeon. Much of the recreational angling for salmon in Coos Bay occurs in late summer and fall, usually beginning in late summer at jetty areas and moving up the bay as fish move upstream. Recreational fishing for sturgeon occurs between the railroad bridge and the McCullough Bridge, and also above the McCullough Bridge. Dredging will occur concurrently with the recreational salmon fishery for approximately one month annually during construction. Dredging will observe the ODFW in-water work window of October 1 – February 15 and is expected to overlap with the salmon fishery primarily during the month of October.

Recreational clamming and crabbing activities occur in Coos Bay on a year-round basis, and they bring revenue to the region. All species of “bay clams” are found in Coos Bay, including butter (about 24 percent of the harvest), cockle (10%), gaper clams (6%), and native littleneck clams (1%). Clamming is conducted on the mud flats on the bay side of the North Spit up to NCM 6, Oregon Department of Fish and Wildlife (ODFW) regulations limit the amount a person can catch in a day to 20 clams, of which 12 may be gaper clams. Between March and September of 2008, a total of about 33,700 kilograms of clams were harvested in Coos Bay, making it the third most productive clamming estuary in the state (Ainsworth and Vance 2008).

Although shore crabbing in Coos Bay is done year-round, it is most productive during fall and winter. Crabbing is conducted from docks in Charleston and Empire, and from boats, particularly to the west of the FNC in the lower bay, on the bay side of the North Spit below NCM 7. Crabs are caught using traps, rings, or snares. While recreational crabbers in Oregon also harvest red rock crabs and Pacific rock crabs, Dungeness crabs are far more popular. A study that collected crabs near the RFP property found that 98 percent were Dungeness crabs, with far lesser counts of hairy shore crabs, red rock crabs, and non-native European green crabs (Yamada 2014). ODFW regulations limit individual daily catches of crabs to 12 male Dungeness larger than 146 millimeters across and 24 red crabs of any sex and size. Another study by ODFW found that between 2008 and 2011 an average of 158,650 pounds per year of Dungeness crabs were harvested from Coos Bay. During that same period an annual average of 14,710 recreational crabbing trips were taken to Coos Bay. The vast majority of the recreational crabbers (76 percent) came from 100 miles away or less (Ainsworth *et al*. 2012).

The west shore of the bay at Jordan Cove contains sand/mudflats, eelgrass beds, and a fringe of salt marsh that provide habitat for recreationally important ghost shrimp and mud shrimp. These shrimp are recreationally harvested at a number of locations throughout the bay, and are popular among anglers for use as bait.

Aesthetics. Dredging equipment and activities would be visible in Coos Bay. However, relative to existing tanker ship traffic in the Bay, and the existing operational ocean-going vessel loading facility at the RFP facility, the dredging is anticipated to be a minor visual impact, as well as limited in duration.

Navigation. The proposed navigation reliability improvement at Dredge Area 4 would have a beneficial impact on the current and future viability for maritime commerce in Coos Bay. The proposed enhancements to the FNC are designed to reduce entry and departure delays for vessel transit through the FNC for the size of vessels entering the Port today. Although log export vessels serving the upper bay are smaller, the proposed enhancements also benefit these vessels by broadening the tidal and environmental limit (wind and current) windows for transiting the FNC, which provides an enhanced margin of safety and improved efficiency in the loaded vessel departure schedule. The navigation reliability improvements also would allow companies to engage in emerging opportunities to export products with today's larger vessels.

During outbound transits it is difficult to make this 35-degree turn from the Jarvis Turn Range, which is 400 feet wide, to the Lower Jarvis Range, which is only 300 feet wide, due to the very short length of the existing corner cutoff of only 1125 feet. Widening the turn area from the current 500 feet to 600 feet at the apex of the turn and lengthening the total corner cutoff area of the turn from the current 1125 feet to about 1750 feet will allow the Pilots to commence their turn earlier. This will greatly improve the ability of today's larger ships to make this turn safely on a consistent basis.

D. The methods which could be employed to avoid or minimize adverse impacts.

Response:

Water quality. JCEP will use methods to minimize the effects of the navigation reliability improvements on water turbidity within the bay. Should turbidity levels remain above ambient background levels greater than 200 feet from dredging operations, BMPs will be employed in place to reduce turbidity levels further. JCEP would avoid and minimize oil spills or toxic discharges during dredging operations and dredged material transport, including the implementation of spill containment plans.

Noise. To minimize impacts to fish and wildlife, BMPs will be implemented to minimize the extent of noise generation to the maximum extent possible. However, it will not be possible to avoid noise generation entirely, but it would be temporary.

Deep subtidal area and living resources. JCEP plans to perform dredging during the ODFW-approved in-water work window for Coos Bay (October 1 to February 15) to reduce impacts to sensitive life stages of fish in the Bay. Due to the short time in which dredging would occur, benthic communities would be expected to recover.

Recreation. The USCG and the OSMB would provide notices to boaters to avoid the area during the dredging activities, which would occur during the in-water work period from October 1 through February 15. All floating and submerged dredging equipment operating in the bay will be clearly marked with day signals and light signals at night accordance with the US Inland Rules of the Road. If the signage and notices are not sufficient to prevent recreational boating from avoiding the construction areas, some form of physical barrier, such as a continuous string of highly visible soft material floats, could be extended across the mouth of the slip or around the construction dredging

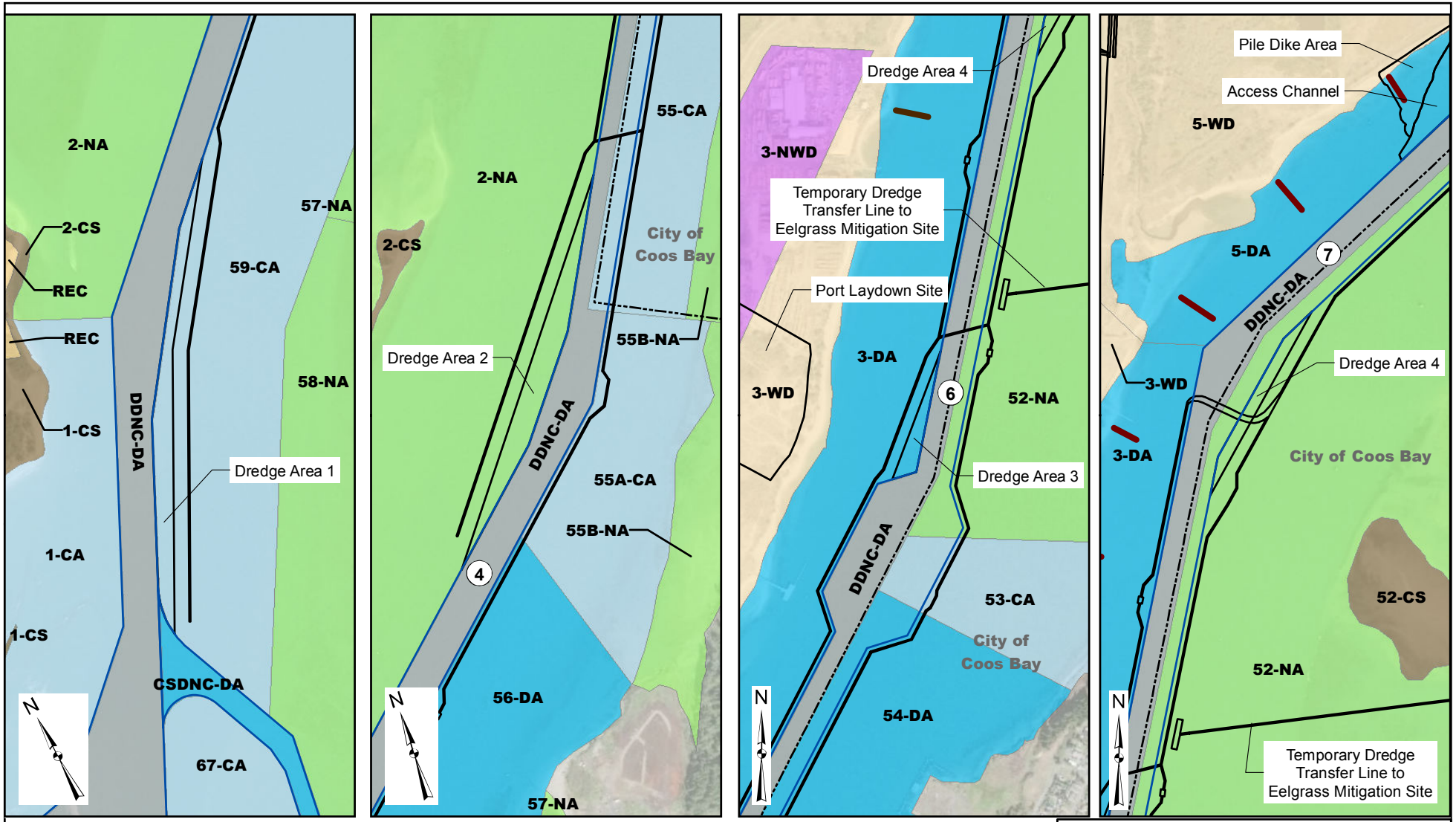
area. Construction safety inspectors would also be responsible for warning any recreational boaters who enter the construction area. As the construction dredging area is limited in size, boaters could easily avoid the construction areas by moving to the opposite side of the bay.

Aesthetics. With minor relative impacts, no avoidance or minimization methods are needed.

Navigation. The sections of the pipeline that cross the FNC will be submerged on the FNC bottom to allow for vessel passage. The section(s) of floating pipeline would be temporarily removed to allow vessel passage.

This policy is based on the recognition that the need for and cumulative effects of estuarine developments were fully addressed during the preparation of this Plan and that, except as otherwise stated above, no additional findings are required to meet Implementation Requirement #1 of LCDC Goal 16.

Response: No response required.



Jordan Cove Energy Project

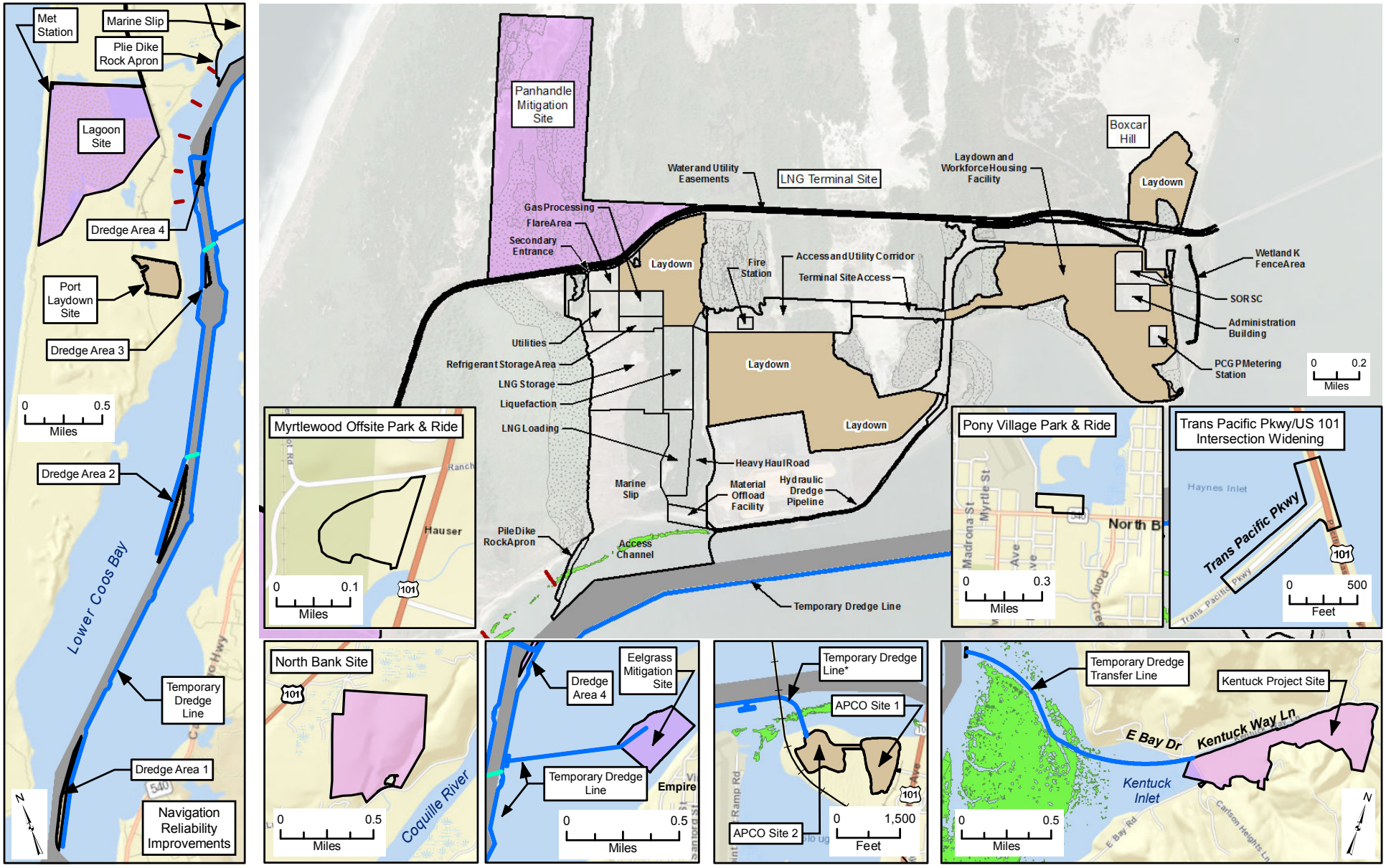
JCEP Project Area Update - July 2018

CBEMP Zoning Navigational Reliability Improvement (NRI) Areas

Jordan Cove LNG℠ 7/10/2018

FIGURE NO. 5

\\deainc.com\files\PROJECT\JJLNG00000001\0600INFO\GS\Maps\Land Use\Perkins Coie CBEMP Zoning by Facility\Fig 4 CBEMP Zoning Temporary Dredge Line.mxd



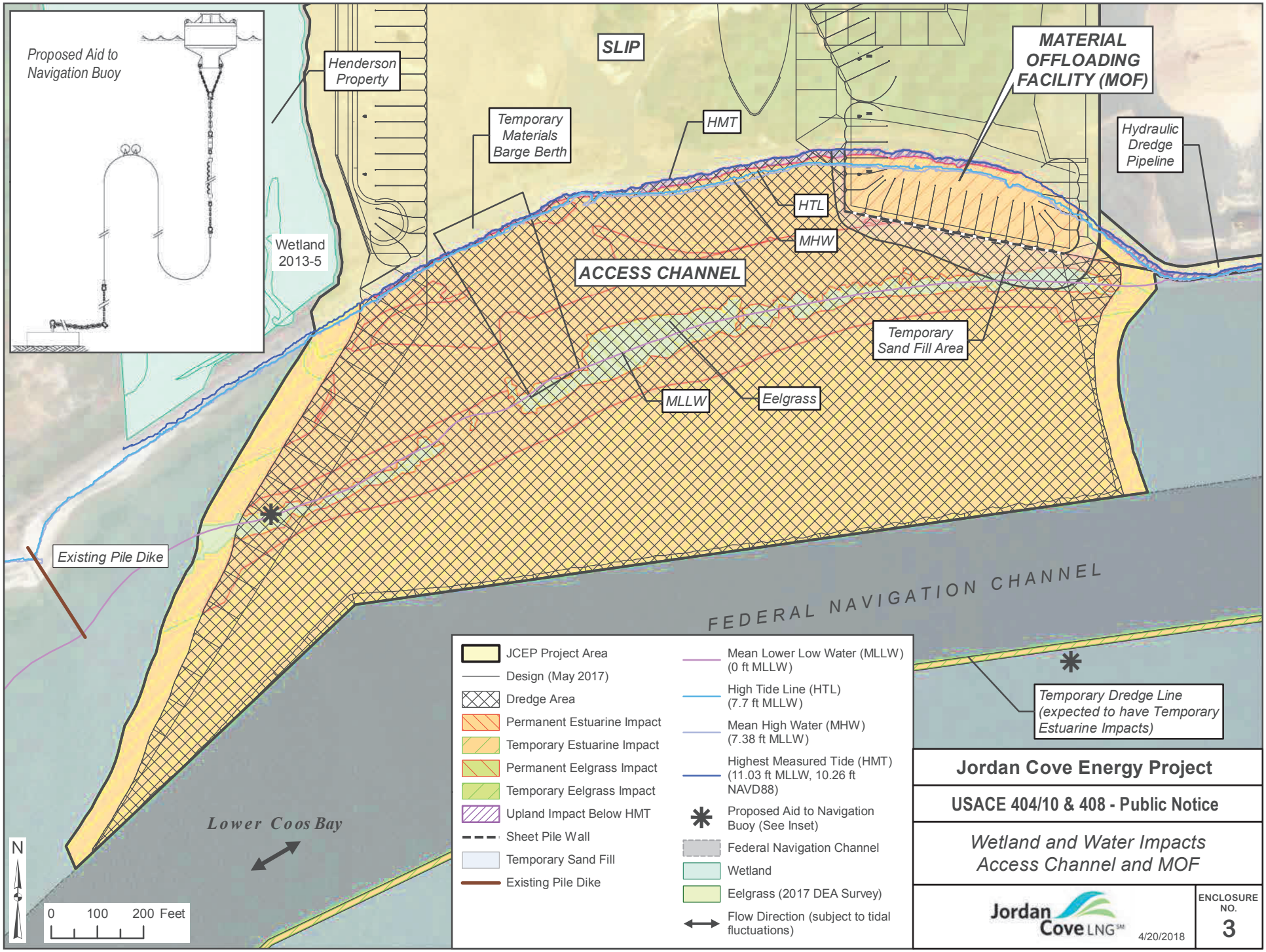
Jordan Cove Energy Project, L.P.

Jordan Cove Energy Project

Figure 1.3-1

Plot Plan of Construction Facilities

J1-000-CIV-MAP-DEA-00001-01 Rev. C


Proposed Aid to Navigation Buoy
Henderson Property
SLIP
MATERIAL OFFLOADING FACILITY (MOF)
Temporary Materials Barge Berth
HMT
Hydraulic Dredge Pipeline
HTL
MHW
Wetland 2013-5
ACCESS CHANNEL
Temporary Sand Fill Area
MLLW
Eelgrass
Existing Pile Dike
FEDERAL NAVIGATION CHANNEL
Lower Coos Bay
N
0 100 200 Feet
JCEP Project Area
Design (May 2017)
Dredge Area
Permanent Estuarine Impact
Temporary Estuarine Impact
Permanent Eelgrass Impact
Temporary Eelgrass Impact
Upland Impact Below HMT
Sheet Pile Wall
Temporary Sand Fill
Existing Pile Dike
Mean Lower Low Water (MLLW) (0 ft MLLW)
High Tide Line (HTL) (7.7 ft MLLW)
Mean High Water (MHW) (7.38 ft MLLW)
Highest Measured Tide (HMT) (11.03 ft MLLW, 10.26 ft NAVD88)
Proposed Aid to Navigation Buoy (See Inset)
Federal Navigation Channel
Wetland
Eelgrass (2017 DEA Survey)
Flow Direction (subject to tidal fluctuations)
Temporary Dredge Line (expected to have Temporary Estuarine Impacts)
Jordan Cove Energy Project
USACE 404/10 & 408 - Public Notice
Wetland and Water Impacts Access Channel and MOF
Jordan Cove LNG
4/20/2018
ENCLOSURE NO. 3

PROPERTY OWNER CERTIFICATION AND CONSENT

I hereby certify that the Oregon Department of State Lands is the manager of those submerged and submersible non-trust lands in Coos Bay owned by the State of Oregon. I hereby approve Jordan Cove LNG, LLC to file land use applications with the City of Coos Bay ("City"), the City of North Bend, and Coos County ("County") for the following land use authorizations for uses and activities to be located and/or undertaken within our area of ownership, as depicted on attached Exhibit 1:

(1) Post-acknowledgment amendments to the Coos Bay Estuary Management Plan ("CBEMP") map at three Coos Bay locations in the City of Coos Bay and unincorporated Coos County depicted in Exhibit 1 to these Applications ("Navigation Reliability Improvement Sites" or "NRI Sites") to change the zoning designation of 59-CA, 2-NA, and 3-DA, to DDNC-DA;

(2) A post-acknowledgment amendment of the CBEMP, which is part of the Coos County Comprehensive Plan ("CCCP"), to take a reasons exception to Statewide Planning Goal ("Goal") 16 text amendment adopted of the CBEMP, which is part of the Coos County Comprehensive Plan ("CCCP"), in the form of a reasons exception to Statewide Planning Goal ("Goal") 16 to authorize the rezone of the NRI Sites to DDNC-DA;

(3) An amendment of the text of the Coos County Zoning and Land Development Ordinance ("CCZLDO") to clarify that the DDNC-DA designation is appropriate for application to area adjacent to, and not only within, the designated federal navigation channel;

(4) Administrative conditional use permit to authorize new and maintenance dredging at the NRI Sites in the DDNC-DA zone, as this Application proposes to amend those sites.

(5) Administrative authorization from the City of North Bend for the installation of temporary dredge material transport lines, an off-loading facility, and the placement of dredged material in an Industrial zone designation.

By: Vicki L Walker

Print Name and Title: Vicki L. Walker, Director, Oregon Department of State Lands

Date: 11/1/18

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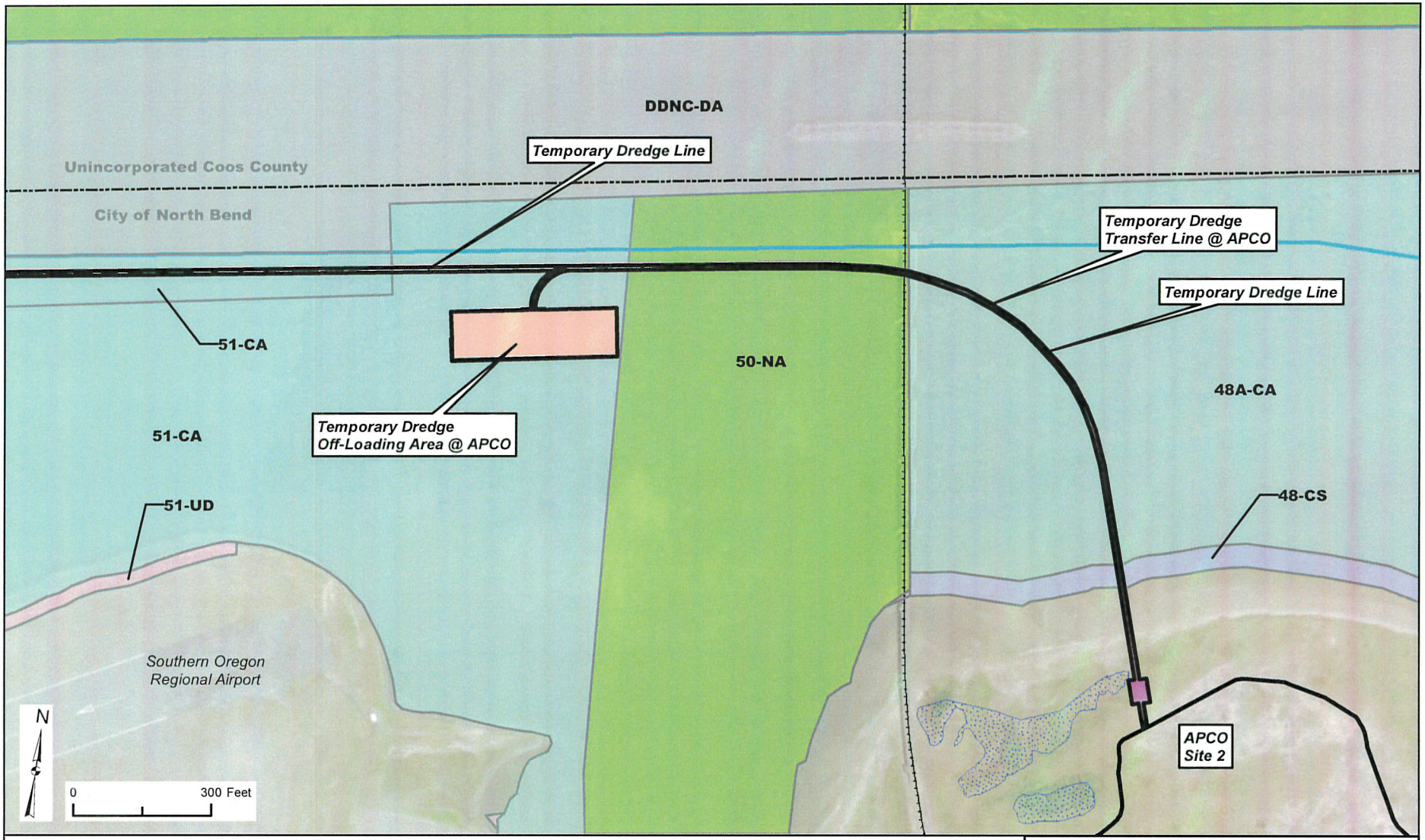

JCEP Project Area
Temporary Dredge Off-Loading Area @ APCO
Temporary Dredge Transfer Line @ APCO

CBEMP Aquatic Management Units
Conservation Aquatic (CA)
Deep Draft Navigation Channel (DDNC)
Development Aquatic (DA)
Natural Aquatic (NA)

CBEMP Shoreland Management Units
Urban Development Area (UD)
Conservation Shorelands (CS)

Wetland
Federal Navigation Channel
City Limits

Jordan Cove Energy Project

JCEP Project Area Update - August 2018

CBEMP Zoning
Temporary Dredge Transfer Line @ APCO

Jordan Cove LNG℠ 8/6/2018

FIGURE NO. 3

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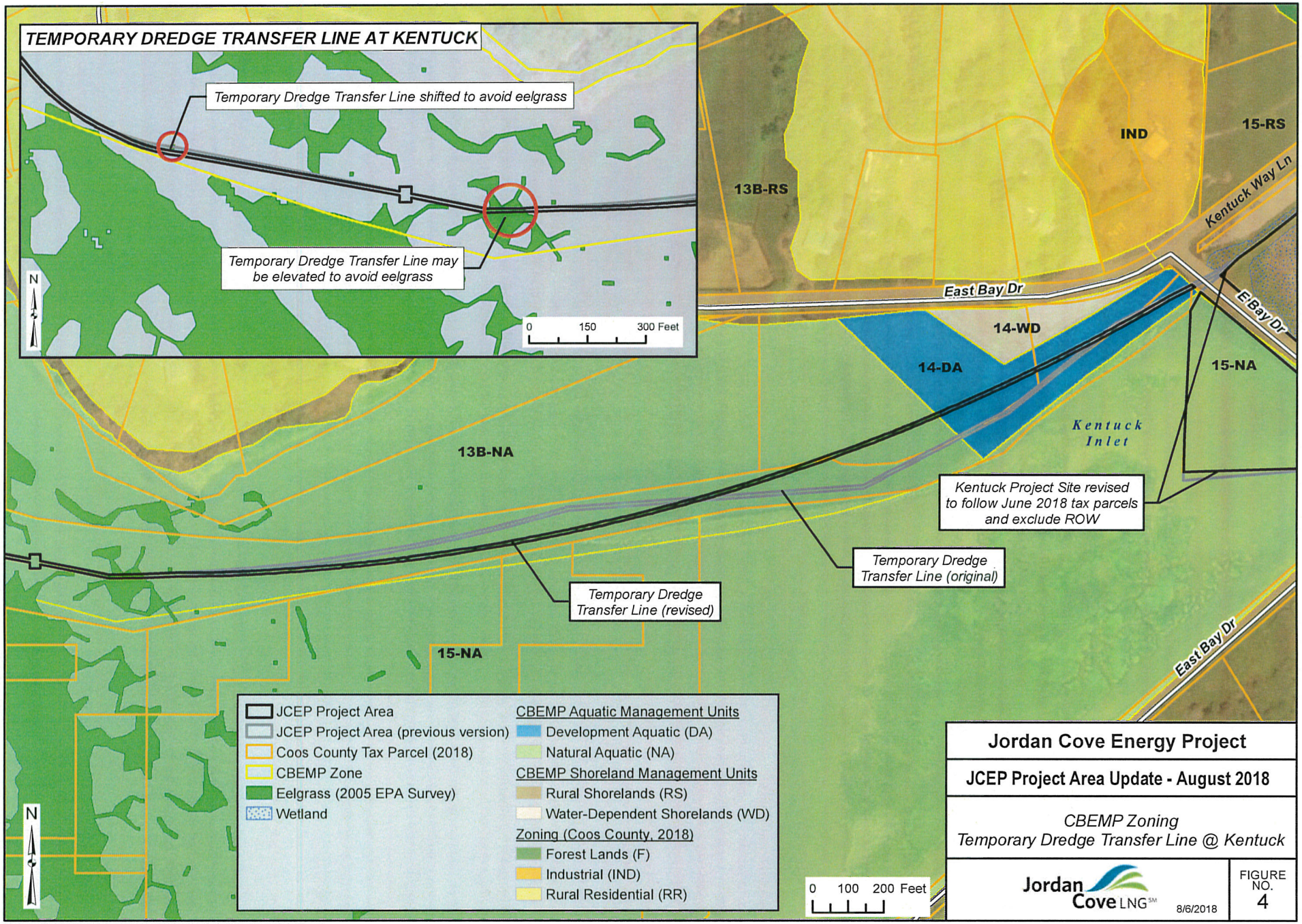

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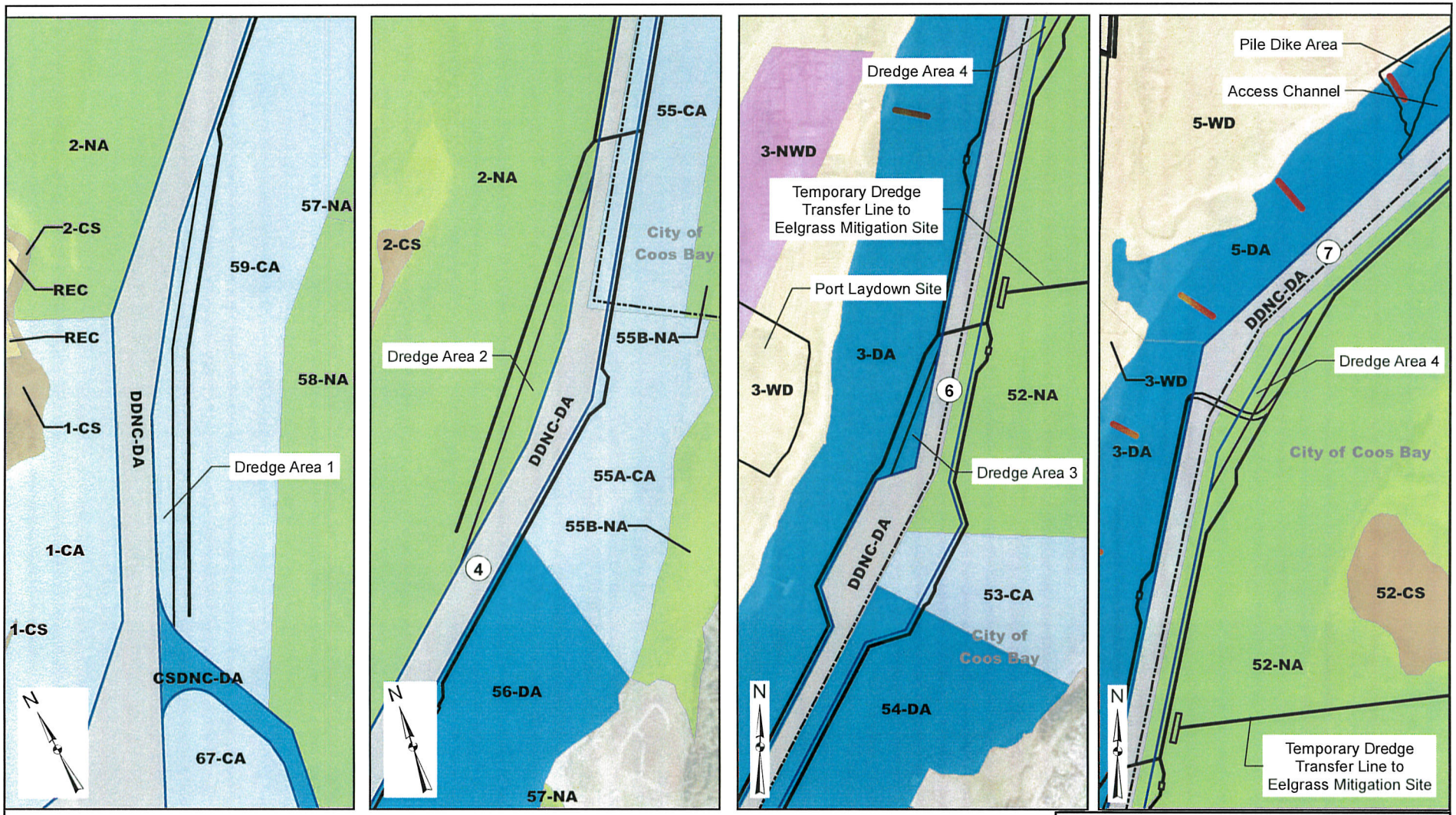

JCEP Project Area
Existing Pile Dike
City Limits
Channel Mile
Federal Navigation Channel

CBEMP Aquatic Management Units
Conservation Aquatic (CA)
Deep Draft Navigation Channel (DDNC)
Development Aquatic (DA)
Natural Aquatic (NA)

CBEMP Shoreland Management Units
Conservation Shorelands (CS)
Water-Dependent Shorelands (WD)

Zoning (Coos County, 2018)
Recreation (REC)

0 0.15 0.3 Miles

Jordan Cove Energy Project

JCEP Project Area Update - July 2018

CBEMP Zoning Navigational Reliability Improvement (NRI) Areas

Jordan Cove LNG℠ 7/10/2018

FIGURE NO. 5

\\teams.com\files\PROJECT\JLNG00000001\0600INFO\GIS\Maps\Land Use\Perkins Coie CBEMP Zoning by Facility\Fig 4 CBEMP Zoning Temporary Dredge Line.mxd

MEMORANDUM OF AGREEMENT

BETWEEN:

JORDAN COVE ENERGY PROJECT L.P., PACIFIC CONNECTOR GAS PIPELINE, LP,

and

THE CONFEDERATED TRIBES OF COOS, LOWER UMPQUA AND SIUSLAW INDIANS

This Memorandum of Agreement ("MOA") is made and entered into by and between Jordan Cove Energy Project L.P., a Delaware limited partnership ("JCEP"), Pacific Connector Gas Pipeline LP a Delaware limited partnership ("PCGP") (JCEP and PCGP are hereinafter referred to as "Jordan Cove" or the "Applicant") and the Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians ("Tribe").

I. PURPOSE

The purpose of this MOA is to establish a process and substantive terms to implement Policy 18 of the Coos Bay Estuary Management Plan ("CBEMP") and parallel Coos County ("County") land use regulations applicable in areas outside of the Coos Bay Estuary to Jordan Cove's land use applications and approvals by Coos County and the City of North Bend ("City"). For purposes of this MOA, reference to "Policy 18" shall include both CBEMP Policy 18 and the land use regulations applicable outside of the Coos Bay Estuary. This MOA establishes the Parties' agreed upon "appropriate measures" to protect the cultural, archaeological and historical values of the sites where the Project (as defined below) will be built as required by CBEMP Policy 18. The Parties agree this MOA applies to both new applications requiring compliance with CBEMP Policy 18 and to existing approvals that have conditions requiring compliance with CBEMP Policy 18 or its implementing land use regulations.

II. BACKGROUND

JCEP proposes to construct, operate, and eventually decommission a liquefied natural gas ("LNG") export facility and supporting infrastructure to be located on the North Spit of Coos Bay, and PCGP proposes to construct, install, own and operate a 36-inch diameter gas pipeline and supporting infrastructure spanning 229-miles across Klamath, Jackson, Douglas, and Coos Counties in the State of Oregon ("the Pipeline") (the LNG Terminal and the Pipeline are collectively referred to as the "Project"), all as set forth in Jordan Cove's applications filed under

Sections 3 and 7 of the Natural Gas Act with the Federal Energy Regulatory Commission ("FERC") on September 21, 2017.

In 2015, Jordan Cove applied to Coos County for a conditional use permit to construct and operate a LNG export terminal at Jordan Cove, located on the North Spit at Coos Bay, located in Coos County ("LNG Facility"). The LNG Facility consists of a number of components, including (1) the LNG export terminal, (2) a marine slip and access channel, (3) a barge berth, (4) a gas processing center, and (5) a fire station and emergency training center, along with associated roads and utilities. The Project would also require significant dredging, dredge disposal, shoreline stabilization, and wetland impact mitigation.

The LNG Terminal, gas processing facility, and fire station and emergency training center will be located on upland areas zoned for industrial uses. Much of the port facilities (slip, barge berth, tugboat dock, etc.) will be located in coastal shoreland areas, which are generally zoned to allow for water-dependent uses. The marine slip and access channel will require dredging in Jordan Cove, designated a natural estuary, and Henderson March, a Statewide Planning Goal 5 (Natural Resources, Scenic and Historic Areas, and Open Spaces) inventoried wetland.

The Coos County Hearings Officer held a hearing on December 18, 2015. On May 2, 2016, the Hearings Officer issued a decision with recommendations to approve the applications. On August 16, 2016, the County Board of Commissioners held a public meeting to deliberate on the recommendations, and voted to adopt the Hearings Officer's finding as the County's decision, with minor modifications. The County's final decision was issued on August 30, 2016. An appeal was promptly filed with the Oregon Land Use Appeals Board ("LUBA Appeal"). The Tribe intervened in the LUBA Appeal.

On November 27, 2017, the LUBA issued its Final Opinion and Order ("FDO") and remanded the matter for the County to further address CBEMP Policy 18 in the context of Jordan Cove's conditional use permit application.

Jordan Cove has provided the Tribe with a Site Plan for the Project, as required by Policy 18, and the Parties agree that there are cultural, archaeological and historical sites identified on the County's adopted and acknowledged inventory located within the Project area, as more specifically listed or depicted in Attachment A. The Parties further agree that there is a potential for unknown or unrecorded cultural, archaeological and/or historical sites to be encountered within the Project area.

The Tribe and the Jordan Cove met, conferred and agreed upon appropriate measures to protect the cultural, historical and archaeological values of identified inventoried sites, together with unknown or unrecorded sites that may be encountered during construction within the Project area during construction ("Cultural Resources").

III. SUBSTANTIVE REQUIREMENTS

A. Standards

1. Policy 18 requires either no adverse impacts to cultural, historic and archeological sites within the Project area or the implementation of appropriate measures to protect the cultural, historical and archaeological values of such sites.

B. Parties Obligations

1. For any land use application for the Project that may adversely affect a Cultural Resources identified in Attachment A, Jordan Cove shall (i) submit to the County or City, as applicable, a detailed cultural resource survey prepared by an archaeologist meeting the Secretary of the Interior's Guidelines as defined in 36 CFR Part 61 Tribe regarding the nature and location of the Cultural Resource; (ii) an analysis of the impacts of the potential impacts to the Cultural Resource; and (iii) if necessary, a recommendation, after consulting with the Tribe, of appropriate measures to protect the cultural, archaeological and historical values of the Cultural Resource. If the Tribe and Jordan Cove are unable to agree upon the appropriate measures to protect such sites, either Party may invoke Section 3.11 of the Cultural Resources Protection Agreement.

2. Subject to the County imposing a condition on any approval requiring compliance with this MOA to ensure compliance with CBEMP Policy 18, the Tribe agrees that Jordan Cove's land use applications for the Project comply with CBEMP Policy 18.

3. The Parties agree that an executed copy of this MOA shall be entered into the County and/or City record for any land use applications or approvals where compliance with the CBEMP Policy 18 is at issue.

IV. APPROPRIATE MEASURES TO PROTECT CULTURAL, ARCHAEOLOGICAL AND HISTORICAL VALUES

A. The Parties have executed a comprehensive Cultural Resources Protection Agreement ("CRPA"), Attachment B, which is attached hereto and incorporated fully herein by this reference. The CRPA includes and incorporates several relevant attachments, including an Unanticipated Discovery Plan ("UDP"), which provides procedures in the event of an unanticipated discovery of historic properties, archaeological objects, archaeological sites or human remains, funerary objects, sacred items and items of cultural patrimony during the construction and operation of the Project.

B. The Parties agree that the CRPA and the UDP constitute "appropriate measures" under the CBEMP Policy 18 as the CRPA provides: a process for the exchange of project related information, confidentiality requirements, commitments to mitigation, monitoring agreements, agreements for the treatment of unanticipated discovery of Cultural Resources, site access agreements, and cost recovery agreements.

V. PERMIT CONDITIONS

A. The Parties agree that compliance with this MOA shall become a condition of any County and/or City issued land use permit for activities within the Project area that involve a Cultural Resource.

IN WITNESS WHEREOF, the Parties hereto have executed this MOA as of the last date written below.

_____ 7/26/18
DATE

for Jordan Cove Energy Project, L.P.
and Pacific Connector Gas Pipeline, LP

_____ _____
Mark Ingersoll, Tribal Council Chairman **DATE**
CONFEDERATED TRIBES OF COOS,
LOWER UMPQUA AND SIUSLAW INDIANS

V. PERMIT CONDITIONS

A. The Parties agree that compliance with this MOA shall become a condition of any County and/or City issued land use permit for activities within the Project area that involve a Cultural Resource.

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_____ _____

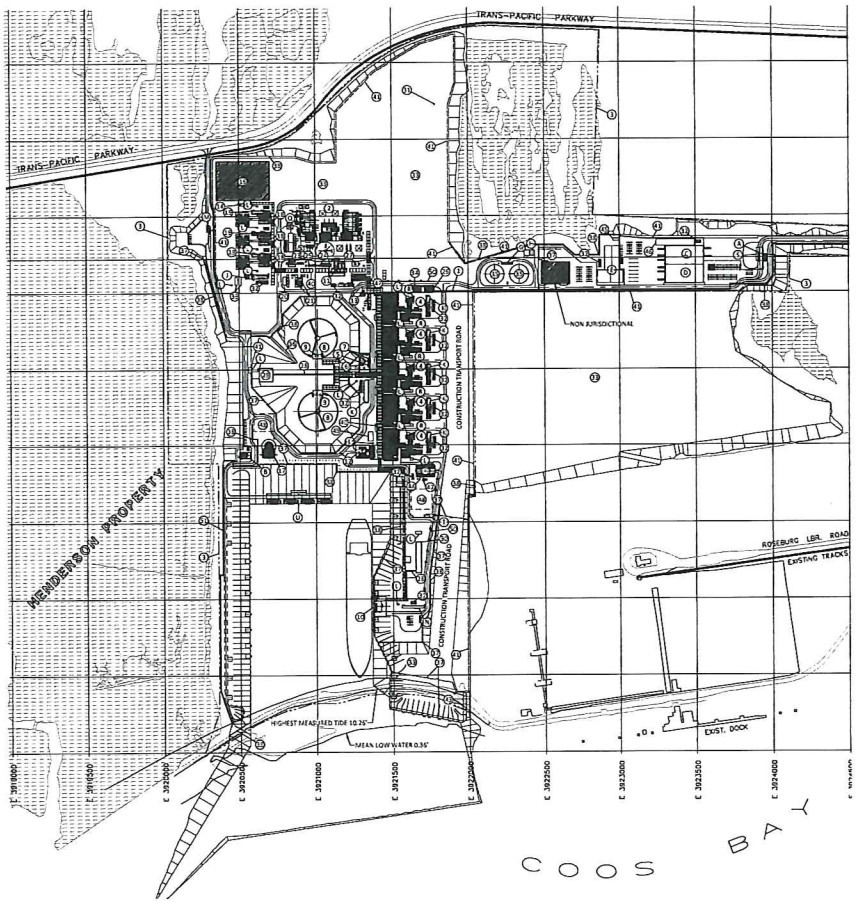
for Jordan Cove Energy Project, L.P.
and Pacific Connector Gas Pipeline, LP

DATE

_____ _____

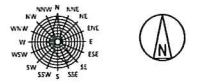
Mark Ingersoll, Tribal Council Chairman
CONFEDERATED TRIBES OF COOS,
LOWER UMPQUA AND SIUSLAW INDIANS

DATE



ITEM	FACILITIES LEGEND
1	FEED GAS HEADER
2	GAS CONDITIONING TRAIN
3	PROPERTY BOUNDARY
4	LNG LIQUEFACTION TRAIN #1 THROUGH #5
5	LNG EXPANDER (WITH SHELTER)
6	LNG FLASH DRUM
7	LNG RUNDOWN PUMPS (WITH SHELTER)
8	LNG STORAGE TANK
9	LNG TANK PUMPS
10	LNG LOADING PLATFORM
11	REFRIGERANT MAKE-UP
12	LP/HP BOG COMPRESSORS (WITH SHELTER)
13	COLD FLARE KO DRUM
14	MULTI POINT GROUND FLARE KO DRUM
15	NOT USED
16	MULTI POINT GROUND FLARE
17	ENCLOSED GROUND FLARE - MARINE
18	BOP AUXILIARY POWER STG
19	BOP AUXILIARY POWER STG CONTROL ENCLOSURE
20	AUXILIARY BOILER
21	DEAERATOR / BFW PUMPS
22	NOT USED
23	PLANT / INSTRUMENT AIR PACKAGES
24	NITROGEN GENERATION PACKAGE
25	LIQUID N2 STORAGE / VAPORIZATION
26	AMMONIA STORAGE TANKS AND PUMPS
27	AMINE STORAGE
28	LNG DRAINAGE CHANNEL
29	PROCESS AREA LNG IMPOUND BASIN
30	MARINE AREA LNG IMPOUND BASIN
31	FIRE FIELD SEISMOMETER SHELTER
32	TRANSFORMERS
33	CONSTRUCTION LAYDOWN AREA
34	DIESEL STORAGE
35	FIRE WATER STORAGE TANKS
36	LNG TANK ACCESS ROAD
37	PLANT SECURITY FENCE
38	RETAINING WALL
39	BACKUP GENERATOR
40	P/RACK
41	IMPERMEABLE VAPOR BARRIER
42	RO PRODUCT TANK
43	CONST. MARINE OFF-LOADING FACILITIES AREA (CONST. MOF)
44	DEMIN WATER STORAGE TANK
45	WASTEWATER TREATMENT PACKAGE PLANT
46	LAYDOWN AREA
47	DUMP CONDENSER
48	BURIED STORM WATER INFILTRATION CHAMBER
49	BOG VFD ENCLOSURE
50	PERMEABLE VAPOR BARRIER
51	TSUNAMI WALL (ELEVATION VARIES TO SUIT THE GES-GN TSUNAMI)
52	METEOROLOGICAL MAST LOCATED WEST OF THE SITE NEAR INDUSTRIAL WASTEWATER LAGOON

ITEM	FACILITIES LEGEND
A	MAIN GUARD HOUSE / SECURITY BUILDING
B	TUG FACILITY BUILDING
C	PLANT WAREHOUSE
D	MAINTENANCE BUILDING
E	OPERATIONS BUILDING (INCLUDES CONTROL ROOM)
F	WATER TREATMENT BUILDING
G	FACILITY FIRE WATER PUMPS WITH BUILDING
H	LUBE OIL, PAINT AND COMPRESSED GAS STORAGE
J	FACILITY AUX POWER-HOUSE ENCLOSURE
K	POWERHOUSE ENCLOSURE
L	FIREWATER VALVE HOUSE
M	SECONDARY ENTRANCE SECURITY GATE/TERMINAL GUARD BUILDING
N	MARINE POWERHOUSE ENCLOSURE
P	FIRE DEPARTMENT
Q	GC TRAIN 1 POWER-HOUSE ENCLOSURE
R	GEMS BUILDING (MSG-FIG)
S	INSPECTION STATION SHELTER
T	MARINE AREA GUARD HOUSE
U	TUG BOAT BERTH

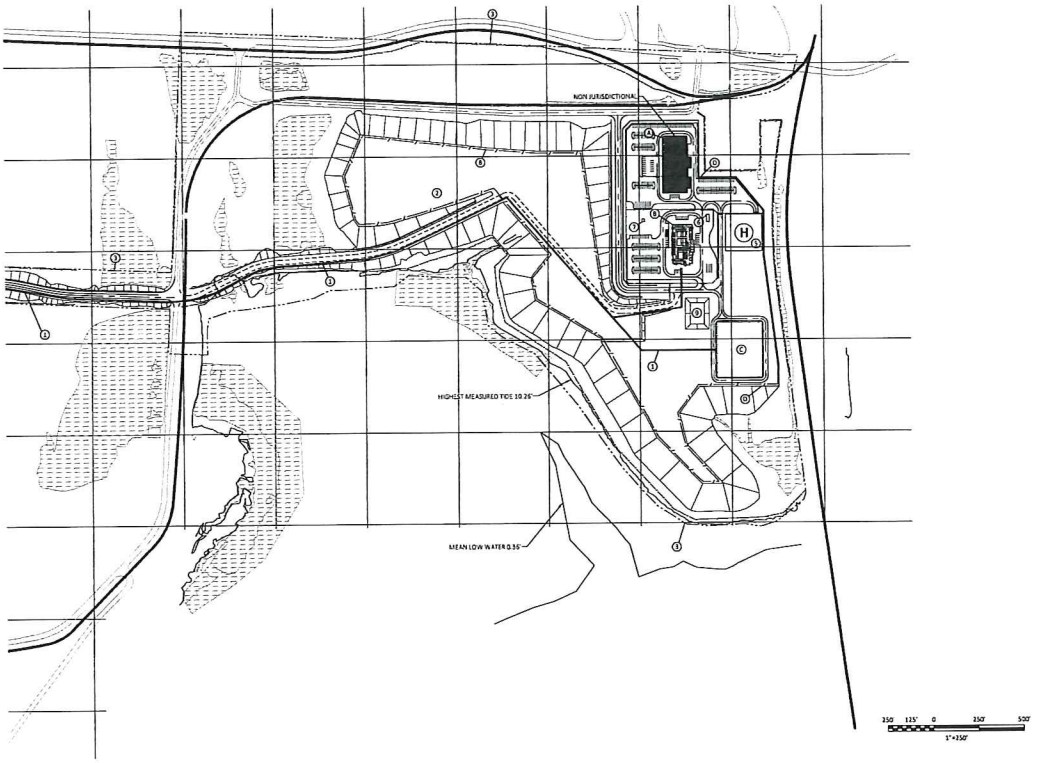


WIND ROSE - ANNUAL
NORTH BEND MUNICIPAL AIRPORT
(PERCENT OF TIME)

NOTES:
1. ELEVATIONS NOTED ARE NAVD88

LEGEND:
- SECURITY FENCE
- DEMARCATION FENCE
- PROPERTY BOUNDARY
- ASPHALT PAVED ROADS AND PARKING
- GRAVEL ROADS AND PARKING
- IMPERMEABLE VAPOR BARRIER WITH SECURITY
- PERMEABLE VAPOR BARRIER

300 150' 0 300 600
1"=300'



ITEM	FACILITIES LEGEND
A	SOSC BUILDING
B	ADMINISTRATION BUILDING
C	GAS METERING STATION
D	RETAINING WALL

ITEM	FACILITIES LEGEND
1	ACCESS AND UTILITY CORRIDOR (SEE NOTE 3)
2	TEMPORARY CONSTRUCTION FACILITIES
3	PROPERTY BOUNDARY
4	PUBLE SWITCHYARD EASEMENT
5	HELI PAD
6	WASTEWATER TREATMENT PACKAGE PLANT
7	COMMUNICATIONS TOWER
8	PLANT SECURITY FENCE
9	VEGETATED INFILTRATION BASIN

WIND ROSE - ANNUAL
NORTH BEND MUNICIPAL AIRPORT
(PERCENT OF TIME)

NOTES:
1. ELEVATIONS NOTED ARE NAVD88.
2. FOR OVERALL PLOT PLAN, SEE DRAWING 189930-0000-PE0300.
3. THE ACCESS AND UTILITY CORRIDOR CONTAINS THE FOLLOWING BURIED LINES. CORRIDOR WILL BE ROUTED ON ICING LAND.
   - FEED GAS LINE
   - FIRE WATER SUPPLY TO ADMIN AND SOSC BUILDINGS
   - POWER TO ADMIN BUILDING
   - IT AND SECURITY TO ADMIN AND SOSC BUILDINGS
   - CONTROL CABLING FROM METERING STATION

LEGEND:

- SECURITY FENCE
- DEMARCATION FENCE
- ASPHALT PAVED ROADS AND PARKING
- GRAVEL ROADS AND PARKING

CULTURAL RESOURCES PROTECTION AGREEMENT
BETWEEN
THE CONFEDERATED TRIBES OF COOS, LOWER UMPQUA AND SIUSLAW INDIANS
AND
JORDAN COVE ENERGY PROJECT LP
AND
PACIFIC CONNECTOR GAS PIPELINE L.P.

THIS CULTURAL RESOURCES PROTECTION AGREEMENT ("Agreement") is entered into as of this 20th day of July, 2018 ("Effective Date") by and between Jordan Cove Energy Project LP, a Delaware limited partnership ("JCEP") and Pacific Connector Gas Pipeline L.P., a Delaware limited partnership ("PCGP") (JCEP and PCGP are hereinafter referred to as "Jordan Cove"), and the Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians, a federally recognized Indian tribe ("CTCLUSI" or the "Tribe"). Jordan Cove and the Tribe are sometimes referred to herein individually as a "Party" and collectively as the "Parties."

I. RECITALS

WHEREAS, JCEP proposes to construct, operate, and eventually decommission a liquefied natural gas ("LNG") export facility and supporting infrastructure to be located on the North Spit of Coos Bay ("LNG Terminal"), and PCGP proposes to construct, install, own and operate a 36-inch diameter gas pipeline and supporting infrastructure spanning 229-miles across Klamath, Jackson, Douglas, and Coos Counties in the State of Oregon ("the Pipeline") (the LNG Terminal and the Pipeline are collectively referred to as the "Project"), all as set forth in Jordan Cove's applications filed under Sections 3 and 7 of the Natural Gas Act with the Federal Energy Regulatory Commission ("FERC") on September 21, 2017; and

WHEREAS, FERC is responsible for compliance with Section 106 of the National Historic Preservation Act, 16 U.S.C. § 470, ("NHPA"), which requires it to take into account the effects of its undertakings on historic properties by identifying the properties within a proposed undertaking's area of potential effects that are listed or eligible for listing in the National Register of Historic Places, 36 C.F.R. § 800.4, evaluate the effects of the proposed undertaking on those properties, *Id.* § 800.5, and if adverse effects are found, resolve such adverse effects through avoidance, minimization or mitigation. *Id.* At 800.6; and

WHEREAS, the Parties expect FERC, the State Historic Preservation Office ("SHPO") and other federal agencies will document compliance with the requirements of the NHPA through execution of a memorandum of agreement that will address resolution of any adverse effects identified within the "area of potential effects" for the Project; and

WHEREAS, Jordan Cove has developed, with input from the Tribe, SHPO and other federally recognized tribes, the plan and procedures addressing Unanticipated Discoveries of Cultural Resources and Human Remains, which outlines the procedures Jordan Cove will follow should Project construction result in the unanticipated or inadvertent discovery of archaeological sites, cultural resources or human remains; and

WHEREAS, the Tribe descends from the indigenous people who resided along the southern Oregon coast for countless generations, and

WHEREAS, the Tribe's ancestral territory extends from the mouth of Tenmile Creek (Lane County) in the north, south to Fivemile Point halfway between the mouths of Whiskey Run Creek and Cut Creek (coinciding with the border between Sections 30 and 31, Township 27 South, Range 14 West, Coos County), thence east to the crest of the Coast Range to Weatherly Creek on the Umpqua River ("Ancestral Territory"); and

WHEREAS, the LNG Terminal and a portion of the Pipeline run through the Tribe's Ancestral Territory; and

WHEREAS, the Tribe is deeply concerned by the potential effects of construction and operation of the LNG Terminal and the Pipeline on the Tribe's cultural resources; and

WHEREAS, cultural resources within the Jordan Cove Area include identified and unidentified but probable archaeological sites and items such as stone tools, fish traps, residential remains, cemetery remains, secondary deposits, historic bottle dumps, early frame houses, and mill works, dating from several thousand to less than one hundred years old, and all of which are a central part of the cultural heritage of the Tribe and of the region; and;

WHEREAS, during previous iterations of the Project, archaeological studies have been conducted and two archaeological sites were identified within the area of potential effects identified at that time – Sites 35CS221 and 35CS227 as requiring additional investigation; and

WHEREAS, as set forth in this Agreement, the Tribe will participate in the identification of potential adverse impacts to Site 35CS227, and the development of measures to avoid or mitigate any such impacts through design measures for the Project, and at least one archaeologist will monitor adjacent construction activities; and

WHEREAS, on July 31, 2006 through Resolution No. 2006-097, and again on July 29, 2015 through Resolution No. 2015-049 the Tribal Council designated the Jordan Cove Area as a Site of Tribal Cultural and Religious Significance; and

WHEREAS, construction, operation and decommissioning of the Project must take place in compliance with local, state and federal laws, including Section 106 of the NHPA, the National Environmental Policy Act (NEPA), the Native American Graves Protection and Repatriation Act (NAGPRA), Oregon laws regarding sites and artifacts (Oregon Revised Statutes (ORS) 358.905 *et seq.*), Oregon laws regarding Indian Graves and Protected Objects (ORS 97.740 *et seq.*; and the Coos Bay Estuary Management Plan; and

WHEREAS, the Parties seek to work cooperatively to avoid, minimize and, where appropriate, mitigate adverse effects to the Tribe's cultural resources from the Project Activities pursuant to the terms and conditions herein set forth.

NOW, THEREFORE, the Parties enter into this Agreement in a spirit of cooperation to provide a means by which the Parties can address the matters set forth in this Agreement with the goal of minimizing adverse effects to the Tribe's cultural resources arising from the construction, operation and decommissioning of the Project.

II. DEFINITIONS

2.1 "Applicable Law" means all applicable federal, state, and local laws, statutes, rules, regulations, codes, or ordinances, of a Governmental Authority.

2.2 "Archaeologist" means a scientist meeting all standards and requirements of the Secretary of the Interior set forth in 36 CFR Part 61, with a graduate degree in anthropology and the required experience to properly identify and record Cultural Resources.

2.3 "Area of Potential Effect" means that area delineated through the section 106 process for the Project.

2.4 "Cultural Resources" mean districts, sites, buildings, structures, Native American Human Remains and funerary objects, and all other physical objects that are significant to the Tribe's history, architecture, archeology and culture, including, but not limited to, historic properties and Traditional Cultural Properties to which the Tribe attaches religious and cultural significance.

2.5 "Curation" means the management and preservation of collections in accordance with the National Park Service's regulations in 36 CFR Part 79, unless otherwise agreed to in writing.

2.6 "Governmental Authority" means any (a) national, state, county, municipal or local government and any political subdivision thereof, (b) court or administrative tribunal, or (c) other governmental, quasi-governmental, judicial, public or statutory instrumentality, authority, body, agency, bureau or entity of competent jurisdiction.

2.7 "Ground Disturbing Activities" means any activity that compacts or disturbs the surface or subsurface within the Project Area. Ground Disturbance can be caused by the use of hand tools (shovels, pick axe, posthole digger, etc.), heavy equipment (excavators, backhoes, bulldozers, trenching and earthmoving equipment, etc.), and heavy trucks (large four-wheel drive trucks, dump trucks and tractor trailers, etc.). Trenching, bulldozing, excavating, scraping, vibrodensification, geo-piering and plowing are typical examples of Ground Disturbance Activities. Project types that usually involve Ground Disturbance include acquisition/demolition/relocation of

structures; vegetation management; landslide stabilization; and infrastructure projects such as utilities, storm water management, and flood control.

2.8 "Mitigate" means to minimize the potential effects to Cultural Resources where avoidance is not reasonably practicable. This may include, but is not limited to, data recovery, Monitoring, or relocation or Curation of the Cultural Resource.

2.9 "Monitor" means observance of Project Activities by a person determined by CTCLUSI to be knowledgeable and qualified in identifying Cultural Resources.

2.10 "Native American Human Remains" means the physical remains or partial remains of the body of a person of established or probable Native American ancestry.

2.11 "Person" means an individual, entity, corporation, partnership, limited liability company, joint venture, association, or unincorporated association or Governmental Authority.

2.12 "Project Activities" means testing, pre-construction, construction, operation, and decommissioning Ground Disturbing Activities within the Project Area that are reasonably likely to have adverse effects on Cultural Resources.

2.13 "Project Area" means the area depicted on Exhibit "A" attached hereto, as it may be amended from time to time.

2.14 "Traditional Cultural Property" or "TCP" means a property that is either eligible for listing or listed on the National Register of Historical Places ("NRHP") based on its associations with the cultural practices, traditions, or beliefs, of the Tribe. TCPs are rooted in the Tribe's history and are important in maintaining the continuing cultural identity of the Tribe.

2.15 "Unanticipated Discovery" means the unintentional encounter or discovery of Cultural Resources or Human Remains.

2.16 "Unanticipated Discovery Plan" or "UDP" means the agreed-upon plan attached to the FERC Memorandum of Agreement resulting from the conclusion of the section 106 process, a draft of which is attached to this Agreement as Exhibit "B", or, until issuance of a certificate by the FERC, an agreed upon-plan that is required by a Governmental Authority as a condition of an authorization, certification, approval or permit associated with Project Activities, or, in the absence of an agreed-upon plan that is required by a Governmental Authority, Exhibit B.

III. STIPULATIONS

3.1 **Purpose**. This Agreement sets forth the terms and conditions governing:

(a) communication and information exchange protocols between the Parties;

(b) the Tribe's participation in the identification of Cultural Resources within the Project Area; assessment of adverse impacts to Cultural Resources; and the development of measures to avoid, minimize or mitigate any potential effects in accordance with Applicable Law, and;

(c) Monitoring of Cultural Resources during Project Activities; and

(d) reimbursement to the Tribe for reasonable costs associated with implementation of this Agreement in accordance with the terms of the cost reimbursement agreement attached hereto as Exhibit 'C" and to fund a full-time position within the Tribe's Historic Preservation Office in accordance with the terms of section 3.9.

3.2 Mitigation Preferences.

(a) Jordan Cove agrees to avoid adverse impacts to Cultural Resources to the extent reasonably practicable. If adverse impacts are unavoidable then Jordan Cove agrees to minimize or mitigate any potential impacts in accordance with Applicable Law and considering the preferences set out in subparagraph (b) of this Section 3.2.

(b) For Project Activities that may impact Cultural Resources, Jordan Cove shall, in accordance with Applicable Law, apply the following order of preference with respect to preferred mitigation methodologies:

(1) Avoiding the impact altogether by not taking a certain action or parts of an action;

(2) Minimizing impacts by limiting the degree or magnitude of the action and its implementation;

(3) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;

(4) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action, and;

(5) Compensating for the impact, including but not limited to the relocation or Curation of the Cultural Resource.

3.3 Communication and Information Sharing. The Parties agree to the following information sharing and communication protocols:

(a) Within thirty (30) days of execution of this Agreement, Jordan Cove will identify individuals who will be the primary contact(s) or their designated representative for the purposes of implementing this Agreement and principal(s) who will be responsible for overall compliance with the Agreement and resolving any disputes in accordance with the terms of this Agreement; CTCLUSI will identify tribal officials or representatives who will be the primary contact for the purposes of implementing this Agreement and principals responsible for resolving any disputes.

(b) Jordan Cove will provide CTCLUSI with complete copies of permit applications required for Project Activities and provide CTCLUSI an opportunity to comment on such permit applications pursuant to Applicable law.

(c) Prior to all Project Activities, Jordan Cove will seek CTCLUSI's expertise and opinions related to potential discovery of Cultural Resources in the Project Area and the need for Monitoring of the Project Activities. CTCLUSI shall provide such expertise and opinions to Jordan Cove pursuant to subsection (f) below.

(c) Jordan Cove will provide timely, good faith responses to, and will take into consideration all timely written comments received from CTCLUSI related to Cultural Resources that could be affected by Project Activities pursuant to the terms of this Agreement.

(d) Jordan Cove will provide CTCLUSI with a schedule for all Project Activities, updated at a minimum quarterly, identifying dates on which or by which comments or Monitoring would be required under the terms of this Agreement ("Project Activity Schedule").

(e) Jordan Cove principals and CTCLUSI principals, in each case identified in accordance with subsection (a) above, will meet not less than quarterly and in coordination with the submission of updated Project Activities schedules, to discuss such schedules. CTCLUSI shall identify which Project Activities require Monitoring or comments to be provided by CTCLUSI. At least once a year, during a meeting to be held in February, the principals shall also review progress under the Agreement and whether the Agreement needs to be amended.

(f) In addition to the Project Activity Schedule, prior to undertaking each Project Activity, Jordan Cove will provide CTCLUSI with a Project Activity Notice in a form substantially as included as Exhibit "D". CTCLUSI shall provide any response or comment to such Project Activity Notice pursuant to the schedule set out below:

1. Not less than thirty (30) days, unless such notification is not practicable, before commencing any Project Activities requiring a Monitor from

CTCLUSI, Jordan Cove will provide CTCLUSI with a Project Activity Notice describing the activity to be taken, timing and any other information reasonably necessary to facilitate CTCLUSI Monitoring of such Project Activity, such as the scope of equipment to be used and number of construction fronts. If there are any material changes to the plans set out in the Project Activity Notice, Jordan Cove agrees to provide CTCLUSI with an additional notice and opportunity to comment. In the event of an emergency, Jordan Cove agrees to provide CTCLUSI with a summary of the Project Activities undertaken during the emergency, as soon as practicable following conclusion of the emergency.

2. Within twenty (20) days of receiving the Project Activity Notice, CTCLUSI will submit to Jordan Cove any comments or concerns, including requests for additional investigations or surveys, related to the proposed Project Activity.

3. Within seven (7) days of receiving CTCLUSI's comments, Jordan Cove will provide CTCLUSI notice regarding any changes Jordan Cove decides to make to the proposed Project Activity based on CTCLUSI's comments.

(d) The Parties will use reasonable efforts to informally resolve disputes arising under this Section 3.3. Disputes arising under this Section 3.3 that cannot be informally resolved between the Parties shall be subject to the dispute resolution provisions of this Agreement.

(e) Jordan Cove agrees to provide notice to staff, contractors, and consultants engaged by Jordan Cove to undertake Project Activities that are reasonably likely to affect Cultural Resources of the provisions of this Agreement and Jordan Cove's responsibilities under this Agreement.

(h) Jordan Cove agrees to work with CTCLUSI to develop a cultural resources awareness and training program, which shall be utilized during the onboarding process for all employees and contractors engaged in Project Activities at the LNG Terminal.

3.4 Identification of Cultural Resources; Assessment and Resolution of Adverse Impacts

(a) The Parties agree to work cooperatively to identify Cultural Resources and to assess and resolve any adverse impacts thereto in compliance with this Agreement and Applicable Laws. To the extent of any conflict, the provisions of Applicable Laws shall control.

(b) The Parties agree that the scope of Cultural Resource identification efforts shall, to the extent allowed by Applicable Law, include reference to and use of ethnographic analysis reports.

3.5 Monitoring During Applicable Project Activities.

(a) CTCLUSI may have Monitors present at Project Activities. All Monitors may be required to execute an Access Agreement substantially in the form attached hereto as Exhibit "E" for access to any lands within the Project Area, other than federal lands, that are owned or controlled by Jordan Cove.

(b) JCEP and PCGP will permit Tribal staff members or designated representatives ("Tribal Monitors") to be present in the Project Area, at the Tribe's option, to monitor Applicable Project Activities, subject to applicable access, safety, and security rules and policies.

(c) Jordan Cove will ensure that (1) the Tribe is provided reasonable notice of Project Activities as set out in this Agreement, and (2) Tribal Monitor are granted reasonable access to the Project Area and any Project Activities as necessary to perform his or her duties as a Tribal Monitor. Jordan Cove shall provide to CTCLUSI the equipment set out in the Project Activity Notice.

(d) Tribal Monitor access to any portion of the Project Area shall be subject to all applicable security and safety rules, laws, and regulations, and Jordan Cove's and its contractors' security and safety policies, including requirements relating to the use of proper clothing and safety equipment, including safety glasses or goggles, masks, rebreathers, hazmat suits, hard hats, or safety vests, provided that Jordan Cove reserves the right for itself and its contractors to prohibit access to any portion of the Project Area by any Person, including any Tribal Monitors, in its sole and absolute discretion to the extent of any actual or threatened breach of any such rules, laws, regulations, or policies.

(e) Jordan Cove acknowledges that the Tribe may incur certain costs in connection with a qualified Tribal Monitor's archaeological and/or safety training directly related to monitoring activities hereunder. Jordan Cove will reimburse the Tribe for all reasonable costs associated with Monitoring activities, pursuant to the Cost Recovery Agreement between the Parties, which is attached hereto as Exhibit "C" and incorporated herein by this reference.

(f) Jordan Cove shall hold the Tribe and its officers and employees harmless from and against any and all claims, actions, liabilities, losses, damages, judgments, grants, costs, and expenses (including attorney's fees) arising out of injury or death to persons, or damage to property caused by the negligence of Jordan Cove, its officers, employees, agents, assigns, and subcontractors in the performance of obligations arising under this Agreement, provided the Tribe promptly notifies Jordan Cove in writing of any such claim, and provided that Jordan Cove shall have the exclusive right to control the defense.

(g) The Tribe shall hold Jordan Cove, its officers and employees harmless from and against any and all claims, actions, liabilities, losses, damages, judgments, grants, costs, and expenses (including attorney's fees) arising out of injury or death to persons, or damage to property caused by the negligence of the Tribe and its officials, employees, agents, and subcontractors in the performance of obligations arising under this Agreement, provided: (i) Jordan Cove promptly notifies the Tribe in writing of any such claim; (ii) the Tribe shall have the exclusive right to control the defense; and (iii) the amount does not exceed and is otherwise covered by the Tribe's liability insurance.

(h) The Tribe shall maintain, during the term and each renewal or extension of this Agreement, at its own expense, the following insurance: (i) statutory workers' compensation insurance or equivalent industrial accident insurance covering all employees as required by law; (ii) commercial automobile liability coverage (if the use of automobiles is required) for all owned, hired, borrowed, leased, or non-owned automobiles, providing bodily injury and property damage liability coverage with a combined single limit of $1,000,000; and (iii) commercial general liability insurance (including, but not limited to, premises operations, property damage, products/completed operations, contractual liability, and personal injury) with limits of at least $1,000,000 per occurrence/ $2,000,000 annual aggregate.

(i) Upon request of the Tribal Council, and subject to any necessary safety requirements, Jordan Cove shall allow reasonable site access to Tribal Council Members and to Tribal Council authorized Tribal cultural leaders, to perform ceremonies and blessings prior to a Tribal Council identified Ground Disturbing Activity.

3.6 Inadvertent Discoveries.

If Cultural Resources are discovered in the Project Area, including during Project Activities, Jordan Cove agrees to:

(a) Promptly inform the Tribe of the discovery; and

(b) Comply with the procedures and protocols set forth in the UDP, which is attached hereto as Exhibit "B" and incorporated herein by this reference. The Parties expect the UDP to remain substantially in the form as the document attached hereto as this document has been provided to FERC.

3.7 Confidentiality

For purposes of this Agreement, the Parties agree as follows:

(a) Tribal Confidential Information means all information whether written or oral, including ethnographic reports, provided by the Tribe to Jordan Cove regarding: potential burial sites, archeological objects, funerary objects or objects of cultural patrimony as defined by ORS 358.905, sacred or religious sites and traditional gathering locations.

(b) Jordan Cove Confidential Information means all information whether written or oral provided by Jordan Cove which it designates as confidential at the time the information is provided to the Tribe in furtherance of the activities under this agreement. Jordan Cove Confidential Information, includes, but is not limited to, technical reports, operations information, construction plans and similar information.

(c) Receiving Party means the party receiving Confidential Information.

(d) Disclosing Party means the party disclosing the Confidential Information.

(e) Confidential Information shall not include information that (i) is available in the public domain; (ii) was in the Receiving Party's possession prior to the date of this Agreement and not covered by any confidentiality requirements; (iii) the Receiving Party received from a third party who was not under any obligation of confidentiality with respect to the information.

(f) The Receiving Party will not disclose the Disclosing Party's Confidential Information and will maintain such information as confidential using practices no less stringent that the Receiving Party applies to its own confidential information. The Receiving Party agrees not to disclose Confidential Information without the prior written consent of the Disclosing Party; provided, however, the Receiving Party may disclose Confidential Information to the Receiving Party's affiliates, officers, directors, partners, employees, accountants, advisors, consultant and representatives (Related Persons) but only to the extent necessary for purposes of this Agreement. The Receiving Party shall be responsible for any acts or omissions of its Related Persons with respect to Confidential Information provided pursuant to the terms of this Agreement.

(g) If Jordan Cove or the Tribe become aware of a disclosure of Confidential Information in violation of the terms of this Agreement, the party making such discovery shall promptly notify the other party of such disclosure. Jordan Cove and the Tribe agree that the unauthorized disclosure of Confidential Information would cause irreparable harm that would be difficult to quantify. Accordingly, Jordan Cove and the Tribe agree the Disclosing Party would be entitled to injunctive relief in the event of a breach of this Agreement with respect to Confidential Information in addition to any other remedies that may be available to the Disclosing Party at law or in equity. The Receiving Party shall not contest the Disclosing Party's right to

seek any such relief on the grounds that monetary damages would be available to compensate the Disclosing Party for any such breach.

(h) Nothing in this Agreement shall convey to either Party any rights in or to the Confidential Information, including any rights of ownership or license, whether arising under patent, copyright, trademark, trade secret or any other intellectual property or other proprietary right.

(i) Notwithstanding anything contained herein to the contrary, the commitments and obligations set forth in this Section 3.7 shall continue until the earlier to occur of Jordan Cove notifying the Tribe that (i) Project Activities are complete or (ii) the Project has been cancelled.

3.8 Funding of full time position. Jordan Cove agrees to provide in accordance with the terms of a separate agreement to be entered into between CTCLUSI and Jordan Cove within sixty (60) days of execution of this Agreement funding for a full-time position to assist CTCLUSI's Tribal Historic Preservation Office in carrying out CTCLUSI's obligations under this Agreement and other duties as assigned by CTCLUSI.

3.9 Governing Law. This Agreement shall be governed by and construed in accordance with the laws of the State of Oregon, without reference to conflicts of law rules, and the federal laws of the United States.

3.10 Dispute Resolution.

(a) All standards and procedures contained within Applicable Law pertinent to the provisions of this Agreement shall control.

(b) The Parties desire to prevent disputes regarding compliance with this Agreement whenever possible, and to quickly and effectively resolve disagreements when they arise. All disputes under this Agreement shall be considered Confidential Information and shall be subject to the provisions of Section 3.7, subject to Applicable Law.

(c) To the extent possible, the Parties will use reasonable efforts to negotiate a mutually agreeable resolution to any disagreements by the parties responsible for the day-to-day implementation of the provisions of this Agreement. In the event such parties are not able to resolve any disagreements within a reasonable period of time, the dispute shall be elevated to the principals designated under section 3.3(a) by either party providing written notice to the other party's principal.

(d) Upon receipt of a notice as set out in subparagraph (c) above, the principals agree to meet in person no later than ten (10) days after receipt of the notice, unless the Parties mutually agree to a different time and manner of meeting.

(e) The Principals will attempt, in good faith, to resolve the dispute between the Parties.

(f) If the parties are unable to resolve the disputed issues through joint discussions under this Section, either party may request arbitration by providing a written arbitration demand to the other party. The party on whom the demand is served shall have ten (10) days after receipt of the arbitration demand to advise the other party as to whether it will agree to arbitration.

(g) If the parties do not agree to arbitrate, then each party reserves the right to terminate this Agreement pursuant to Section 3.13, and/or to argue that failure to comply with this Agreement results in a violation of Applicable Law and any permits, certifications or approvals related to the Project.

(h) Arbitration shall be conducted in accordance with the Commercial Arbitration Rules of the American Arbitration Association ("AAA") or other mutually agreed-upon procedures. All arbitration hearings shall be held at Coos Bay, Oregon or such other place mutually agreed to by the Parties. If either Party fails to abide by such arbitration ruling, the Parties agree to enforce the arbitration award in Oregon state courts or any federal court having jurisdiction.

(i) In determining any matter(s) the arbitrators shall apply the terms of the Agreement, without adding to, modifying or changing the terms in any respect, and shall apply the laws of the State of Oregon.

(j) Prior to submitting to arbitration, the Parties may mutually agree to engage in mediation, in which case the Commercial Mediation Procedures of the AAA shall apply or other mutually agreed-upon procedures.

3.11 Limited Waiver of Sovereign Immunity

(a) CTCLUSI hereby grants an irrevocable, limited waiver of sovereign immunity to compel arbitration, once the Tribe has provided written notice to agree to arbitration pursuant to Subsection 3.11(f), and to enforcement of an arbitration award. Furthermore, for the sole and limited purpose of enforcement of any arbitration award, CTCLUSI expressly waives its sovereign immunity from suit by Jordan Cove, JCEP and PCGP and consents to be sued in the Oregon state courts or, if Oregon state courts lack jurisdiction over the suit, then in the United States District Court for the District of Oregon and appeals may be made to the United States Court of Appeals for the Ninth Circuit and the United States Supreme Court.

(b) Relief against the Tribe is specifically limited to the following actions and remedies:

(1) Injunctive relief as necessary to enforce arbitration awards or orders pursuant to Section 3.10.

(2) An Action to compel arbitration, once the Tribe has provided written notice to agree to arbitration pursuant to Subsection 3.10(f).

3.12 Term and Termination

(a) This Agreement shall be for a term of ten (10) years from the Effective Date unless extended upon the mutual written agreement of the Parties.

(b) This Agreement may be terminated by either Party by providing thirty (30) days written notice to the other Party. If this Agreement is terminated pursuant to this Section, then each party reserves all rights to argue that termination of this Agreement results in a violation of Applicable Laws and any permits, certifications or approvals related to the Project.

3.13 General Provisions.

(a) If any term or provision of this Agreement is held invalid, illegal or unenforceable by a court of competent jurisdiction for any reason, the Parties agree to modify such provision to the extent required to render it valid, legal, or enforceable, and the remainder of this Agreement shall in no way be affected and shall remain valid and enforceable for all purposes.

(b) All words in this Agreement shall be deemed to include any number or gender as the context or sense of this Agreement requires. The words "will," "shall," and "must" in this Agreement indicate a mandatory obligation subject to the terms hereof and Applicable Law. The use of the words "include," "includes," and "including" followed by one or more examples is intended to be illustrative and shall be deemed to be followed by the words "without limitation." The words "day" and "days" refer to calendar days unless otherwise stated. The words "month" and "months" refer to calendar months unless otherwise stated. The words "hereof", "hereto" and "herein" refer to this Agreement, and are not limited to the article, section, paragraph or clause in which such words are used.

(c) The headings and captions contained herein are for the purposes of convenience and reference only and are not to be construed as a part of this Agreement. All references to any Section in this Agreement are to Sections of this Agreement, unless otherwise noted.

(d) No third party shall be a beneficiary of a Party's rights or benefits under this Agreement, other than as expressly set forth herein.

(e) NOTWITHSTANDING ANYTHING CONTAINED HEREIN TO THE CONTRARY, IN NO EVENT SHALL EITHER PARTY BE LIABLE TO THE OTHER PARTY WITH RESPECT TO ANY CLAIM ARISING OUT OF OR RELATING TO THIS AGREEMENT FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, OR INDIRECT LOSSES OR DAMAGES FROM ITS PERFORMANCE UNDER THIS AGREEMENT OR ANY FAILURE OF PERFORMANCE HEREUNDER OR RELATED HERETO, WHETHER ARISING OUT OF BREACH OF CONTRACT, TORT, STRICT LIABILITY OT OTHERWISE; provided, however, that the limitations of this clause (e) shall not apply to any rights to defense and indemnification of Jordan Cove, the Tribe or any other Indemnified Parties as provided elsewhere in this Agreement.

(f) Except as the Parties may otherwise agree in writing or as otherwise provided herein, each Party shall bear its respective fees, costs and expenses in connection with this Agreement and the transactions contemplated hereby.

(g) No waiver by any Party, whether express or implied, of any right under any provision of this Agreement shall constitute a waiver of such Party's right at any other time or a waiver of such Party's rights under any other provision of this Agreement unless it is made in writing. No failure by any Party hereto to take any action with respect to any breach of this Agreement or default by another Party shall constitute a waiver of the former Party's right to enforce any provision of this Agreement or to take action with respect to such breach or default or any subsequent breach or default by such latter Party.

(h) **Each Party acknowledges that it and its attorneys have been given an equal opportunity to draft, review, negotiate, and modify the terms and conditions of this Agreement and that any rule of construction to the effect that ambiguities or any other matters are to be resolved against the drafting party, or any similar rule operating against the drafter, shall not be applicable to the construction or interpretation of this Agreement.**

(i) This Agreement shall apply to Jordan Cove's successors and assigns.

(j) Any notice, demand, offer, or other written instrument required or permitted to be given pursuant to this Agreement shall be in writing signed by the Party giving such notice and shall be delivered by (1) hand, (2) same-day or overnight courier, (3) certified mail, return receipt requested, or (4) email to the other Party at the address set forth below:

i. If to the Tribe:

Confederated Tribes of Coos,

Lower Umpqua and Siuslaw Indians
1245 Fulton Avenue
Coos Bay, Oregon 97420
Attention: Tribal Council Chairman
E-mail: MCorvi@ctclusi.org (with CC to SScott@ctclusi.org and scott@wheatlawoffices.com)

ii. If to Jordan Cove:

Jordan Cove Energy Project L.P.
Pacific Connector Gas Pipeline L.P.
c/o Jordan Cove LNG L.L.C.
5615 Kirby Drive, Suite 500
Houston, Texas 77005
Attention: Manager Tribal Affairs
E-mail: (with a CC to neades@pembina.com)

Each Party shall have the right to change the place to which notice shall be sent or delivered by sending a written notice to the other Party in like manner. Notices, demands, offers or other written instruments shall be deemed to be received: (1) if delivered by hand, by same-day or overnight courier service, or certified mail on the date actually received at the address of the intended recipient; or (2) if sent by email, upon actual receipt.

[*Signature pages follow.*]

SIGNATORIES:

7/26/18

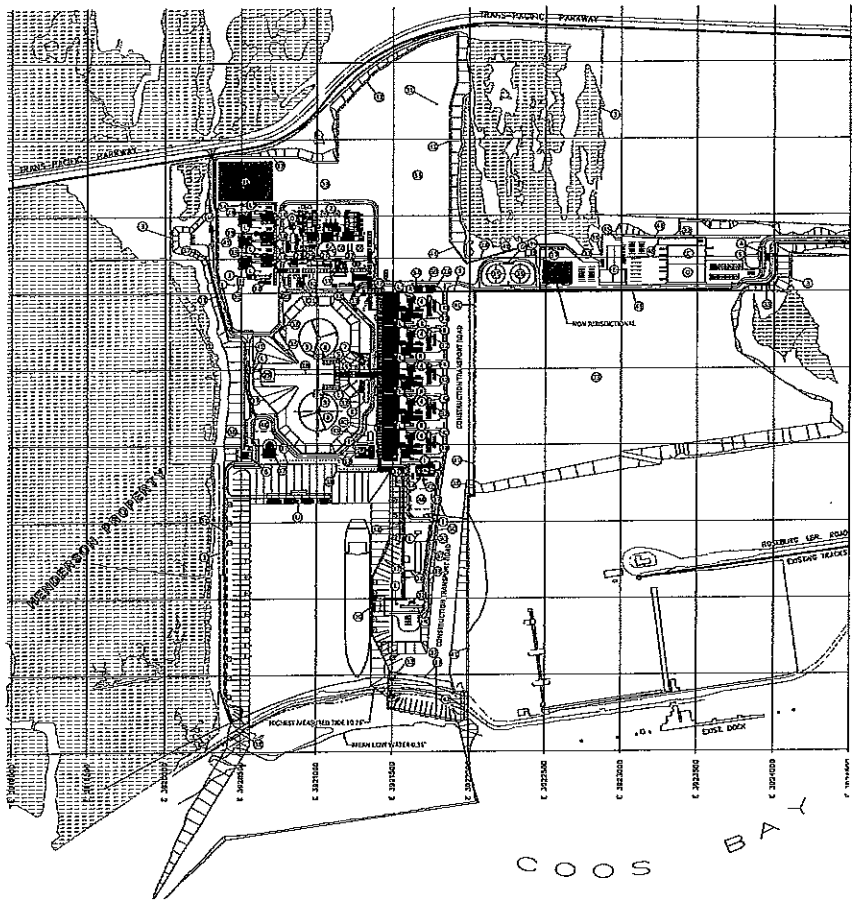
JORDAN COVE ENERGY PROJECT, LP Date
by its General Partner, Jordan Cove Energy Project, L.L.C.
and Pacific Connector Gas Pipeline, LP
by its General Partner, Pacific Connector Gas Pipeline, L.L.C.

SIGNATORIES:

2-20-2018

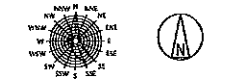
Mark Ingersoll Date
Tribal Council Chairman
Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians

Exhibit A
Project Area



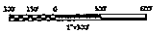
ITEM	FACILITIES LEGEND
1	NEW GAS HEATER
2	GAS CONDITIONING TRAIN
3	PROPERTY BOUNDARY
4	LNG LIQUEFACTION TRAIN #1 TO LIQUEFIES
5	LNG EXPANDER (WITH SHELTER)
6	LNG FLASH DRUM
7	LNG REFRIGERANT PUMPS (WITH SHELTER)
8	LNG STORAGE TANK
9	LNG TANK ELEVATE
10	LNG LOADING PLATFORM
11	REFRIGERANT MAKE-UP
12	LNG BOG COMPRESSORS (WITH D-SHELTER)
13	CONTROL ROOM BUILDING
14	BAKER POINT GROUND FLARE RD DRUM
15	MOTOR LOCK
16	JASPER POINT GROUND FLARE
17	ENCLOSED GROUND FLARE - MARINE
18	TOP AUXILIARY POWER STG
19	TOP AUTO LIT POWER STG CONTROL ENCLOSURES
20	MAIN LIGHT BOILER
21	CIRCULATION / LEVEL PUMPS
22	NOT USED
23	PLANT / INSTRUMENT AIR COMPRESSORS
24	NITROGEN GENERATION PACKAGE
25	HEATING STORAGE / VAPORIZATION
26	AMMONIA STORAGE TANKS AND PUMPS
27	AMINE STORAGE
28	LNG DRAINAGE CHANNEL
29	PROCESS AREA TANK BUILDING SHOW
30	MARINE AREA ENCLOSURE BUILDING
31	FIRE PUMP GENERATOR SHELTER
32	TRANSFORMERS
33	CONSTRUCTION LAYDOWN AREA
34	DIESEL STORAGE
35	FIREWATER STORAGE TANKS
36	LNG TRANSFER PUMP
37	PLANT SECURITY FENCE
38	RETAINING WALL
39	BACKUP GENERATOR
40	PIPERACK
41	INFRARED FLAME VAPOR BARRIER
42	RD PRODUCT TANK
43	CONST. MARINE OFF-LOADING FACILITIES AREA (CONST. BASE)
44	DEMIN WATER STORAGE TANK
45	WASTEWATER TREATMENT PACKAGE PLANT
46	LAYDOWN AREA
47	DUMP CONCRETE
48	TOTEM STORM WATER INFILTRATION CHAMBER
49	BOG VFD ENCLOSURE
50	FLEXIBLE VAPOR SLEEVES
51	TSUNAMI WALL ELEVATION VARIES TO SUIT THE DESIGN TSUNAMI
52	METEOROLOGICAL MAST LOCATED WEST OF THE SITE NEAR INDUSTRIAL WASTEWATER LAGOONS

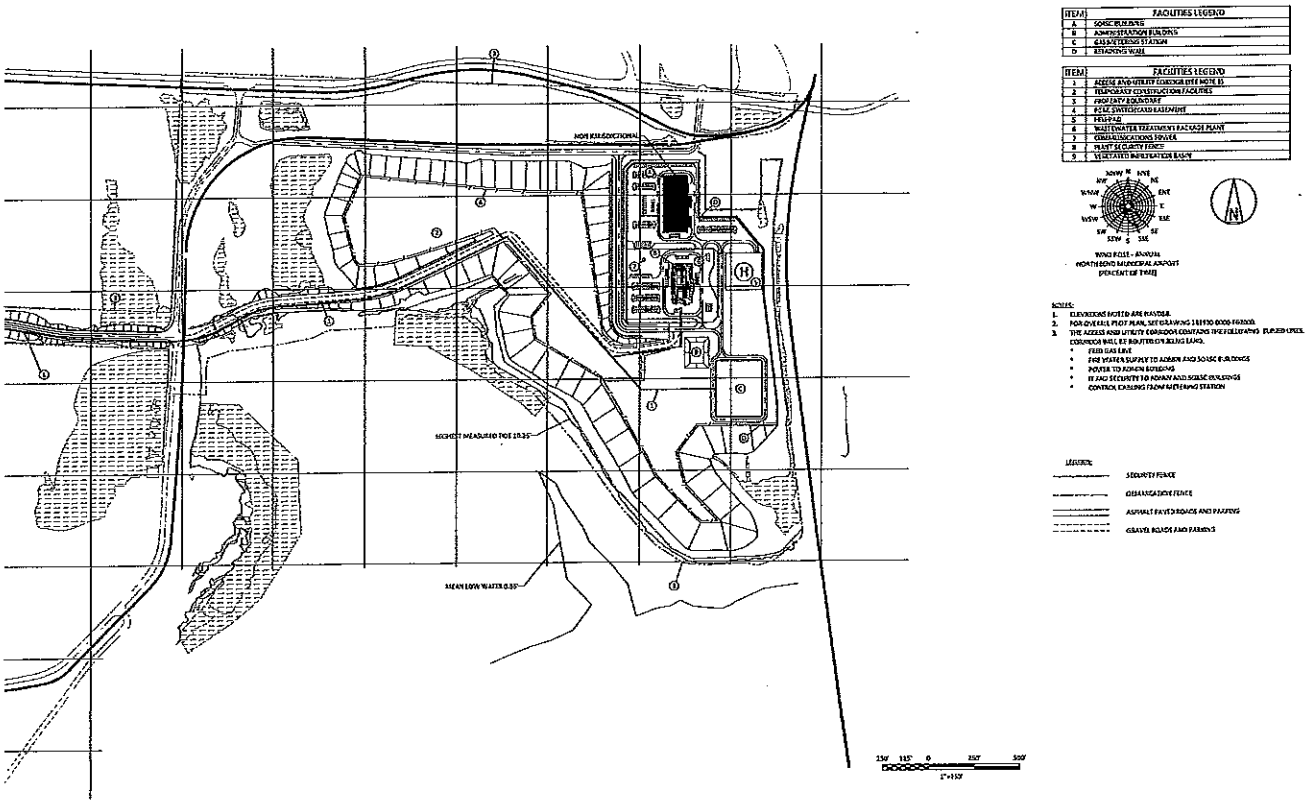
ITEM	FACILITIES LEGEND
A	MAIN GUARD HOUSE / SECURITY BUILDING
B	FIRE FACILITY BUILDING
C	PLANT WAREHOUSE
D	MAINTENANCE BUILDING
E	OPERATIONS BUILDING (INCLUDES CONTROL ROOM)
F	WASTE TREATMENT BUILDING
G	FACILITY FIRE WATER PUMPS WITH BUILDING
H	LIQUEFIED PROPANE AND COMPRESSED GAS STORAGE
I	FACILITY ADMIN POWER CABLE ENCLOSURE
K	POWER & UTILITY ENCLOSURE
L	FIRE WATER VALVE HOUSE
M	SECONDARY ENTRANCE SECURITY GATE/TEMPORARY GUARD BUILDING
N	MAINTENANCE VEHICLES ENCLOSURE
P	FIRE DEPARTMENT
Q	ESC TRAIN 3 POWER HOUSE ENCLOSURE
R	CEMS BUILDING BOSS PAD
S	INSPECTION STATION SHELTER
T	SAND PIT AREA (GUARD HOUSE
U	TUG BOAT BERTH



NOTES:
1. ELEVATIONS NOTED ARE IN NAVD88.

LEGEND:
- SECURITY FENCE
- DEMARCATION FENCE
- PROPERTY BOUNDARY
- ASPHALT PAVED ROADS AND PARKING
- GRAVEL ROADS AND PARKING
- IMPERMEABLE MEMBRANE BARRIER WITH SECURITY
- FLAME ARRESTER VAPOR BARRIER




FACILITIES LEGEND
A SONIC BUILDING
B ADMINISTRATION BUILDING
C GAS METERING STATION
D RETAINING WALL
FACILITIES LEGEND
1 ACCESS AND UTILITY CORRIDOR (SEE NOTE 3)
2 TEMPORARY CONSTRUCTION FACILITIES
3 PROPERTY BOUNDARY
4 PUBLIC ENTRY ROAD EASEMENT
5 HELIPAD
6 WASTEWATER TREATMENT PACKAGE PLANT
7 COMMUNICATIONS TOWER
8 PLANT SECURITY FENCE
9 VEGETATED INFILTRATION BASIN
WIND ROSE - ANNUAL
MONTEREY MUNICIPAL AIRPORT
(PERCENT OF TIME)
NOTES:
1. ELEVATIONS NOTED ARE NAVD88.
2. FOR OVERALL PILOT PLAN, SEE DRAWING 181970-0000-PA0000.
3. THE ACCESS AND UTILITY CORRIDOR CONTAINS THE FOLLOWING FUNCTIONS, PLEASE CHECK CORRIDOR WILL BE ROUTED ON BELOW LAND.
• FEED GAS LINE
• FIRE WATER SUPPLY TO ADMIN AND SONIC BUILDINGS
• POWER TO ADMIN BUILDING
• IT AND SECURITY TO ADMIN AND SONIC BUILDINGS
• CONTROL CABLING FROM METERING STATION
LEGEND:
SECURITY FENCE
ORNAMENTAL FENCE
ASPHALT PAVED ROADS AND PARKING
GRAVEL ROADS AND PARKING
HIGHEST MEASURED TIDE 10.25'
MEAN LOW WATER 0.35'
150' 100' 0 150' 300'
1" = 150'

0 3.75 7.5 15
Miles

Coos County
Route

N

REV 1
REVISED DATE:
Date: 8/7/2018

EXHIBIT

Pacific Connector GAS PIPELINE

PACIFIC CONNECTOR GAS PIPELINE, LP

MAP BOOK

COOS COUNTY, OREGON

Jordan Cove LNG, LLC

DRAFT

Unanticipated Discovery Plan

Jordan Cove Energy Project

and

Pacific Connector Gas Pipeline Project

July 2018

Unanticipated Discovery Plan

1.0 Introduction

This document provides an Unanticipated Discovery Plan (UDP) that will be followed by Jordan Cove Energy Project, LP (JCEP) and Pacific Connector Gas Project, LP (PCGP) (JCEP and PCGP are collectively referred to as "Jordan Cove"). JCEP is seeking authorization from the Federal Energy Regulatory Commission (FERC) to site, construct and operate a natural gas liquefaction and liquefied natural gas (LNG) export facility on the North Spit of Coos Bay, Oregon (LNG Terminal). PCGP will simultaneously be seeking an authorization from FERC to construct and operate an approximately 229-mile long, 36-inch diameter natural gas transmission pipeline from near Malin, Oregon to the LNG Terminal (the LNG Terminal and Pipeline are collectively referred to as the "Project"). This UDP provides the procedures Jordan Cove, its personnel and consultants will follow in the event that unanticipated discoveries of historic properties, archaeological objects, archaeological sites, or human remains, funerary objects, sacred items and items of cultural patrimony are made during the construction and operation of the Project.

Potential unanticipated discoveries fall into two primary classes. The first class includes archaeological objects, materials or features such as hearths, pit features, or remains of dwellings. The second class consists of human remains, funerary objects, sacred items and items of cultural patrimony. The two classes are governed by different laws and regulations and require different treatment procedures.

Procedures for dealing with unanticipated discovery of human remains are outlined in Section 3.0, and procedures for dealing with the unanticipated discovery of archaeological objects are outlined in Section 4.0.

This UDP is intended to:

- Comply with applicable Federal and State and local laws and regulations – the National Historic Preservation Act of 1966, 16 U.S.C. § 470 and its implementing regulations at 36 CFR Part 800, 36 CFR Part 63; 36 CFR Part 61; the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA), 25 U.S.C. §§ 3001 *et. seq.* and its implementing regulations at 43 CFR Part 10; Archaeological Resources Protection Act of 1979, as amended and its implementing regulations at 36 CFR Part 296; Oregon Revised Statutes (ORS) 97.740-97.760 for Indian Graves and Protected Objects; ORS 358.905-358.961 for the Protection of Archaeological Objects and Sites; ORS 390.235 for Archaeological Permit Requirements; OAR 736-051-0080 through 0090 Administrative Rules for Oregon Archaeological Excavation Permits; the Government to Government Cultural Resource Cluster Group "Treatment of Native American Human Remains Discovered Inadvertently or Through Criminal Investigations on Private and Non-Federal Public Lands in Oregon"; and Federal Energy Regulatory Commission's Guidelines for Reporting on Cultural Resources Investigations for Pipeline Projects (July 2017);
- Describe to regulatory and review agencies the procedure Jordan Cove and its contractors will follow to address the unanticipated discovery of archaeological

objects, historic properties or human remains, funerary objects, sacred items and items of cultural patrimony; and

- Provide direction and guidance to Project personnel as to the proper procedure to be followed should an unanticipated discovery occur.
- Provide contact information for all parties that require notification – State police, LCIS, SHPO and affected Tribes.

2.0 Training and Orientation

Jordan Cove, in consultation with the FERC, will designate a Cultural Resources Coordinator (CRC) who will be responsible for all archaeological materials and historic properties-related activities on the Project. The CRC will be a professional archaeologist (meeting the Secretary of the Interior's Guidelines as defined in 36 CFR 61). For practical purposes, the CRC may designate an Environmental Inspector (EI) or other supervisor to provide notifications required under this UDP but may not delegate any of the CRC's other responsibilities, unless the EI is a professional archaeologist and meets the requirements of 36 C.F.R. Part 61, in which case the EI may act in the CRC's place if the CRC is unavailable. The CRC will provide archaeological/cultural resource orientation for Jordan Cove and advise construction contractors and personnel on the procedures to follow in the event that an unanticipated discovery is made. Training will occur as part of the pre-construction on-site training program for foremen, environmental inspectors (EIs), construction supervisors, and all other supervisory personnel who supervise any construction or inspection activities. Training will involve both general and detailed instructions regarding how to follow the requirements of the UDP, basic archaeological artifact and site identification, and an overview of the state and federal laws pertaining to the protection of archaeological resources. General instructions shall include:

- Ensure that all construction supervisors have contact information for the CRC.
- Stop work immediately if archaeological objects (artifacts, historic or prehistoric features [wells, privies, shell middens, etc.], bones, or any item suspected of being archaeological), funerary objects, sacred items and items of cultural patrimony are identified.
- Contact the construction supervisor immediately. The construction supervisor shall notify the CRC or its designee as soon as possible.
- Restrict access to the discovery.
- Drawings, photographs, or analysis will not be permitted without consultation and approval from the appropriate Indian Tribes.
- The discovery will not be shared with the media or individuals not pertinent to the assessment or protection of the remains.
- Comply with all unanticipated discovery procedures.
- Treat human remains, funerary objects, sacred objects, and objects of cultural patrimony with dignity and respect. Do not touch any human remains.
- A description of the potential penalties for failure to report discoveries or to comply with the procedures outlined in this UDP.
- The penalties that could be incurred by anyone who illegally collects or destroys any archaeological objects, archaeological sites, or historical artifacts, funerary

objects, sacred objects and objects of cultural patrimony and associated materials and/or their context.

3.0 Procedures for the Inadvertent Discovery of Human Remains or Burial Sites

Any human remains, burial sites, or burial related objects that are discovered during construction will at all times be treated with dignity and respect.

Pursuant to ORS 97.745(4), if suspected Native American remains are encountered on private or non-federal public lands, Jordan Cove will notify the state police, SHPO, the Oregon Commission on Indian Services (OCIS), the FERC, and the appropriate Indian Tribe(s) as soon as possible but in all cases, within twenty-four hours of the determination.

In accordance with NAGPRA, if the remains are found on federal lands, in addition to contacting those entities listed in the previous paragraph, the CRC will immediately contact the applicable federal land management agency in accordance with the requirements of 43 C.F.R. § 10.4. The federal land management agency will then be responsible for further contact with any appropriate Indian Tribes.

Indian Tribes that may have ancestral burial sites in the Project area include, but are not limited to, the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians, the Confederated Tribes of Grand Ronde, the Confederated Tribes of Siletz, the Coquille Indian Tribe, the Cow Creek Band of Umpqua Tribe of Indians, and the Klamath Tribes.

The CRC will, in all cases of a potential discovery, complete a form or provide other written documentation acceptable to FERC and SHPO to document a potential discovery. The CRC and all EIs will comply with the following procedures:

A. If any Jordan Cove personnel or contractors believe he or she has made an unanticipated discovery of human remains (skeletal, teeth or hair), the remains will not be moved or disturbed, and the construction supervisor shall be immediately notified. The construction supervisor shall, in turn, immediately notify the CRC and the appropriate EI.

B. The CRC or its designee will be responsible for taking appropriate steps to protect the discovery. The construction activity that resulted in the exposure of the discovery will be immediately halted, followed, as soon as possible, by the cessation of all other ground-disturbing activity within 300 ft (91 m) of the discovery, unless a greater distance is required by SHPO to protect a discovery. Construction activities may continue elsewhere on the Project site. After all construction activity within 300 ft (91 m) of the discovery has been halted, the following steps will be taken to ensure that no further disturbance occurs to the discovery:

i) secure an area at least 300 ft (91 m) around the discovery using orange safety fencing or a similar material, as necessary;
ii) prevent vehicle traffic through the area immediately surrounding the discovery except as necessary to remove vehicles and equipment already present in the area;
iii) consult with the SHPO to determine whether a 24-hour guard is needed to ensure that the find is secure at all times or consult with the applicable federal land management agency if the lands are federal;

iv) limit access to the area surrounding the discovery to essential personnel, who will be identified by the CRC; and

v) If the remains are suspected to be Native American, no photographs will be allowed unless approval is provided by the appropriate Indian Tribe(s). If the state police determine the discovery to be a crime scene, then any photographs will be taken at the direction of the state police.

C. The CRC or its designee will immediately call the state police, SHPO, the LCIS, the appropriate Indian Tribe(s) and FERC, who will, according to their responsibilities, examine the discovery and determine whether it should be treated as a crime scene or as a human burial/cemetery. The CRC or its qualified designee will also have a physical anthropologist examine the discovery to concur with the coroner on whether the remains are human and whether or not they are contemporary. The physical anthropologist will have been previously agreed upon by the Indian Tribe(s). In the event of a disagreement between the coroner and the physical anthropologist, the opinion of the physical anthropologist shall control. A forensic anthropologist may also be required to determine whether the remains are of Native American ancestry. If the remains are determined to be or suspected to be of Native American ancestry, no photographs will be taken. If the discovery occurs on federal lands, the CRC will also immediately notify the applicable federal land management agency, and the Federal Land Archaeologist, if qualified to do so, will make, in consultation with the appropriate Indian Tribe(s), the determination as to whether the remains are human and of possible Native American ancestry. If the Federal Land Archaeologist is not qualified to determine whether the remains are human, the Federal Land Archaeologist will engage a forensic anthropologist or osteo-archaeologist, who shall consult with the appropriate Indian Tribes to determine whether the remains are of Native American ancestry. All work within 300 ft buffer around the discovery will halt until permission to resume work is provide by FERC, the SHPO or the applicable federal agency for finds on federal lands.

D. If the remains are determined to be non-human by the archaeologist and/or forensic anthropologist, and there are no archaeological objects identified in association with the remains, then the archaeologist or forensic anthropologist will inform the CRC, who will notify the Construction Superintendent that construction can resume. The CRC will complete the Discovery Form and take photographs of any find. The photographs shall be sufficient for a trained archaeologist to determine that the remains are not human by reviewing them. The Discovery Form and photographs shall be submitted to FERC, the SHPO and the appropriate Indian Tribe(s) within 15 days of the discovery.

E. If the remains are determined to be non-human by the archaeologist and/or forensic anthropologist, but associated with an archaeological site, the CRC shall follow the procedures identified in Section 4 below.

F. If the remains are determined to be human and associated with a crime scene by the appropriate county coroner, then the CRC shall immediately inform the Construction Superintendent to follow the coroner's protocol for removal of the remains. The CRC will complete the Discovery Form and take photographs of the find to the extent allowed by State law. The Discovery Form and photographs shall be submitted to FERC and the SHPO within 15 days of the discovery.

G. If the remains are determined to be human, not to be the result of criminal activity and not within an archaeological context, and not of Native American Ancestry, the CRC or its designee will notify the SHPO as soon as possible but in all cases within

24 hours. The SHPO will be kept informed of all discussions regarding the remains until their final status is resolved.

The CRC or its designee will contact the OCIS as well as all appropriate Indian Tribes and notify them of the discovery by phone or e-mail as soon as possible but in all cases within twenty-four hours of the discovery. The appropriate Indian Tribe(s) also will be notified in writing within three days of the discovery, and this notification shall include information on the site of the human remains along with the name of the person or agency in charge of the find.

H. If the remains are determined to be human, within an archaeological context, and of Native American ancestry, the CRC shall follow the steps in Section 4 subparagraphs (5) - (13) for the unanticipated discovery of an archaeological site and the following:

- Notifications to the appropriate agencies and Indian Tribes shall indicate that human remains have been identified.
- No photographs shall be taken of Native American human remains.
- No further assessment shall be conducted until a Tribal representative(s) is present.
- The public and non-essential personnel will be excluded from the site.
- The discovery will not be shared with the media or any individuals who are not required for the assessment and protection of the remains.
- The CRC shall request that the appropriate Indian Tribe(s) inform them of any requests they have regarding the treatment of the remains and such requests shall be honored to the greatest extent possible.
- Field investigations to determine the NRHP-eligibility of archaeological materials shall avoid contact with the human remains.
- The CRC will consult with the SHPO and appropriate Tribe(s) to develop field investigations designed to evaluate the potential for additional human remains to be present without disturbing them.
- The CRC will consult with the Construction Superintendent, the SHPO, and appropriate Tribe(s) to determine if the remains can be avoided by an alternative construction technique. If such a technique is possible, construction shall resume upon approval from SHPO and will be monitored by a professional archaeologist and the appropriate Indian Tribe(s) if they request to do so.
- If disturbance of the remains cannot be avoided and the remains are not part of a crime scene or are part of an historic cemetery, the CRC will consult with the SHPO and appropriate Indian Tribe(s), if applicable, or likely descendants to develop a treatment plan. The treatment plan will outline measure to be implemented, including addressing how the remains should be excavated, repatriated, reinterred and reported. The treatment plan will clearly state that Jordan Cove shall be responsible for all costs associated with implementation of an approved treatment plan. Human remains will not be permanently curated.
- If disturbance of the remains cannot be avoided and the remains are part of an archaeological site that will also be affected by construction, the CRC will consult with the SHPO and appropriate Tribe(s) to develop a treatment plan for the site that includes provisions for temporary curation, reporting, repatriation

and re-internment of the human remains and disposition of any artifacts. The treatment plan will be implemented after approval from the SHPO.

I. The FERC will consult with the appropriate Indian Tribes to determine best practices for handling human remains of Native American ancestry. No work is to take place 300 feet of the area of the delineated discovery until a treatment plan has been approved and implemented.

J. Jordan Cove will offer to compensate the appropriate Indian Tribe(s) for their time and expenses related to any activities associated with the implementation of this UDP. In the event Jordan Cove has entered into a cost recovery agreement with a Tribe addressing such costs, Jordan Cove will abide by the terms of such agreement.

K. Jordan Cove will be responsible for any reburial costs associated with any human remains encountered during construction of the Project that are not associated with a criminal site.

L. If multiple sets of remains are found, which are determined to be of Native American ancestry, Jordan Cove will consult with the appropriate Tribe(s) to determine the appropriate action, including rerouting around any such sites.

4.0 Procedures for the Inadvertent Discovery of Archaeological Objects or Sites

In Oregon, it is illegal to disturb an archaeological site or object on private or non-federal public land without obtaining an archaeological excavation permit (ORS 358.920[1] [a]). When archaeological objects or archaeological sites are identified inadvertently, this law applies once the discovery is determined to be archaeological. Similarly, federal laws prohibit the disturbance of archaeological resources on federal lands in the absence of a valid permit (43 C.F.R. §§ 7.5 and 7.6). The CRC and the EIs will be aware of and follow the procedures set out below:

A. If any Jordan Cove personnel or contractors believe he or she has found archaeological object or an archaeological site, all work within 100 ft (30 m) of the discovery will stop and the Construction Superintendent will be notified immediately. The Construction Superintendent shall notify the EI and the CRC or its designee as soon as possible but no later than within 24 hours of the discovery. The area of work stoppage will be adequate to provide for the security, protection, and integrity of the objects found and therefore may need to be greater than 100 ft depending on the nature of the find. Examples of archaeological objects include but are not limited to:

i) An area of charcoal or charcoal-stained soil;

ii) An arrowhead, stone tool, or stone flakes (chips);

iii) A cluster of animal bones or burned rocks in association with stone tools or flakes (chips);

iv) A cluster of tin cans, bottles, or other historic materials older than 50 years that have not previously been identified as objects that can be removed; or

v) A dense pocket of shells.

B. The CRC or the EI onsite will make an initial determination regarding whether the discovery consists of an archaeological site and/or an archaeological object.

Appropriate Indian Tribes shall be notified of such determination. The CRC or EI shall prepare a report regarding the determination. The report shall be provided to Appropriate Indian Tribes for review and comment. If the CRC or EI initially determines it is not an archaeological site or object and an Indian Tribe disagrees, the SHPO shall make the final determination.

C. If it is determined that the discovery consists of archaeological objects or a site, the Construction Superintendent, CRC, and/or EI will take appropriate steps to protect the discovery site. At a minimum, the construction activity that resulted in the exposure of the discovery will be immediately halted, followed as soon as possible by the cessation of all other ground-disturbing activity within 100 ft (30 m) of the discovery. Vehicles, equipment, and unauthorized personnel will not be permitted to traverse the buffer zone around the site, provided, however, a travel corridor will be allowed along the edge of the buffer zone furthest removed from the discovery, provided that:

a) vehicles will not be allowed to pass closer than 45 ft from the discovery;

b) the edge of the travel corridor nearest the discovery will be secured using orange safety fencing or similar material; and

c) the CRC will consult with the SHPO to determine whether a 24-hour guard is needed to ensure that the find is secure at all times or if the discovery occurs on federal lands, the CRC will consult with the applicable federal land management agency regarding implementation of any security measures.

D. Work in the immediate area will not be re-started until treatment of the discovery has been completed and authorization to proceed has been provided by FERC and/or the SHPO as applicable, and after any required permits have been issued.

E. The buffer zone of 100 ft (30 m) will be established using orange safety fencing or a similar material.

F. The CRC or its qualified designee will arrange for the discovery to be evaluated by a professional archaeologist as soon as possible. The archaeologist must meet the Secretary of the Interior standards as described in 36 CFR Part 61. The appropriate Indian Tribe(s) shall be notified, afforded and opportunity to monitor the examination and provide comments on any written reports provided to Jordan Cove by the archaeologist. The professional archaeologist shall examine the find within 48 hours of notification. The archaeologist will recommend whether the discovery is potentially eligible for listing in the National Register of Historic Places (NRHP) pursuant to 36 CFR §800.4 and 36 CFR Part 63. The CRC will consider the archaeologist's conclusion, make its own recommendation, and then submit documentation, including any documentation or comments provided by an Indian Tribe(s), about the find, the archaeologist's recommendation and its recommendation to FERC, the SHPO and any appropriate Indian Tribe(s) for concurrence within 72 hours of receipt of the professional archaeologist's recommendation. The documentation will be in memorandum form with appropriate photographs included to facilitate FERC and SHPO's review of the conclusions reached.

G. If FERC, in consultation with the SHPO, Jordan Cove, and the appropriate Indian Tribe(s) determines that the discovery is eligible for listing under the NRHP ("NRHP-eligible") as a pre-contact deposit, FERC, Jordan Cove, the SHPO, and the

appropriate Indian Tribe(s) will consult to determine if the Project will adversely affect the resource pursuant to 36 CFR 800.5.

H. If FERC, in consultation with the SHPO, Jordan Cove, and the appropriate Indian Tribe(s) determines that the discovery is not NRHP-eligible, then Jordan Cove will prepare a memorandum to this effect and deliver it to the SHPO and the FERC for concurrence. A copy will also be provided to the appropriate Indian Tribe(s). To the extent any Indian Tribe disagrees with the conclusions in such memorandum, the Indian Tribe reserves its rights pursuant to paragraph L below.

I. If FERC, in consultation with the SHPO, Jordan Cove, and the appropriate Indian Tribe(s) determines that the resource is NRHP-eligible and that the Project will have an adverse effect on it, Jordan Cove will first propose whether or not avoidance or minimization of adverse effects is possible via alternative construction techniques.

J. If it is determined that avoidance or minimization of adverse effects via alternative construction techniques to an NRHP-eligible site is not possible, then Jordan Cove will develop a treatment plan in consultation with the appropriate Indian Tribe(s), designed to mitigate the adverse effect pursuant to 36 CFR 800.6. Jordan Cove will consult with the FERC, SHPO, and the appropriate Indian Tribe(s) and follow state and federal regulations for applicable treatment measure(s). Jordan Cove will provide FERC, the SHPO and the appropriate Indian Tribe(s) with a draft treatment plan for review and comment. The SHPO will provide approval of the treatment plan, which will be implemented in accordance with any schedule set out in the plan. Treatment measures may include mapping, photography, subsurface testing and sample collection, complete data recovery, or other activities. Jordan Cove will provide a report on the methods, analysis, and results in compliance with 36 CFR 800.11 and in accordance with the treatment plan. The specific work plan and schedule for these procedures will be included in the treatment plan.

K. If FERC, in consultation with the SHPO, Jordan Cove, and the appropriate Indian Tribe(s) determines that the resource is NRHP-eligible but that the Project will not adversely affect it, then Jordan Cove will prepare a memorandum to this effect and deliver it to the SHPO and the FERC for concurrence and provide a copy to the appropriate Indian Tribe(s).

L. Jordan Cove will ensure that field investigations, research, analysis, reporting, and curation of any materials collected during these investigations are sufficiently funded and implemented and follow all federal and state guidelines and procedures. All treatment efforts shall be conducted under an Oregon permit for archaeological excavation (OAR 736-051-0080 through 0090).

M. If any Indian Tribe does not agree with the findings of the SHPO and Jordan Cove's archaeologist, such Tribe reserves the right to address its concerns with the Advisory Council on Historic Preservation pursuant to 36 C.F.R. Part 800, and otherwise reserves all rights under state and federal law to obtain relief.

N. Upon completion of the treatment plan, Jordan Cove will submit a summary report to the SHPO and appropriate Indian Tribe(s) within thirty (30) days of completion of the treatment plan. If archaeological data recovery is a component of the treatment plan, a full report will be submitted to the SHPO, appropriate Indian Tribes, and the OCIS in accordance with any schedule set out in the treatment plan.

5.0 Parties to Contact

Notice required under this UDP shall be made to those parties set out in the table below. Any party may update its contact information at any time. An effort will be made to update this information on an annual basis during the life of the Project.

Contacts for the Discovery of Archaeological Resources				
Organization	**Name**	**Role**	**Contact Information**	**Mailing Address**
Jordan Cove	To Be Determined	Cultural Resource Coordinator (CRC)	Office: Mobile: Email:	
Historical Research Associates	Bradley Bowden	Archaeological/Historical Consultant	Office: (503) 247-1319 Direct: (971) 386-2042 Mobile: (206) 898-5781 Email: bbowden@hrassoc.com	1825 SE 7th Ave, Portland, OR 97214
Oregon State Historic Preservation Office (SHPO)	Dr. Dennis Griffin	State Archaeologist	Office:(503) 986-0674 Fax: (503) 986-0793 Email: dennis.griffin@state.or.us	Heritage Conservation Division Oregon Parks and Recreation Dept., 725 Summer Street NE, Suite C, Salem, OR 97301-1266
Oregon State Historic Preservation Office (SHPO)	John Pouley	Assistant State Archaeologist	Office: (503) 986-0675 Fax: (503) 986-0793 Email: john.pouley@state.or.us	Heritage Conservation Division Oregon Parks and Recreation Dept., 725 Summer Street NE, Suite C, Salem, OR 97301-1266
Federal Energy Regulatory Commission (FERC)	Paul Friedman	FERC Cultural Resources Contact	Office: (202) 502-6353 Fax: (202) 208-0353 Email: paul.friedman@ferc.gov	888 First Street NE, Washington, D.C. 20426
Federal Energy Regulatory Commission (FERC)		Alternate FERC Contact	Office: Fax: (202) 208-0353 Email:	888 First Street NE, Washington, D.C. 20426
Federal Land Owners				
BLM Coos Bay District	William Kerwin	Archaeologist	Office: (541) 756-0100 Phone: (541)751-4306-3246 Email: wkerwin@blm.gov	1300 Airport Lane North Bend, OR 97459

Contacts for the Discovery of Archaeological Resources				
Organization	**Name**	**Role**	**Contact Information**	**Mailing Address**
BLM—Medford District	Cheryl Foster-Curley	Archaeologist	Office: (541) 618-2200 Phone: (541) 618-2280 Email: cfostercurley@blm.gov	3040 Biddle Road Medford, OR 97504
BLM—Roseburg District	Molly Casperson	Archaeologist	Office: (541) 440-4930 Phone: (541) 440-3284 Email: mcasperson@blm.gov	777 NW Garden Valley Blvd. Roseburg, OR 97471
BLM—Lakeview District: Klamath Falls Resources Area	Laird Naylor II	Archaeologist	Office: (541) 883-6916 Phone: (541) 885-4139 Email: lnaylor@blm.gov	2795 Anderson Avenue, Bldg. #25 Klamath Falls, OR 97603
Umpqua National Forest	Christopher Kelly	Heritage Program Manager/Tribal Liaison	Office: (541) 957-3200 Phone: (541) 957-3350 Email:	2900 NW Stewart Parkway, Roseburg, OR 97471
Rogue River – Siskiyou National Forest	Melissa Schroeder	Heritage Program Manager/Tribal Liaison	Office: (541) 618-2200 Phone: (541) 618-2077 Email:	3040 Biddle Road, Medford, OR 97504
Fremont – Winema National Forest	John Kaiser	Klamath Ranger District Forest Archaeologist	Office: (541) 883-6714 Phone: (541) 947-6260 Email:	2819 Dahlia Street Suite A, Klamath Falls, OR 97601
Fremont – Winema National Forest	Amy Gowen	Tribal Government Relations	Office: (541) 883-6741 Email:	
Bureau of Reclamation Klamath Basin	Adam Nickels	Archaeologist	Office: (541) 883-6935 Fax: (916) 978-5005 Phone (916) 978-5053 Email:	6600 Washburn, Klamath Falls, OR 97603

Contacts for the Discovery of Human Remains				
Organization	**Name**	**Role**	**Contact Information**	**Mailing Address**
Oregon State Police	Sergeant Chris Allori		Office: (503) 731-4717 Mobile: (503) 708-6461 Dispatch: (503) 731-3030	
Coos Bay Area Command State Police	Lieutenant Jeff Lewis		Office: (541) 888-2677 Email: jeffrey.lewis@state.or.us	
Oregon Medical Examiner's Office	Karen Gunson	Oregon State Medical Examiner	Office: (971) 673-8200	

Contacts for the Discovery of Human Remains				
Organization	**Name**	**Role**	**Contact Information**	**Mailing Address**
Oregon Medical Examiner's Office	Eugene Gray	Forensic Administrator	Office: (971) 673-8200 Email: Eugene.Gray@state.or.us	
Oregon Medical Examiner's Office	James Olson, M.D.	Deputy State Medical Examiner-Southern Region	Office: (541) 440-4453	
Tribal Contacts				
Oregon Commission on Indian Services (OCIS)	Karen Quigley	Executive Director	Office: (503) 986-1067 Fax: (503) 986-1071 Email: Karen.Quigley@state.or.us	900 Court Street NE, Rm. 167, Salem OR 97301-1347
Coquille Indian Tribe	Kassandra Rippee	THPO & Archaeologist	Office: (541) 756-0904 ext. 1216 Mobile: (541) 808-5554 Fax: (541) 756-0847 Email: kassandrarippee@coquilletribe.org	3050 Tremont Street, North Bend, OR 97459
Confederated Tribes of Coos, Lower Umpqua & Siuslaw Indians	Stacy Scott	THPO, Cultural Resources Protection Specialist	Office: (541) 888-7513 Mobile: (541) 297-5543 Fax: (541) 888-2853 Email: sscott@ctclusi.org	1245 Fulton Avenue, Coos Bay, OR 97420
Confederated Tribes of Grand Ronde	Briece Edwards	Deputy THPO	Office: (503) 879-2084 Fax: (503) 879-2126 Email: THPO@grandronde.org	9615 Grand Ronde Road, Grand Ronde, OR 97347
Confederated Tribes of Siletz	Robert Kentta	Cultural Resource Program Director	Office: (541) 444-2532 Home: (541) 444-2204 Mobile: (541) 351-0148 Fax: (541) 444-2307 Email: Rkentta@ctsi.nsn.us	PO Box 549, Siletz, OR 97380
Cow Creek Band of Umpqua Tribe of Indians	Jessie Plueard	THPO and Cultural Programs Manager	Office: (541) 677-5575 X5577 Fax: (541) 677-5574 Email: jpluard@cowcreek.com	2371 NE Stephens St. Suite 100, Roseburg OR 97470
The Klamath Tribes	Perry Chocktoot	Director of Culture and Heritage	Office: (541) 783-2219 X159 or (541) 891-5450 Fax: (541) 783-2764 x107 Email: perry.chocktoot@klamathtribes.com	PO Box 436, Chiloquin, OR 97624

EXHIBIT C - COST RECOVERY AGREEMENT

CONFIDENTIAL

Exhibit D

PROJECT ACTIVITY NOTICE

Notice Provided to CTCLUSI

Name: _____ Email: _____

Position: _____ Date: _____

Description of Project Activity

Date(s) and Time(s) of Project Activity: _____

Type of Project Activity and Equipment: _____

_____

_____

Location of Project Activity: _____

_____

Equipment needed –

a. Provided by Jordan Cove:

b. Provided by CTCLUSI:

Safety Requirements for Any Monitors:

Monitors shall always require the following equipment and clothing to be worn at all times on site:

- Closed toed shoes, long pants and long sleeves;
- a hard hat;
- a safety vest (brightly colored with reflectors); and
- protective eyewear.

Additional Requirements for this Project Activity and site:

_____

_____

Response Required from CTCLUSI by: _____

Exhibit E
Access Agreement

SITE ACCESS AGREEMENT
BETWEEN JORDAN COVE ENERGY PROJECT, L.P.
AND THE CONFEDERATED TRIBES OF COOS, LOWER UMPQUA
AND SUISLAW INDIANS

This SITE ACCESS AGREEMENT ("Agreement") is entered into on _____ ("Effective Date") by and between Jordan Cove Energy Project, L.P. ("Grantor") and _____ ("Grantee") (collectively referred to herein as the "Parties") for the purposes of granting a right to access certain lands owned and operated by Grantor.

WHEREAS, Grantor owns real property located in Coos County, Oregon, on which Grantor intends to construct and operate a liquefied natural gas terminal ("Grantor's Property").

WHEREAS, Grantee desires to access Grantor's Property to observe Project Activities to be performed by _____ ("_____") on behalf of Grantor on Grantor's Property;

WHEREAS, this Agreement governs the right of access to Grantor's Property by Grantee.

NOW THEREFORE, in consideration of the foregoing premises and the mutual covenants contained herein and subject to the terms and conditions set forth below, Grantor and Grantee agree as follows:

1. **Grantor's Right to Grant Access.** Grantor has the authority to grant access to Grantor's Property.

2. **Right of Access.** Subject to the terms of this Agreement, Grantor hereby grants access to Grantee for the sole purpose of observing the Surveys.

3. **Conditions of Use of Grantor's Property.**

i. At all times while on Grantor's Property, Grantee shall comply with the instructions and safety requirements of Grantor or its designee.

ii. Grantee agrees to use only established routes for vehicular travel on Grantor's Property, if such routes exist.

iii. Existing gates shall be used and shall remain closed and secured, unless otherwise authorized by Grantor.

iv. The use of alcohol, drugs or the carrying of firearms on Grantor's Property by Grantee is strictly prohibited at all times.

4. **Indemnity**. Grantee shall indemnify, defend and hold harmless, Grantor, its affiliates, successors, assigns, employees, officers, directors, shareholders, contractors and agents ("Grantor Indemnitees") from and against any and all claims, actions, losses, costs, and damages arising out of injury or death to persons, or damage to property caused by the negligence or misconduct of the Tribe and its officials, employees, agents, and subcontractors in the performance of obligations arising under this Agreement, provided: (i) JCEP promptly notifies the Tribe in writing of any such claim; (ii) the Tribe shall have the exclusive right to control the defense; and (iii) the amount does not exceed and is otherwise covered by the Tribe's liability insurance. Grantor shall indemnify, defend and hold harmless, Grantee, its affiliates, successors, assigns, employees, officers, directors, shareholders, contractors and agents ("Grantee Indemnitees") from and against any and all claims, actions, losses, costs, and damages arising out of injury or death to persons, or damage to property caused by the negligence or misconduct of the Grantor and its officials, employees, agents, and subcontractors in the performance of obligations arising under this Agreement, provided the Tribe promptly notifies JCEP in writing of any such claim and JCEP shall have the exclusive right to control the defense. This indemnity provision survives termination of this Agreement.

5. **Termination.** This Agreement shall terminate upon completion of the Monitoring activities for which access has been granted or sooner if terminated in writing by either Party.

6. **Scope**. This Agreement constitutes the entire agreement between Grantor and Grantee regarding site access.

7. **Amendment.** This Agreement may not be changed, amended or modified except by instrument in writing signed by the Parties.

8. **Breach of this Agreement.** Grantee acknowledges and agrees that failure to adhere to any of the provisions of this Agreement by Grantee shall render this Agreement subject to cancellation by Grantor without further notice by Grantor. Failure of Grantor to cancel this Agreement upon discovery or notice of breach of the Agreement does not render the Agreement void nor does it negate Grantor's right to cancel the Agreement in the event of subsequent breaches by Grantee Personnel.

9. **Execution.** This Agreement may be executed in counterparts, and each counterpart shall for all purposes be an original, and all such counterparts shall together constitute one and the same Agreement.

[*Signature page follows.*]

IN WITNESS THEREOF, the parties hereto have caused this Agreement to be duly executed by their duly authorized officers, in accordance with their duly respective laws.

GRANTOR

JORDAN COVE ENERGY PROJECT, LP
by its General Partner, Jordan Cove Energy Project, L.L.C.

_____ Date:_____
Signature

_____
Name (Print)

_____
Title

GRANTEE

[NAME]

_____ Date:_____
Signature

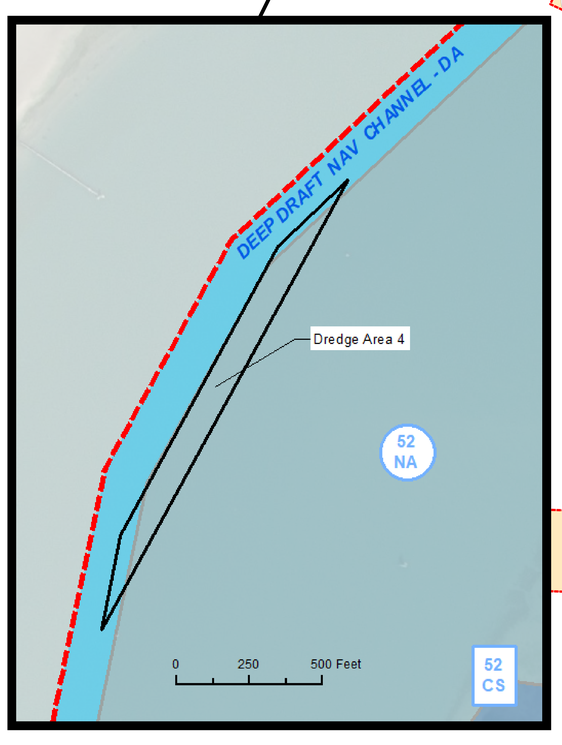
_____
Title

COOS BAY ESTUARY MANAGEMENT PLAN

LEGEND

COOS BAY ESTUARY MANAGEMENT PLAN

- 53 CS — SHORELAND OR UPLAND UNIT DESIGNATION
- 53 CA — AQUATIC UNIT DESIGNATION
- CITY LIMITS

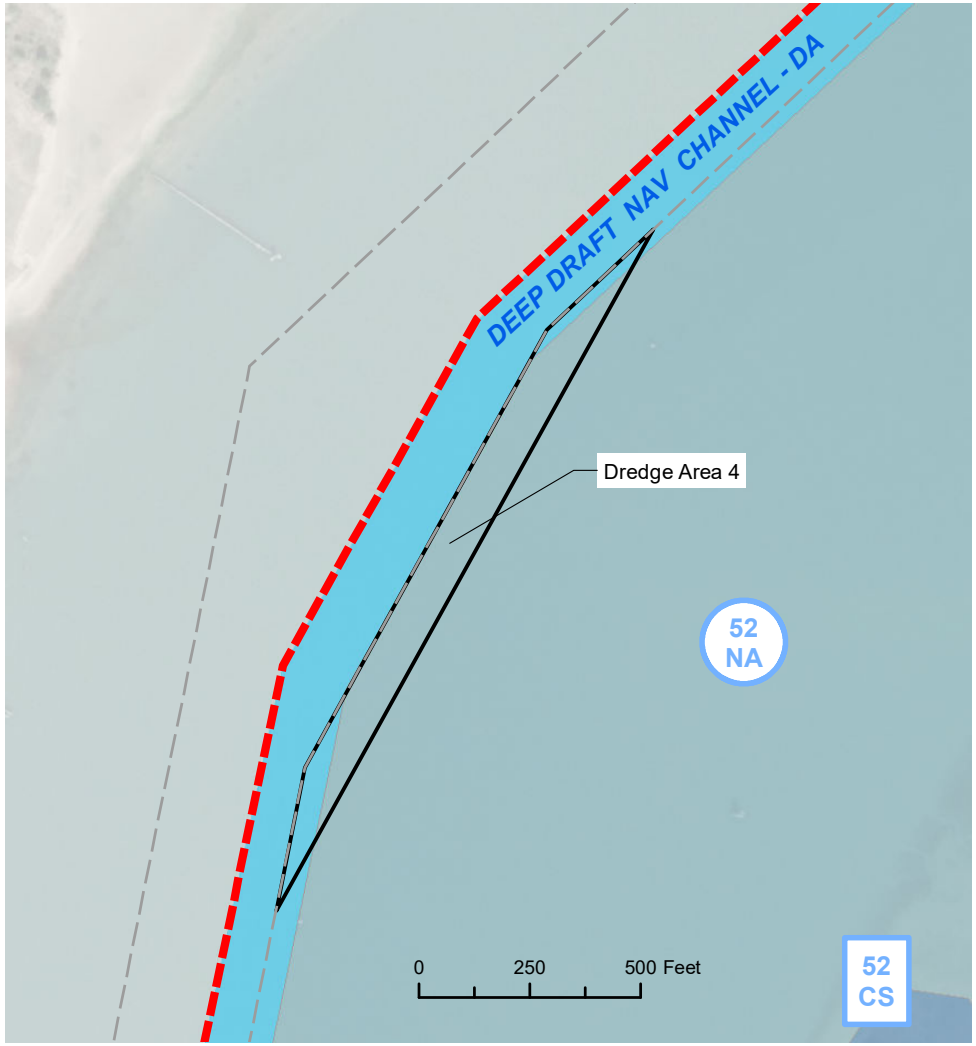


Disclaimer:
This document is produced using a Geographic Information System (GIS). The data contained herein is intended to be a graphical representation only and is by no means an official survey or legal interpretation thereof. The City of Coos Bay provides this data in good faith and makes no warranties, guarantees or representations of any kind, either expressed or implied, as to the content, accuracy, completeness or reliability of this data.

REVISED 06/20/13

N W E S

NOT TO SCALE



Legend

N

CBEMP Aquatic Management Units
- Development Aquatic
- Natural Aquatic (NA)
- Conservation Shorelands (CS)

- NRI Dredge Area 4
- Federal Navigation Channel
- City Limits

Data Source: City of Coos Bay, Feb 2019

Jordan Cove Energy Project

Land Use Permit Application

City of Coos Bay CBEMP Zoning
Navigational Reliability Improvement (NRI)
Dredge Area 4

Jordan Cove LNG℠

2/13/2019

FIGURE NO. 1

C:\Users\sast\Desktop\JPG for City Map_CBEMP Zoning NRI Dredge Area 4.mxd

N

0 0.05 0.1 Miles

Legend

CBEMP Aquatic Management Units

- Development Aquatic
- Natural Aquatic
- Conservation Shorelands (CS)

- NRI Dredge Area
- Federal Navigation Channel
- City Limits

Data Source: City of Coos Bay, Feb 2019

Jordan Cove Energy Project

Land Use Permit Application

City of Coos Bay CBEMP Zoning
Navigational Reliability Improvement (NRI)
Dredge Area 4

Jordan Cove LNG℠ 2/8/2019

FIGURE NO. 1

\\deainc.com\files\PROJECT\JJLNG00000001\0600INFO\GS\Maps\Land Use\Perkins Coie - NRI 4 CBEMP\Fig 1 CBEMP Zoning NRIs.mxd

ATTACHMENT C

CONFEDERATED TRIBES OF
COOS, LOWER UMPQUA & SIUSLAW INDIANS
1245 Fulton Ave. Coos Bay, OR 97420
Phone (541) 888-9577 or 1-888-280-0726
Fax (541) 888-2853

March 21, 2019

City of Coos Bay Planning Commission
500 Central Avenue
Coos Bay, Oregon 97420

SENT VIA EMAIL (hhearley@lcog.org; jcallister@lcog.org; cjohnson@coosbay.org)

RE: Comprehensive Plan Amendment 187-18-00153: Jordan Cove Energy Navigation and Efficiency and Reliability of the Coos Bay Deep Draft Navigation Channel

Dear Members of the Planning Commission:

The Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians ("Tribe") respectfully submits these comments on Comprehensive Plan Amendment 187-18-00153: Jordan Cove Energy Navigation and Efficiency and Reliability of the Coos Bay Deep Draft Navigation Channel (the "Proposal").

1. BACKGROUND

The application proposes dredging, or "Navigational Reliability Improvements" ("NRIs") SR four locations within the Coos Bay Deep Draft Navigational Channel. The dredging is referred to as NRIs. Three of the proposed NRIs are within Coos County and one (Dredge Area #4) is within the City of Coos Bay.

This Proposal is one component of the approval process for the Jordan Cove Energy Project ("JCEP") and the Pacific Connector Gas Pipeline ("PCGP").

The JCEP will involve the construction and operation of a Liquified Natural Gas ("LNG") terminal that would receive a maximum of 1.2 million dekatherms per day of natural gas and produce a maximum of 7.8 million tons of LNG for export each year. The LNG terminal will cool natural gas into its liquid form in preparation for export from Coos Bay. The LNG terminal is composed of Ingram Yard, South Dunes site, the Access and Utility Corridor, and the Roseburg Forest Products property. The LNG terminal and associated facilities would cover 538-acres of land, including 5.2 acres of open water and 169-acres of wetlands.

The Pacific Connector Gas Pipeline, to which this Proposal is a part, involves the construction of a 36-inch underground 229-mile natural gas pipeline from Malin, Oregon to Coos Bay. Over the

229-mile pipeline route, the applicants propose to cross Coos Bay, the South Coast watershed (Coos and Coquille Subbasins), the Umpqua watershed, the Rogue watershed, and the Klamath watershed (Upper Klamath and Lost Subbasins). Overall pipeline construction would impact 30,778-feet (5.83 miles) of wetlands and 3,028-feet of waterways. Approximately 48,675 cubic yards of material would be excavated and discharged into wetlands and 9,519 cubic yards of material would be excavated and discharged into waterways. Within Coos Bay, Jordan Cove proposes to install the 36-inch pipeline across the Bay using two horizontal directional drills ("HDD") of 5,200 and 9,000 feet each.

The actions described in the Proposal before the City are part of a larger regulatory process that necessitates a myriad of federal, state, and local approvals to comments. The JCEP and pipeline, are subject to review and approval by the Federal Energy Regulatory Commission, who can approve the projects only if there is a demonstrated public need for the projects and if the projects can comply with federal, state, and local environmental and cultural resource laws. Both projects must also comply with permitting requirements from the Army Corps of Engineers, the Oregon Department of Environmental Quality, the Oregon Department of State Lands, the Oregon Department of Energy, and others. In addition, there are several permits pending with Coos County and a hearing heard earlier this week with the City of North Bend. All of these federal, state, and local approvals are necessary for the two projects to proceed.

2. POSITION OF THE TRIBE

Before addressing specific concerns, the Tribe would like to strongly concur with proposed Condition of Approval #2, as well as the request of JCEP on page 35 of its Narrative in Support of the Application to adopt terms and requirements of the Memorandum of Agreement ("MOA") and the Cultural Resource Management Plan ("CRPA") as a condition of approval of this proposal in order to satisfy the requirements of CBEMP Policy #18. The MOA is a product of years of negotiations between the Tribe and the applicant, and will serve as the framework through which the Tribe's cultural resources within the Project area are properly identified and protected. We appreciate the applicant's willingness to partner with us to accomplish these important objectives.

The purpose of the MOA and CRPA is to set forth binding, "appropriate measures" to protect cultural, historic, and archaeological resources as required by CBEMP Policy #18, including sites shown on the map of inventoried sites, sites identified by the State Historic Preservation Officer ("SHPO") or Tribal Historic Preservation Officer ("THPO"), and, as stated on page 2 of the MOA, "unknown or unrecorded cultural, archaeological and/or historical sites" that may "be encountered within the Project area."

The importance of Coos Bay to the Tribe and the presence of archaeological and cultural resources through the area impacted by this proposal cannot be understated. The Coos people have continuously used the estuary since time immemorial to the present as demonstrated by archaeological sites, named places in Hanis and Miluk dialects of the Coosan Language, and the presence of prehistoric and historic burials of peoples at former villages and subsistence sites of our people. The Coos Bay estuary is a central feature of Coos culture and identity.

Coos Bay includes hundreds of sites of nearby fish weirs and traps, former villages, and loci of events in the oral literature of the Coos people. We have used the estuarine and shore lands in the area all our lifetimes to fish, gather shellfish, harvest berries, medicines, and plants for consumption or cultural purposes. The main stem was used as a primary transportation route for

the Coos and is still used for fishing and canoeing by Tribal members today as well as for resource gathering and/or ceremonial purposes.

Tribal members have significant connections to the Bay, including named villages, abundant traditional food sources, historic fish weirs, gathering areas and numerous ceremonial and burial sites. And while records capture village areas edging nearly all the shorelines of the Bay the estuary was not static until the jetties were built so it is likely that occupation shifted as water pathways, sand deposits and significant events such as the earthquake and tsunami of the 1700s changed the Bay's shorelines. For example, in October 2017, there was an inadvertent discovery on the edge of the shipping channel that was 25 to 30 feet below the bottom of the Bay (under Corp Permit NWP-2017-41.1- geotechnical pipeline work). In that case, there was a midden discovered that was subsequently radiocarbon dated to approximately 3,000 years ago.

The Tribe has consistently maintained the many cultural resources within Jordan Cove area and the bay should be considered eligible for listing as a Traditional Cultural Property on the National Register of Historic Places. On July 31, 2006, the Tribe passed Resolution No. 2006-097 which designated Jordan Cove and the surrounding area as a TCP. The Tribe reaffirmed this designation on July 29, 2015 in Resolution No. 2015-049. Last year, the Tribe submitted an application to the Oregon SHPO for listing Jordan Cove and Bay of the Coos People (Coos River Estuary), *Q'alay ta Kukwis shichdii me*, as a TCP on the National Register. The Oregon SHPO recently recommended to the National Park Service that the *Q'alay ta Kukwis shichdii me* should be listed in the National Register.

Given the significance of the Bay to the Tribe and its rich cultural resources, it is essential that the MOA and CRPA be adopted as a condition of approval as proposed by JCEP, as agreed by the Tribe, and as required by Policy #18.

The Tribe does not take a position "for" or "against" the Proposal. Instead, the Tribe seeks to ensure that any permits issued for the JCEP LNG terminal and natural gas pipeline comply with all laws applicable to the Project, including proper consideration and protection of cultural and natural resources. The City's review of this proposal is governed by Oregon's Statewide Planning Goals, the Coos Bay Estuary Management Plan ("CBEMP"), and a number of other local and state requirements.

3. SPECIFIC COMMENTS

a. Draft Condition of Approval #3 states, "Prior to the commencement of any dredging associated with an Estuarine and Coastal Shoreline Uses and Activities permit, JCEP shall obtain, and provide evidence to the Coos Bay Community Development Director, of all necessary DSL and Federal Section 404 authorizations. JCEP shall provide the City with copies of these approved authorizations for the record." **This condition should be amended to state, "… all necessary DSL, Clean Water Act approvals, including a Section 404 permit from the Army Corps of Engineers and the 401 Certification from the Oregon Department of Environmental Quality ("ODEQ"), and approval from the Federal Energy Regulatory Commission."**

Statewide Goal 6 provides that the Proposal "maintain and improve the quality of the air, water and land resources of the state." The staff report indicates, "[I]t relies entirely on state and federal regulations for direction and implementation. Staff believe it is reasonable to find that the applicant will comply with federal and state environmental

standards in the future if and when federal and state permits for dredging are secured." Moreover, CBEMP Policy #5 requires this Proposal to be consistent with the objectives of the Estuarine Resources Goal and to otherwise comply with the "requirements of state and federal law." In addition to the permits referenced in the draft condition, this Proposal is subject to a Clean Water Act Section 401 certificate[1] and approval from the Federal Energy Regulatory Commission ("FERC") (FERC reviews applications for the construction and operation of natural gas pipelines to ensure compliance with the Natural Gas Act and ensure compliance with the National Environmental Policy Act and other federal requirements).[2] Because the FERC approval and 401 certificate (both federal requirements) are not addressed in the draft condition, it should be amended as proposed.

b. Statewide Goal 8 provides that the Proposal must not interfere with recreation in Bay. Consistent with this, the Tribe requests that the City and the applicant consider measures to minimize disruption of fishing, fishing, and shellfish gathering during dredging and maintenance dredging thereafter. The attached document illustrates important shellfish areas in the Bay. The Coos Bay region is an important recreational Dungeness crab fishery area. Estimates from the 2007-2011 period found a minimum of 10,661 to a maximum of 15,023 crabbing trips were made in Coos Bay from April to October per year.[3] According to the State, nearly 90 percent of the boat use-days in Coos Bay involved fishing (including angling, crabbing, and clamming). Coos County recreation expenditures, including hunting, fishing, wildlife, viewing, and shell fishing totaled $6.2 million dollars in 2008. Travel-generated expenditures for these activities in Coos County generated $33.5 million dollars in 2008.[4] **Accordingly, the Tribe requests that an additional condition of approval be adopted that specifically requires that notice be provided to the community (including notice at boat launches and other recreation sites) that describes when dredging will occur and areas that may be closed/restriction from boat use during dredging.**

c. CBEMP Policy #5 requires a finding that there is a demonstrated "public need" for the project. Likewise, OAR 660-004-0022(1) provides that the applicant must demonstrate a need for the proposed use/activity. OAR 660-004-0020 (2)(a) states that the exception shall state the "[r]easons [to] justify why the state policy embodied in the applicable goals should not apply." The stated need for the Proposal is that the existing navigation channel is insufficient. However, evidence in the record indicates that this is not the case. In May 2018, the Coast Guard indicated "that the waterway in its current state" is "considered suitable for the LNG marine traffic associated with the proposed project" and can accommodate vessels with a maximum length of 300 meters or approximately 984 feet which is over 200 feet longer than any of the proposed current LNG vessels. *See*

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[1] Information about this process is available on the State's webpage at https://www.oregon.gov/deq/Programs/Pages/Jordan-Cove.aspx.

[2] Information about the FERC process is available on the federal permitting dashboard website at https://www.permits.performance.gov/permitting-projects/jordan-cove-lng-terminal-and-pacific-connector-gas-pipeline.

[3] "The Oregon Recreational Dungeness Crab Fishery, 2007-2011 54, (July 2012) available at https://www.dfw.state.or.us/MRP/shellfish/docs/2012-04.pdf.

[4] "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.

Exhibit 4 at 9-10. Additionally, "simulated transits were piloted by the Coos Bay Pilots and witnessed by the USCG…these successful simulations expand the ability for Jordan Cove LNG to use any class of LNG carrier (membrane, Moss, or SBT) with physical dimensions equal to or smaller than observed during the simulated transits." *See* Exhibit 4 at 15. Accordingly, while there may be a desire for greater dredging, there is not a demonstrated need as evidenced by the Coast Guard's statements.

d. CBEMP Policy #5 requires that "adverse impacts" of the project of the Proposal are minimized. This requires that conditions are adopted to minimize impacts of the Proposal.

First, the staff report indicates that the "in-water work window" for the project will be October 1 to February 15 "to reduce impacts to sensitive life stages of fish in the bay." Staff Report at 17. However, as indicated by the photos taken below by the Tribe's Natural Resource Department staff of herring spawn by Fossil Point taken this last February, the Bay serves as an important spawning area for herring.[5] Herring spawning in the Bay occurs during February. **Accordingly, in order to avoid adverse impacts to herring spawning as required by CBEMP Policy # 5, the City must adopt a condition of approval that provides that in-water work should end by February 1.**

[5] ODFW, Natural Resources of Coos Bay Estuary at 40 ("Spawning occurs from January through April, and herring remain in the bay through summer.), available at https://odfw.forestry.oregonstate.edu/freshwater/inventory/pdffiles/Natural%20Resources%20of%20Coos%20%20Estuary%20No.6.pdf. *See also* http://www.clamdigging.info/Pacific%20Herring.html ("Herring occasionally spawn in most all of Oregon's bays but spawn consistently in Coos Bay, Umpqua Bay and Yaquina Bay from February through early April but most consistently during March."); http://www.milebymile.info/Chetco%20Bay.html ("Pacific herring enter the bay to spawn in February, March and into April.").

Second, Coos Bay is a crucial "nursery" habitat for the Dungeness crab and impacts must be minimized. In her statement given to the Department of State Lands at the Public Hearing for Jordan Cove in Salem, Oregon, Professor Sylvia B. Yamada stated that dredging could negatively impact this important nursery habitat for the native species of Coos Bay and its estuary, including the Dungeness crab.[6] According to Professor Yamada, the highest number of juvenile crabs are found in soft sediments and eel grass beds of estuaries, where the young crabs find food and shelter from predators. Indeed, Professor Yamada stated that she herself has consistently trapped an average of 15 young Dungeness crabs per trap in her Coos Estuary study site, located along the Trans Pacific Parkway (adjacent to Jordan Cove). Turbidity associated with in-water activities, such as dredging can adversely impact these crabs and their habitat. In study conducted by Professor Yamada and designed to simulate a dredging operation, she found that between 45 to 85 percent of the Dungeness crabs exposed to the operation died. In order to comply with Policy # 5, conditions of approval should be developed to avoid any discharge of turbidity into habitat areas or destruction of aquatic resources.

The concerns about the impacts of dredging to crab and associated Bay habitat are further echoed in the attached comments from the Oregon Department of Fish and Wildlife ("ODFW") to the Department of State Lands – "The expected hydrological changes at the site due to the project development will potentially result in a number of changes to the biological communities at those locations (e.g. densities, species composition, predatory interactions, etc.). These changes may occur in areas adjacent to or a considerable distance from the project area where there is little or no construction activity." ODFW Comments at 18. "Mobilization of substrates will occur during the initial dredging and with continued regular disturbance associated with maintenance dredging (estimated 360,000 CY in the first 10yrs.; 36,000/yr.) within the project area." *Id.* at 20. "Marked change will occur to the productivity of the dredged portion of the bay and little recovery is expected over time due to the continual need for maintenance dredging. Maintenance dredging for the JCEP will result in a continually disturbed

[6] Public Hearing for Jordan Cove Removal-Fill Permit Application – Salem, OR: Before the Or. Dept. of State Lands (1.15.2019) at 2:17:07, 2:17:19 (statement of Sylvia B. Yamada, Assistant Professor, Senior Research; Dep't of Zoology, Oregon State Univ.), available at https://www.youtube.com/watch?v=aRQATTbaE6k.

condition preventing development of any reliable estuarine production in the affected areas. Additionally, the Port of Coos Bay project will likely dredge substantially more on an annual basis." *Id.* at 6.

The Tribe requests that the City include a condition of approval that requires the monitoring of turbidity and other dredging impacts recommended in the attached ODFW comments at page 20 be adopted as a specific condition of approval by the City in order to minimize adverse impacts of the Proposal.

e. State Goal 5 and CBEMP Policy # 18 both require protection of historic, cultural, and archaeological resources. In order to be compliant, an inventory of cultural resources and natural resources should be done by local municipalities, including the City of Coos Bay. Appropriate mitigation areas should be identified by the City in conjunction with an inventory. Currently, the City of Coos Bay does not have an inventory of these resources and relies on the County's inventory, which is grossly outdated. Directly adjacent to and on either side of the Bay, collectively, are two village sites, four cultural landscape features, and one natural landscape feature including a rock feature that is part of a Coos Myth Tale noted in the TCP nomination and submitted to the SHPO and National Park Service for consideration as a National Register site that is based on information compiled from archaeological investigations and ethnographic informants. The proposed dredging has the potential to both directly and indirectly impact these cultural sites both from the dredging activity itself and from potentially increased shoreline erosion and potential changes to current sediment dispersal patterns. While the CRPA addresses monitoring and mitigation of impacts to these resources when they cannot be avoided, it does not address the City's obligation for inventory and effects determinations under the CBEMP for these resources.

Thank you for consideration of these comments. If you have any questions about these comments, please contact me at mcorvi@ctclusi.org or by phone at 541-435-7151.

Sincerely,

Margaret Corvi
Culture and Natural Resource Director
Confederated Tribes of Coos, Lower Umpqua & Siuslaw Indians

cc: JCEP
FERC Docket
SHPO
DSL

ATTACHMENTS (2)

ATTACHMENT D

Number	Name	Date Received	For or against	Synopsis (please see attachment for full comments)
1	Jody McCaffery	January 4, 26, 28, 2019 February 15, 2019 March 19-20, 2019 April 23- 25 (submitted written comments on April 25), 2019	Against	General inquiry wishing to receive notice when available. How to submit comments. view current code. Update on open record period. Ownership dynamic of the Bay. JCEP not legal owners of Coos Estuary. EIS must be completed first. Insufficient evidence submitted to meet applicable criteria. Proper environmental studies not completed by applicant. Public need not demonstrated by applicant. Additional CBEMP Policies must be followed. Detriment to eel grass and habitat. Need to consider concurrent application in other jurisdictions. Earthquake / Tsunami concerns. Coast Guard Letter from May 10, 2018. Submitted 76 Exhibits.
2	Jan Hodder, PHD	February 12, 2019; March 8, 19, 2019	Against	General inquiry wishing to receive notice when available. How to participate in public hearing. Eelgrass mitigation site. No demonstrated need based on Goal 9 or 12. Coast Guard letter indicating Channel is suitable for LNG traffic. Letter indicating Pilots can safely maneuver Bay as is. Disputes claims of "economic boon". Failure to satisfy Goal 16: (compatible with other adjacent uses) (only lists the Channel as an adjacent use). Must consider applications in other jurisdictions.
3	Jamie Fereday	February 14, 2019	Against	General inquiry wishing to receive notice when available. Not shown a demonstrated need based on Goal 9 and Goal 12. Application shows little justification of any measured increase in safety. Detrimental to environment, economy and recreation. Application should be denied.
4	Sam Schwarz	March 12, 2019	Against	General inquiry wishing to receive notice when available.

5	Sarah Ruth Crawford	March 13, 2019	Against	General inquiry on how to find documents related to the application. Opposes rezoning. Uphold Goal 16. Detrimental to eel grass and habitat. Carbon emitter and greenhouse gas emitter. No alterations should be made.
6	Debra New	March 18-20, 2019	Against	Comment. Map of proposed map amendment. Damage to estuary. Impartiality. Third party study of impacts. Prior contacts / relationships with Coos Bay Council, Planning Department, and Pembina/Jordan Cove staff. Impartiality of studies done by applicant. Inquire about becoming a Planning Commissioner.
7	Sylvia Yamada, PHD	March 20, 2019	Against	Comment. Impacts to native species, including Dungeness crab. Detriment to crabbing industry economically. Crabs found in eelgrass. Disturbance to ecosystem. Simulated dredging operation showed a 45-85% mortality rate of Dungeness crabs.
8	Heike-Marie Eubanks	March 20, 2019	Against	Comment. Opposition to any permits or zoning changes to accommodate Jordan Cove facility. Contaminated sludge. Harm to marine life, tidal flow, recreation and fishing.
9	Pamela Frazier	March 20, 2019	Against	Comment. Environmental degradation. Temporary project. Foreign project. Proposal part of larger extreme environmental destruction. Danger to wildfire and public by way of explosion or leak. Application should be denied.
10	Monique	March 21, 2019	Against	Comment. Puts at risk forests and rivers. Land taken away by a Canadian company. Unethical. Scared land being taken. Does not consent to having pipeline In Oregon.
11	Jennifer and Robert Legate	March 21, 2019	Against	Property, quality of life and enjoyment of area directly impacted. Harm Oregon's water resources, fishing, navigation and recreation. Duplicate facility being built in British Columbia. Home near surveyed pipeline is proposed. Please deny permits to alter estuary.

12	Confederated Tribes (in conjunction with Rick Eichstaedt from Wheat Law Offices)	March 21, 2019 April 25, 2019	Neutral	This project just a piece of the entire project. Tighten up conditions of approval. Antiquated Shoreland Values Map. Adjust IWWW work window to end February 1. Support for MOU signed with applicant. Applicant does not show a demonstrated need.
13	Chuck Erickson	March 21, 2019	Against	Strongly oppose proposal. Regulations based on sound science. Detrimental to recreational and commercial clamming, shrimping and fishing. Corporate and foreign influence.
14	Jan Dilley	March 21, 2019 April 25, 2019	Against	Concerned about damage to estuary and the 110-120 ships a year that will be added to the current ships. Hold off on any decisions until DSL and FERC make determinations. Concerns about dredge spoil sites and tsunami in reach of dredge spoil sites. Written account of what's contained in dredge spoils.
15	Margaret Maddron	March 21, 2019	Against	Determent to eel grass. Concerned about effect of dredging on local marine life and recreation in the area. Detriment to wildlife that visit the Bay. Habitat loss. Kentuck Golf Course does not meet test of mitigation. Pembina paid elected representatives.
16	Natalie Ranker	March 21, 2019 April 25, 2019	Against	Concerned about dredging and the effect on marine life and tourism, noise from blasting and dredging, pile driving that will go on for years. 1%-2% increase in LNG export from straightening of Channel does not demonstrate a public need. Coast Guard letter indicates Channel is suitable. Letter pointing to Pilot ability to safely maneuver LNG ships. Proposal is harmful to local residents who live and work in Coos Bay. Composition of dredge spoils not identified. Slope stability at dredge disposal sites. Harmful to fish and wildlife. No economic analysis completed for Goal 16. Harmful to tourism, and crabbing (recreational and commercial)

17	James Fereday	March 21, 2019	Against	Concerned about dredging and the effect on the estuary and adjacent shorelands. Don't think there is a need to widen (Coast Guard labeled Channel suitable).
18	Janet Hodder	March 21, 2019	Against	No justification for revision to estuary management zone. Evidence does not support the request.
19	Wim DeVriend	March 21, 2019	Against	Concerned about damage to estuary and marine life, no justification for request amendment. Existing channel adequate to handle ship traffic.
20	Oregon Shores Conservation Coalition (Crag Law Center)	March 21, 2019 April 25, 2019 (supplemental materials 3 emails)	Against	Concerned about damage to estuary and marine life and surrounding communities for over a decade (during work). Rebuts applicable criteria. Asks applicant to respond to DSL Letter dated April 10, 2019. Issues raised to the proposal should be addressed by the applicant prior to any final decision.
21	Bruce Williams	March 28, 2019	Against	Exacerbate climate change. Pollute water. Harmful to fish, wildlife, native American cultural resources and public lands. Compromises domestic energy sources. A threat to communities by gas leaks, explosions and pollution.
22	Christine Moffitt	March 22, 2019	Against	Extend comment period. Any amendments to CBEMP should be addressed to consider the aquatic system in its entirety. Piecemeal approach does not work.

23	Donna Tyler	March 26, 2019	Against	Proposal will ruin crabbing and clamming industry. Ruin recreation. Ruin the ecosystem that lives in the Bay. Advised to please vote no to LNG.
24	Erin Crawford	March 21, 2019	Against	Jordan Cove will destroy the estuary and creatures living in it. Dredging is counterproductive to a healthy estuary and environment.
25	Lynnea Helgedalen	March 21, 2019	Against	Oppose a foreign company bringing fossil fuel infrastructure into Oregon. Oregon legislature have the duty to protect Oregon. Proposal is destructive and will forever change areas aquaculture and recreation. Earthquake and Tsunami risks. Any rewards do not outweigh the risks.
26	William Lackner	March 21, 2019	Against	Clam Diggers Association opposed to proposal. Degradation of ecological productivity in Bay. Proposal threatens: Chinook, Coho, Steelhead, Dungeness and Red Rock Crab. State's proposal of Kentuck Golf Course to offset recreational mitigation does not meet test of mitigation.
27	Mike Graybill	March 26, 2019 April 24, 2019	Against	Need to consider all four NRIs when considering impacts on the Estuary. Jurisdictions should be reviewing applications and respective permits in a coordinated manner. Provided comments on Staff Report (Mr. Graybill's comments on Staff Report are included in the record). Submitted 12 Exhibits. See cover letter and exhibits for details.
28	Roberta Meyer	March 26, 2019	Against	Opposes proposed zoning change. Proposal would limit public access to the Bay and hurt the local fishing industry and harm delicate ecosystems.

29	Darcy Grahek	April 14, 2019	Against	Harmful impacts to the Estuary, eelgrass and crabbing industry. Wishes Commissioners to respect Goal 16 to protect estuarine resources.
30	Vicki Affatati	April 16, 2019	Against	Harmful impacts to the Estuary, eelgrass and crabbing industry. Wishes Commissioners to respect Goal 16 to protect estuarine resources.
31	Dick Leshley	April 22, 2019	For	Urges approval of the proposed zone change from NA-52 to DDNC-DA. Main concern is economic future of the Bay. A deeper, wider channel is a good first step to improve the economic prospect for the Bay.
32	George Wales (Coos Bay Pilots Association)	April 24, 2019	For	Proposal will provide navigation enhancements necessary to improve safety, efficient and navigability for vessels transiting the Bay.
33	Laurie Friedman	April 24, 2019	Against	Application should be denied to maintaining and protect eel grass and habit. Degradation of eelgrass will harm habitat for local wildlife and be detriment to local fishing and crabbing (including commercially and recreationally). Application will have negative impacts on the Bay's ecosystem.
34	Edward Hughes	April 24, 2019	Against	Hydrodynamic model shows entire shoreline of Bay will be affected by the proposed dredging. Coast guard letter indicates shipping Channel is currently sufficient. Only reason for proposal is to allow LNG transport vessels.

35	Jon Barton	April 23, 2019	For	Environmental impacts from dredging are an assumption with zero factual basis. Community stands to benefit in economic terms. The environment is remarkably self-healing.
36	Randy Hoffine, Pacific Properties	April 23, 2019	For	In support of the proposal. In favor of potentially allowing larger ships to travel the Bay.
37	Dale Sause, Sause Bros Inc.	April 25, 2019	For	In favor of proposal. A deeper, wider channel will create better steerage conditions for ships. Improved channel alignment, turning radius and depth. Benefit local economy. Measured environmental impact outweighed by its safety and economic benefits.
38	Cory Sause, Sause Bros Inc.	April 25, 2019	For	In favor of proposal. A deeper, wider channel will create better steerage conditions for ships. Improved channel alignment, turning radius and depth. Benefit local economy. Measured environmental impact outweighed by its safety and economic benefits.
39	Steve Pfeiffer, Representing applicant	April 25, 2019	For	Applicant's first open record period submittal.

Comments and Public Inquiries Received for Application No. 187-18-00153: Jordan Cove Energy Navigation and Efficiency and Reliability of the Coos Bay Deep Draft Navigation Channel.

ATTACHMENT E

Comments and Public Inquiries Received for Application No. 187-18-00153: Jordan Cove Energy Navigation and Efficiency and Reliability of the Coos Bay Deep Draft Navigation Channel. April 26 – May 16, 2019

Number	Name	Date Received	For or against	Synopsis (please see attachment for full comments)
1	Rick Skinner	April 25, 2019 (after 5PM)	For	In favor of proposal. Channel needs better navigation. Faster and more channelized water would help to scour out sediment to the Ocean. Direct correlation to ships in the Bay and our local economy.
2	Brad Mitchell	May 1 & 7, 2019	Against	Expressing frustration over the volume of materials submitted by the applicant in the first open record period and the limited amount of time to respond. Also the size of the file (downloading challenges).
3	Jan Hodder	May 2, 2019	Against	Appealed to Governor Brown. Inadequate time to review applicant's large first open record submission (~17,000 pages). Staff and public do not have means nor time to property review the submission. Goes against the intent of Goal 1 (Citizen Involvement).
4	Melissa Bishop	May 7, 2019	Against	Is a nurse. Keeping people healthy requires healthy environment. JECP would become larger producer of greenhouse gas. Ships would adversely affect shoreline and sea life. Also asked a question about submitting comments to the FERC comment site.
5	Oregon Shores Conservation Coalition	May 10 & 13, 22, 2019		Procedural inquiry regarding the application's open record period. Regarding availability of documents and upcoming meetings/hearings.
6	Natalie Ranker	May 16, 2019	Against	Outlined State agency, (DSL, DEQ) feedback on applications, reviews under their purview. Attached DSL letter and referenced DEQ's denial of the clean water permit. Noted eelgrass impacts. Only JCEP tankers need the increased depth.
7	Oregon Shores Conservation Coalition	May 16, 2019	Against	Oregon Shores objects to the process that is occurring for this Application. Numerous submission materials existed when the original application was submitted and should have been included then. The complete DEQ 401 Water Quality Certification Evaluation and Findings Report. The Applicant's approach is inconsistent with Goal 1 and the intent of the law to allow for meaningful public participation. Oregon Shores believes that the City of Coos Bay ("City") should not allow the Application to proceed in this way, but instead ask the Applicant to withdraw its application and resubmit with a complete package of initial materials sufficient to evaluate the proposal for compliance with all relevant criteria at the outset. Oregon Shores urges the City to consider the DEQ's decision as well as the DSL's concerns in making its own final decision on the proposed City NRI. Like the original Application, the Applicant's ORP Submission fails to justify the four approvals being sought. All Statewide Planning Goals need to be addressed. Contrary to the Applicant's assertion "that NRI areas are not eelgrass habitat and so dredging these areas would not cause the impacts" asserted to Dungeness crabs, aquatic segment 52-NA contains extensive eelgrass beds with associated important fish and waterfowl habitat. DEIS is not finalized and, on its own, does not demonstrate compliance with relevant criteria.
8	Jan Dilley	May 16, 2019	Against	Directs staff attention to the DEQ decision and includes some direct links to related items.
9	Jody McCaffree	May 16, 2019	Against	Request for more time to review the large amount of information that the applicant submitted as part of the first open record period. Not reasonable to rebut that amount of information in 3 weeks. Inconsistent with Goal 1. Need has not been demonstrated. Use or alteration would unreasonably interfere with public trust rights. Feasible alternative LNG terminal locations exist but have not been considered.

				Adverse impacts are not minimal. Jordan Cove Memorandum/Reports do not consider ALL impacts. Included numerous Exhibits
10	Steve Pfeiffer – Representing Applicant	May 16, 2019	For	Applicant's second open record period submittal.

received about 42,000 public comments electronically and by mail.

This Evaluation and Findings Report does not include responses to these public comments because DEQ is denying certification JCEP. Therefore, a response to public comments has not been prepared.

1.4 WQC Decision

DEQ has prepared this Evaluation and Findings Report supporting the attached 401 Water Quality Certification decision (the DEQ WQC Decision) for the Corps' issuance of CWA Section 404 and RHA Section 10 permits pursuant to Section 401 of the Clean Water Act (33 U.S.C. Section 1431), Oregon Revised Statutes (ORS) chapter 468B) and OAR 340 Division 48, other water quality related requirements of state law, and in consideration of all public comments received relevant to water quality and beneficial use concerns. As described in the DEQ WQC Decision, DEQ denies the requested certification because it does not have a reasonable assurance that the construction and operation of the Project would comply with applicable state water quality standards. DEQ's decision, however, is made without prejudice. Jordan Cove may reapply for 401 WQC for the Project, and DEQ would consider additional information that is responsive to the bases for denial in this decision.

DEQ notes that it has not received an application for WQC for issuance of a FERC permit or license associated with the Project. DEQ did receive information relevant to JCEP's applications to the Corps for Section 404/10 permits on February 6, 2018; May 21, 2018; November 21, 2018; March 19, 2019 and April 30, 2019. However, to the extent there was any ambiguity as to the nature of the materials received by DEQ on February 6, 2018 (specifically, whether that submittal constituted a separate request to DEQ for WQC for any FERC authorization or was a supplement to materials for the Corps' review) JCEP confirmed in correspondence on December 7, 2018, that the February 6, 2018 materials were supplements to its application to the Corps for Section 404 and Section 10 permits. Additionally, contrary to JCEP's assertion in its December 7, 2018, letter to DEQ that JCEP had submitted to DEQ a 401 WQC application on October 22, 2017, no record supports this assertion. The only materials DEQ received regarding the Project in October of 2017 were emailed notices from the Corps on October 23, 2017 and October 24, 2017 of the Corps' receipt of Section 404/10 permit application materials from JCEP. As described above, the Corps deemed that application incomplete (33 CFR 325.2(a)). As a result, in accordance with DEQ's rule (OAR 340-048-0032(1)) DEQ did not receive a 401 WQC application from JCEP for the Corps' permits until the Corps determined JCEP's application constituted a valid request for certification and issued the Public Notice on May 22, 2018, pursuant to Corps regulations. See 33 CFR 325.2(b)(1)(ii). In the event that JCEP resubmits an application to DEQ for certification, DEQ requests that JCEP expressly state whether the application is for certification for pending FERC authorizations under the Natural Gas Act as well as the pending Corps Section 404/10 permits.[3]

2.0 Summary of Application

Section 401(a) of the Clean Water Act, 33 U.S.C. § 1341(a), requires an applicant for "a Federal license or permit to conduct any activity which may result in a discharge into the navigable waters" to provide the federal licensing or permitting agency a certification from the relevant state that the discharge would comply with applicable provisions of sections 1311, 1312, 1313, 1316, and 1317 of the Clean Water Act.

[3] At this time, DEQ is not aware of any reason why review of a new certification request would require additional time as a result of including both the Corps permits and the proposed FERC authorizations.

authorize actions to exceed numeric turbidity limits provided the applicant employ all practicable turbidity control techniques. On September 7, 2018, DEQ requested additional information related to JCEP's proposed dredging methods and measures to avoid or minimize turbidity. Specifically, DEQ requested a Dredging Pollution Control Plan. In particular, the request was for a "description of water pollution controls (operational controls, structural such as floating turbidity curtain etc.) that JCEP would use in dredging and transporting dredged material".

JCEP has not submitted a Dredging Pollution Prevention Plan. DEQ finds JCEP's proposed activities would cause turbidity to increase in excess of numeric limits, and absent any Dredging Pollution Prevention Plan, JCEP has failed to demonstrate its methods include sufficient controls to prevent exceedance of turbidity standard in OAR 340-041-0036.

6.9.3 DEQ Findings: Turbidity

DEQ's preceding evaluation of Project results in the following findings related to OAR 340-041-0036:

1. JCEP's proposed activities do not employ the highest and best treatment to control turbid discharges by failing to:
    a. Demonstrate the deployment of effective BMPs during pipeline construction and operation.
    b. Demonstrate the use of effective BMPs during road maintenance.
    c. Provide a site-specific waterbody crossing and restoration plans to minimize turbid discharges and restore stream form and function supporting water quality.
2. JCEP's proposed activities do not employ methods to construct and maintain roads in a manner to prevent turbid discharges to public waters by minimizing erosion of cut bank, fills, and roads.
3. JCEP's proposed activities do not employ methods to control turbid discharges generated by organic or inorganic debris from landslides during pipeline construction, pipeline operation, waterbody construction planning, and road maintenance, and road construction.
4. JCEP has not provided site-specific waterbody crossing and restoration plans that sufficiently describe required methods to avoid, minimize, and mitigate for turbidity. DEQ relies on the plans and information described above to confirm the project has considered the highest and best treatment techniques for minimizing turbidity during construction activities. Absent these plans and information, DEQ does not have a reasonable assurance that the JCEP's proposed activities will comply with the turbidity water quality standard. OAR 340-048-0020(3).
5. JCEP's proposed activity would likely violate the Turbidity water quality standard for the following reasons:
    a. JCEP has not provide an NDPDES 1200-C required Erosion and Sediment Control Plan demonstrating sediment and erosion controls with installation techniques have been properly deployed during the construction of the Terminal and Off-Site Project Areas to control turbidity from construction activities.
    b. JCEP proposes the disposal of dredged material producing turbid discharges from the leachate (i.e., decant flows), from this disposed material, and from exposed soils without demonstrating the deployment of site-specific controls to prevent exceedance of turbidity standard in OAR 340-041-0036.
6. JCEP's modeling conducted confirms that dredging at the Navigational Reliability Improvement locations, the Slip, and Access Channel would cause turbidity levels to increase above allowable numeric limits.
7. JCEP did not provide a Dredging Pollution Prevention Plan that sufficiently demonstrates JCEP considered and proposed all practicable turbidity control techniques to avoid, minimize, and mitigate these effects as required by OAR 340-041-0036.

Based upon these findings, violations of the turbidity water quality standard are likely to occur and DEQ concludes that it lacks a reasonable assurance that the proposed activities will be conducted in a manner that will not violate the Turbidity water quality standard.

6.10 Antidegradation

Spill Prevention, Control, and Countermeasure Plan - Construction

Note: This document is a preliminary version of a document to be used during facility construction. This document provides general content but will be updated prior to the start of construction to final detail including further consideration of staging and the activities of specific sub-contractors. The focus of an SPCC plan is oil spill prevention under federal requirements.

			SHH	KJL	SPH	
1	29-Aug-17	Issued for FERC Filing	SHH	KJL	SPH	
REV	**DATE**	**DESCRIPTION**	**BY**	**CHKD**	**APPVD**	**COMPANY APPROVAL**

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Emergency Contacts (to be updated)

PRIORITIZED CONTACT LIST	RESPONSIBLE ROLE	PHONE NUMBER
COMPANY CONTACTS		
Primary Contact: Chris HaddonJCEP Project Manager	Notification Spill Reporting Onsite Incident Command and Control	Work:
Primary Contractor Contact: TBD-KBJ Project Manager	Notification Spill Reporting Onsite Incident Command and Control	Work:
Primary Subcontractor Contact: TBD- Marine/Water spills contractor To Be Determined	Notification Spill Reporting Onsite Incident Command and Control	Work:
Secondary Subcontractor Contact: To Be Determined	Notification Spill Reporting Onsite Incident Command and Control	Work:
OUTSIDE CONTRACTORS (Also see list included in Appendix E)		
Possible Emergency Response Contractor: To Be Determined	Provide Contaminated Material Removal and Absorbents, and Spill Response	Work:
Possible Waste Vendor: To Be Determined	Provide Waste Hauling and Disposal Services	Work:
GOVERNMENT AGENCIES		
National Response Center (NRC)	Emergency Incident Reporting	(800) 424-8802
Oregon Emergency Response System (OERS)	Emergency Incident Reporting	(800) 452-0311
Fire/Police/Ambulance – Local Response	Emergency-Assist in spill clean-up, fire control, medical emergencies	911
EPA Region 10	Follow-up - Incident Reporting	800-424-4372 Office Hours: 8-4:30 M-F
Oregon Department of Environmental Quality (ODEQ)	Follow-up- Incident Reporting	800 -997-7888 Office Hours: 8-5 M-F
Local Emergency Planning Committee – Coos County Emergency Management	Follow-up - Incident Reporting	(541) 396-7790

1.0 General

This Spill Prevention, Control, and Countermeasure (SPCC) Plan addresses construction activities for the JCEP Liquefied Natural Gas (LNG) Terminal Project (Project) and will be amended whenever there is a change in facility design or construction activity that materially affects the facility's potential for the discharge of oil into or upon the waters of the United States or adjoining shorelines or into or upon the water of the contiguous zone, or in connection activities under the Outer Continental Shelf Lands Act or the Deepwater Port Act of 1974, or that may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States (including resources under the Magnuson-Stevens Fishery Conservation and Management Act).

The SPCC Plan for construction for this project will need to include the following considerations:

- A separate SPCC plan will be needed for each site that stores more than 1,320 gallons of oil. Thus, any separate staging area with such items as fuel tanks or storage of multiple drums of oil will possibly need an active construction phase SPCC plan.
- A construction SPCC plan is typically a moving target, with different equipment, tanks, and other equipment physically on a construction site at different times. An advance SPCC plan usually provides initial considerations of the type of oil containers on site and typical locations on the site. The use of such containment options as double walled tanks and containment tubs for drums of oil is encouraged.
- The updated SPCC plan for construction will add specific detail about the locations of containment and spill prevention and cleanup supplies, sensitive areas to be protected, re-fueling plans and other related final procedures and arrangements for controlling oil used for construction.

The Environmental Protection Agency (EPA) Oil Pollution Prevention Rule became effective January 10, 1974. It was published under the authority of Section 31 1(j)(1)(C) of the Federal Water Pollution Control Act (Clean Water Act [CWA]). The regulation may be found at Title 40, Code of Federal Regulations (CFR), Part 112 (40 CFR 112). The prevention rule was revised on July 17, 2002. Facilities subject to the rule will prepare and implement a plan to prevent any discharge of oil into or upon navigable waters of the United States or adjoining shorelines. The plan is called an SPCC Plan.

1.1 LOCATION AND SPILL EXPERIENCE

The Project site will be located on the bay side of the North Spit of Coos Bay, Oregon, located in unincorporated Coos County to the north of the cities of North Bend and Coos Bay, Oregon. JCEP will use approximately 505 acres to construct an LNG terminal and associated facilities. The project location map is located in Appendix A. The plot plan of the LNG terminal site is also located in Appendix A.

The type and quantity of oil associated with the Project will predominantly include gasoline, diesel, fuel, motor oil, hydraulic fluid, solvents, cleaners, sealants, welding flux, lubricants, paint, and paint thinner. Appendix A includes drawings from the Erosion and Sediment Control Plan for the purpose of showing overland directional flow. During detailed design, drawings specific to this SPCC Plan including the planned location for fuel storage, maintenance, and hazardous materials storage will be will be developed for inclusion in Appendix A. These materials will be used to maintain and coat

equipment in accordance with the manufacturer's instructions. Proper storage and maintenance of equipment will further limit their potential to contact storm water. The primary contractor is responsible for listing specific containers of oil, 55 gallons or larger (Table 1-1). A Material Safety Data Sheet (MSDS) for all hazardous substances listed in Table 1-1 will be maintained on-site.

1.2 TYPE OF OIL AND CAPACITY

The Project will include several construction storage/staging areas, but will have one main hazardous materials storage area that will contain the majority of drums, totes, and aboveground storage tanks (ASTs) that contain more than 55 gallons of oil. Initial planning indicates six 10,000 gallon ultra-low sulfur diesel storage tanks (60,000 gallons) will be used on site. The type and volume of oil held within the construction storage/staging areas is provided in Table 1-1. The Project will also require a diverse inventory of oil products in containers that will be less than 55 gallons in size and other hazardous substances.

1.3 DISCHARGE PREVENTION MEASURES

The discharge preventive measures applicable for the facility are provided in Appendix B.

1.4 DISCHARGE/DRAINAGE CONTROLS

Discharges from tanks and containers will be controlled by using secondary containment (e.g., drip pans, lined earthen berms, double-walled tanks). Specific discharge/drainage controls for each container will be described in Table 1-1.

In accordance with the January 17, 2003, version of the Federal Energy Regulatory Commission (FERC) Upland Erosion Control, Revegetation, and Maintenance Plan (Plan) and the Wetland and Waterbody Construction and Mitigation Procedures (Procedures), adopted by JCEP and used to prepare the JCEP Plan and Procedures, the following procedures will be followed:

- All employees handling fuels and other hazardous substances will be properly trained.
- All heavy equipment will be kept in good operating order and will be inspected on a regular basis.
- Fuel trucks transporting fuel to on-site equipment or tanks will travel only on approved access roads or controlled areas.
- All land-based equipment will be parked overnight and/or fueled at least 150 feet from a waterbody or in an upland area at least 150 feet from a wetland boundary. These activities may occur closer, if the project manager for the primary contractor determines that no reasonable alternative location exists; and that appropriate steps, such as secondary containment, will be taken to prevent spills and provide prompt cleanup in the event of a spill.
- Marine equipment will strictly follow U.S. Coast Guard procedures for spill prevention and controls, including secondary containment and cleanup supplies.
- Hazardous substances, including chemicals, oils, and fuels, will not be stored within 150 feet of a waterbody or wetland boundary. This applies to storage rather than normal operation of equipment in these areas.

- Whenever possible, concrete coating activities will not be performed within 150 feet of a waterbody or wetland boundary, unless the location is an existing industrial site designed for such use. Coatings for structures adjacent to wetlands or the marine environment will have appropriate containment and processes in place.

Table 1-1 Bulk Storage Containers

CONTAINER	LOCATION	TYPE OF OIL	QUANTITY	TANK MATERIAL	DISCHARGE PREVENTION (SEE APPENDIX B)	SECONDARY CONTAINMENT (112.7(A)(3)(III)	CONTAINMENT VOLUME	DISCHARGE SCENARIO
EXAMPLE 10-gallon AST (6)	EXAMPLE Hazardous Materials Storage Area	EXAMPLE Diesel (ULSD)	EXAMPLE 10,000 gallon AST	EXAMPLE Steel	EXAMPLE Double-walled	EXAMPLE Double-walled	EXAMPLE 10,000 gallons each	EXAMPLE This tank is double-walled to prevent discharge, should both walls be breached then oil would flow east into the geotextile-lined containment.
EXAMPLE Diesel tanks in dredges and tugs		Diesel (ULSD)	10,000-30,000 (TBD)					
Diesel AST								
Lube oils								
Transformers (after delivery to Site)								

Note: This facility has other equipment containing oil in quantities less than 55 gallons that are not covered by this SPCC Plan; although, the same spill response procedures will be applied.

1.5 COUNTERMEASURES

Countermeasure procedures for the facility are presented in Appendix C. Additional spill response can be obtained from the outside contractors and local fire department listed in the Emergency Contacts section of this SPCC Plan.

1.6 METHODS OF DISPOSAL (40 CFR 112.7(A)(3)(V))

Typical disposal methods that will be employed at the facility are as follows:

- Recovered oil will be collected in a designated container and stored in the Hazardous Materials Storage Area, or other appropriate area. The outside waste disposal contractor(s) listed in the Emergency Contacts section will pick up this material for disposal.
- Contaminated soil will be drummed or stored in appropriately covered container for pickup and disposal by an outside waste disposal contractor. All drums will be appropriately labeled and stored in a secure construction staging area. For larger quantities of contaminated soils, temporary waste piles will be constructed using plastic liners by placing the contaminated soil on top of the liner and then covering the pile with a plastic liner. A plastic-lined roll-off box will be rented/leased for this purpose.
- Contaminated equipment and materials, including drums, tanks, parts, valves, and shovels will be cleaned as appropriate for disposal or reuse.
- Personal protective equipment, decontamination solutions, spent chemical and absorbents will be drummed and stored in the Hazardous Materials Storage Area, or other appropriate area, for disposal or reuse.

Actual disposal methods will depend on the volume of the release and its condition. Under most arrangements, the outside waste disposal contractor will transport all contaminated material from the site for proper disposal. Spilled residues and other materials contaminated by spilled oil will be characterized using applicable vendor information, laboratory analyses, or other available information as appropriate. Following characterization, these residues and materials will be disposed offsite in a manner consistent with all applicable regulations (e.g., Resource Conservation and Recovery Act).

Additionally, if KBJ in the course of construction identifies suspect contamination not created by KBJ, the area of potential construction will be blocked off and Jordan Cove will be notified. Jordan Cove is responsible for the cleanup of that area. If KBJ makes a spill during construction, then KBJ is responsible for cleanup.

1.7 CONTACT LIST

The contact list and telephone numbers for those individuals/agencies that will be contacted in the event of a discharge are provided in the Emergency Contacts section of this SPCC Plan. Information regarding the designated coordinator for the primary contractor and subcontractor will be provided in the Emergency Contacts section of this SPCC Plan.

1.7.1 Discharge Reporting

In the event of a discharge, all personnel will be instructed to contact the primary company contacts. The primary company contact or his designee will report the necessary information using the Spill Notification Form (provided in Appendix D).

In Oregon, the Oregon Department of Environmental Quality (ODEQ) adopted Oregon Spill Reporting Oregon Administrative Regulations (OAR) 340 Division 142 regarding notifications and procedures for unauthorized discharges. The rules define what a reportable spill is and outline what is to be reported to the state by telephone. Also, notification requirements are described along with the follow-up written report requirement.

The following are the reportable spill quantities for oil, petroleum, and used oil (OAR 340-142-0005(9)):

(A) For spills or discharges onto land—one barrel (42 gallons);

(B) Any spills or discharges directly into water in the state (excludes normal discharges for properly operating marine engines).

Upon the determination that a reportable discharge or spill has occurred that does not cause an emergency condition, the primary company contact or his designee will notify the ODEQ and NRC as soon as possible but not later than 24 hours after the discovery of the spill or discharge by telephone or letter. .

The initial notification will provide, to the extent known, the information in the following:

- The name, address, and telephone number of the person making the telephone report;
- The date, time, and location of the spill or discharge;
- A specific description or identification of the oil, petroleum product, hazardous substances or other substances discharged or spilled;
- An estimate of the quantity discharged or spilled;
- The duration of the incident;
- The name of the surface water or a description of the waters in the state affected or threatened by the discharge or spill;
- The source of the discharge or spill;
- A description of the extent of actual or potential water pollution or harmful impacts to the environment and an identification of any environmentally sensitive areas or natural resources at risk;
- If different from point (1), the names, addresses, and telephone numbers of the responsible person and the contact person at the location of the discharge or spill;
- A description of any actions that have been taken, are being taken, and will be taken to contain and respond to the discharge or spill;
- Any known or anticipated health risks;

- The identity of any governmental representatives, including local authorities or third parties, responding to the discharge or spill;
- The name and address of transporter and generator, if a transporter is involved; and
- Any other information that may be significant to the response action.

If the discharge or spill creates an emergency condition, then the Oregon State Fire Marshall 24-hour Oregon Emergency Hazardous Materials Hotline will be notified immediately. The primary company contact will immediately notify and cooperate with local emergency authorities (fire department, fire marshal, law enforcement authority, health authority, as appropriate). As soon as possible, but no later than 5 days after the telephone notification was made, the primary company contact will file a written report with the ODEQ.

1.7.2 Discharge Procedures

In the event of a discharge, procedures outlined in the Spill Contingency Plan, provided in Appendix C, will be followed.

2.0 Potential Spills

The expected modes of potential major failure or accident in which oil could be spilled from the facility are listed in Table 2-1.

Table 2-1 Potential Spills

CONTAINER	SPILL SOURCE	SPILL MODE	QUANTITY	FLOW RATE	FLOW PATHWAY
EXAMPLE Diesel (ULSD) AST (6)	EXAMPLE Tank is punctured.	EXAMPLE Oil spills from puncture onto containment.	EXAMPLE 10,000 gallons	EXAMPLE Rapid. Liquid is not viscous.	EXAMPLE This tank is double-walled to prevent discharge, should both walls be breached then oil would flow east into the containment.
(other items to be added as applicable)					

As an additional note, if KBJ identifies potential contamination, not created by KBJ, during the course of construction, the area of potential contamination will be blocked off and Jordan Cove will be notified. Jordan Cove is responsible for the cleanup of those areas. If KBJ causes a spill during construction, then KBJ is responsible for cleanup.

3.0 Containment, Drainage Control, and Diversionary Structures

The secondary containment for the oil containers at this facility are listed in Table 1-1. Secondary containment or diversionary devices will be required for all containers 55 gallons or larger. Discharge prevention measures include dikes, retaining walls, curbing, weirs, booms, diversion ponds, retention ponds, and absorbent materials. Drums and portable ASTs in the Hazardous Materials Area will be provided with secondary containment. Sufficient absorbent materials will be provided to enable quick spill response. The secondary containment systems will be adequate to contain the content of the largest container plus sufficient freeboard for precipitation (i.e., 110 percent). All drainage of accumulated storm water from containment systems will be inspected to ensure no visible sheen is present and the condition documented prior to discharge.

A contingency plan, which has been prepared in general accordance with 40 CFR Part 109, as well as a spill response action checklist, is included as Appendix C.

Marine equipment will strictly follow U.S. Coast Guard procedures for spill prevention and controls, including secondary containment and cleanup supplies.

4.0 Inspections, Testing, and Records

Inspections and tests required in this SPCC Plan will be conducted in accordance with written procedures developed for this facility. Written procedures for inspections of containers and blank forms are provided in Appendix F.

In addition, the following inspection forms/records are included with this SPCC Plan:

- Facility Inspection Form.
- Spill Training Attendance Logs.

The written procedures and completed forms/records of the inspections and tests, signed by the appropriate supervisor or inspector, will be kept with the SPCC Plan at the facility. The completed inspection forms will be retained in Appendix G for at least 3 years.

5.0 Personnel, Training, and Spill Prevention Procedures

The facility's primary contractor, as listed on Page 4 of this plan, will be accountable for oil spill prevention. The primary contractor reports to the primary Jordan Cove Energy Project L.P. contact and management.

Facility personnel will be properly instructed in the operation and maintenance of equipment to prevent oil discharges; discharge procedures protocols; and applicable pollution control laws, rules, and regulations. The personnel operating the facility will be instructed regarding their job responsibilities and duties.

Periodic safety meetings will be held to discuss safety procedures and other pertinent job responsibilities criteria. In addition, spill training/discharge prevention briefings for oil-handling personnel will be conducted, as required, at least once a year. This training covers the content of the SPCC Plan, known spill events or failures, malfunctioning components, and recently developed precautionary measures. Completed Personnel Training Logs will be kept in Appendix G for at least 3 years.

6.0 Security

The Project will employ the following security measures related to fuel storage areas and the construction site:

- The handling, processing, and oil storage areas at the facility will be entirely fenced and locked or provided with a guarded entrance gate when not active or unmanned.
- The construction site will be illuminated at night, so that discharges, releases, or acts of vandalism can be discovered during hours of darkness.
- Loading/offloading connections for other containers 55 gallons or larger will be securely capped when not in service or standby service for an extended time.
- The fuel pump will be locked in the closed position when not in use.

7.0 Truck Loading/Offloading Procedures

Truck and vehicle fuel tank loading and unloading areas will only occur in areas at least 150 feet from all waterbodies and wetlands and 200 feet from any well. All fuel vehicles will be equipped with a spill response kit. Spill control material will also be available in the Hazardous Materials Storage Area. Facility personnel will be trained in spill response procedures. Spill control measures detailed in the contingency plan will be implemented in the event of a spill.

Truck loading/offloading fueling procedures will meet the minimum requirements and regulations of the Department of Transportation. The driver or operator stays at the tank at all times during loading/offloading procedures. Drains and outlets on trucks will be checked for leakage before loading/offloading or departure. Containment pans will be available, if a leak is noted. Signs, wheel chocks, or a vehicle interlock system will be provided at the loading/offloading area to remind drivers/operators to disconnect transfer hoses before vehicle departure.

8.0 Bulk Storage

8.1 BULK STORAGE FACILITIES

The bulk storage facilities containing quantities of oil greater than 55 gallons located on the Project construction site are identified in Table 1-1. This table includes the location; size; storage content; material of construction; fail safe features; and containment/diversionary structure, size, and drainage of each applicable container on-site. Only containers that will be compatible with their contents will be employed. Containers will be stored in a Fuel/Hazardous Material Storage Areas as designated on site plans.

8.2 SECONDARY CONTAINMENT

All drums and totes 55 gallons or larger will be provided with a secondary containment system that will be adequate to contain the content of the largest container plus sufficient freeboard for precipitation (i.e., 110 percent). Discharge prevention measures include dikes, retaining walls, curbing, weirs, booms, diversion ponds, retention ponds, and absorbent materials.

The secondary containment systems will be either provided with open drains to the oil/water separator or will be provided with manual valves kept in the closed position for draining to the storm water system. Following careful examination of any collected rainwater, water without a sheen will be discharged by opening this manual valve.

8.3 INTEGRITY TESTING

Aboveground containers will not be tested for integrity, due to the temporary and short-term nature of the project. Visual inspections will be performed..

Visual inspections of the tanks, including secondary containment systems and dikes, will be performed during routine activities at the facility. In addition, the outside of the containers will be inspected for signs of deterioration, discharges, or accumulation of oil. Any indication of deterioration or leakage that may cause a spill or accumulation of oil inside containment areas will be reported to site management. A documented inspection of oil tanks, secondary containment systems, and spill response equipment will be completed as defined in the forms in Appendix F. The results of the inspection will be recorded on the forms in Appendix F. Completed inspection forms are to be kept at the facility and retained for at least 3 years in Appendix G.

8.4 SANITARY FACILITIES

This facility will employ portable toilets during construction - partially units to be serviced and some equipped with holding tanks. Waste from the holding tanks will be transported by truck to an on-site temporary sanitary treatment unit or an authorized disposal facility.

8.5 VISIBLE OIL LEAKS

If visible oil leaks from equipment or containers are observed, they will be promptly corrected. Containment pans will be available to capture oil leaks. Facility personnel will promptly remove any accumulation of oil.

8.6 MOBILE OR PORTABLE TANKS (40 CFR 112.8(C)(11))

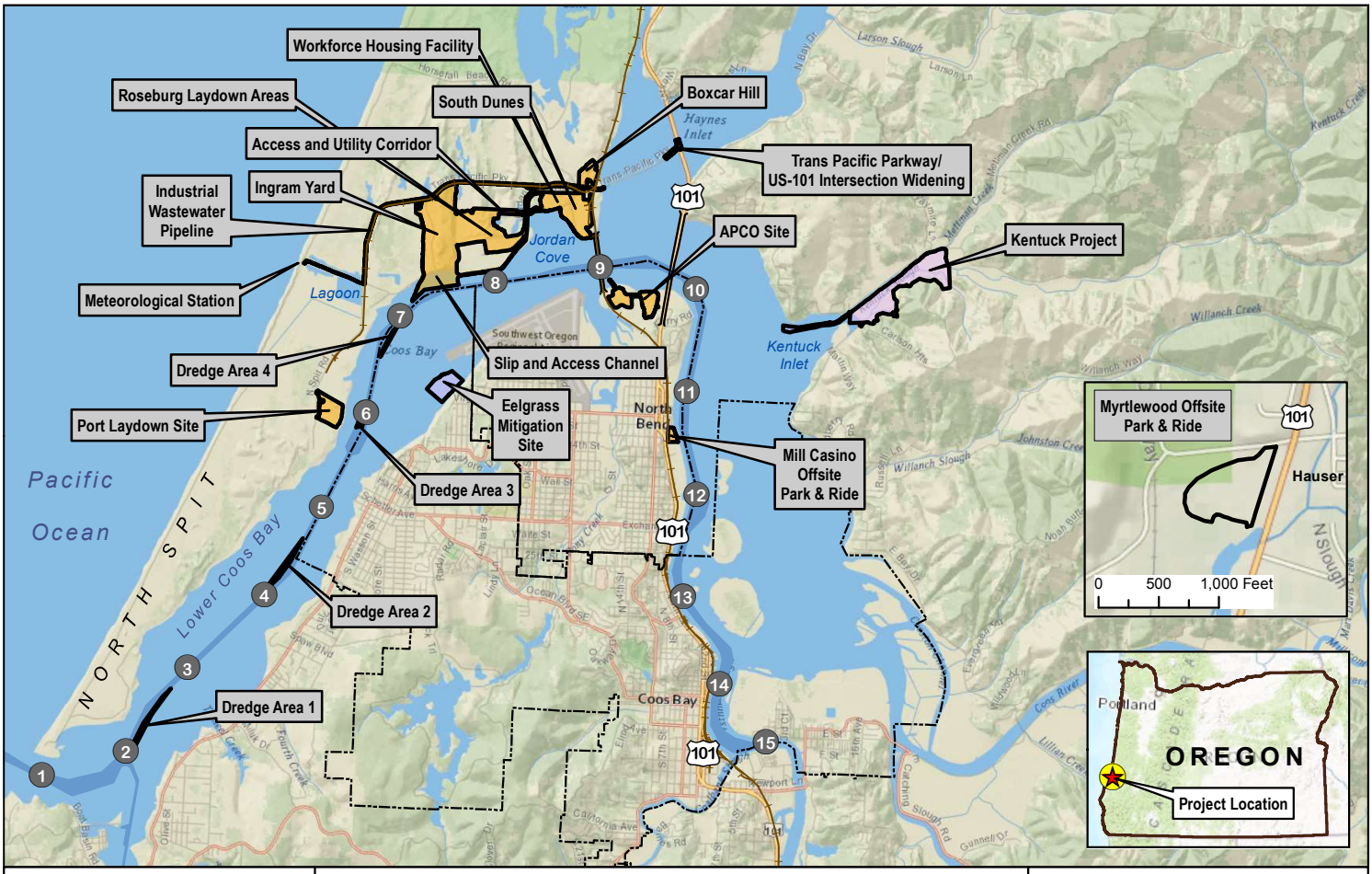
The secondary containment for the oil containers at this facility is listed in Table 1-1. Secondary containment or diversionary devices will be required for all containers 55 gallons or larger. Discharge prevention measures will include dikes, retaining walls, curbing, weirs, booms, diversion ponds, retention ponds, and absorbent materials. Drums and tanks in the Hazardous Materials Area will be provided with secondary containment. The portable ASTs will be provided with spill response equipment (i.e., absorbents).

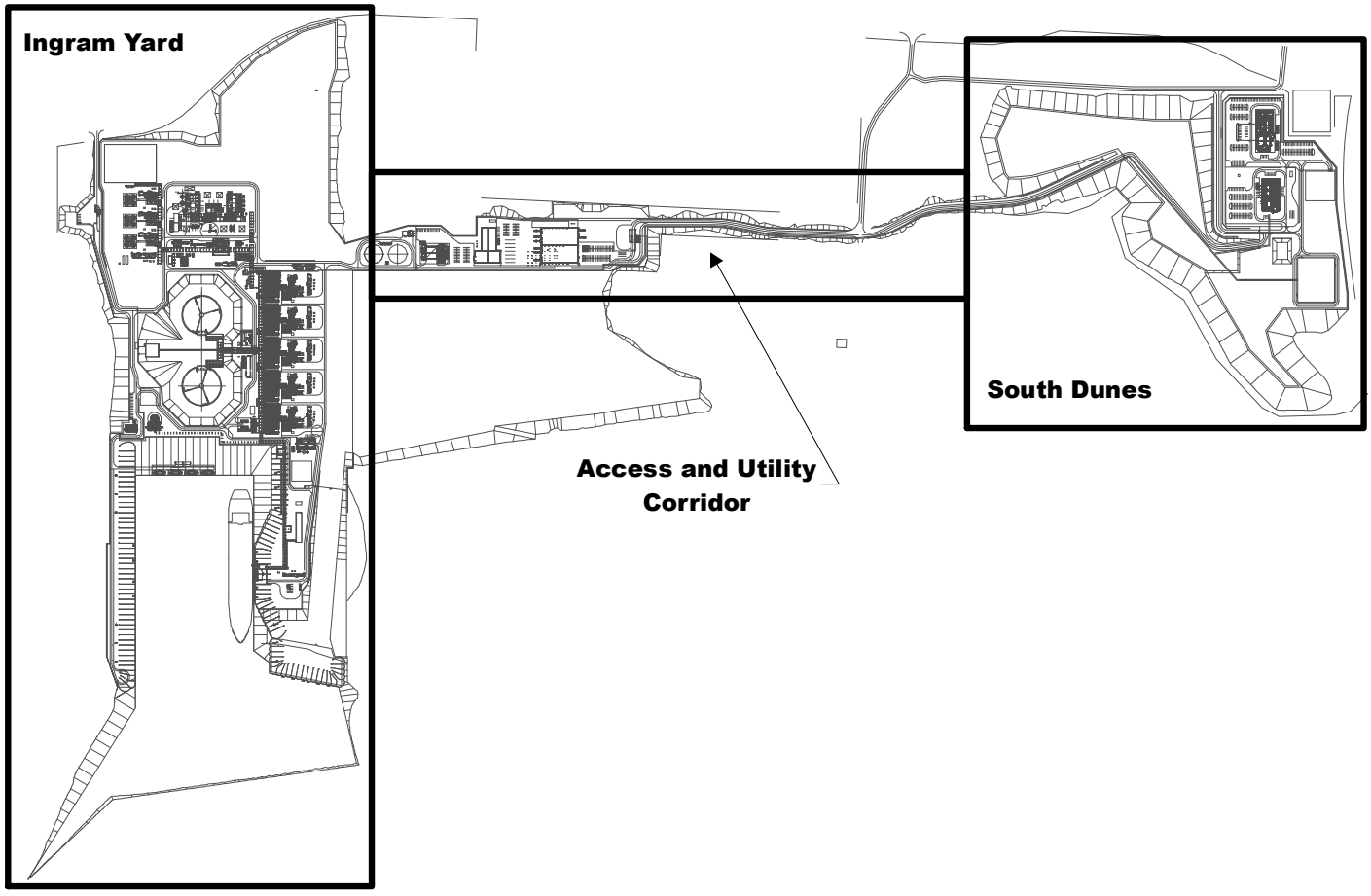
8.7 OTHER EQUIPMENT OR CONTAINERS THAT MAY HOLD OIL

Other equipment containing 55 gallons or smaller quantities of petroleum products will also be located at this facility. Spill control measures will be implemented in the event of a spill.

Appendix A. Figures

Drawings illustrating the planned location for fuel storage, maintenance, and hazardous materials storage will be developed during detailed design.


Workforce Housing Facility
Roseburg Laydown Areas
South Dunes
Boxcar Hill
Access and Utility Corridor
Trans Pacific Parkway/
US-101 Intersection Widening
Industrial
Wastewater
Pipeline
Ingram Yard
APCO Site
Kentuck Project
Meteorological Station
Dredge Area 4
Slip and Access Channel
Eelgrass
Mitigation
Site
Port Laydown Site
Dredge Area 3
Mill Casino
Offsite
Park & Ride
Dredge Area 2
Dredge Area 1
Pacific
Ocean
NORTH SPIT
Lower Coos Bay
Jordan
Cove
Haynes
Inlet
Kentuck
Inlet
Lagoon
Coos Bay
North
Bend
Coos Bay
Myrtlewood Offsite
Park & Ride
Hauser
0 500 1,000 Feet
Portland
OREGON
Project Location
N
0 1 Mile
JCEP Project Area
Mitigation Site
Federal Navigation Channel
River Mile
City Limits
Jordan Cove
Energy Project, L.P.
Jordan Cove Energy Project
Figure 1.1-1
Project Location Map



Jordan Cove Energy Project, L.P.

N

0 0.1 0.2 Miles

Jordan Cove Energy Project

Figure 1.1-2

Plot Plan of the LNG Terminal Site

NARRATIVE DESCRIPTIONS

EXISTING SITE CONDITIONS

2 TANKS, FORESTED AREAS, AGGREGATE-SURFACED AREAS, AND AGGREGATE-SURFACED ROADS

DEVELOPED CONDITIONS

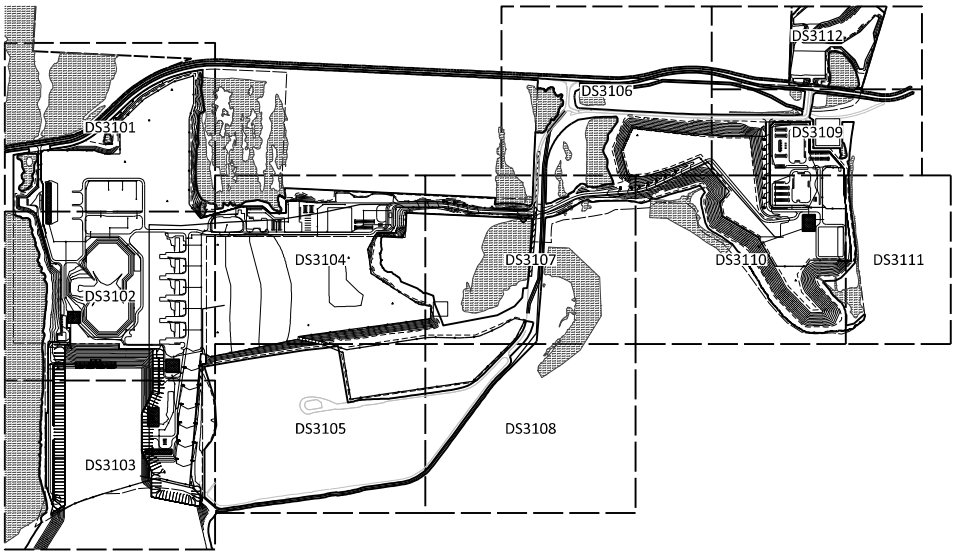
LIQUEFIED NATURAL GAS TERMINAL, INCLUDING TANKS, EQUIPMENT, BUILDINGS, UTILITIES AND ROADS.
TOTAL DISTURBED AREA IS APPROXIMATELY 380 ACRES.

ESTIMATED TIME TABLE

BEGINNING SECOND HALF OF 2019

RECIEVING WATER BODIES

COOS BAY



PROJECT LOCATION
ON THE NORTH SPIT OF COOS BAY, COOS COUNTY, OREGON
LATITUDE = 43°25'53" N. LONGITUDE = 124°15'56" W

ABBREVIATIONS APPLICABLE TO ALL S3100 DRAWINGS

A	-	ARC LENGTH	EGP	-	EDGE OF PAVEMENT	LS	-	LIFT STATION	RD	-	ROOF DRAIN
AGG	-	AGGREGATE	EGS	-	EDGE OF SHOULDER	LTR	-	LATER	RED	-	REDUCER
APPROX	-	APPROXIMATE	EHH	-	ELECTRICAL HANDHOLE	MATL	-	MATERIAL	REQD	-	REQUIRED
ASPH	-	ASPHALT	EL	-	ELEVATION	MH	-	MANHOLE	REV	-	REVISION
AVG	-	AVERAGE	EOP	-	END OF PIPE	MSL	-	MEAN SEA LEVEL	R/W	-	RIGHT-OF-WAY
BLDG	-	BUILDING	EJ	-	EXPANSION JOINT	MW	-	MONITORING WELL	S	-	SOUTH
B/MH	-	BOTTOM OF MANHOLE ELEVATION	EW	-	EACH WAY	N	-	NORTH	SE	-	SUPERELEVATION
BDD	-	BOTTOM OF ELECTRICAL DUCT BANK	EXP	-	EXPANSION	NG	-	NATURAL GRADE	SIM	-	SIMILAR
BOP	-	BOTTOM OF PIPE	FD	-	FLOOR DRAIN	NO.	-	NUMBER	STA	-	STATION
BU	-	BELL-UP	FDN	-	FOUNDATION	NTS	-	NOT TO SCALE	T	-	TANGENT LENGTH
CHDPE	-	CORRUGATED HIGH DENSITY POLYETHYLENE PIPE	FF	-	FINISHED FLOOR	OD	-	OUTSIDE DIAMETER	TMH	-	TOP OF MANHOLE
CJ	-	CONTRACTION JOINT	FG	-	FINISHED GRADE	OWS	-	OIL/WATER SEPARATOR	TOC	-	TOP OF CONCRETE
CL	-	CENTERLINE	FRP	-	FIBER REINFORCED PIPE	PC	-	POINT OF CURVATURE	TOG	-	TOP OF GRATING
CMP	-	CORRUGATED METAL PIPE	FT	-	FOOT	PE	-	PLAIN END	TOP	-	TOP OF PAVEMENT
CO	-	CLEAN OUT	HC	-	HANDICAPPED	PI	-	POINT OF INTERSECTION	TYP	-	TYPICAL
D	-	DEGREE OF CURVE	HDPE	-	HIGH DENSITY POLYETHYLENE	PL	-	PROPERTY LINE	UNO	-	UNLESS NOTED OTHERWISE
Δ	-	DELTA ANGLE OF HORIZONTAL CURVE	HVCM	-	HORIZ & VERT CONTROL MONUMENT	PLCS	-	PLACES	DS	-	DESIGN SPEED
DI	-	DUCTILE IRON	HP	-	HIGH POINT	PRC	-	POINT OF REVERSE CURVE	VERT	-	VERTICAL
DIA	-	DIAMETER	I	-	INLET	PT	-	POINT OF TANGENT	W	-	WEST
DIM	-	DIMENSION	ID	-	INSIDE DIAMETER	PVC	-	POINT OF VERTICAL CURVE	W/	-	WITH
DWG	-	DRAWING	IN	-	INCH	PVI	-	POINT OF VERTICAL INTERSECTION	W/O	-	WITHOUT
E	-	EAST	INV	-	INVERT	PVT	-	POINT OF VERTICAL TANGENT	WP	-	WORK POINT
EA	-	EACH	L	-	LENGTH	R	-	RADIUS			
EF	-	EACH FACE	LC	-	LENGTH OF VERTICAL CURVE	RCP	-	REINFORCED CONCRETE PIPE			

500' 250' 0 500' 1000'
1"=500'

KBJ JORDAN COVE LNG

Jordan Cove LNG™

NOT TO BE USED FOR CONSTRUCTION
THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

NO	DATE	JCLNG REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	FOR	APP

NO	DATE	KBJ REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	FOR	APP

I HEREBY CERTIFY THAT THIS DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF: OREGON
SIGNED
DATE REG NO.

DESIGNER | DRAWN
CHECKED | DATE

JORDAN COVE LNG PROJECT

EROSION AND SEDIMENT CONTROL PLAN
KEY PLAN, GENERAL NOTES AND ABBREVIATIONS

PROJECT 189980-0000-DS3100
DRAWING NUMBER
REV
JCNG NUMBER J1-000-CIV-KEY-KBJ-01370-01
REV

MicroStation v8.11.9.578
7/9/2017 7:45:14 PM
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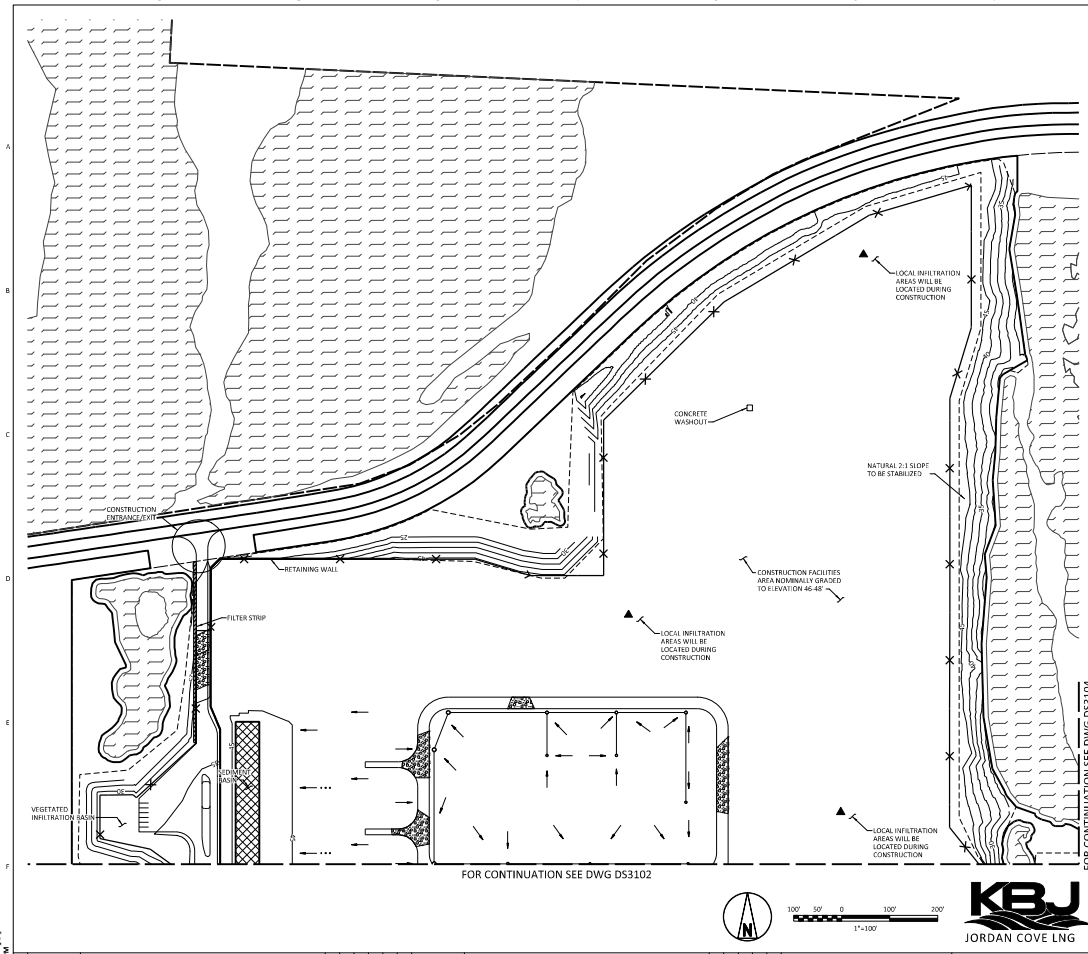
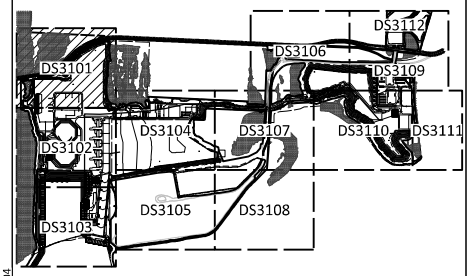
fn58067



OFFSITE CONSTRUCTION AREAS

DS3113 APCO LAYDOWN SITE
DS3114 PORT LAYDOWN SITE
DS3115 MILL CASINO OFFSITE PARK & RIDE
DS3116 MYRTLEWOOD OFFSITE PARK & RIDE
DS3117 METEOROLOGICAL TOWER SITE

KEY PLAN



NOTES

1. SEE DRAWING 0000-DS3100 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.

100' 50' 0 100' 200'
1"=100'

KBJ JORDAN COVE LNG

Jordan Cove LNG

NOT TO BE USED FOR CONSTRUCTION

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NO	DATE	JCLNG REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	FOR	APP

NO	DATE	KBJ REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	FOR	APP

I HEREBY CERTIFY THAT THIS DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF: OREGON
SIGNED
DATE REG NO.

DESIGNED DRAWN
CHECKED DATE

JORDAN COVE LNG PROJECT

EROSION AND SEDIMENT CONTROL PLAN AREA 1

PROJECT	DRAWING NUMBER	REV
189980-0000-DS3101		
JCNG NUMBER		REV
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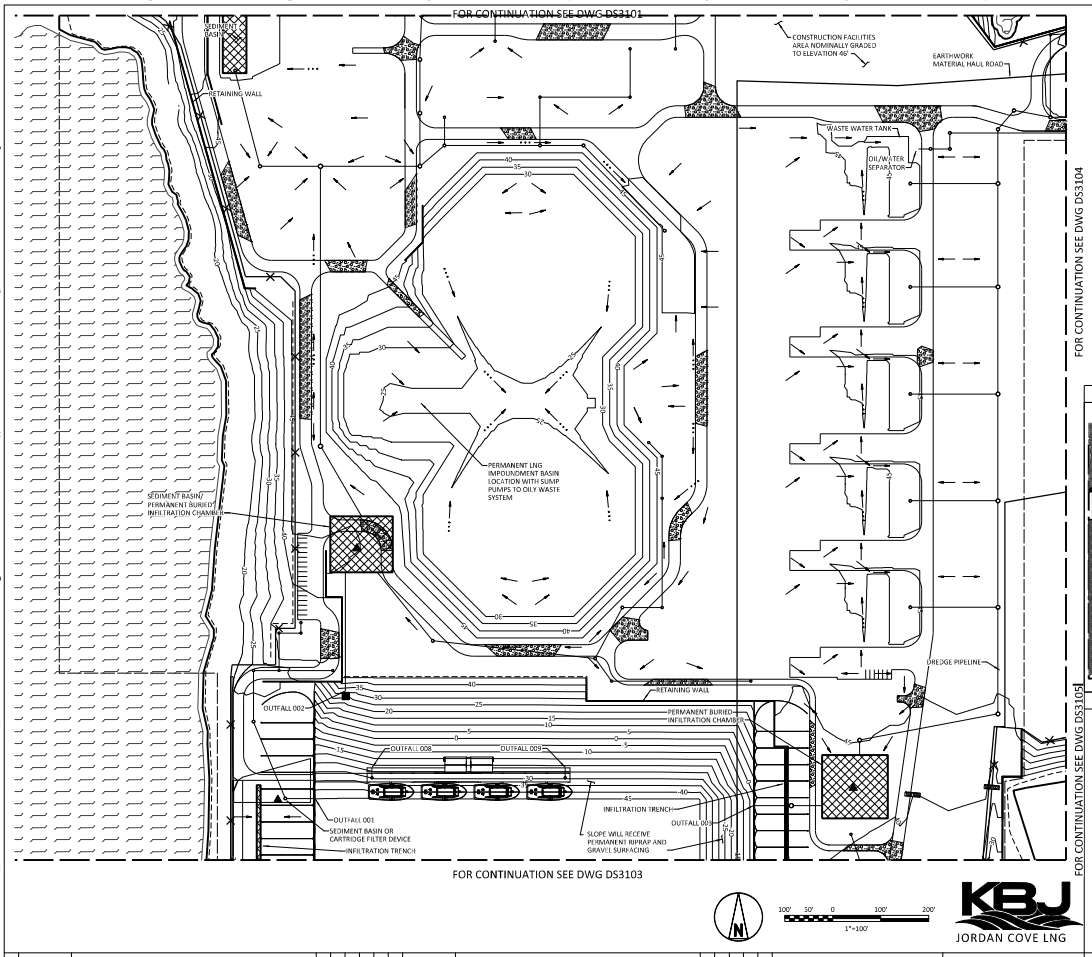
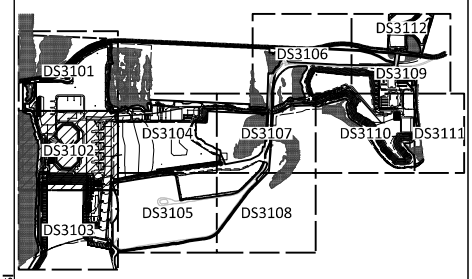


OFFSITE CONSTRUCTION AREAS

DS3113 APCO LAYDOWN SITE
DS3114 PORT LAYDOWN SITE
DS3115 MILL CASINO OFFSITE PARK & RIDE
DS3116 MYRTLEWOOD OFFSITE PARK & RIDE
DS3117 METEOROLOGICAL TOWER SITE

KEY PLAN



NOTES

1. SEE DRAWING 0000-DS3100 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.

100' 50' 0 100' 200'
1"=100'

JORDAN COVE LNG

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NO	DATE	JCLNG REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	FOR	APP

NO	DATE	KBJ REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	FOR	APP

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DATE
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CHECKED DATE

JORDAN COVE LNG PROJECT

EROSION AND SEDIMENT CONTROL PLAN AREA 2

PROJECT	DRAWING NUMBER	REV
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KCNG NUMBER		REV
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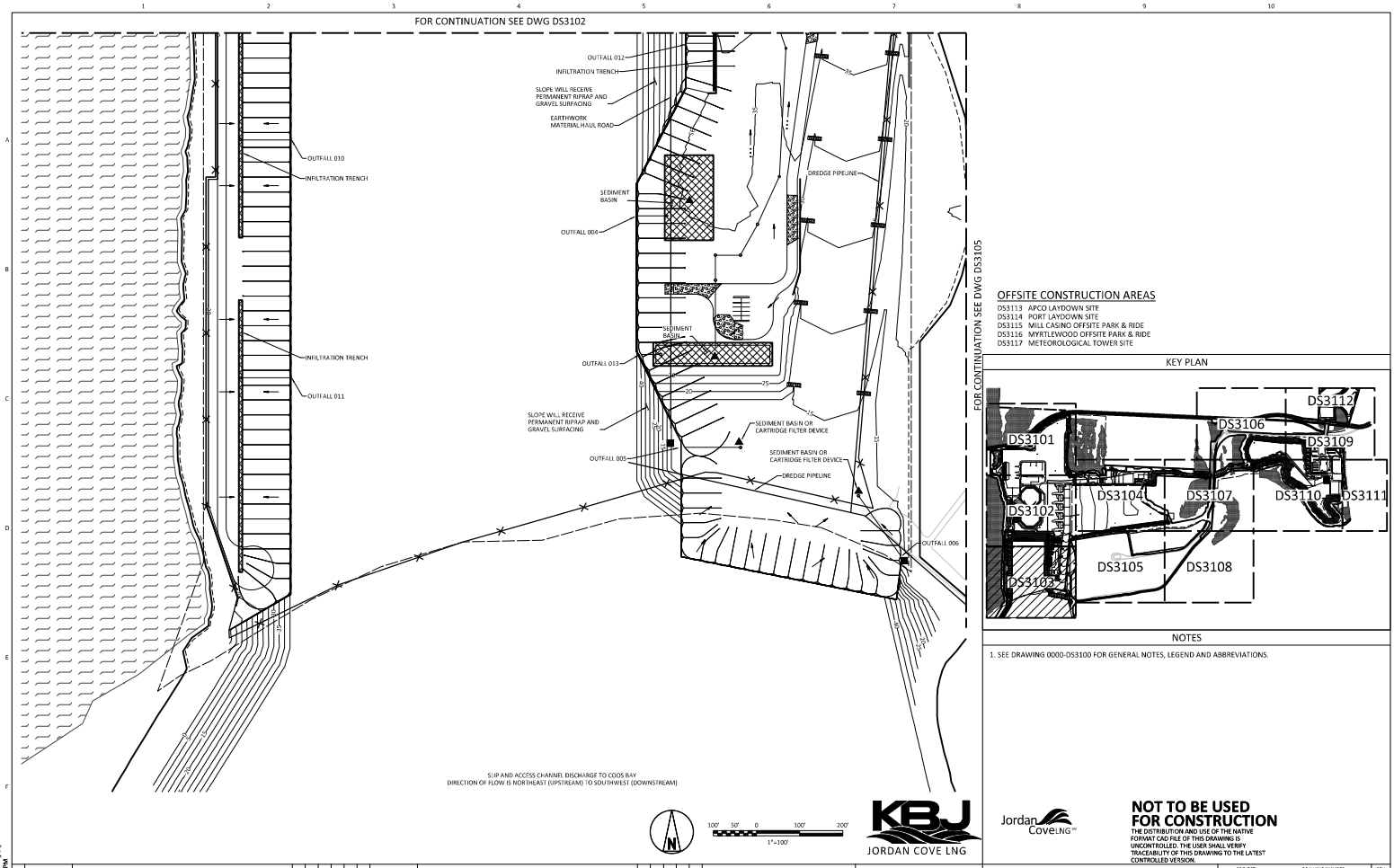

OFFSITE CONSTRUCTION AREAS

DS3113 APCO LAYDOWN SITE
DS3114 PORT LAYDOWN SITE
DS3115 MILL CASINO OFFSITE PARK & RIDE
DS3116 MYRTLEWOOD OFFSITE PARK & RIDE
DS3117 METEOROLOGICAL TOWER SITE

KEY PLAN

NOTES

1. SEE DRAWING 0000-DS3100 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.

KBJ JORDAN COVE LNG

Jordan Cove LNG

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NO	DATE	KBJ REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	FOR	APP

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JORDAN COVE LNG PROJECT

EROSION AND SEDIMENT CONTROL PLAN AREA 3

PROJECT 189980-0000-DS3103 DRAWING NUMBER REV

JCNG NUMBER J1-000-CIV-GRD-KBJ-01304-03 REV

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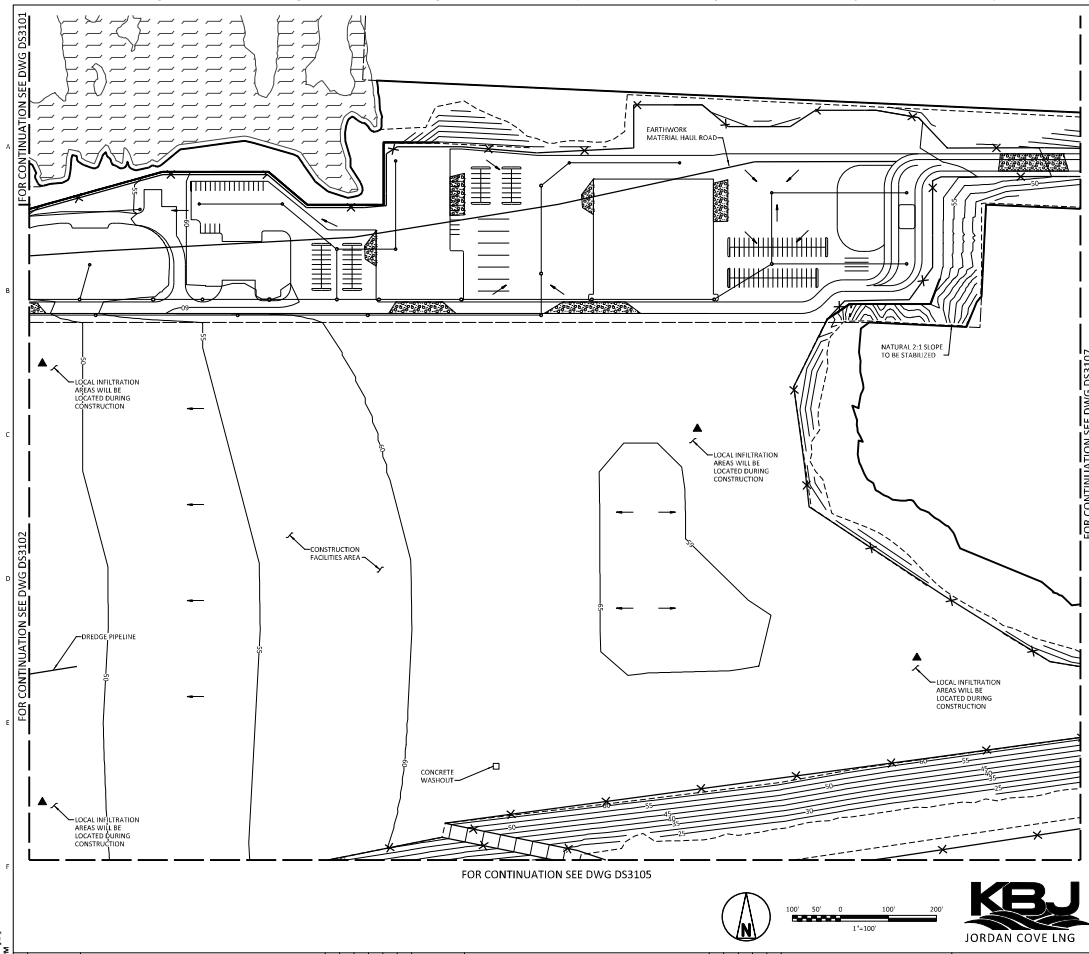
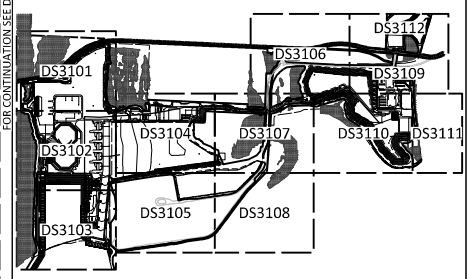


OFFSITE CONSTRUCTION AREAS

DS3113 APCO LAYDOWN SITE
DS3114 PORT LAYDOWN SITE
DS3115 MILL CASINO OFFSITE PARK & RIDE
DS3116 MYRTLEWOOD OFFSITE PARK & RIDE
DS3117 METEOROLOGICAL TOWER SITE

KEY PLAN



NOTES

1. SEE DRAWING 0000-DS3100 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.

100' 50' 0 100' 200'
1"=100'

KBJ
JORDAN COVE LNG

Jordan Cove LNG

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NO	DATE	KBJ REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	FOR	APP

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JORDAN COVE LNG PROJECT

EROSION AND SEDIMENT CONTROL PLAN AREA 4

PROJECT 189980-0000-DS3104
DRAWING NUMBER
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JCNG NUMBER J1-000-CIV-GRD-KBJ-01304-04
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FOR CONTINUATION SEE DWG DS3104

FOR CONTINUATION SEE DWG DS3102

FOR CONTINUATION SEE DWG DS3103

FOR CONTINUATION SEE DWG DS3108

EXISTING DRAINAGE PATTERNS WILL BE MAINTAINED TO THE GREATEST EXTENT POSSIBLE

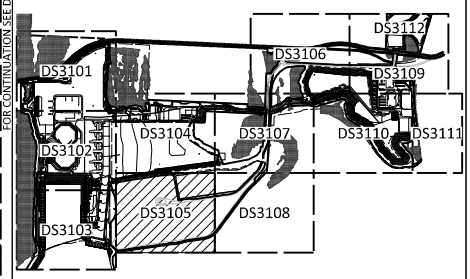
CONSTRUCTION FACILITIES AREA

DREDGE PIPELINE

OFFSITE CONSTRUCTION AREAS

DS3113 APCO LAYDOWN SITE
DS3114 PORT LAYDOWN SITE
DS3115 MILL CASINO OFFSITE PARK & RIDE
DS3116 MYRTLEWOOD OFFSITE PARK & RIDE
DS3117 METEOROLOGICAL TOWER SITE

KEY PLAN



NOTES

1. SEE DRAWING 0000-DS3100 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.

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1"=100'

JORDAN COVE LNG

Jordan Cove LNG

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NO	DATE	KBJ REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	FOR	APP

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JORDAN COVE LNG PROJECT

EROSION AND SEDIMENT CONTROL PLAN AREA 5

PROJECT 189980-0000-DS3105
DRAWING NUMBER
REV
JCNG NUMBER J1-000-CIV-GRD-KBJ-01304-05
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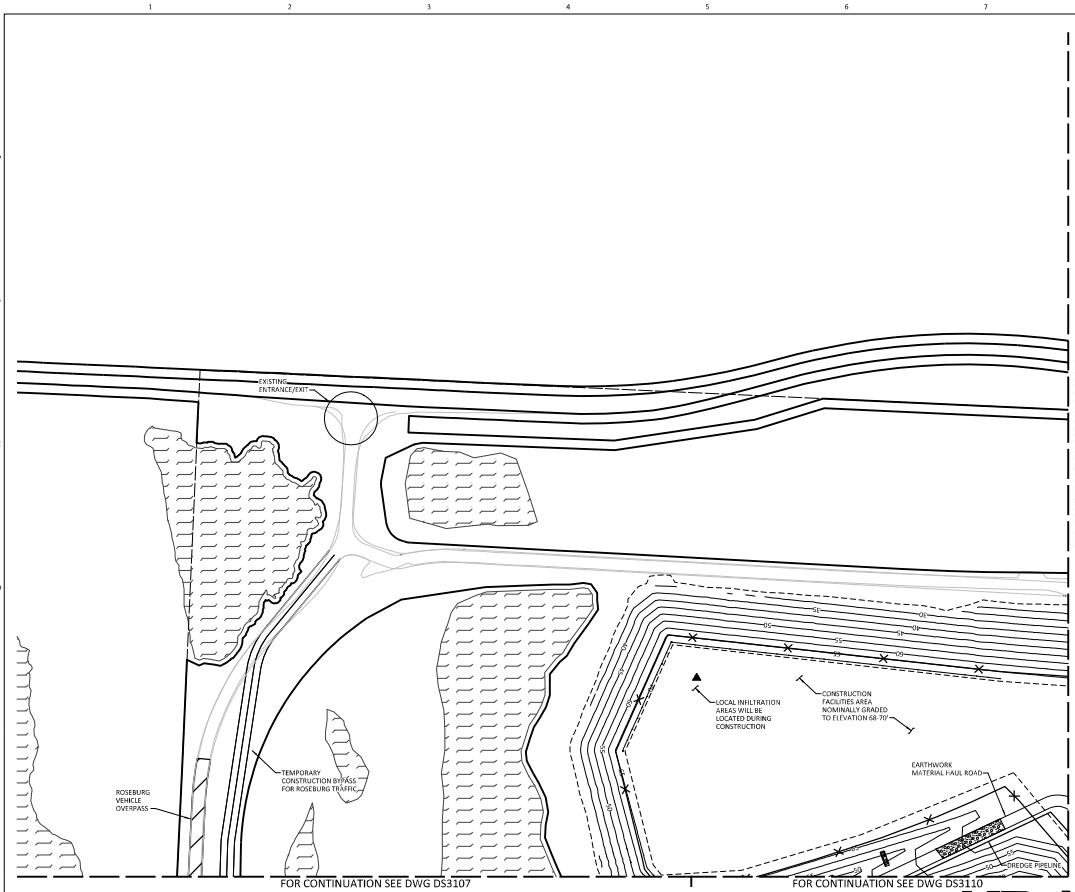
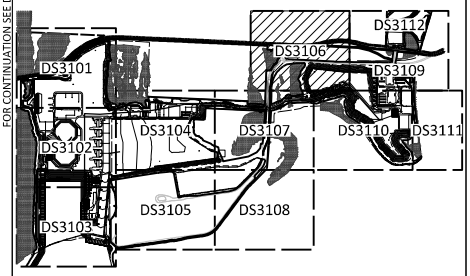


OFFSITE CONSTRUCTION AREAS

DS3113 APCO LAYDOWN SITE
DS3114 PORT LAYDOWN SITE
DS3115 MILL CASINO OFFSITE PARK & RIDE
DS3116 MYRTLEWOOD OFFSITE PARK & RIDE
DS3117 METEOROLOGICAL TOWER SITE

KEY PLAN



NOTES

1. SEE DRAWING 0000-DS3100 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.

KBJ JORDAN COVE LNG

Jordan Cove LNG

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NO	DATE	KBJ REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	FOR	APP

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JORDAN COVE LNG PROJECT

EROSION AND SEDIMENT CONTROL PLAN AREA 6

PROJECT 189980-0000-DS3106

DRAWING NUMBER

REV

JCNG NUMBER J1-000-CIV-GRD-KBJ-01304-06

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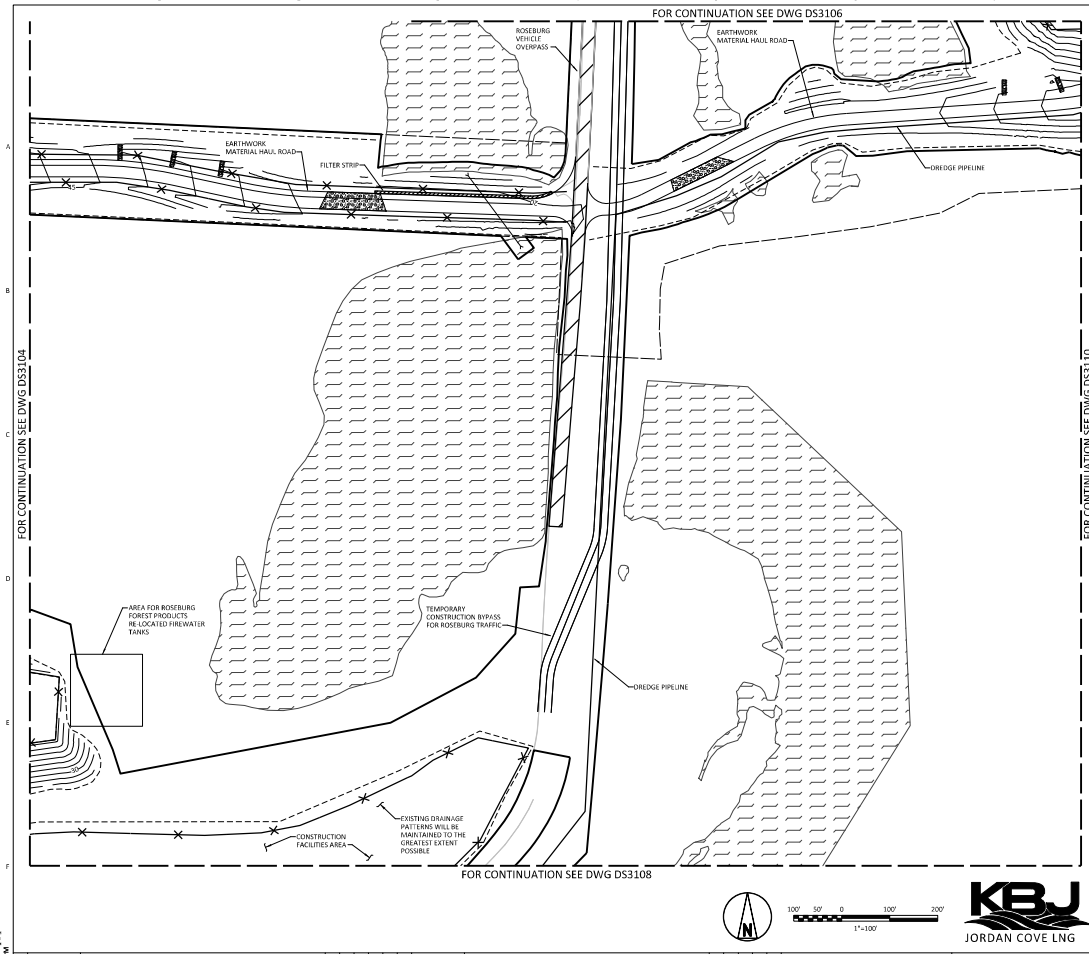
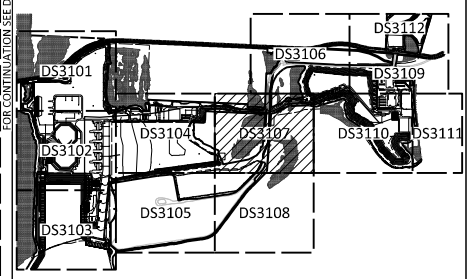


FOR CONTINUATION SEE DWG DS3110

OFFSITE CONSTRUCTION AREAS

DS3113 APCO LAYDOWN SITE
DS3114 PORT LAYDOWN SITE
DS3115 MILL CASINO OFFSITE PARK & RIDE
DS3116 MYRTLEWOOD OFFSITE PARK & RIDE
DS3117 METEOROLOGICAL TOWER SITE

KEY PLAN



NOTES

1. SEE DRAWING 0000-DS3100 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.

100' 50' 0 100' 200'
1"=100'

KBJ JORDAN COVE LNG

Jordan Cove LNG

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JORDAN COVE LNG PROJECT

EROSION AND SEDIMENT CONTROL PLAN AREA 7

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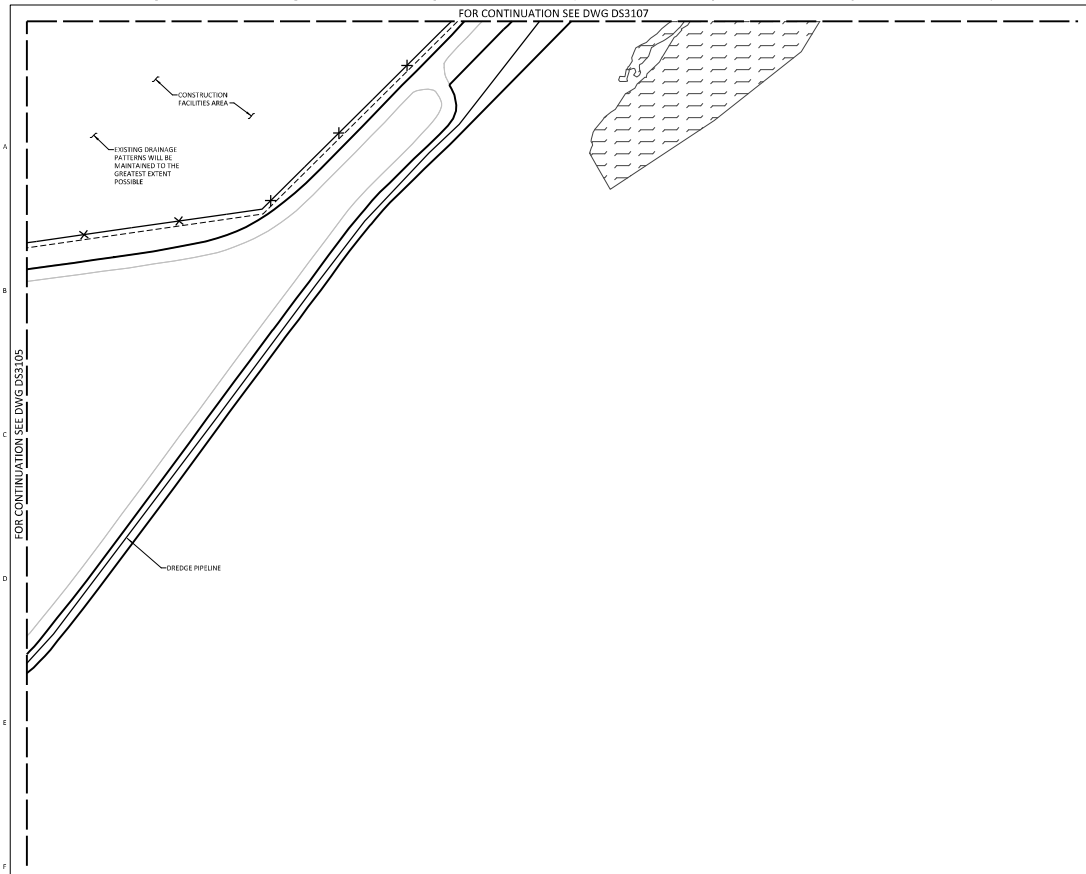
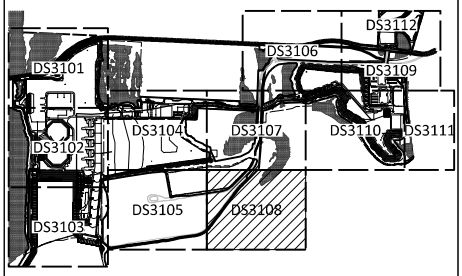


OFFSITE CONSTRUCTION AREAS

DS3113 APCO LAYDOWN SITE
DS3114 PORT LAYDOWN SITE
DS3115 MILL CASINO OFFSITE PARK & RIDE
DS3116 MYRTLEWOOD OFFSITE PARK & RIDE
DS3117 METEOROLOGICAL TOWER SITE

KEY PLAN



NOTES

1. SEE DRAWING 0000-DS3100 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.

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1"=100'

JORDAN COVE LNG

Jordan Cove LNG

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NO	DATE	KBJ REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	FOR	APP

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JORDAN COVE LNG PROJECT

EROSION AND SEDIMENT CONTROL PLAN AREA 8

PROJECT 189980-0000-DS3108

DRAWING NUMBER

REV

JCLNG NUMBER J1-000-CIV-GRD-KBJ-01304-08

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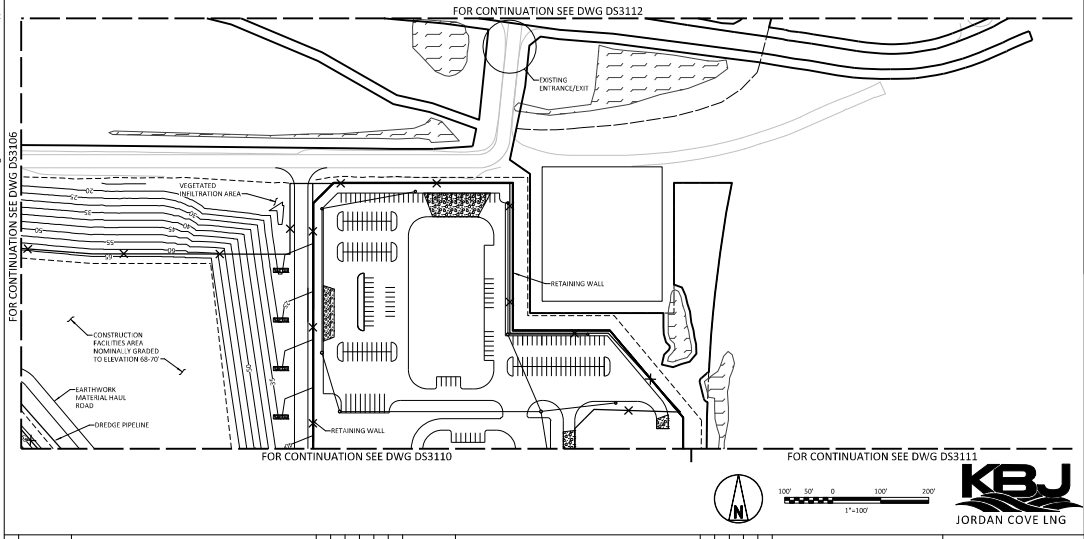
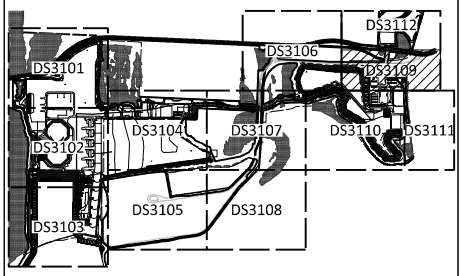


OFFSITE CONSTRUCTION AREAS

DS3113 APCO LAYDOWN SITE
DS3114 PORT LAYDOWN SITE
DS3115 MILL CASINO OFFSITE PARK & RIDE
DS3116 MYRTLEWOOD OFFSITE PARK & RIDE
DS3117 METEOROLOGICAL TOWER SITE

KEY PLAN



NOTES

1. SEE DRAWING 0000-DS3100 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.

KBJ JORDAN COVE LNG

Jordan Cove LNG

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JORDAN COVE LNG PROJECT

EROSION AND SEDIMENT CONTROL PLAN AREA 9

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JCLNG NUMBER		REV
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Exhibit A.4
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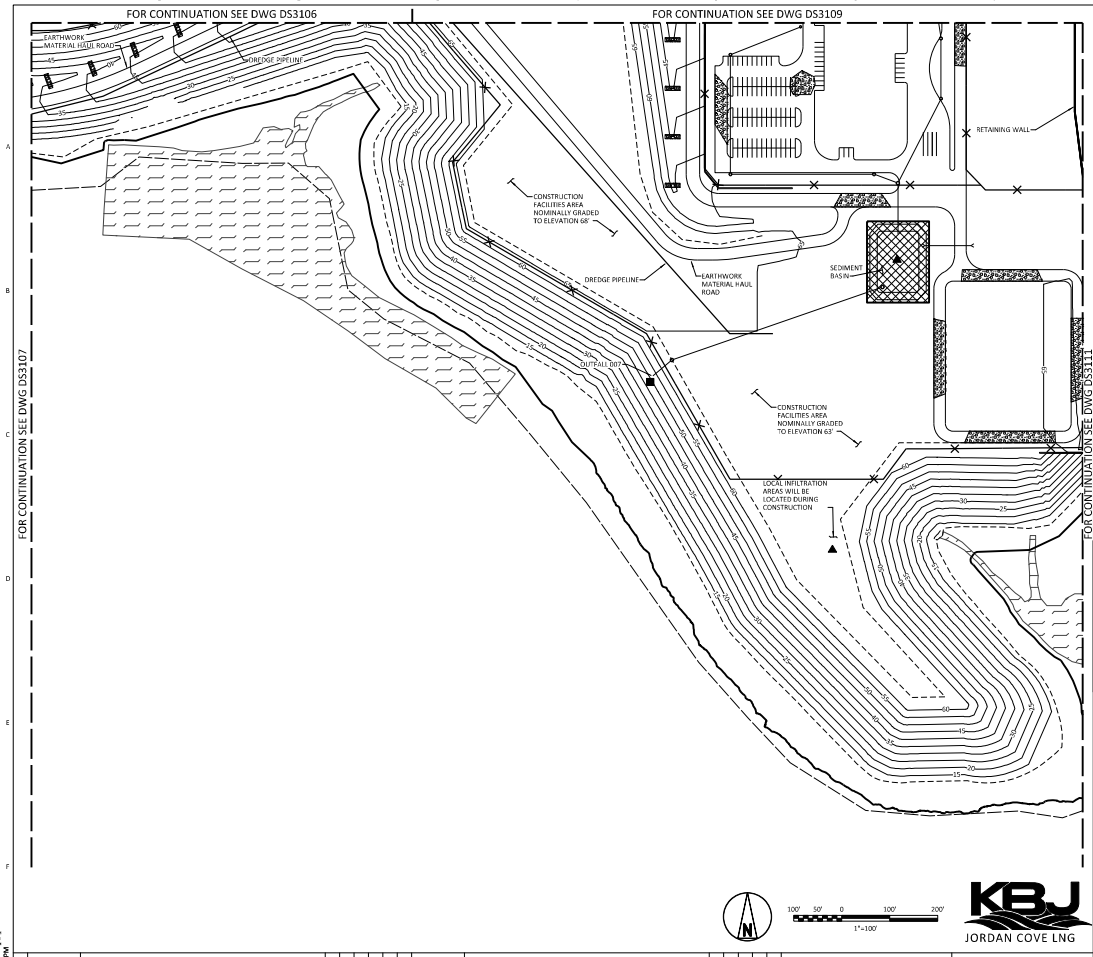
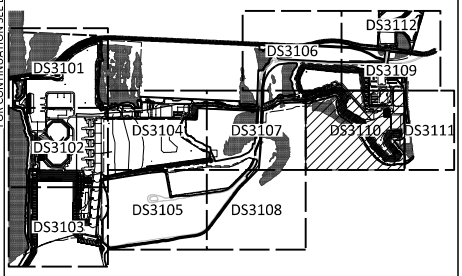


OFFSITE CONSTRUCTION AREAS

DS3113 APCO LAYDOWN SITE
DS3114 PORT LAYDOWN SITE
DS3115 MILL CASINO OFFSITE PARK & RIDE
DS3116 MYRTLEWOOD OFFSITE PARK & RIDE
DS3117 METEOROLOGICAL TOWER SITE

KEY PLAN



NOTES

1. SEE DRAWING 0000-DS3100 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.

100' 50' 0 100' 200'
1"=100'

KBJ JORDAN COVE LNG

Jordan Cove LNG

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NO	DATE	KBJ REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	FOR	APP

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DESIGNED DRAWN
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JORDAN COVE LNG PROJECT

EROSION AND SEDIMENT CONTROL PLAN AREA 10

PROJECT 189980-0000-DS3110
DRAWING NUMBER
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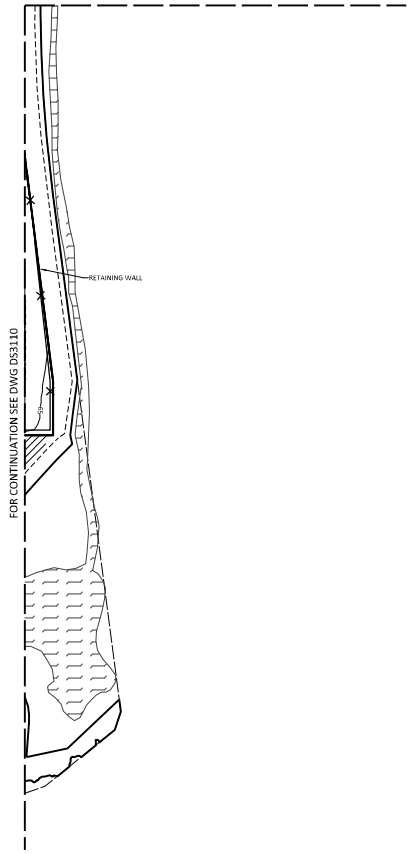
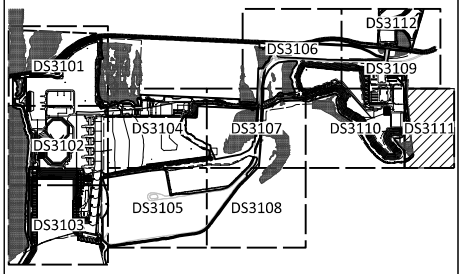
FOR CONTINUATION SEE DWG DS3109



OFFSITE CONSTRUCTION AREAS

DS3113 APCO LAYDOWN SITE
DS3114 PORT LAYDOWN SITE
DS3115 MILL CASINO OFFSITE PARK & RIDE
DS3116 MYRTLEWOOD OFFSITE PARK & RIDE
DS3117 METEOROLOGICAL TOWER SITE

KEY PLAN



NOTES

1. SEE DRAWING 0000-DS3100 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.

100' 50' 0 100' 200'
1"=100'

JORDAN COVE LNG

Jordan Cove LNG

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JORDAN COVE LNG PROJECT

EROSION AND SEDIMENT CONTROL PLAN AREA 11

PROJECT 189980-0000-DS3111 DRAWING NUMBER REV

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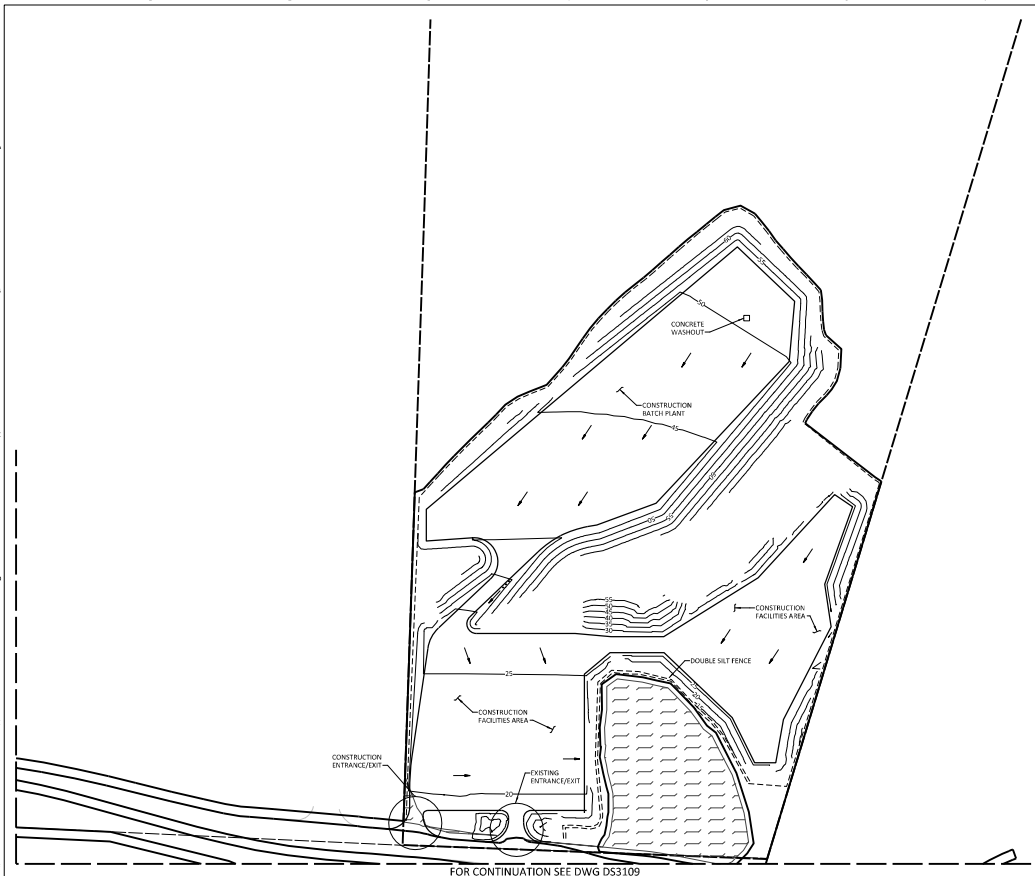
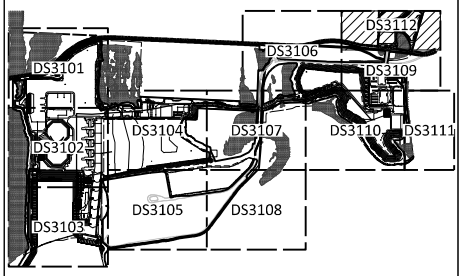


OFFSITE CONSTRUCTION AREAS

DS3113 APCO LAYDOWN SITE
DS3114 PORT LAYDOWN SITE
DS3115 MILL CASINO OFFSITE PARK & RIDE
DS3116 MYRTLEWOOD OFFSITE PARK & RIDE
DS3117 METEOROLOGICAL TOWER SITE

KEY PLAN



NOTES

1. SEE DRAWING 0000-DS3100 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.

100' 50' 0 100' 200'
1"=100'

KBJ JORDAN COVE LNG

Jordan Cove LNG

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JORDAN COVE LNG PROJECT

EROSION AND SEDIMENT CONTROL PLAN AREA 12

PROJECT 189980-0000-DS3112 DRAWING NUMBER REV

JCNG NUMBER J1-000-CIV-GRD-KBJ-01304-12 REV

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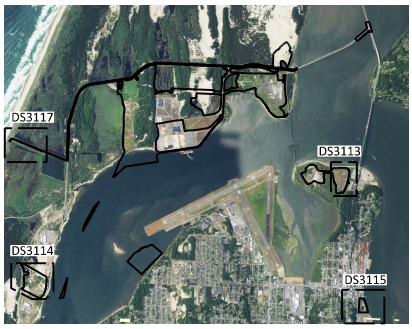
OFFSITE CONSTRUCTION AREAS MAP



NOTES

1. SEE DRAWING 0000-DS3100 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.

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EROSION AND SEDIMENT CONTROL PLAN
APCO LAYDOWN SITE

PROJECT 189980-0000-DS3113

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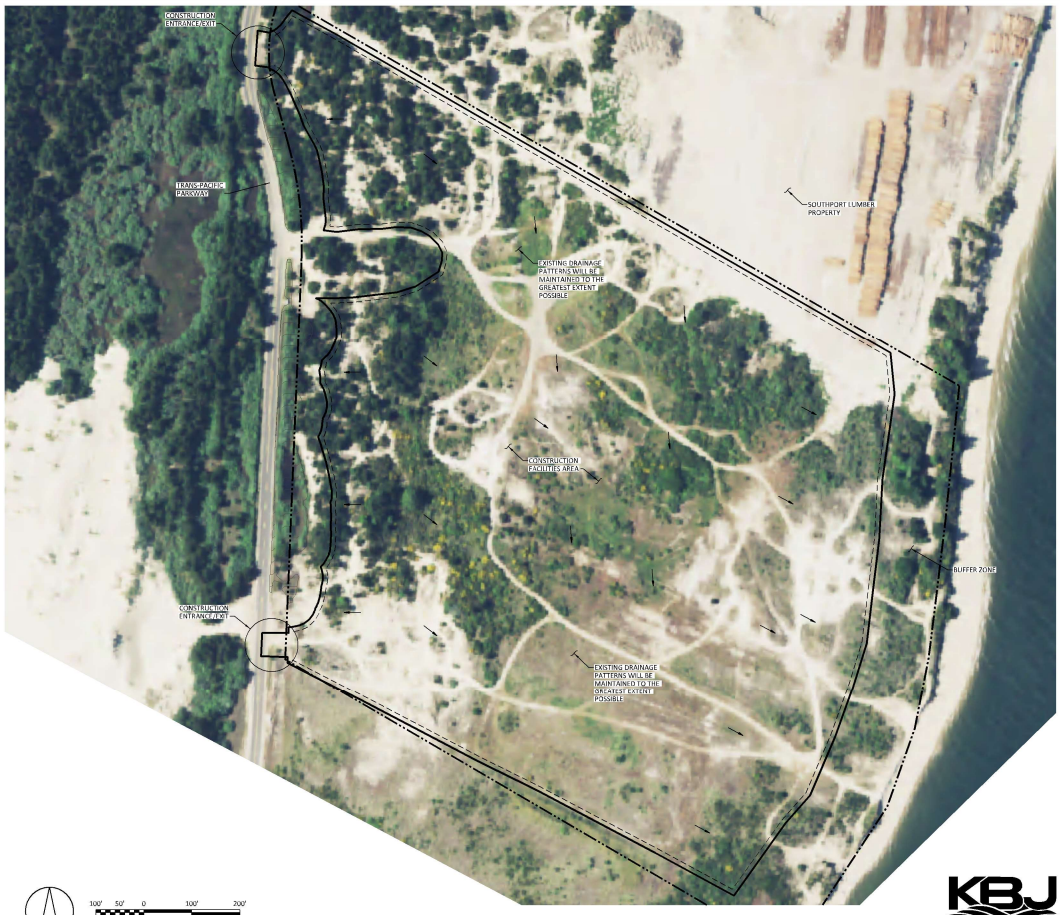

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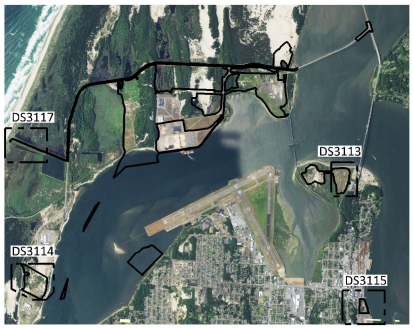

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EROSION AND SEDIMENT CONTROL PLAN
PORT LAYDOWN SITE

PROJECT 189980-0000-DS3114

JCLNG NUMBER J1-000-CIV-GRD-KBJ-01304-14

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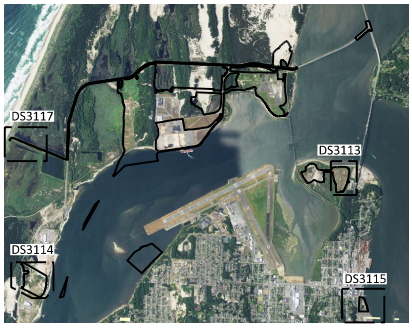

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PROJECT 189980-0000-DS3115

DRAWING NUMBER

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EROSION AND SEDIMENT CONTROL PLAN
MILL CASINO OFFSITE PARK & RIDE

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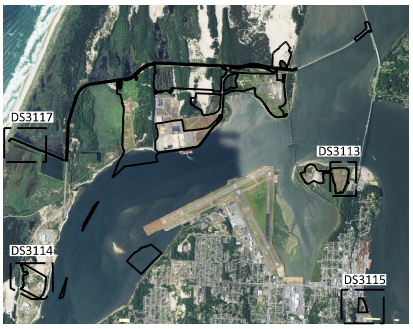

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JORDAN COVE LNG PROJECT

EROSION AND SEDIMENT CONTROL PLAN
MYRTLEWOOD OFFSITE PARK & RIDE

PROJECT 189980-0000-DS3116
DRAWING NUMBER
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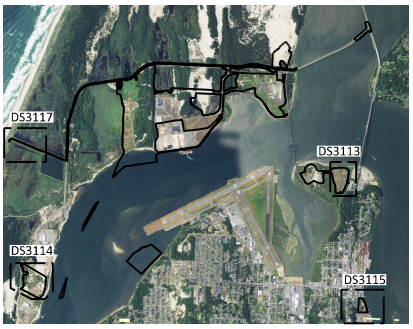

NOTES

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JORDAN COVE LNG PROJECT

EROSION AND SEDIMENT CONTROL PLAN
METEOROLOGICAL TOWER SITE

PROJECT 189980-0000-DS3117

DRAWING NUMBER

REV

JCLNG NUMBER J1-000-CIV-GRD-KBJ-01304-17

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APPENDIX F.2 (continued)

Spill Prevention, Control, and Countermeasure Plan – Construction (KBJ 2017a)

Appendix B. Specific Spill Prevention

The following management, preventive maintenance, housekeeping, and inspection practices will be put in place at the construction site.

Aboveground Tanks

- Tanks will be monitored during filling to avoid overfilling.
- Tanks will be contained, monitored, and inspected to detect potential release of materials.
- Visual inspections of the tank and seams will be conducted to look for signs of deterioration and/or leaks, particularly at seams, welds, and flanged connections, which might cause a spill or accumulation inside contained areas.
- With the exception of active product lines, the valves on the tanks will be in the closed position.

Storage Areas

- Storage areas will be clearly marked and designated as a storage area.
- Drums and tanks that are not in use will not be stored outside of designated areas.
- Storage areas will be inspected regularly to check for leaks and container deterioration.
- Containers will be properly labeled to indicate the contents and accumulation dates, if applicable.
- Containers will be kept closed when not in use.
- Employees will be present while the container contents are dispensed or transferred to oversee operations and stop or control leaks and spills.
- Hazardous substances, including chemicals, oils, and fuels, will not be stored within 100 feet of a waterbody or wetland boundary. This applies to storage rather than normal operation of equipment in these areas.
- Concrete coating activities will not be performed within 100 feet of a waterbody or wetland boundary, unless the location is an existing industrial site designed for such use, or other acceptable arrangements are developed (e.g., at corridor bride, the corridor, or the MOF).

Tank Truck Loading/Offloading

The following procedures will be implemented in compliance with Department of Transportation requirements (49 CFR, Sections 171, 173, and 177).

- Before Tank Truck Loading/Offloading
  - Prior to delivery, a fuel offloading schedule will be prepared by company.
  - The vehicle will be parked inside the loading/offloading containment, if applicable.
  - The vehicle's motor and lights will be turned off, and the parking brake set.

- The driver will inspect the liquid level in the tank.
- The driver will get out of the vehicle to monitor the procedure and stop or control any leaks and spills that may arise.
- Outlet valves will be checked to ensure that they are closed.
- If required, a grounding wire will be attached to the truck body.
- Ungrounded objects will be removed from the loading/offloading area to prevent any chance of generating sparks.
- Unless the engine will be needed to offload the fuel, the vehicle will remain off.
- Fuel trucks will use only approved access roads.
- All equipment will be parked overnight and/or fueled at least 150 feet from a waterbody or in an upland area at least 150 feet from a wetland boundary. These activities may occur closer, if the project manager for the contractor determines that no reasonable alternative location exists; and that appropriate steps, such as secondary containment, will be taken to prevent spills and provide prompt cleanup in the event of a spill.

- During Loading/Offloading
  - Flow should start slowly.
  - Transfer operator will be present and attentive.
  - Dome covers will be kept closed during bottom offloading. When top offloading, only the cover of the compartment being offloaded will be open.
  - No smoking at any time.
- After Loading/Offloading
  - The driver will check the liquid level of the tank versus the compartment marker on the tanker truck. Document inventory as required.
  - The hose used for transfer will be stored aboveground level and rolled in such a way as to prevent spillage of any fuel oil remaining in the hose.
  - Valves will be closed and loading arms disengaged. Spillage will be noted and cleanup actions taken if necessary.
  - Hatches will be closed tightly.
  - Internal safety valves will be closed.
- Warning signs, chock blocks, or vehicle brake interlock system will be provided in truck loading/offloading areas that prohibit vehicle departure or movement unless a complete disconnect of flexible or fixed transfer lines has taken place.

Appendix C. Spill Contingency Plan

1.0 NOTIFICATION PROCEDURE

In the event of an oil spill incident, facility personnel will take immediate action to notify the primary contacts listed in the Emergency Contacts section of this document. The designated person (call Primary Jordan Cove Energy Project L.P. contact) accountable for oil spill prevention will be responsible and required by federal and state laws to notify the applicable federal, state, and local agencies provided on the list.

2.0 SPILL CONTINGENCY PLAN

In the event of an oil spill incident, facility personnel will follow the procedures outlined in this contingency plan. Spill response procedures will be posted in the areas where fueling and oil storage activities occur at the facility. A spill response action checklist is provided following Section 5.0.

3.0 SPILL CONTROL PROCEDURES

An oil spill incident could occur at the facility from the following situations:

Potential spill scenarios were listed in Section 2.0 of the SPCC Plan. Should an oil spill incident occur, facility personnel will immediately implement the following spill control measures to prevent a spill from entering navigable waters:

- Storage tank or drum rupture
  - Ensure that spilled oil will be contained (refer to Section 4.0, Countermeasure Procedures);
  - Add absorbent to lift oil off of surface;
  - Divert spilled material away from outfalls and waterbodies with absorbent booms or trenches;
  - If the release is to water, use oil booms and hay bales to prevent further spread; and
  - Pump used oil into drums or other appropriate containers.
- Spill during fueling operations
  - Turn off pump;
  - Ensure that spilled oil will be contained (refer to Section 4.0, Countermeasure Procedures);
  - Divert spilled material away from outfalls and waterbodies and toward the sedimentation basin with absorbent booms or trenches;
  - If the release is into water, use oil booms and hay bales to prevent further spread; and
  - Pump used oil into drums or other appropriate containers.

- Spill during truck loading/offloading operations
  - Turn off pump;
  - Ensure that spilled oil will be contained (refer to Section 4.0, Countermeasure Procedures);
  - Divert spilled material away from outfalls and waterbodies and toward the sedimentation basin with absorbent booms or trenches;
  - If the release is to water, use oil booms and hay bales to prevent further spread; and
  - Pump used oil into drums or other appropriate containers.

4.0 COUNTERMEASURE PROCEDURES

Once the spill control procedures outlined above have been implemented, facility personnel will initiate countermeasure activities to contain, cleanup, and mitigate the effects of an oil spill that could impact navigable waters. Furthermore, incident-specific considerations and precautions will also be implemented during each spill incident to adequately protect human health and the environment.

The facility's countermeasure procedures are outlined below.

- Containment. Containment activities will be initiated as soon as possible to prevent spreading of the spilled material. Containment techniques include, but are not limited to:
  - Trenching and diking;
  - Filter fences; and
  - Booms.
- Removal. Once the spill is contained, the oil will be removed. Removal techniques include, but are not limited to:
  - Pumps;
  - Sorbents (kitty litter, pads, pillows, or booms);
  - Skimmers;
  - Vacuum trucks; and
  - Shovels.
- Storage. Hazardous substances, including chemicals, oils, and fuels, should not be stored within 100 feet of a waterbody or wetland boundary. Storage techniques include, but are not limited to:
  - DOT drums;
  - For larger quantities of soils, construct a temporary waste pile on plastic liners and cover the pile or use a plastic-lined roll-off box;
  - Label the container; and
  - Move the container to a secure area.

- Disposal. After the spill is contained, the site will be cleaned up. This includes recycling any recovered oil, disposing of abatement materials used to contain and/or remove the spill, and excavating oil-contaminated soil. Disposal techniques include, but are not limited to:
  - Recycling; and
  - Disposal at an appropriate licensed facility.

5.0 EMERGENCY RESPONSE EQUIPMENT LOCATION

The following table identifies the type and location of the emergency response equipment, including personal protective equipment, available at the facility.

Additional spill response equipment such as pumps, booms, and additional absorbents will be available by contacting the outside emergency response contractor listed in the Emergency Contacts section of this SPCC Plan.

EXAMPLE FACILITY RESPONSE EQUIPMENT LIST		
EQUIPMENT CLASS	**TYPES OF EQUIPMENT**	**STORAGE LOCATION**
	Absorbent pads and booms	
	Empty sandbags	
	Sewer pipe plugs	
	Several bags of ultra-absorbent granules	
	Square end shovels	
	Pry bar	
	Drain covers	
	Fire extinguishers	
	Plastic zip ties	
	Temporary disposal bags	
	Nitrile gloves	
	Safety goggles	
	Haz-mat suit	
	Copy of the facilities SPCC Plan	

NOTE: To be updated prior to the start of construction and the coordination of the contractors..

Equipment supplies (such as booms) are to be coordinated with the supplies to be provided by response contractors.

FIRST RESPONDER RESPONSIBILITIES
SAFETY FIRST. Consider your personal safety and the safety of others before conducting the following spill response actions.
Stop the product flow. Secure pumps, close valves, etc.
Treat spills as flammable and hazardous, minimize personal contact and exposure to spill material and shut off ignition sources (motors, electrical circuits, open flames, etc.)
Halt processes and isolate affected areas to prevent additional fires, explosions, and releases.
Contact your supervisor who will contact the Primary Jordan Cove LNG Contact/Emergency Coordinator.
Follow the direction of Supervisors and Primary Jordan Cove LNG Contact/Emergency Coordinator.
SUPERVISOR RESPONSIBILITIES
Upon knowledge of a spill/discharge, contact the Primary Jordan Cove LNG Contact/Emergency.
If spill is minor (less than 100 gallons), initiate cleanup activities.
If Primary Company Jordan Cove LNG/Emergency Coordinator is not available, initiate Primary Jordan Cove LNG Contact/Emergency Coordinator responsibilities until they arrive.
Enforce safety and security measures to protect the safety of personnel.
Assist Primary Jordan Cove LNG Contact/Emergency Coordinator as directed.
PRIMARY JORDAN COVE LNG CONTACT/EMERGENCY COORDINATOR
Notify the state, federal, or local authorities, as appropriate (Emergency Contacts).
Call if spill affects electrical operations. Call various on-site departments that may be affected by spill.
Identify the character, source, amount and extent of the material spilled and record the information.
Assess the interaction of the spilled substance with water and/or other substances stored at the facility.
Assess the possible hazards to human health and the environment caused by the release. This assessment will consider both the direct and indirect effects of the release (i.e., the effects of any toxic, irritating or asphyxiating gases that could be generated, or the effects of potentially hazardous surface water runoffs generated from the water or chemical agents used to control fire and heat induced explosions).
Initiate evacuations as deemed necessary. Direct emergency efforts until relieved by the local agency, if necessary.
Use authority to immediately access company funding for cleanup activities. Ensure that emergency equipment is cleaned, repaired, or replaced.
Conduct an incident critique and revise this SPCC and the storm water plans.
RESPONSE PERSONNEL RESPONSIBILITIES
Secure appropriate personal protective and emergency equipment.
Take action to contain and prevent the spread of the material, especially into drains or waterbodies.
Pump or absorb the spilled material with an approved, compatible absorbent agent and transfer to a recovery container.
Responders will decontaminate the spill area and transfer cleanup debris into a recovery container.
Responders will properly label the recovery containers that will be disposed of as per contracts with emergency responders and/or qualified waste removal/recycling agencies.

Appendix D. Spill Response Notification Form

This information will be updated during detailed design.

Spill Response Notification Form

Jordan Cove LNG Project

Contractor Emergency Contact:
To Be Determined

Jordan Cove LNG Project Emergency Contact:
To Be Determined

Date of Report: _____

Name of Company: _____

Person Making Report:_____Title:_____

Date, Time, and Duration of Occurrence:_____

Location of incident (attach sketch if necessary):_____

_____

_____

Name, Source, and Quantity of Substance Spilled or Released (attach MSDS):_____

_____

_____

Description of Occurrence:_____

_____

_____

Weather Conditions at Time of Release (wind direction and speed, rain intensity, temperature, snow, ice, etc.):_____

_____

Extent of Damage to the Environment (Air, Water, Ground, Property):_____

_____

_____

Remedial Action Taken to Prevent Spread and Cleanup Site (list dates, time, site personnel, transporters, disposal sites, government inspectors, etc.):_____

_____

_____

Persons Injured or Exposed (list complete names, addresses, and phone numbers):

_____

_____

_____

Site Emergency Coordinator Name/Title/ Company:_____

_____

Site Personnel Involved (Names/Titles):_____

_____

_____

_____

Company Personnel Notified (list names and time notified):_____

_____

_____

_____

Federal, State and Local Agencies/Authorities Notified (list names, agency, phone numbers, who notified, date/time notified, and any verbal response or instructions):

_____

_____

_____

Others Notified (consultants, contractors, emergency assistance):_____

_____

_____

_____

Additional Information:_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Signature:_____ Date:_____

Title:_____

Appendix E. Emergency Contractor or Subcontractor Information

This information will be identified during detailed design.

Appendix F. Written Procedures for Inspections

Instructions for inspecting the aboveground containers are provided below. The following tank inspection procedures are based upon the EPA-recommended Steel Tank Institute's STANDARD FOR INSPECTION OF IN-SERVICE SHOP FABRICATED ABOVEGROUND TANKS FOR STORAGE OF COMBUSTIBLE AND FLAMMABLE LIQUIDS (SP001-03, September 2000) PERIODIC INSPECTION (PERFORMED BY TANK OWNER OR HIS DESIGNATE)

The first three situations are considered Critical Situations. These REQUIRE IMMEDIATE ATTENTION. Inspect the tank for serviceability and make corrections as required prior to returning it to service.

1) Take a tank out of service immediately (within 24 hours) if a leak is found in the tank at any time. Repair or replace the tank. Consult the tank manufacturer prior to making any alternations or repairs to a tank.

2) If the tank has been exposed to a fire or other means that could cause possible damage, inspect the tank for serviceability and leaks prior to being put into service. Follow the inspection criteria described below. Make corrections and/or repairs as required. Consult the tank manufacturer prior to making any alterations or repairs to a tank.

3) Check for proper drainage during or after a major storm in accordance with paragraph below.

4) Monthly, check the secondary tank or secondary containment if the aboveground tank is so equipped. Remove any water found. Bacteria in the water can cause corrosion and plug filters. If water is found in a tank, check for the presence of corrosion inducing bacteria using a microbe detection kit. If bacteria are present, treat with a suitable bactericide. See the US Department of Energy BNL 48406, a report which provides additional information. Remove a tank from service that has a known leak in either the primary or secondary tank or secondary containment.

5) Monthly, inspect the interstice (i.e., space between tank walls) of a double wall tank for the presence of fuel. If tank is so equipped, check the leak detection system and replace or correct as necessary. Check groundwater wells if the tank is so equipped. Remove a tank from service that has a known leak in either the primary or secondary tank or secondary containment.

6) Monthly, inspect all pipe connections to the tank for evidence of leakage. Replace the gaskets in flanged connections, as necessary, with ones compatible with the stored fluid and rated to cover the temperature extremes of the tank environment. Tighten threaded connections if necessary.

7) Quarterly, perform a walk-around inspection to identify and repair areas of damage to the tank or its coating. Clean the exterior if necessary. Promptly repair any deficiencies that are found. It is important that the tank exterior be inspected periodically to ensure that the integrity of the coating will be maintained. The frequency of periodic repainting will be based upon environmental factors in the geographic area where the tank is located. Give special consideration when repainting to the selection of the coating, surface preparation and coating application. Select a coating of industrial quality that is compatible with the existing coating or else remove the existing coating prior to repainting.

8) Quarterly, inspect and clean normal operating vents and emergency vents on the primary tank (and secondary tank and secondary containment tank, if applicable) and spill containers.

9) Quarterly, inspect and restock the spill response equipment and any personal protective equipment.

10) Once a year, perform a walk-around inspection checking for proper drainage around the tank area. Proper site maintenance is vital to ensure drainage of surface water. Check for ground settling and puddling of water near the tank. Correct as necessary. If ground conditions change or settlement occurs, correct the situation by providing drainage to prevent standing water from being in contact with the steel tank and its supports.

11) Once a year, check o-ring/gasket of emergency vents, if present, for damage or deterioration.

12) Once a year, inspect the tank supports to determine if there is damage or deterioration of the supports. Inspect the supports for signs of damage from vehicles, misuse, and corrosion. Damage may require replacement of the supports. Contact the tank manufacturer for their recommendation. If deterioration has occurred, more frequent inspections may be required. Periodic repainting of the supports may be necessary.

13) Once a year, inspect the tank foundation for signs of settlement, cracking, pitting, and spilling. Contact a qualified contractor for repair of concrete foundations. Observe the condition of the anchor bolts to determine if there has been distortion of the bolts or significant cracking around the bolts. Replace the bolts if they have deteriorated.

14) If a cathodic protection system has been installed on the tank to prevent corrosion of the bottom of the tank, perform periodic readings of the system to be sure that the protection remains adequate in accordance with local, state, and federal guidelines. This procedure will be performed by a qualified cathodic protection tester. The criteria for protection will be as defined by NACE RP-0285, “Corrosion Control of Underground Storage Tank Systems by Cathodic Protection.”

Facility Inspection Form

Inspector Name and Signature:

Date and Time:

	Comments	
		Containers / Storage Areas
Area of Concern	**OK**	**Deficient**
Water Accumulation: Monthly		
Valve/Containment: Monthly		
Signs of Leaks: Monthly		
Signs of Spills: Monthly		
Response Equipment: Quarterly		
Levels and Alarms: Quarterly		
Signs of Tank Deterioration: Quarterly		
Signs of Tank Support Deterioration: Annual		
Signs of Settlement: Annual		
Corrosion/Integrity: Every 10 years		**Not Applicable.**
Notes: Check appropriate box. Report any deficiencies to responsible personnel and note in comment section. Store completed forms in Appendix G.		

To be modified as supplies and equipment are added cto construction effort.

SPCC Training Attendance Log

Trainer Name and Signature:

Date and Time:

Name	Signature

Appendix G. Completed Facility Inspection Forms

APPENDIX G.2

Spill Prevention, Control, and Countermeasure Plan – Operation
(KBJ 2017b)

Spill Prevention, Control, and Countermeasure Plan - Operation

Note: This document is a preliminary version of a document to be used during facility operation. This document provides general content but will be updated prior to the start of operations to incorporate as-built information, final operating plans, and other current detail. The focus of an SPCC plan is oil spill prevention under federal requirements.

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	KBJ-029		**189980-0000-DS0168**				**1**
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Revision Modification Log

Document Title :	Spill Prevention, Control, and Countermeasure Plan - Operation	Rev. :	1
Document No. :	J1-000-CIV-RPT-KBJ-50005-00	Rev. Date :	29-Aug-17

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Certification

I hereby certify that I or my agent have examined the facility, and being familiar with the provisions of 40 CFR 112, attest that this Spill Prevention, Control, and Countermeasure (SPCC) Plan has been prepared in accordance with good engineering practices, including consideration of applicable industry standards and with the requirements of Part 112. Furthermore, I certify that procedures for required inspection and testing have been established. The SPCC Plan is adequate for this facility.

_____

Signature and Date

_____

Printed Name and Title

_____

Registration Number and State

Emergency Contacts (to be updated)

PRIORITIZED CONTACT LIST	RESPONSIBLE ROLE	PHONE NUMBER
COMPANY CONTACTS		
Primary Contact: Chris Haddon JCEP Project Manager	Notification Spill Reporting Onsite Incident Command and Control	Work:
Plant 24-hour Contact	Role: TBD	Phone Number: TBD
Subcontractor Contact: (if applicable) To Be Determined	Notification Spill Reporting Onsite Incident Command and Control	Work:
OUTSIDE CONTRACTORS (Also see list included in Appendix E)		
Possible Emergency Response Contractor: To Be Determined	Provide Contaminated Material Removal and Absorbents, and Spill Response	Work:
Possible Waste Vendor: To be determined	Provide Waste Hauling and Disposal Services	Work:
GOVERNMENT AGENCIES		
National Response Center (NRC)	Emergency Incident Reporting	(800) 424-8802
Oregon Emergency Response System (OERS)	Emergency Incident Reporting	(800) 452-0311
Fire/Police/Ambulance – Local Response	Emergency- Assist in spill clean-up, fire control, medical emergencies	911
EPA Region 10	Follow-up --Incident Reporting	800-424-4372 Office hours:8-4:30 M-F
Oregon Department of Environmental Quality (DEQ)	Follow-Up--Incident Reporting	800-997-7888 Office Hours: 8-5 M-F
Local Emergency Planning Committee – Coos County Emergency Management	Follow-up - Incident Reporting	(541) 396-7790

Overview

Governing Regulation

The Environmental Protection Agency (EPA) Oil Pollution Prevention Rule became effective January 10, 1974. It was published under the authority of Section 31 1(j)(1)(C) of the Federal Water Pollution Control Act (Clean Water Act [CWA]). The regulation may be found at Title 40, Code of Federal Regulations (CFR), Part 112 (40 CFR 112). The prevention rule was revised on July 17, 2002. Facilities subject to the rule will prepare and implement a plan to prevent any discharge of oil into or upon navigable waters of the United States or adjoining shorelines. The plan is called a Spill Prevention, Control, and Countermeasure (SPCC) Plan.

Applicability (40 CFR 112.1 and 40 CFR 120)

Before a facility is subject to the SPCC rule, it must meet three criteria:

1) It must be non-transportation-related (e.g., oil well drilling or pipeline);
2) It must have an aggregate aboveground storage capacity greater than 1,320 gallons of oil or a completely buried storage capacity greater than 42,000 gallons of oil or petroleum products; and
3) There is a possibility of a discharge into or upon navigable waters of the United States or adjoining shorelines.

   When calculating oil storage capacity, do not count:

   - Containers with less than 55 gallons of storage capacity;
   - Completely buried tanks that are subject to all of the technical requirements of the Underground Storage Tank (UST) Regulation (40 CFR Part 280) or all of the technical requirements of a state UST program approved under 40 CFR Part 281;
   - Containers that are permanently closed as defined in 40 CFR Part 112.2; or,
   - Parts of the facility used exclusively for wastewater treatment and not used to satisfy any requirement of 40 CFR Part 112. Note, the production, recovery, or recycling of oil is not considered wastewater treatment; therefore, oil-water separators should be used when calculating oil storage capacity.

This facility will have an aggregate aboveground storage capacity greater than 1,320 gallons of oil.

Note that the feedstock and products are natural gas, liquefied natural gas (LNG), and derivatives. US EPA has clarified that highly volatile liquids such as LNG are not considered to be oil products and thus are not regulated under the Oil Pollution Prevention Rule and do not need to be included in SPCC plans. The guidance was noted in 67 FR 47076 dated July 17, 2002 and in communications with the American Petroleum Institute.

Thus, this Jordan Cove SPCC Plan will document oil products on each site such as the following:

- Oil in equipment (such as oil in compressors, transformers).
- Diesel and gasoline tanks (maybe associated with vehicles and standby generators).
- Oil supplies (such as 55 gallon drums of lubrication products).
- Any other oil products on-site including mineral oils.

Some industrial organizations choose as a best management procedure to include other chemical products in their SPCC plans, such as any bulk tanks of chemicals used at the facility such as acids, coolants, water treatment chemicals, cooling tower chemicals, and maintenance supplies. These are not part of the federal SPCC requirements which focus only on oil. (These may be added in a future edit of this plan.)

There are some system components (namely large power transformers) that contain large volumes of mineral oil, thereby meeting the threshold requirements (after the components are delivered to site). While prevention measures should control any leakage, there is a possibility of discharge into or upon navigable waters of the United States. This facility will implement this SPCC Plan and its provisions.

Additionally, the owner or operator of any non-transportation-related onshore facility that, because of its location, could reasonably be expected to cause substantial harm to the environment by discharging oil into or on the navigable waters or adjoining shorelines will prepare a Facility Response Plan for the EPA Regional Administrator. The following is a description of the screening criteria for determining if the facility poses a substantial harm; it must be:

- A non-transportation-related facility with a total oil storage capacity greater than or equal to 42,000 gallons that transfers oil over water to or from vessels; or
- A facility with a total oil storage capacity of greater than or equal to one million gallons without adequate secondary containment, near a public water supply, or near a sensitive habitat.

This facility will likely fail to meet either of the two screening criteria above, and thus will likely not be required to develop a Facility Response Plan.

Concerning on water-operations and marine equipment, the facility will strictly follow U.S. Coast Guard procedures for spill prevention and controls, including secondary containment and cleanup supplies.

Important Definitions (40 CFR 112.2)

Discharge includes, but is not limited to, any spilling, leaking, pumping, pouring, emitting, emptying, or dumping of oil, but excludes discharges in compliance with a permit under Section 402 of the CWA; discharges resulting from circumstances identified, reviewed, and made a part of the public record with respect to a permit issued or modified under Section 402 of the CWA, and subject to a condition in such permit; or continuous or anticipated intermittent discharges from a point source, identified in a permit or permit application under Section 402 of the CWA, that are caused by events occurring within the scope of relevant operating or treatment systems. For

purposes of this regulation, the term discharge shall not include any discharge of oil that is authorized by a permit issued under Section 13 of the River and Harbor Act of 1899 (33 U.S. Code 407).

Facility means any mobile or fixed onshore or offshore building, structure, installation, equipment, pipe, or pipeline.

Navigable waters means the waters of the United States, including the territorial seas. The term includes:

(i) All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters subject to the ebb and flow of the tide;

(ii) All interstate waters, including interstate wetlands;

(iii) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce including any such waters:

(A) That are or could be used by interstate or foreign travelers for recreational or other purposes; or

(B) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or,

(C) That are or could be used for industrial purposes by industries in interstate commerce;

(iv) All impoundments of waters otherwise defined as waters of the United States under this section; under any other waters.

Oil means any oil of any kind or in any form, including, but not limited to: petroleum, including asphalt; fuel oil, sludge; oil refuse; oil mixed with wastes other than dredged spoil; fats, oils or greases of animal, fish, or marine mammal origin; vegetable oils, including oil from seeds, nuts, fruits, or kernels; and other oils and greases, including synthetic oils and mineral oils.

Permanently closed means any container or facility for which all liquid and sludge has been removed from each container and connecting line; and all connecting lines and piping have been disconnected from the container and blanked off, all valves (except for ventilation valves) have been closed and locked, and conspicuous signs have been posted on each container stating that it is a permanently closed container and closure.

Important Dates

In accordance with EPA regulations, this SPCC Plan will be reviewed and re-certified by a Professional Engineer at least once every 5 years and updated within 6 months of that review.

SPCC Plan Goal

The goal of this SPCC Plan is to prevent discharge of oil into waters of the United States or adjoining shorelines and to address spill response and cleanup methods.

Modifications to this SPCC Plan

This SPCC Plan should be modified and re-certified by a Professional Engineer when there is a change in the facility design, construction, operation, or maintenance that materially affects the facility's potential for the discharge of oil. Minor modifications, such as personnel changes, do not require that this SPCC Plan be re-certified by a Professional Engineer.

This SPCC Plan will also require modification to better address spill prevention if:

1) The facility has discharged more than 1,000 gallons of oil into or upon the navigable water of the United States or adjoining shoreline, or upon the water if the contiguous zone, or in connection activities under the Outer Continental Shelf Lands Act or the deepwater Port Act of 1974, or that may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States (including resources under the Magnuson Fishery Conservation and Management Act).

2) The facility has discharged more than 42 gallons of oil in each of two discharges (as described above) occurring within a 12 month period.

Records Retention

All training records, inspection forms, and SPCC Plan review documentation will be maintained with this document at the facility for a period of at least 3 years.

1.0 General (40 CFR 112.7(a)(1))

This SPCC Plan has been prepared in accordance with the requirements of the SPCC regulations in 40 CFR 112 as updated in the July 17, 2002, Federal Register. The facility conforms to the stated requirements and will implement a contingency plan.

This SPCC Plan is for the JCEP LNG Terminal Project and will be amended whenever there is a change in facility design, construction, operation, or maintenance that materially affects the facility's potential for the discharge of oil into or upon the waters of the United States or adjoining shorelines or into or upon the water of the contiguous zone, or in connection activities under the Outer Continental Shelf Lands Act or the Deepwater Port Act of 1974, or that may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States (including resources under the Magnuson-Stevens Fishery Conservation and Management Act).

1.1 LOCATION AND SPILL EXPERIENCE (40 CFR 112.7(A)(3)

The Project will be located on the bay side of the North Spit of Coos Bay, Oregon in unincorporated Coos County to the north of the cities of North Bend and Coos Bay, Oregon. JCEP will use approximately 198 acres for the built LNG terminal and associated facilities.

The type and quantity of oil associated with the Project will predominantly include gasoline, diesel, fuel, motor oil, hydraulic fluid, solvents, cleaners, sealants, welding flux, lubricants, paint, and paint thinner. Drawings developed based on as-built detail will be included in the final version of Appendix A to identify the planned location for fuel storage, maintenance, and hazardous materials storage as between and just west of the existing buildings on the site. Storm Water Management Plan drawings are included in Appendix A to show the overland flow, outfalls, and project facilities and structures. These materials will be used to maintain and coat equipment in accordance with the manufacturer's instructions. Proper storage and maintenance of equipment will further limit their potential to contact storm water.

The figures provided at the end of the SPCC Plan will be updated to reflect any changes to the Project.

1.2 TYPE OF OIL AND CAPACITY (40 CFR 112.7(A)(3)(I))

The Project will have one main Lube Oil, Paint, and Compressed Gas Storage Area that will contain the majority of drums, totes, and aboveground storage tanks (ASTs) as applicable that contain more than 55 gallons of oil. The type and volume of oil held within the storage areas are provided in Table 1-1. The Project will also require a diverse inventory of oil products in containers that will be less than 55 gallons in size and other hazardous substances that do not fall under the SPCC Plan requirements. However, spill prevention and response procedures found in this plan still apply.

1.3 DISCHARGE PREVENTION MEASURES (40 CFR 112.7(A)(3)(II))

The discharge preventive measures applicable for the facility are provided in Appendix B.

1.4 DISCHARGE/DRAINAGE CONTROLS (40 CFR 112.7(A)(3)(III))

Discharges from tanks and containers will be controlled by using secondary containment (e.g., drip pans, lined earthen berms, double-walled tanks). Specific discharge/drainage controls for each container are described in Table 1-1.

In accordance with JCEP's Upland Erosion Control, Revegetation, and Maintenance Plan (Plan) and the Wetland and Waterbody Construction and Mitigation Procedures (Procedures), which adopt in their entirety the January 17, 2003, version of the Federal Energy Regulatory Commission (FERC) Plan and Procedures, the following procedures will be followed:

- All employees handling fuels and other hazardous substances will be properly trained (refer to Section 6.0).
- All heavy equipment will be kept in good operating order and will be inspected on a regular basis (refer to Section 6.0).
- Fuel trucks transporting fuel to on-site equipment or tanks will travel only on approved access roads or controlled areas.
- All equipment will be parked overnight and fueled at least 150 feet from a waterbody or in an upland area at least 150 feet from a wetland boundary.
- Hazardous substances, including chemicals, oils, and fuels, will not be stored within 100 feet of a waterbody or wetland boundary. This applies to storage rather than normal operation of equipment in these areas.

Table 1-1 Bulk Storage Containers

CONTAINER	LOCATION	TYPE OF OIL	QUANTITY	TANK MATERIAL	DISCHARGE PREVENTION (SEE APPENDIX B)	SECONDARY CONTAINMENT (112.7(A)(3)(III)	CONTAINMENT VOLUME	DISCHARGE SCENARIO
EXAMPLE 240-gallon Portable AST	EXAMPLE Lube Oil, Paint, and Compressed Gas Storage Area	EXAMPLE Gasoline	EXAMPLE 240 gallon AST	EXAMPLE Steel	EXAMPLE Double- walled	EXAMPLE Double-walled	EXAMPLE 264 gallons	EXAMPLE This tank is double-walled to prevent discharge, should both walls be breached then oil would flow east into the concrete containment.
Diesel AST (2)	Backup generator area	Diesel (ULSD)	1,000 gallons each	Steel	Double-walled	Double-walled	1,000 gallons	This tank is double-walled to prevent discharge
Diesel AST		Diesel (ULSD)	10,000 gallons	Steel	Double-walled	Double-walled	10,000 gallons	This tank is double-walled to prevent discharge and is located in concrete containment
Diesel AST	Fire pump area	Diesel (ULSD)	829 gallons	Steel	Double-walled	Double-walled	829 gallons	This tank is double-walled to prevent discharge and is ain a curbed area
Diesel AST (3)	SORSC Generator areas	Diesel (ULSD)	600 gallons each	Steel	Double-walled	Double-walled	600 gallons	This tank is double-walled to prevent discharge
Lube oils								
Transformers				Steel				

Other items as applicable to be added based on as-built status, such as LUBE OIL SYSTEMs in installed equipment and Oil supplies in the Maintenance Building	TBD	TBD	TBD					

Note: This facility may have other equipment containing oil in quantities less than 55 gallons that are not covered by this SPCC Plan; although, the same spill response procedures will be applied.

1.5 COUNTERMEASURES (40 CFR 112.7(A)(3)(IV))

Countermeasure procedures for the facility are presented in Appendix C. Additional spill response can be obtained from the outside contractors and local fire department listed in the Emergency Contacts section of this SPCC Plan.

1.6 METHODS OF DISPOSAL (40 CFR 112.7(A)(3)(V))

Typical disposal methods that are employed at the facility are as follows:

- Recovered oil will be collected in a designated container and stored in the Lube Oil, Paint, and Compressed Gas Storage Area, or other appropriate area. The outside waste disposal contractor(s) listed in the Emergency Contacts section will pick up this material for disposal.
- Contaminated soil will be drummed or stored in appropriately covered container for pickup and disposal by an outside waste disposal contractor. All drums will be appropriately labeled and stored in a secure staging area. For larger quantities of contaminated soils, temporary waste piles will be constructed using plastic liners by placing the contaminated soil on top of the liner and then covering the pile with a plastic liner. A plastic-lined roll-off box will be rented/leased for this purpose.
- Contaminated equipment and materials, including drums, tanks, parts, valves, and shovels will be cleaned as appropriate for disposal or reuse.
- Personal protective equipment, decontamination solutions, spent chemical and absorbents will be drummed and stored in the Lube Oil, Paint, and Compressed Gas Storage Area, or other appropriate area, for disposal or reuse.

Actual disposal methods will depend on the volume of the release and its condition. Under most arrangements, the outside waste disposal contractor will transport all contaminated material from the site for proper disposal. Spilled residues and other materials contaminated by spilled oil will be characterized using applicable vendor information, laboratory analyses, or other available information as appropriate. Following characterization, these residues and materials will be disposed offsite in a manner consistent with all applicable regulations (e.g., Resource Conservation and Recovery Act).

1.7 CONTACT LIST (40 CFR 112.7(A)(3)(VI) AND 40 CFR 112.7(J))

The contact list and telephone numbers for those individuals/agencies that will be contacted in the event of a discharge are provided in the Emergency Contacts section of this SPCC Plan. Information regarding the designated coordinator for the primary contractor and subcontractor will be provided in the Emergency Contacts section of this SPCC Plan.

1.7.1 Discharge Reporting (40 CFR 112.7(a)(4) and 40 CFR 112.7(j))

In the event of a discharge, all personnel will be instructed to contact the primary company contacts. The primary company contact or his designee will report the necessary information using the Spill Notification Form (provided in Appendix D).

In Oregon, the Oregon Department of Environmental Quality (ODEQ) adopted Oregon Spill Reporting Oregon Administrative Regulations (OAR) 340 Division 142 regarding notifications and procedures for unauthorized discharges. The rules define what a reportable spill is and outline what is to be reported to the state by telephone. Also, notification requirements are described along with the follow up written report requirement.

The following are the reportable spill quantities for oil, petroleum, and used oil (OAR 340-142-0005(9)):

(A) For spills or discharges onto land—one barrel (42 gallons);

(B) For spills or discharges directly into water in the state--quantity sufficient to create a visible film, sheen, oily slick, oily solids, or coat aquatic life, habitat or property (excludes normal discharges for properly operating marine engines).

Upon the determination that a reportable discharge or spill has occurred that does not cause an emergency condition, the primary company contact or his designee will notify the ODEQ and NRC as soon as possible but not later than 24 hours after the discovery of the spill or discharge by telephone or letter..

The initial notification will provide, to the extent known, the information in the following:

- The name, address, and telephone number of the person making the telephone report.
- The date, time, and location of the spill or discharge.
- A specific description or identification of the oil, petroleum product, hazardous substances or other substances discharged or spilled.
- An estimate of the quantity discharged or spilled.
- The duration of the incident.
- The name of the surface water or a description of the waters in the state affected or threatened by the discharge or spill.
- The source of the discharge or spill.
- A description of the extent of actual or potential water pollution or harmful impacts to the environment and an identification of any environmentally sensitive areas or natural resources at risk.
- If different from point (1), the names, addresses, and telephone numbers of the responsible person and the contact person at the location of the discharge or spill.
- A description of any actions that have been taken, are being taken, and will be taken to contain and respond to the discharge or spill.
- Any known or anticipated health risks.
- The identity of any governmental representatives, including local authorities or third parties, responding to the discharge or spill.
- The name and address of transporter and generator, if a transporter is involved.

Appendix A. Figures

Figures will be developed before operations and will be based on as-built detail.

- Any other information that may be significant to the response action.

If the discharge or spill creates an emergency condition, then the Oregon State Fire Marshall 24-hour Oregon Emergency Hazardous Materials Hotline will be notified immediately. The primary company contact will immediately notify and cooperate with local emergency authorities (fire department, fire marshal, law enforcement authority, health authority, as appropriate). Discharge Procedures (40 CFR 112.7(a)(5))

In the event of a discharge, procedures outlined in the Spill Contingency Plan, provided in Appendix C, will be followed.

2.0 Potential Spills (40 CFR 112.7(b))

The expected modes of potential major failure or accident in which oil could be spilled from the facility are listed in Table 2-1.

Table 2-1 Potential Spills

CONTAINER	SPILL SOURCE	SPILL MODE	QUANTITY	FLOW RATE	FLOW PATHWAY
EXAMPLE Gasoline Portable AST	EXAMPLE Tank is punctured.	EXAMPLE Oil spills from puncture onto concrete containment.	EXAMPLE 240 gallons	EXAMPLE Rapid. Liquid is not viscous.	EXAMPLE This tank is double-walled to prevent discharge, should both walls be breached then oil would flow into the concrete containment.
(other items to be added with as-built summary information)					

3.0 Containment, Drainage Control, and Diversionary Structures (40 CFR 112.7(c))

The secondary containment for the oil containers at this facility are listed in Table 1-1 and described in Subsection 11.2.2. Secondary containment or diversionary devices will be required for all containers 55 gallons or larger. Discharge prevention measures include dikes, retaining walls, curbing, weirs, booms, diversion ponds, retention ponds, and absorbent materials. Drums and portable ASTs in the Lube Oil, Paint, and Compressed Gas Storage Area will be provided with secondary containment. Sufficient absorbent materials will be provided to enable quick spill response. The secondary containment systems will be adequate to contain the content of the largest container plus sufficient freeboard for precipitation (i.e., 110 percent). All drainage of accumulated storm water from containment systems will be inspected to ensure no visible sheen is present and the condition documented prior to discharge.

A contingency plan, which has been prepared in general accordance with 40 CFR Part 109, as well as a spill response action checklist, is included as Appendix C.

Concerning on water-operations and marine equipment, the facility will strictly follow U.S. Coast Guard procedures for spill prevention and controls, including secondary containment and cleanup supplies.

4.0 Demonstration of Impracticability (40 CFR 112.7(d))

This facility provides secondary containment devices for storage containers 55 gallons and larger, so this section is not applicable.

5.0 Inspections, Testing, and Records (40 CFR 112.7(e))

Inspections and tests required in this SPCC Plan will be conducted in accordance with written procedures developed for this facility. Written procedures for inspections of containers and blank forms are provided in Appendix F.

In addition, the following inspection forms/records are included with this SPCC Plan:

- Facility Inspection Form.
- SPCC Training Attendance Logs.

The written procedures and completed forms/records of the inspections and tests, signed by the appropriate supervisor or inspector, will be kept with the SPCC Plan at the facility. The completed inspection forms will be retained in Appendix G for at least 3 years.

6.0 Personnel, Training, and Spill Prevention Procedures (40 CFR 112.7(f))

Facility personnel will be properly instructed in the operation and maintenance of equipment to prevent oil discharges; discharge procedures protocols; and applicable pollution control laws, rules, and regulations. The personnel operating the facility will be instructed regarding their job responsibilities and duties.

Periodic safety meetings will be held to discuss safety procedures and other pertinent job responsibilities criteria. In addition, SPCC training/discharge prevention briefings for oil-handling personnel will be conducted, as required, at least once a year. This training covers the content of the SPCC Plan, known spill events or failures, malfunctioning components, and recently developed precautionary measures. Completed Personnel Training Logs will be kept in Appendix G for at least 3 years.

7.0 Security (40 CFR 112.7(g))

JCEP will prepare a security procedures manual and plan in close coordination with the USCG, FERC, and the Oregon Department of Transportation. The manual/plan will establish a written program for physical security for all facilities at the LNG terminal. The plan, which will comply with DOT regulations, provides for risk-based levels of security carried out by trained personnel during all operation shifts and, if necessary, by governmental law enforcement offices to respond to serious threats.

8.0 Truck Loading/Offloading Procedures (40 CFR 112.7(h))

Truck and tank loading and unloading areas will only occur in areas at least 150 feet from all waterbodies and wetlands. All fuel vehicles will be equipped with a spill response kit. Spill control material will be also available in the Lube Oil, Paint, and Compressed Gas Storage Area as listed in Appendix C. Facility personnel will be trained in spill response procedures. Spills from tank trucks would be captured in the loading apron in the event of a large spill. Spill control measures detailed in the contingency plan will be implemented in the event of a spill.

Truck loading/offloading fueling procedures will meet the minimum requirements and regulations of the ODOT. The driver or operator stays at the tank at all times during loading/ offloading procedures. Drains and outlets on trucks will be checked for leakage before loading/offloading or departure.. Signs, wheel chocks, or a vehicle interlock system will be provided at the loading/offloading area to remind drivers/operators to disconnect transfer hoses before vehicle departure.

(Note- This Section will be updated prior to the start of operations to reflect as built-design, the newest operational plans, and any other applicable safety plans.)

9.0 Brittle Fracture (40 CFR 112.7(i))

(This section will be updated prior to the start of operation based on final as built detail).

10.0 Conformance with Applicable Requirements (40 CFR 112.7(j))

Conformance with the applicable requirements of 40 CFR 112 is summarized in the table below.

Table 10-1 Cross-Reference Table

40 CFR 112	DESCRIPTION OF REGULATION	LOCATION IN THIS SPCC
§112.7	General requirements for SPCC Plans for all facilities and all oil types.	Section 1
§112.7(a)	General requirements; discussion of facility's conformance with rule requirements; deviations from Plan requirements; facility characteristics that must be described in the Plan; spill reporting information in the Plan; emergency procedures.	Section 1
§112.7(b)	Fault analysis.	Section 2
§112.7(c)	Secondary containment.	Section 3
§112.7(d)	Contingency planning.	Section 4
§112.7(e)	Inspections, tests, and records.	Section 5
§112.7(f)	Employee training and discharge prevention procedures.	Section 6
§112.7(g)	Security (excluding oil production facilities).	Section 7
§112.7(h)	Loading/unloading (excluding offshore facilities).	Section 8
§112.7(i)	Brittle fracture evaluation requirements.	Section 9
§112.7(j)	Conformance with state requirements.	Section 10
§112.8 §112.12	Requirements for onshore facilities (excluding production facilities).	Section 11
§112.8(a) §112.12(a)	General and specific requirements.	Section 10
§112.8(b) §112.12(b)	Facility drainage.	Section 11
§112.8(c) §112.12(c)	Bulk storage containers.	Section 11
§112.8(d) §112.12(d)	Facility transfer operations, pumping, and facility process.	Section 11
§112.9 - §112.15	Requirements for onshore production facilities, drilling, and work over facilities, as well as offshore oil drilling, production, or work over facilities.	Not Applicable

11.0 Onshore Nonproduction Facilities

The specific requirements for onshore facilities are discussed in the sections below. (Additionally, marine equipment will strictly follow U.S. Coast Guard procedures for spill prevention and controls, including secondary containment and cleanup supplies. This plan will be appended to the SPCC prior to the start of operations.)

11.1 FACILITY DRAINAGE (40 CFR 112.8(B))

The facility's secondary containment systems will either be connected by open drains to the oil/water separator or will be provided with manual valves kept in the closed position for draining to the storm water system. Following careful examination of any collected rainwater, water without a sheen will be discharged by opening this manual valve. For more information see the Storm Water Management Plan [REF].

11.2 BULK STORAGE TANKS (40 CFR 112.8(C))

11.2.1 Construction of Materials Used for Tank Description (40 CFR 112.8(C)(1))

The equipment containing quantities of oil greater than 55 gallons located at this facility is identified in Table 1-1. This table includes the location; size; storage content; material of construction; fail safe features; and containment/diversionary structure, size, and drainage of each applicable container on-site. Only containers that will be compatible with their contents will be employed. Portable containers will be stored in the Lube Oil, Paint, and Compressed Gas Storage Area.

11.2.2 Secondary Containment (40 CFR 112.8(C)(2))

All drums and totes 55 gallons or larger will be provided with a secondary containment system that will be adequate to contain the content of the largest container plus sufficient freeboard for precipitation (i.e., 110 percent). Discharge prevention measures include dikes, retaining walls, curbing, weirs, booms, diversion ponds, retention ponds, and absorbent materials.

11.2.3 Draining Rainwater (40 CFR 112.8(C)(3))

Should rainwater accumulate in the secondary containment, it will be inspected to make sure no oil sheen is present on the rainwater prior to draining the containment. Secondary containment systems will either be connected by open drains to the oil/water separator or will be provided with manually operated valves normally kept in the closed/locked position for drainage to the storm water system.

11.3 UNDERGROUND STORAGE TANKS (40 CFR 112.8(C)(4))

Although the facility has no underground storage tanks for oil supply, the facility will contain sumps that are below grade, an amine drain tank, and HRSG blowdown tanks. Refrigerant pumps are vertical turbine pumps below grade. This SPCC plan will be updated prior to the start of operations to include details applicable to 40CFR 112.8(C)(4) as applicable at that time.

11.4 PARTIALLY BURIED STORAGE TANKS (40 CFR 112.8(C)(5))

This facility has no partially buried storage tanks, so these requirements are not applicable.

11.5 ABOVEGROUND CONTAINER INTEGRITY TESTING (40 CFR 112.8(C)(6))

Aboveground containers will be tested for integrity as per applicable code. Visual inspections will be performed. Written procedures for inspections of containers will be provided in Appendix F based on American Petroleum Institute Standard 653 for inspection of aboveground storage tanks.

Visual inspections of the tanks, including secondary containment systems and dikes, will be performed during routine activities at the facility. In addition, the outside of the containers will be inspected for signs of deterioration, discharges, or accumulation of oil. Any indication of deterioration or leakage that may cause a spill or accumulation of oil inside containment areas will be reported to appropriate personnel. A documented inspection of oil tanks, secondary containment systems, and spill response equipment will be completed periodically. The results of the inspection will be recorded on the forms in Appendix F. Completed inspection forms are to be kept at the facility and retained for at least 3 years in Appendix G.

11.6 HEATING COILS (40 CFR 112.8(C)(7))

This facility employs steam as a heating medium, so these requirements are not applicable.

11.7 ALARM SYSTEMS (40 CFR 112.8(C)8))

Drums and tanks will be visually monitored to prevent overfilling and will be equipped with audible level alarm systems.

11.8 VISIBLE OIL LEAKS (40 CFR 112.8(C)10))

If visible oil leaks from equipment or containers are observed, they will be promptly corrected. Containment pans will be available to capture oil leaks. Facility personnel will promptly remove any accumulation of oil. Potential leak locations and corrective measures may be added to the inspection form in Appendix G.

11.9 MOBILE OR PORTABLE TANKS (40 CFR 112.8(C)(11))

The secondary containment for the oil containers at this facility is listed in Table 1-1. Secondary containment or diversionary devices will be required for all containers 55 gallons or larger. Discharge prevention measures will include dikes, retaining walls, curbing, weirs, booms, diversion ponds, retention ponds, and absorbent materials. Drums and tanks in the Lube Oil, Paint, and Compressed Gas Storage Area will be provided with secondary containment. The portable ASTs will be provided with spill response equipment (i.e., absorbents).

11.10 OTHER EQUIPMENT OR CONTAINERS THAT MAY HOLD OIL

Other equipment containing 55 gallons or smaller quantities of petroleum products will also be located at this facility. Spill control measures will be implemented in the event of a spill.

12.0 Facility Transfer Operations, Pumping, and In-Plant Processes (40 CFR 112.8(d))

This section will be developed prior to the start of operations based upon final operating plans. The transfer and pumping of bulk oil product subject to the SPCC rule is expected to be a relatively small scale activity.

This section will also reference Marine transfer operations involving oil product as applicable.

13.0 Onshore Oil Production Facilities (40 CFR 112.9)

This facility is not an onshore oil production facility.

14.0 Onshore Oil Drilling and Workover Facilities (40 CFR 112.10)

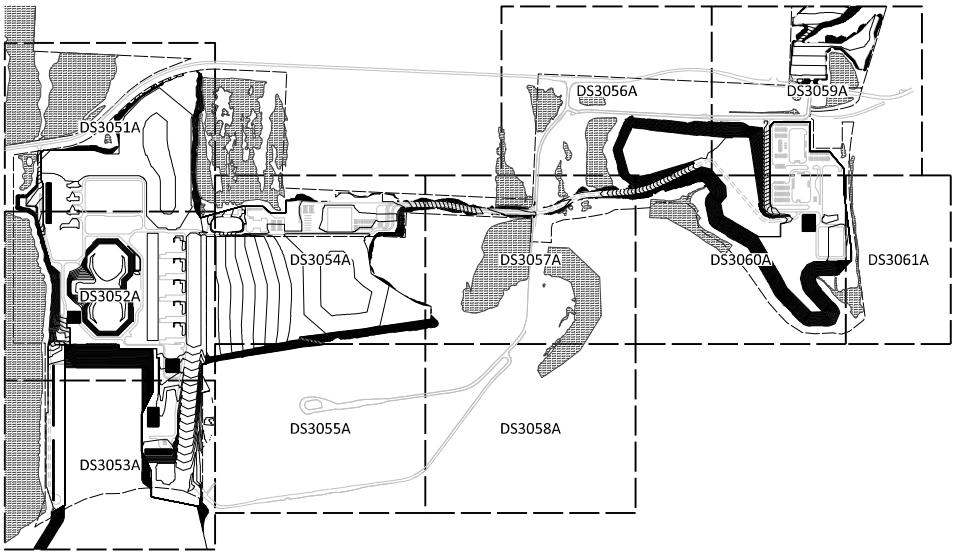
This facility is not an onshore oil drilling or workover facility.

15.0 Offshore Oil Drilling, Production, or Workover Facilities (40 CFR 112.11)

This facility is not an offshore oil production and/or drilling facility.

GENERAL NOTES

1. GENERAL NOTES APPLICABLE TO ALL S3050A SERIES DRAWINGS.
2. COORDINATES SHOWN ARE BASED ON NORTH AMERICAN DATUM OF 1983 OREGON STATE PLANE COORDINATE SYSTEM - SOUTH ZONE. ELEVATIONS ARE BASED ON THE NAVD88 DATUM. ALL BEARINGS, DISTANCES AND COORDINATES ARE GRID.
3. GRADE SHALL SLOPE UNIFORMLY BETWEEN FINISH SPOT ELEVATIONS AND CONTOURS SHOWN ON THE PLANS.
4. SPOT ELEVATIONS AND CONTOURS ON DRAWINGS 0000-DS3051A THRU DS3061A ARE TOP OF FINISHED GRADE.



LEGEND APPLICABLE TO ALL S3050A DRAWINGS

- PROPERTY LINE
- R/W — LIMIT OF RIGHT-OF-WAY
- 99 — EXISTING CONTOUR
- 99 — NEW CONTOUR
- WETLANDS
- NEW INFILTRATION AREA
- 1 / S3050A — SECTION OR DETAIL NUMBER / DRAWING DESIGNATION NUMBER

ABBREVIATIONS APPLICABLE TO ALL S3050A DRAWINGS

A	-	ARC LENGTH	EGP	-	EDGE OF PAVEMENT	LS	-	LIFT STATION	RD	-	ROOF DRAIN
AGG	-	AGGREGATE	EGS	-	EDGE OF SHOULDER	LTR	-	LATER	RED	-	REDUCER
APPROX	-	APPROXIMATE	EHH	-	ELECTRICAL HANDHOLE	MATL	-	MATERIAL	REQ'D	-	REQUIRED
ASPH	-	ASPHALT	EL	-	ELEVATION	MH	-	MANHOLE	REV	-	REVISION
AVG	-	AVERAGE	EOP	-	END OF PIPE	MSL	-	MEAN SEA LEVEL	R/W	-	RIGHT-OF-WAY
BLDG	-	BUILDING	EJ	-	EXPANSION JOINT	MW	-	MONITORING WELL	S	-	SOUTH
B/MH	-	BOTTOM OF MANHOLE ELEVATION	EW	-	EACH WAY	N	-	NORTH	SE	-	SUPERELEVATION
B/D	-	BOTTOM OF ELECTRICAL DUCT BANK	EXP	-	EXPANSION	NG	-	NATURAL GRADE	SIM	-	SIMILAR
BOP	-	BOTTOM OF PIPE	FD	-	FLOOR DRAIN	NO	-	NUMBER	STA	-	STATION
BU	-	BELL-UP	FDN	-	FOUNDATION	NTS	-	NOT TO SCALE	T	-	TANGENT LENGTH
CHDPE	-	CORRUGATED HIGH DENSITY POLYETHYLENE PIPE	FF	-	FINISHED FLOOR	OD	-	OUTSIDE DIAMETER	TMH	-	TOP OF MANHOLE
CJ	-	CONTRACTION JOINT	FG	-	FINISHED GRADE	OWS	-	OIL WATER SEPARATOR	TOC	-	TOP OF CONCRETE
CL	-	CENTERLINE	FRP	-	FIBER REINFORCED PIPE	PC	-	POINT OF CURVATURE	TOG	-	TOP OF GRATING
CMP	-	CORRUGATED METAL PIPE	FT	-	FOOT	PE	-	PLAIN END	TOP	-	TOP OF PAVEMENT
CO	-	CLEAN OUT	HC	-	HANDICAPPED	PI	-	POINT OF INTERSECTION	TYP	-	TYPICAL
D	-	DEGREE OF CURVE	HDPE	-	HIGH DENSITY POLYETHYLENE	PL	-	PROPERTY LINE	UNO	-	UNLESS NOTED OTHERWISE
Δ	-	DELTA ANGLE OF HORIZONTAL CURVE	HVCM	-	HORIZ & VERT CONTROL MONUMENT	PLCS	-	PLACES	DS	-	DESIGN SPEED
DI	-	DUCTILE IRON	HP	-	HIGH POINT	PRC	-	POINT OF REVERSE CURVE	VERT	-	VERTICAL
DIA	-	DIAMETER	I	-	INLET	PT	-	POINT OF TANGENT	W	-	WEST
DIM	-	DIMENSION	ID	-	INSIDE DIAMETER	PVC	-	POINT OF VERTICAL CURVE	W/	-	WITH
DWG	-	DRAWING	IN	-	INCH	PVI	-	POINT OF VERTICAL INTERSECTION	W/O	-	WITHOUT
E	-	EAST	INV	-	INVERT	PVT	-	POINT OF VERTICAL TANGENT	WP	-	WORK POINT
EA	-	EACH	L	-	LENGTH	R	-	RADIUS			
EF	-	EACH FACE	LC	-	LENGTH OF VERTICAL CURVE	RCP	-	REINFORCED CONCRETE PIPE			

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1"=500'

KBJ
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Jordan Cove LNG™

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NO	DATE	KBJ REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	FOR	APP

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DATE REG NO.

DESIGNER | DRAWN
CHECKED | DATE

JORDAN COVE LNG PROJECT

STORM WATER MANAGEMENT PLAN
CONTOURS - KEY PLAN, GENERAL NOTES AND LEGEND

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JCLNG NUMBER J1-000-CIV-KEY-KBJ-01360-01 | REV

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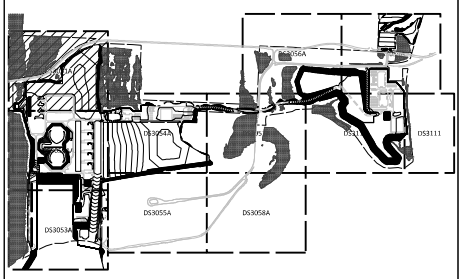

NOTES

1. SEE DRAWING 0000-DS3050A FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.

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STORM WATER MANAGEMENT PLAN
CONTOURS - AREA 1

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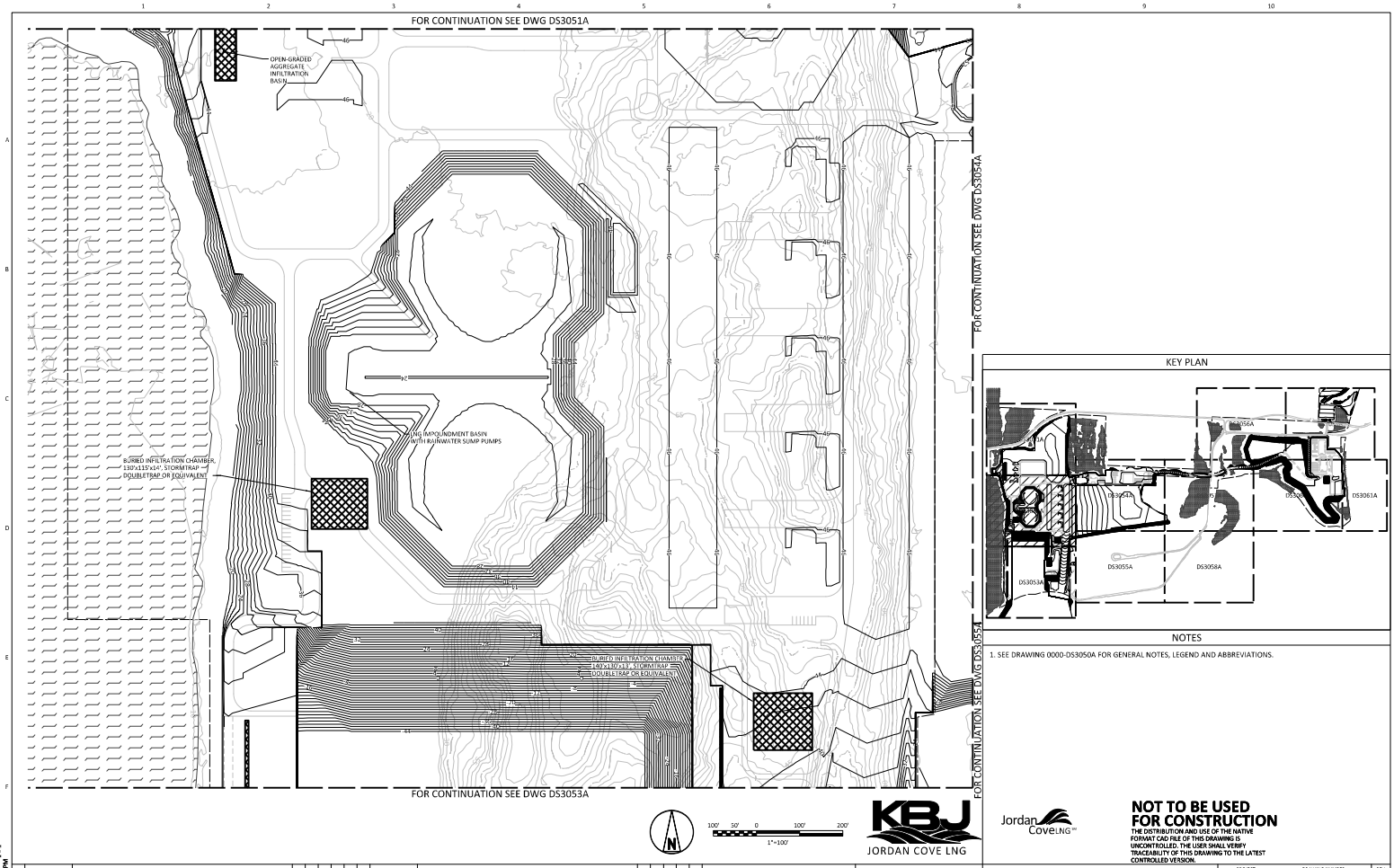

KEY PLAN

NOTES

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STORM WATER MANAGEMENT PLAN
CONTOURS - AREA 2

PROJECT 189980-0000-DS3052A

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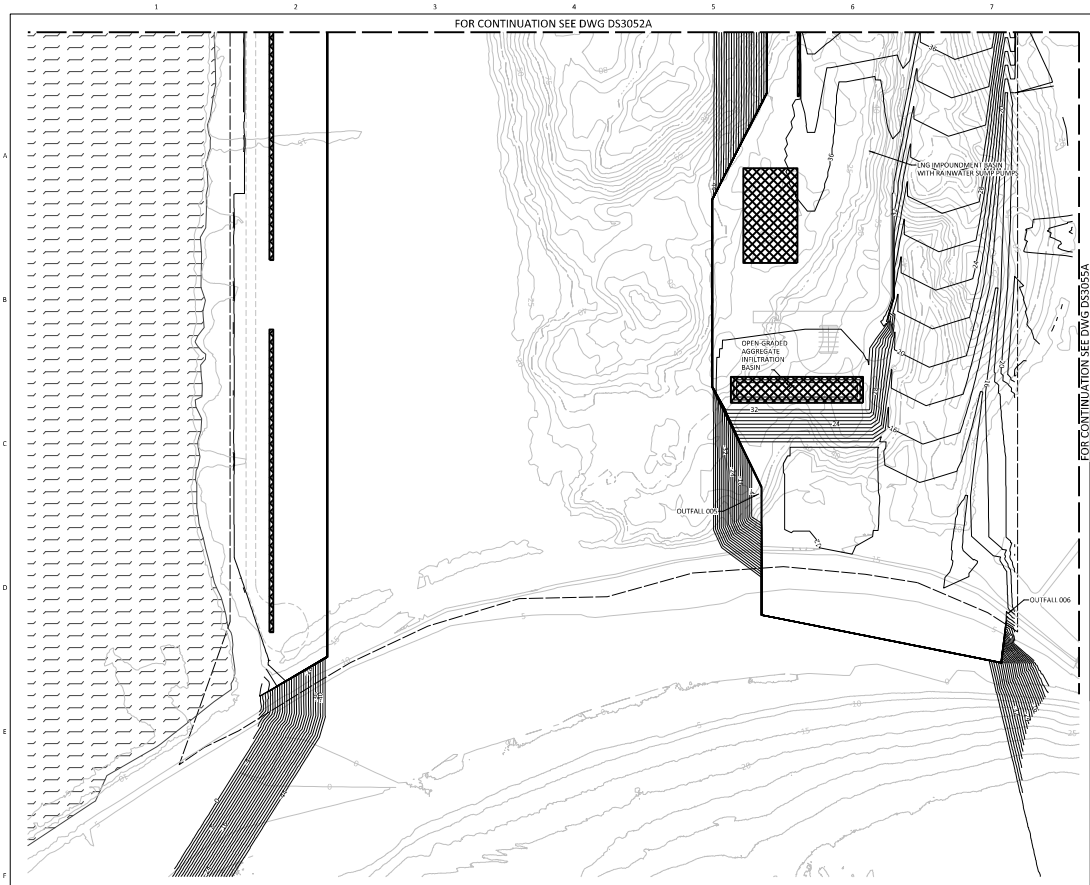

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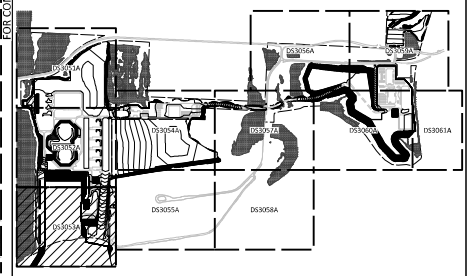

NOTES

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STORM WATER MANAGEMENT PLAN
CONTOURS - AREA 3

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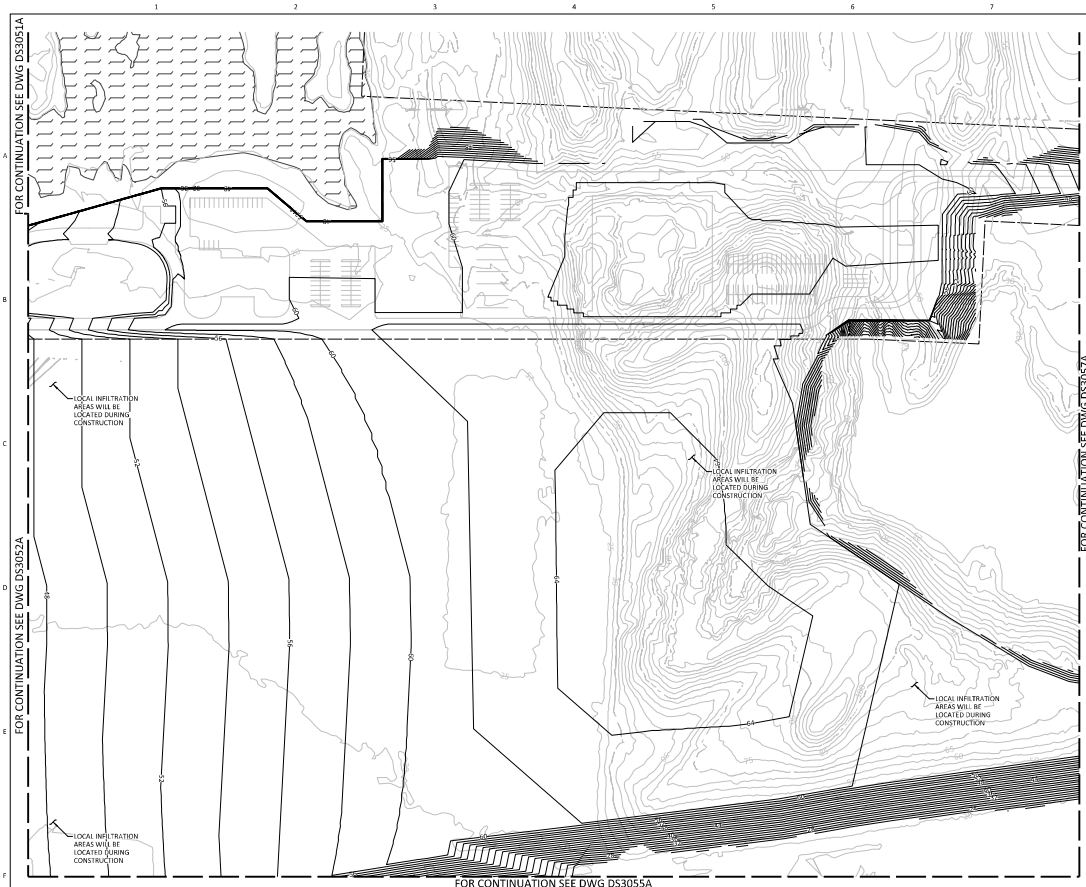

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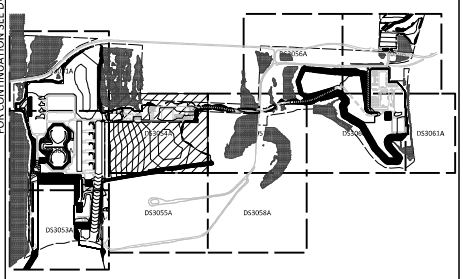

NOTES

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STORM WATER MANAGEMENT PLAN
CONTOURS - AREA 4

PROJECT 189980-0000-DS3054A
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Exhibit A.4
Page 488 of 1623

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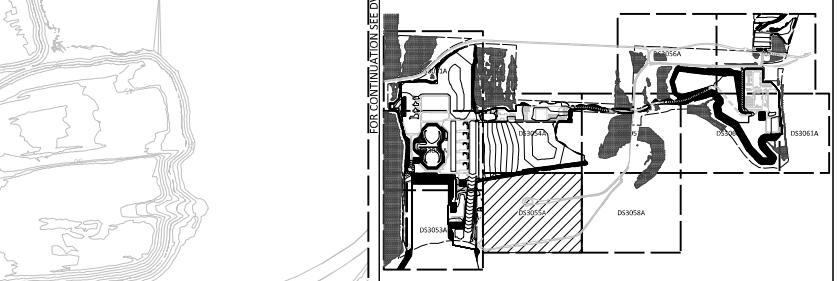

NOTES

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JORDAN COVE LNG PROJECT

STORM WATER MANAGEMENT PLAN
CONTOURS - AREA 5

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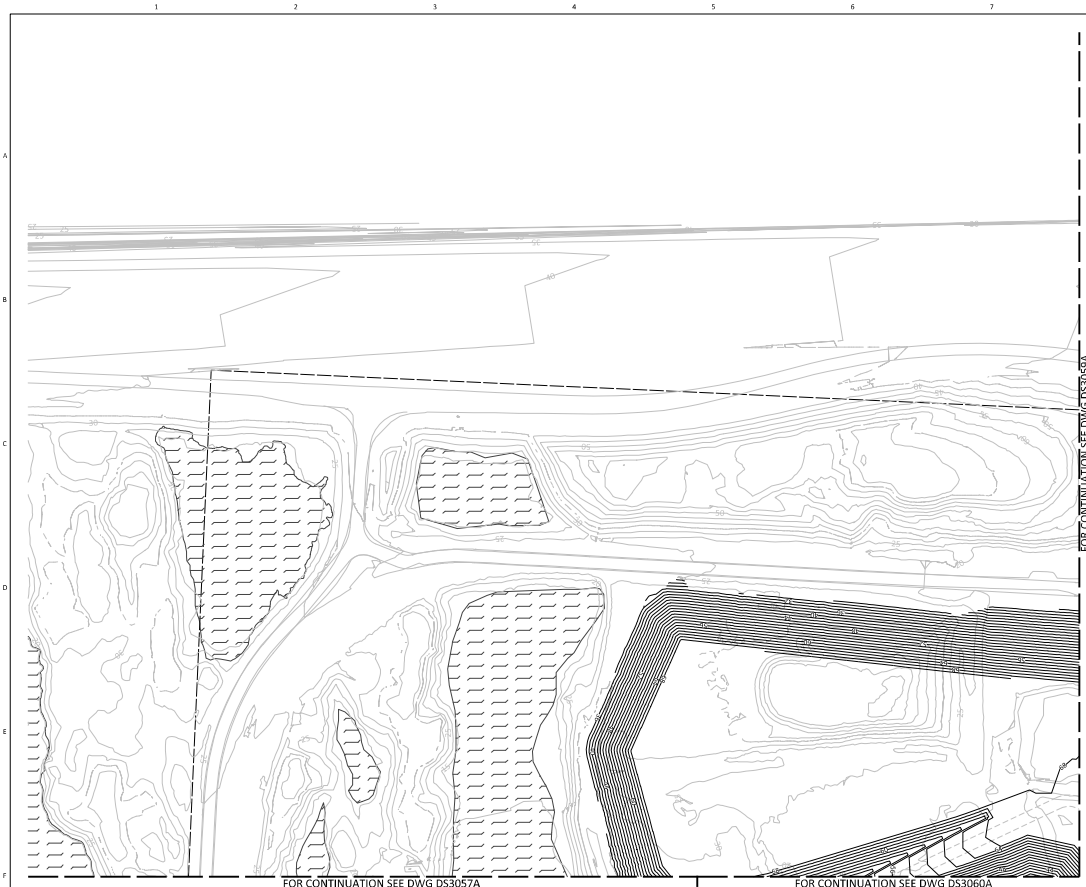

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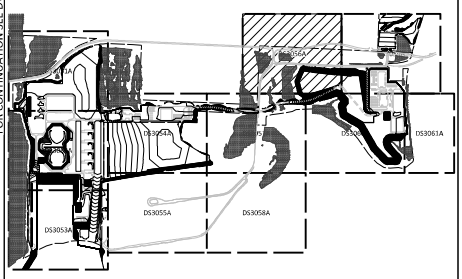

NOTES

1. SEE DRAWING 0000-DS3050A FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.

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1"=100'

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JORDAN COVE LNG PROJECT

STORM WATER MANAGEMENT PLAN
CONTOURS - AREA 6

PROJECT 189980-0000-DS3056A

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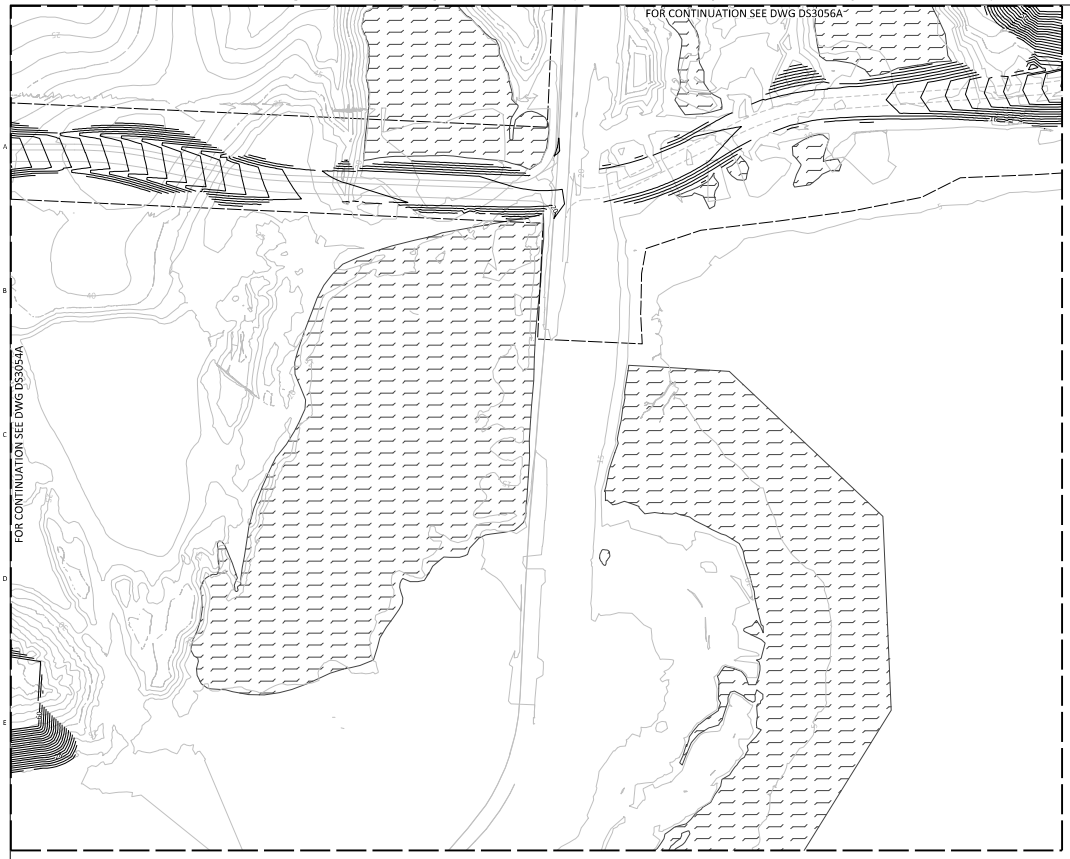

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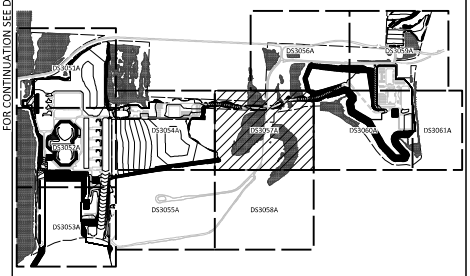

NOTES

1. SEE DRAWING 0000-DS3050A FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.
2. CONTECH STORMFILTER VAULT WITH FILTER MEDIA CARTRIDGES OR SIMILAR. OUTLET TO BE DETERMINED LATER.

100' 50' 0 100' 200'
1"=100'

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JORDAN COVE LNG PROJECT

STORM WATER MANAGEMENT PLAN
CONTOURS - AREA 7

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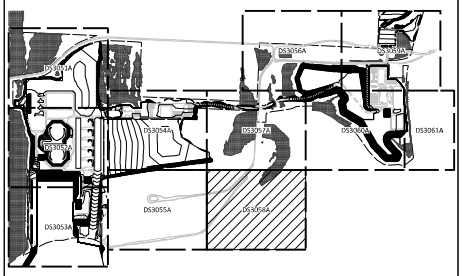

NOTES

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JORDAN COVE LNG PROJECT

STORM WATER MANAGEMENT PLAN
CONTOURS - AREA 8

PROJECT 189980 DRAWING NUMBER 0000-DS3058A REV

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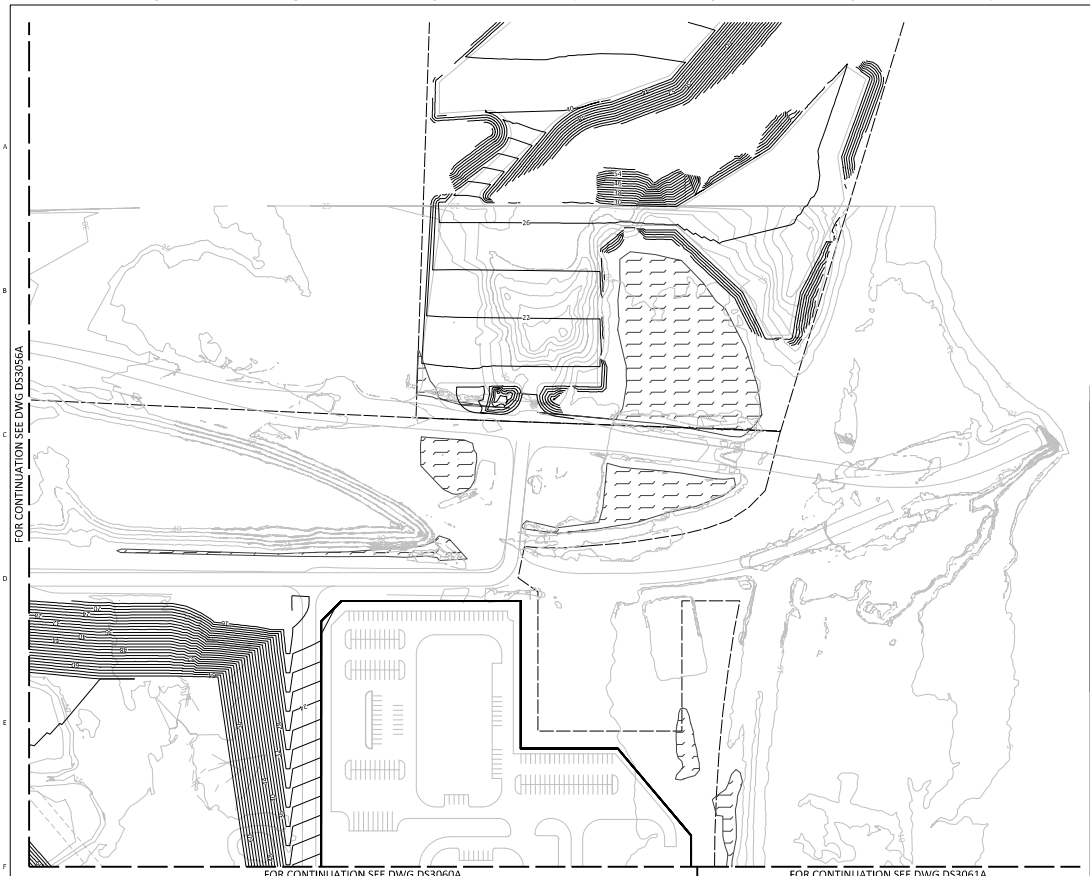

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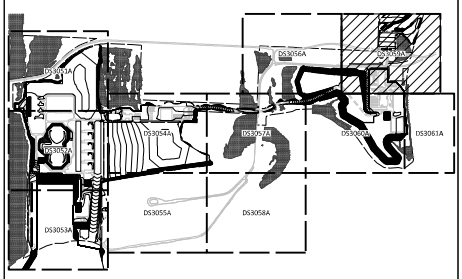

NOTES

1. SEE DRAWING 0000-DS3050A FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.
2. CONTECH STORMFILTER VAULT WITH FILTER MEDIA CARTRIDGES OR SIMILAR. OUTLET TO BE DETERMINED LATER.

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STORM WATER MANAGEMENT PLAN
CONTOURS - AREA 9

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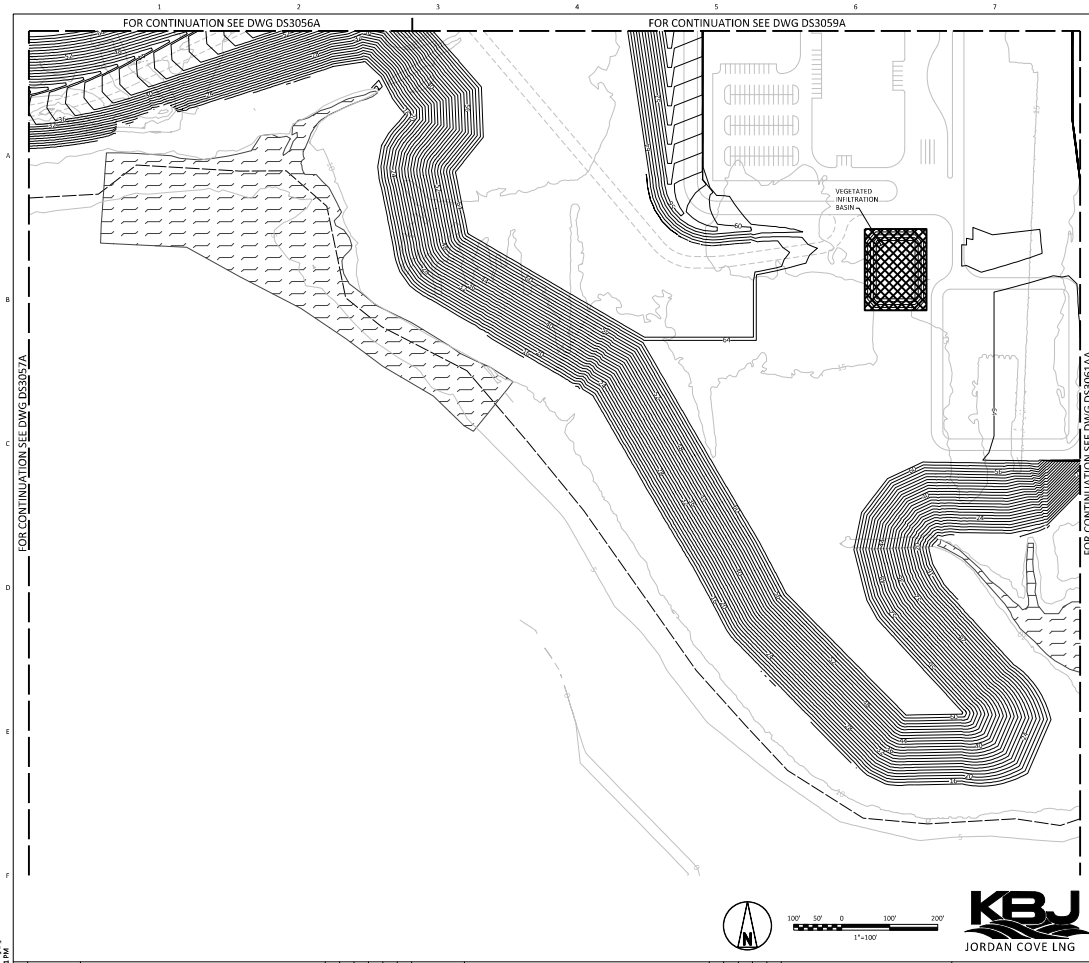

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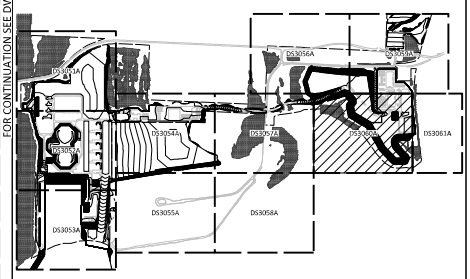

NOTES

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JORDAN COVE LNG PROJECT

STORM WATER MANAGEMENT PLAN
CONTOURS - AREA 10

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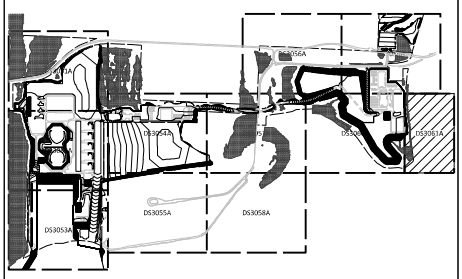
FOR CONTINUATION SEE DWG DS3060A

KEY PLAN



NOTES

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JORDAN COVE LNG PROJECT

STORM WATER MANAGEMENT PLAN
CONTOURS - AREA 11

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Appendix B. Specific Spill Prevention

The following management, preventive maintenance, housekeeping, and inspection practices will be put in place at the facility.

Aboveground Tanks

- Tanks will be monitored during filling to avoid overfilling.
- Tanks will be contained, monitored, and inspected to detect potential release of materials.
- Visual inspections of the tank and seams will be conducted to look for signs of deterioration and/or leaks, particularly at seams, welds, and flanged connections, which might cause a spill or accumulation inside contained areas. Inspection frequency to be determined in conjunction with final operating plans.
- With the exception of active product lines, the valves on the tanks will be in the closed position.

Storage Areas

- Storage areas will be clearly marked and designated as a storage area.
- Drums and tanks that are not in use will not be stored outside of designated areas.
- Storage areas will be inspected regularly to check for leaks and container deterioration.
- Containers will be properly labeled to indicate the contents and accumulation dates, if applicable.
- Containers will be kept closed when not in use.
- Employees will be present while the container contents are dispensed or transferred to oversee operations and stop or control leaks and spills.
- Hazardous substances, including chemicals, oils, and fuels, will not be stored within 100 feet of a waterbody or wetland boundary. This applies to storage rather than normal operation of equipment in these areas.

Tank Truck Loading/Offloading

The following procedures will be implemented in compliance with Department of Transportation requirements (49 CFR, Sections 171, 173, and 177).

- Before Tank Truck Loading/Offloading
  - Prior to delivery, a fuel offloading schedule will be prepared by company.
  - The vehicle will be parked inside the loading/offloading containment, if applicable.
  - The vehicle's motor and lights will be turned off, the parking brake set, and chocks placed.
  - The driver will inspect the liquid level in the tank.

- The driver will get out of the vehicle to monitor the procedure and stop or control any leaks and spills that may arise.
- Outlet valves will be checked to ensure that they are closed.
- If required, a grounding wire will be attached to the truck body.
- Ungrounded objects will be removed from the loading/offloading area to prevent any chance of generating sparks.
- Unless the engine will be needed to offload the fuel, the vehicle will remain off.
- Fuel trucks will use only approved access roads.
- All equipment will be parked overnight and fueled at least 100 feet from a waterbody or in an upland area at least 100 feet from a wetland boundary. These activities may occur closer, if t JECP determines that no reasonable alternative location exists; and that appropriate steps, such as secondary containment, will be taken to prevent spills and provide prompt cleanup in the event of a spill.

- During Loading/Offloading
  - Flow should start slowly.
  - Transfer operator will be present and attentive.
  - No smoking at any time.
- After Loading/Offloading
  - The driver will check the liquid level of the tank versus the compartment marker on the tanker truck. Document inventory as required.
  - The hose used for transfer will be stored aboveground level and rolled in such a way as to prevent spillage of any fuel oil remaining in the hose.
  - Valves will be closed. Spillage will be noted and cleanup actions taken if necessary.
  - Hatches will be closed tightly.
  - Internal safety valves will be closed.
- Warning signs, chock blocks, or vehicle brake interlock system will be provided in truck loading/offloading areas that prohibit vehicle departure or movement unless a complete disconnect of flexible or fixed transfer lines has taken place.

(Note- additional similar activities may be added to this list in coordination with other operating plans)

Appendix C. Spill Contingency Plan

1.0 NOTIFICATION PROCEDURE

In the event of an oil spill incident, facility personnel on-duty will take immediate action to notify the primary contacts listed in the Emergency Contacts section of this document. The designated person (call Primary Jordan Cove Energy Project L.P. contact) accountable for oil spill prevention will be responsible and required by federal and state laws to notify the applicable federal, state, and local agencies provided on the list.

2.0 SPILL CONTINGENCY PLAN

In the event of an oil spill incident, facility personnel will follow the procedures outlined in this contingency plan. Spill response procedures will be posted in the areas where fueling and oil storage activities occur at the facility. A spill response action checklist is provided following Section 5.0.

3.0 SPILL CONTROL PROCEDURES

An oil spill incident could occur at the facility from the following situations:

Potential spill scenarios were listed in Section 2.0 of the SPCC Plan. Should an oil spill incident occur, facility personnel will immediately implement the following spill control measures to prevent a spill from entering navigable waters:

- Storage tank or drum rupture
  - Ensure that spilled oil will be contained (refer to Section 4.0, Countermeasure Procedures);
  - Add absorbent to lift oil off of surface;
  - Divert spilled material away from outfalls and waterbodies with absorbent booms;
  - If the release is to water, use oil booms to prevent further spread; and
  - Pump used oil into drums or other appropriate containers.
- Spill during fueling operations
  - Turn off pump;
  - Ensure that spilled oil will be contained (refer to Section 4.0, Countermeasure Procedures);
  - Divert spilled material away from outfalls with absorbent booms;
  - If the release is into water, use oil booms to prevent further spread; and
  - Pump fuel into drums or other appropriate containers.
- Spill during truck loading/offloading operations
  - Turn off pump;

- Ensure that spilled oil will be contained (refer to Section 4.0, Countermeasure Procedures);
- Divert spilled material away from outfalls and waterbodies and toward the sedimentation basin with absorbent booms or trenches;
- If the release is to water, use oil booms to prevent further spread; and
- Pump used oil into drums or other appropriate containers.

4.0 COUNTERMEASURE PROCEDURES

Once the spill control procedures outlined above have been implemented, facility personnel will initiate countermeasure activities to contain, cleanup, and mitigate the effects of an oil spill that could impact navigable waters. Furthermore, incident-specific considerations and precautions will also be implemented during each spill incident to adequately protect human health and the environment.

The facility's countermeasure procedures are outlined below.

- Containment (as described above).
- Removal. Once the spill is contained, the oil will be removed. Removal techniques include, but are not limited to:
  - Pumps;
  - Sorbents (kitty litter, pads, pillows, or booms);
  - Skimmers;
  - Vacuum trucks; and
  - Shovels.
- Storage. Hazardous substances, including chemicals, oils, and fuels, should not be stored within 100 feet of a waterbody or wetland boundary. Storage techniques include, but are not limited to:
  - DOT drums;
  - For larger quantities of soils, construct a temporary waste pile on plastic liners and cover the pile or use a plastic-lined roll-off box;
  - Label the container; and
  - Move the container to a secure area.
- Disposal. After the spill is contained, the site will be cleaned up. This includes recycling any recovered oil, disposing of abatement materials used to contain and/or remove the spill, and excavating oil-contaminated soil. Disposal techniques include, but are not limited to:
  - Recycling; and
  - Disposal at an appropriate licensed facility.

5.0 EMERGENCY RESPONSE EQUIPMENT LOCATION

The following table identifies the type and location of the emergency response equipment, including personal protective equipment, available at the facility.

Additional spill response equipment such as pumps, booms, and additional absorbents will be available by contacting the outside emergency response contractor (TBD) listed in the Emergency Contacts section of this SPCC Plan.

EXAMPLE FACILITY RESPONSE EQUIPMENT LIST		
EQUIPMENT CLASS	**TYPES OF EQUIPMENT**	**STORAGE LOCATION**
	Absorbent pads and booms	
	Empty sandbags	
	Containment Pans	
	Over-pack containers for leaking drums	
	Sewer pipe plugs	
	Several bags of ultra- absorbent granules	
	Square end shovels	
	Pry bar	
	Drain covers	
	Fire extinguishers	
	Plastic zip ties	
	Temporary disposal bags	
	Nitrile gloves	
	Safety goggles	
	Haz-mat suit	
	Copy of the facilities SPCC Plan	

NOTE: To be updated prior to the start of operations.

Equipment supplies (such as booms) are to be coordinated with the supplies to be provided by response contractors.

Appendix D. Spill Response Notification Form

This information will be updated prior to operations.

Spill Response Notification Form

Jordan Cove LNG Project

Contractor Emergency Contact:
To Be Determined

Jordan Cove LNG Emergency Contact:
To Be Determined

Date of Report: _____

Person Making Report:_____Title:_____

Date, Time, and Duration of Occurrence:_____

Location of incident (attach sketch if necessary):_____

_____

_____

Name, Source, and Quantity of Substance Spilled or Released (attach MSDS):_____

_____

_____

Description of Occurrence:_____

_____

_____

Weather Conditions at Time of Release (wind direction and speed, rain intensity, temperature, snow, ice, etc.):_____

_____

Extent of Damage to the Environment (Air, Water, Ground, Property):_____

_____

_____

Remedial Action Taken to Prevent Spread and Cleanup Site (list dates, time, site personnel, transporters, disposal sites, government inspectors, etc.):_____

_____

_____

Persons Injured or Exposed (list complete names, addresses, and phone numbers):

_____

_____

_____

Site Emergency Coordinator Name/Title/ Company:_____

_____

Site Personnel Involved (Names/Titles):_____

_____

_____

_____

Company Personnel Notified (list names and time notified):_____

_____

_____

_____

Federal, State and Local Agencies/Authorities Notified (list names, agency, phone numbers, who notified, date/time notified, and any verbal response or instructions):

_____

_____

_____

Others Notified (consultants, contractors, emergency assistance):_____

_____

_____

_____

Additional Information:_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Signature:_____ Date:_____

Title:_____

Appendix E. Emergency Contractor or Subcontractor Information

This information will be identified prior to operations.

Appendix F. Written Procedures for Inspections

General instructions for inspecting the aboveground containers are provided below based upon the EPA-recommended Steel Tank Institute's STANDARD FOR INSPECTION OF IN-SERVICE SHOP FABRICATED ABOVEGROUND TANKS FOR STORAGE OF COMBUSTIBLE AND FLAMMABLE LIQUIDS (SP001-03, September 2000) PERIODIC INSPECTION (PERFORMED BY TANK OWNER OR HIS DESIGNATE).

(**Additionally the facility will use the guidance of API Standard 653 for contracted inspections and repairs**.)

The first three situations are considered Critical Situations. These REQUIRE IMMEDIATE ATTENTION. Inspect the tank for serviceability and make corrections as required prior to returning it to service.

1) Take a tank out of service immediately (within 24 hours) if a leak is found in the tank at any time. Repair or replace the tank. Consult the tank manufacturer prior to making any alternations or repairs to a tank.

2) If the tank has been exposed to a fire or other means that could cause possible damage, inspect the tank for serviceability and leaks prior to being put into service. Follow the inspection criteria described below. Make corrections and/or repairs as required. Consult the tank manufacturer prior to making any alterations or repairs to a tank.

3) Check for proper drainage during or after a major storm in accordance with paragraph below.

4) Monthly, check the secondary tank or secondary containment if the aboveground tank is so equipped. Remove any water found. Bacteria in the water can cause corrosion and plug filters. If water is found in a tank, check for the presence of corrosion inducing bacteria using a microbe detection kit. If bacteria are present, treat with a suitable bactericide. See the US Department of Energy BNL 48406, a report which provides additional information. Remove a tank from service that has a known leak in either the primary or secondary tank or secondary containment.

5) Monthly, inspect the interstice (i.e., space between tank walls) of a double wall tank for the presence of fuel. If tank is so equipped, check the leak detection system and replace or correct as necessary. Check groundwater wells if the tank is so equipped. Remove a tank from service that has a known leak in either the primary or secondary tank or secondary containment.

6) Monthly, inspect all pipe connections to the tank for evidence of leakage. Replace the gaskets in flanged connections, as necessary, with ones compatible with the

stored fluid and rated to cover the temperature extremes of the tank environment. Tighten threaded connections if necessary.

7) Quarterly, perform a walk-around inspection to identify and repair areas of damage to the tank or its coating. Clean the exterior if necessary. Promptly repair any deficiencies that are found. It is important that the tank exterior be inspected periodically to ensure that the integrity of the coating will be maintained. The frequency of periodic repainting will be based upon environmental factors in the geographic area where the tank is located. Give special consideration when repainting to the selection of the coating, surface preparation and coating application. Select a coating of industrial quality that is compatible with the existing coating or else remove the existing coating prior to repainting.

8) Quarterly, inspect and clean normal operating vents and emergency vents on the primary tank (and secondary tank and secondary containment tank, if applicable) and spill containers.

9) Quarterly, inspect and restock the spill response equipment and any personal protective equipment.

10) Once a year, perform a walk-around inspection checking for proper drainage around the tank area. Proper site maintenance is vital to ensure drainage of surface water. Check for ground settling and puddling of water near the tank. Correct as necessary. If ground conditions change or settlement occurs, correct the situation by providing drainage to prevent standing water from being in contact with the steel tank and its supports.

11) Once a year, check o-ring/gasket of emergency vents, if present, for damage or deterioration.

12) Once a year, inspect the tank supports to determine if there is damage or deterioration of the supports. Inspect the supports for signs of damage from vehicles, misuse, and corrosion. Damage may require replacement of the supports. Contact the tank manufacturer for their recommendation. If deterioration has occurred, more frequent inspections may be required. Periodic repainting of the supports may be necessary.

13) Once a year, inspect the tank foundation for signs of settlement, cracking, pitting, and spilling. Contact a qualified contractor for repair of concrete foundations. Observe the condition of the anchor bolts to determine if there has been distortion of the bolts or significant cracking around the bolts. Replace the bolts if they have deteriorated.

14) If a cathodic protection system has been installed on the tank to prevent corrosion of the bottom of the tank, perform periodic readings of the system to be sure that the protection remains adequate in accordance with local, state, and federal guidelines. This procedure will be performed by a qualified cathodic protection

tester. The criteria for protection will be as defined by NACE RP-0285, "Corrosion Control of Underground Storage Tank Systems by Cathodic Protection."

Facility Inspection Form (to be expanded to list each oil-containing item and area)

Inspector Name and Signature:

Date and Time:

	Comments	
		Containers / Storage Areas/Equipment
Area of Concern	**OK**	**Deficient**
Water Accumulation: Monthly		
Valve/Containment: Monthly		
Signs of Leaks: Monthly		
Signs of Spills: Monthly		
Leaks in lube oil systems and transformers: weekly		
Response Equipment: Quarterly		
Levels and Alarms: Quarterly		
Signs of Tank Deterioration: Quarterly		
Signs of Tank Support Deterioration: Annual		
Signs of Settlement: Annual		
Corrosion/Integrity: Every 10 years		
Notes: Check appropriate box. Report any deficiencies to responsible personnel and note in comment section. Store completed forms in Appendix G.		

SPCC Training Attendance Log

Trainer Name and Signature:

Date and Time:

Name	Signature

Appendix G. Completed Facility Inspection Forms

APPENDIX H.2

Report on Turbidity Due to Dredging (Moffat and Nichol 2006)

Appendix H.2: The existing Report of Turbidity Due to Dredging was prepared in 2008 by Moffatt and Nichol. This report is currently being updated to reflect the current project configuration and will be issued to FERC at a later date. As appropriate, additional technical analysis will include:

1. Extent and duration of turbidity generated by dredging slip and access channel, four corners, eelgrass mitigation site.
2. Extent and duration of turbidity generated by placing fill in the bay to construct the Marine Offloading Facility.
3. Extent and duration of turbidity generated by connecting the Kentuck site to the bay.
4. Potential for increased turbidity from decant water from dredge spoil placement at APCO and the Kentuck site.

Exhibit 29

Limitations of the Haynes Inlet sediment transport study

by

Tom Ravens, Ph.D.

Professor, Dept. of Civil Engineering

University of Alaska, Anchorage

(907) 786-1943

TomRavens@uaa.alaska.edu

Nov. 13, 2011

Limitations of the Haynes Inlet sediment transport study presented in Exhibit 4:

Chapters 10 and 11 of Exhibit 4 (entitled Jordan Cove Energy Project and Pacific Connector Gas Pipeline - Volume 2) present sediment transport calculations which purport to show that sediment transport impacts of the proposed dredging project in Haynes Inlet would have minimal impacts. However, close scrutiny of Exhibit 4 shows that there are serious deficiencies in the methodology employed in the sediment transport modeling. Consequently, the finding that there would only be limited impacts is lacking a solid foundation. The most serious flaws are outlined below:

1. Use of un-validated sediment transport model to establish background conditions

According to the Department of Environmental Quality, an "impacted" area is one that suffers a dredging-related turbidity level that is 10% or greater than background. Establishing background conditions is therefore a critical part of the process of defining impacted areas. The authors of the sediment transport study indicated that little data on ambient suspended sediment concentrations was available. The limited data available near the dredging site was collected in summer time whereas the dredging would occur in the fall and winter. As a consequence, the authors decided to use a model to establish background conditions. However, the model used was not validated with measurements from the study site.

Use of an un-validated sediment transport model to establish background conditions leads one to question the reliability of the project's findings. Using turbidity calculations generated by an un-validated model to establish background conditions is not reliable since sediment transport models are notoriously inaccurate especially when they have not been calibrated with data. Figure 1 (below) compares measured and modeled sediment transport (including bedload and

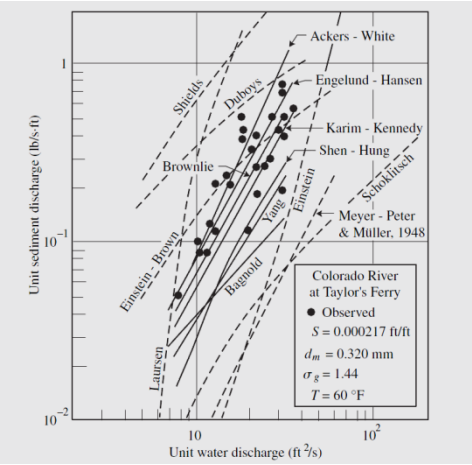

Figure 1. Plot comparing measured and calculated sediment discharge in the Colorado River as a function of water flow rate. The dashed and solid lines are calculated with various sediment transport models and the dots are measurements. The figure is from Erosion and Sedimentation, 2nd Edition, by Prof. Julien, Univ. of Colorado.

suspended sediment transport). It demonstrates the unreliable nature of sediment transport equations and models. If the authors of the Haynes Inlet sediment transport study are intent on using a model to establish ambient conditions, they should use the available data to validate their model. Model validation is a key part of peer-reviewed science and engineering work.

Use of an un-validated sediment transport model could result in an over-estimate of the background turbidity or suspended sediment concentration. This, in turn, would lead to an underestimate of the area impacted by the dredging project. For example, suppose the model calculated the background suspended sediment concentration to be 500 mg/liter (500 milligrams/liter), whereas the actual background concentration was 100 mg/liter. Based on the modeled result, the dredging-derived suspension could be as high as 50 mg/liter (10% of background) before the area was designated as impacted. However, based on the actual background condition, areas seeing dredging-derived suspension greater than 10 mg/liter should be defined as impacted. Using the actual background would clearly lead to an increase in the area that was designated as being "impacted". We can estimate the increase by extrapolating from Figure 10-5 of Exhibit 4 (reproduced below). Use of the true threshold (10 mg/liter or 2% on the y axis of Figure 10-5) would cause the linear extent of the impacted area to increase from about 350 ft to about 600 ft (for a 4 ft/s current).

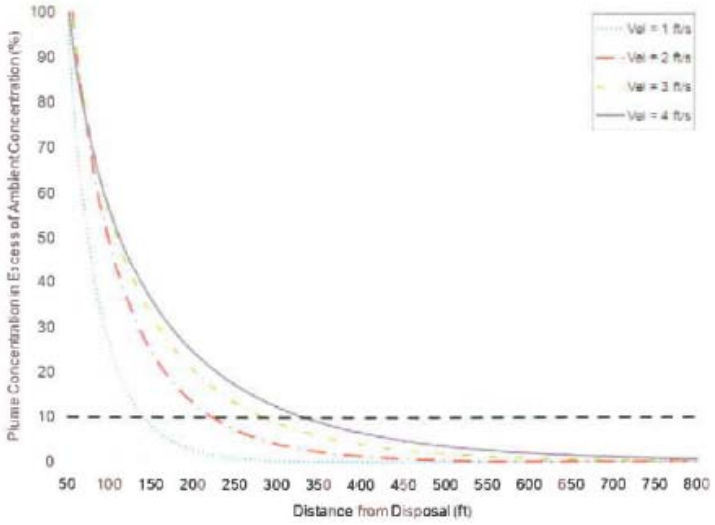

Figure 10-5. Suspended sediment concentration in excess of ambient concentration from numerical modeling results of trench stockpile placement activities in Haynes Inlet

Figure 2. Reproduction of Figure 10-5 of Exhibit 4.

2. Assumption of spatially uniform sediment size despite data indicating significant heterogeneity.

The authors of the Haynes Inlet sediment transport study conduct their modeling of background conditions and their modeling of dredging-related releases of sediment assuming that the sediment grain size is uniform throughout the study area (grain size is assumed to be 0.27 mm). However, the sediment characterization study conducted by GeoEngineers (August 2010) indicates that the sediments are significantly finer than this in large portions of the study area. GeoEngineers examined composite samples from three sections of the proposed pipeline route (DWWU-1, DWWU-2, DWWU-3, Figure 3). They found that, in section DWWU-1, the majority of the sediments were in the silt/clay size range with an overall median grain size of 0.04 to 0.05 mm (Figure 4, below).

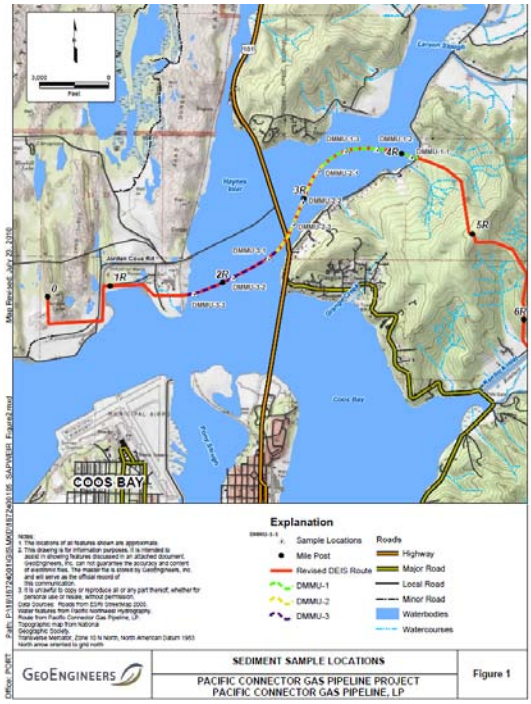

Figure 3. Map of sections of the pipeline (DWWU-1, DWWU-2, DWWU-3) from Figure 1 of the sediment characterization study of GeoEngineers.

TABLE B-1

GRAIN SIZE ANALYSIS

PACIFIC CONNECTOR GAS PIPELINE PROJECT

HAYNES INLET, OREGON

Sample Identification	Sample Depth (ft)	Percent (%)		
		Gravel	Sand	Silt/Clay
In-Place Sediment Samples				
DMMU-1-Composite	0-9	1.2	48.4	50.4
DMMU-2-Composite	0-9	0.0	67.0	33.0
DMMU-3-Composite	0-9	0.7	86.2	13.1

W:\Boise\Projects\16\16724001\05\Finals\Sediment Characterization\[16724-001-05Tables.xlsx]B-1

Figure 4. Grain size data in the various sections of the pipeline from Table B-1 of the GeoEngineers Sediment Characterization Study.

The implications of assuming a uniform grain size when in fact the grain size is spatially variable are two-fold. First, the calculation of the background turbidity distribution at the study site would be inaccurate if the wrong grain size is assumed (even if the model itself was accurate). This is because sediment transport calculations are very sensitive to grain size. To illustrate this point, the average suspended sediment concentration was estimated for three different grain sizes (0.27, 0.10, and 0.05 mm) for a particular hydraulic condition (velocity = 3.3 ft/sec, depth = 10 ft, T = 50 F), similar to that assumed in Exhibit 4. The results are summarized in Table 1 below. Sediments of grain size 0.27 and 0.10 mm were considered to be non-cohesive. Suspended sediment concentrations were estimated based on the Einstein method (Julien 2010). In this approach, a near-bottom reference concentration is estimated based on a bedload transport calculation, and the Rouse Equation is used to determine the vertical distribution of suspended sediment. For the 0.05 mm sediment, a different calculation technique was used since the sediment would likely be cohesive. With cohesive sediment, resistance to motion is controlled by inter-particle forces instead of gravitational forces. The technique of Lavelle et al. (1984) of estimating a near-bottom reference concentration based on the sediment erosion rate and fall velocity was employed. Sediment erosion rate was estimated based on a linear erosion rate model in which erosion rate constant of 0.0032 kg m^{-2} s^{-1} Pa^{-1} was assumed (following Ravens and Gschwend 1999).

Grain size (mm)	Critical shear stress	Sediment fall velocity	Average suspended sediment concentration
[mm]	[Pa]	[mm/s]	[mg/liter]
0.27	0.2	30	10
0.10	0.1	9	3000
0.05	0.1	2	200

Table 1. Estimated suspended sediment concentrations for different grain sizes assuming an average velocity of 3.3 ft/sec and a depth of 10 ft.

The second implication of assuming the wrong grain size is that the modeling of the dredging-derived turbidity would be inaccurate. The time a given dredging-derived turbidity plume is suspended can be estimated based on the ratio of depth over the fall velocity. The fall velocity for 0.27 mm and 0.05 mm sediments is about 30 mm/s and 2 mm/s, respectively. Consequently, the finer sediment would be suspended for about 15 times as long and would be dispersed over 15 times the distance.

References:

Julien, P. Y. 2010. Erosion and Sedimentation, 2nd edition, Cambridge University Press.

Lavelle, J. W., Mofjeld, H. O., and Baker, E. T. (1984). ‘‘An in situ erosion rate for a fine-grained marine sediment.’’ *J. Geophys. Res.*, 89(C4): 6543–6552.

Ravens, T. M. and P.M. Gschwend. 1999. “Flume Measurements of Sediment Erodibility in Boston Harbor.” *J. of Hydraulic Engineering*. 125(10): 998-1005.

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Oct. 14, 2011

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At the request of Mark Chernaik, expert for Citizens Against LNG, I was asked to answer the following questions relating to the modeling of sedimentation impacts of pipeline construction in Haynes Inlet.

Q1. Could you describe your qualifications for answering the following questions? How many years have you studied hydrodynamic modeling of sedimentation that results from dredging activities? What peer-reviewed scientific publications on hydrodynamic modeling of sedimentation have you authored?

I have been modeling hydrodynamics and sediment transport in estuarine environments for 18 years. Some of the work that I have done tangentially addressed sediment transport impacts of dredging. My peer-review scientific publications that address hydrodynamics and sediment transport in coastal environments include:

Ravens, T., Jones B. M., Zhang, J., Arp, C. D., and J. A. Schmutz. Process-Based Coastal Erosion Modeling for Drew Point (North Slope, Alaska). *J. of Waterway, Port, Coastal, and Ocean Engineering* (in press).

Ravens, T. M., Thomas, R. C., Roberts, K. A., and P. H. Santschi. 2009. Causes of Salt Marsh Erosion in Galveston Bay, Texas. *J. of Coastal Research,* 25(2): 265-272.

Ravens, T. M. and M. Sindelar. 2008. Flume Test Section Length and Sediment Erodibility. *J. of Hydraulic Engineering*, 134(10): 1503-1506.

Rogers, A. and T. M. Ravens. 2008. Measurement of longshore sediment transport rates in the surf zone on Galveston Island, Texas. *J. of Coastal Research, 24(2): 62-73.*

Ravens, T. M. and R. C. Thomas. 2008. Ship wave-induced sedimentation of a tidal creek in Galveston Bay. *J. of Waterway, Port, Coastal, and Ocean Engineering.* 134(1): 21-29.

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Ravens, T. M., and K. I. Sitanggang. 2007. Numerical modeling and analysis of shoreline change on Galveston Island. *J. of Coastal Research*, 23(3): 699-710.

Ravens, T. M. 2007. Comparison of two techniques to measure sediment erodibility in the Fox River, Wisconsin. *J. of Hydraulic Engineering*, 133(1): 111-115.

Ravens, T. M., and R. A. Jepsen. 2006. CFD analysis of flow in a straight flume for sediment erodibility testing. *J. of Waterway, Port, Coastal, and Ocean Engineering*, 132(6): 457-461.

Ravens, T. M., and P. M. Gschwend. 1999. Flume measurements of sediment erodibility in Boston Harbor. *J. Hydraulic Engineering* 125(10): 998-1005.

Ravens, T. M., Madsen, O. S., Signell, R. P., Adams, E. E., and P. M. Gschwend. 1998. Hydrodynamic forcing and sediment quality in Boston Harbor. *Journal of Waterway, Port, Coastal, and Ocean Engineering.* 124(1): 40-42.

I would also point out that I am a regular reviewer of peer-reviewed Journals that address hydrodynamics and sediment transport including ASCE's Journal of Hydraulic Engineering, ASCE's Journal of Waterway, Port, Coastal and Ocean Engineering, Limnology and Oceanography, etc.

I earned my Ph.D. in Civil and Environmental Engineering from MIT. I have been tenured and promoted at both Texas A&M University and the University of Alaska.

Q2. What documents have you examined about the hydrodynamic modeling of sedimentation related to dredging in Haynes Inlet in Coos Bay?

1. Haynes Inlet – Trenched Sediment Transport and Sedimentation, dated 2011-09-21

2. Letter from Vladimir Shepsis, dated 2011-10-10

3. Report of Mark Chernaik, dated 2011-10-10 (see last section)

Q3. Could you please describe what "source terms" are in hydrodynamic modeling of sedimentation? Why would the disclosure of these source terms be indispensable for evaluating the validity of predictions from hydrodynamic models of dredging impacts?

Dredging and trenching operations are notorious for generating unwanted suspended sediment concentrations and deposition. For example, the recent dredging of PCB-contaminated sediments from the Hudson River has released a huge amount of sediments and contaminants. The EPA estimates that 440 kg of PCB's (largely born by sediments) was released (see the

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Executive Summary of the EPA Phase 1 Evaluation Report, March 12 2010). Sediment transport modeling of dredging operations should generally include a sediment production term that accounts for the introduction of suspended sediment into the water column. Data such as that cited in the report by Mark Chernaik (Exhibit 7) – showing the mass rate of sediment introduction due to clam shell dredging – should be used to assess the sediment transport impacts of dredging operations. However, a close reading of the statement provided by Vladimir Shepsis indicates that such an accounting of the particle generation of the dredging operation was not undertaken.

Vladimir Shepsis states:

My analysis is limited to the question of whether flow velocities resulting from pipeline construction will cause an increase in suspended sediment concentration and deposition of sediments in Haynes Inlet.

Thus, his analysis does not address the fate and transport of particles generated by the dredging project. His modeling only calculates the changed velocities that would result following dredged material placement and the increase in suspended sediment transport due to the changed velocity and – presumably - the changed bottom morphology. Again, there is no explicit accounting of suspended particles generated by the dredging and placement operation.

Although his statements are ambiguous[a], Vladimir Shepsis implies that more particles are generated **following** placement of dredged materials than during the dredging and placement process. If this is true, it is not common knowledge among sediment transport specialists. He should provide data or references to back up this assertion.

In addition to the issues raised above, it is important to point out that the statement provided by Vladimir Shepsis does not provide sufficient information to enable a full review of his sediment transport assessment. The statement provides little or no data on the character of the sediments. For sediment transport specialists, data on particle grain size distribution and fall velocity are critical. Also, it is critical to know whether the sediments are cohesive (fine) or non-cohesive (sand/gravel). If the particles are cohesive, then it is important to know the erodibility of the sediments. All of this basic information is missing.

The statement of Vladimir Shepsis does indicate that there would in fact be some elevated suspended sediment concentrations associated with the trenching. Further, he states that those suspensions would disperse and effectively disappear. This is not credible. Small concentration of particles can lead to significant deposition over time.

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[a] The ambiguous statement by Vladimir Shepsis is provided below:

Results from our analysis on this project and many other projects indicate that turbidity during placement of dredged material on an open bottom of a water body … is significantly higher than that during the digging of the same material.

Taking this statement at face value, it would appear prudent to assess the turbidity generated "*during the placement of dredged material*". However, elsewhere in his statement (see quote at the beginning of this section), he implies that turbidity generated during dredging and placement is minor compared to that which is generated following placement.

Q4. Do any of the documents you examined about the hydrodynamic modeling of sedimentation related to dredging in in Haynes Inlet in Coos Bay reveal the source terms?

As stated above, a close reading of the statements indicate that there was no accounting of the generation of particles due to the dredging/trenching operation.

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Jordan Cove Energy Project and Pacific Connector Gas Pipeline: An Economic Impact Analysis for Operations

June 12, 2017

Prepared for:

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ACRONYMS

CEP	Community Enhancement Plan
CSF	Community Service Fee
dth/d	Dekatherms per day
FERC	Federal Energy Regulatory Commission
FYE	Full-year-equivalent
GDP	Gross domestic product
IMPLAN	Impact Analysis for Planning
JCEP	Jordan Cove Energy Project, L.P.
JCLNG	Jordan Cove LNG, LLC
LNG	Liquefied natural gas
mtpa	Million tons per annum
NGA	Natural Gas Act
PCGP	Pacific Connector Gas Pipeline, L.P.
EZ	Enterprise zone

Section 1: Introduction

Jordan Cove LNG ("JCLNG") is seeking authorization from the Federal Energy Regulatory Commission ("FERC" or "Commission") under Section 3 of the Natural Gas Act ("NGA") to site, construct, and operate a natural gas liquefaction and liquefied natural gas ("LNG") export facility ("LNG Terminal"), located on the bay side of the North Spit of Coos Bay, Oregon. JCEP will design the LNG Terminal to receive a maximum of 1,200,000 dekatherms per day ("dth/d") of natural gas and produce a maximum of 7.8 million tons per annum ("mtpa") of LNG for export. The LNG Terminal will turn natural gas into its liquid form via cooling to about -260°F, and in doing so it will reduce in volume to approximately 1/600th of its original volume, making it easier and more efficient to transport.

In order to supply the LNG Terminal with natural gas, Pacific Connector Gas Pipeline, LP ("PCGP") is proposing to contemporaneously construct and operate a new, approximately 235-mile-long, 36-inch-diameter natural gas transmission pipeline from interconnections with the existing Ruby Pipeline LLC and Gas Transmission Northwest LLC systems near Malin, Oregon, to the LNG Terminal ("Pipeline"). PCGP will submit a contemporaneous application to FERC that will include its own set of resource reports with references to certain materials in the LNG Terminal resource reports.

In addition, the Project will have support operations in four other locations in Oregon. This includes a 20-person company office in Multnomah County, offices in Coos and Jackson counties, and a compressor station in Klamath County.

References to "the Project" throughout this document refer to both the LNG Terminal, Pipeline, and support operations.

JCLNG engaged ECONorthwest to forecast the annual operating economic impacts of the Project on Oregon. This report summarizes the economic impacts for the first full operating year 2024. These impacts will reoccur in future years, as the LNG Terminal and Pipeline continue operating at 2024 levels of output.

Major Findings

This analysis finds that in 2024, the first full year of operations, the Project will have the following economic impacts on Oregon:

- 200 workers will be directly employed in Oregon for the LNG Terminal and offices in Coos Bay and Portland. Total labor compensation in 2024 for the LNG Terminal and offices will be about $44.8 million. They, in addition to LNG vessel operators, will buy approximately $99.1 million a year of goods and services from Oregon suppliers.
- In 2024, PCGP will employ 15 workers in Oregon and spend $3.1 million on wages, benefits, and other employee compensation costs. Purchases of goods and services from Oregon businesses for the Pipeline will total about $8.7 million in 2024.
- The Project, in total, will directly employ 215 workers in Oregon. Through the Project's annual purchases of goods and services from Oregon businesses and household spending by employees, it will support an additional 1,567 jobs in Oregon, $95.8 million in additional labor income, and $235.2 in additional output for Oregon businesses.
- The Project will also contribute to the fiscal health of local communities through property taxes and through a local Community Enhancement Plan (CEP) in Coos County. For PCGP, property taxes are anticipated to average approximately $20.0 million a year for school districts and other local districts will be shared between Coos, Douglas, Jackson, and Klamath counties. For JCLNG, the cities of Coos Bay and North Bend, along with Coos County and the Port of Coos Bay, will oversee a community fund to implement the CEP, which once in operations will amount to approximately $40 million per year, on average, during the initial 15 years of operations.

Section 2: Data and Methodology

Overview of Operations

Operation of the LNG Terminal and the Pipeline will impact Oregon's economy in 2024 (and throughout the life of the Project) through its purchases of goods and services from Oregon suppliers and its employment of Oregon workers. In addition, LNG carrier calls will also trigger local economic impacts through spending, paying of various fees, and employing local labor.

Description of the Terminal

The LNG Terminal will be built in unincorporated Coos County, Oregon. The LNG Terminal will be constructed on a strip of land between the Pacific Ocean and the waters of Coos Bay, known as the North Spit, and will occupy approximately 620 acres of temporary and permanent workspace. During operations, the LNG Terminal will occupy just less than 200 acres on the bay side of the North Spit.

PCGP will transport natural gas to the LNG Terminal from a major natural gas pipeline hub near Malin, Oregon. At the LNG Terminal the natural gas will be purified, cooled to a liquid state, stored, and subsequently loaded onto LNG carriers. The LNG Terminal will have a marine slip where ocean going LNG carriers will dock, be loaded with LNG, and depart for delivery to export markets.

The LNG Terminal will produce a maximum of 7.8 mtpa of LNG for export. The Project's expected average annual output will be about 7.5 mtpa and require up to 120 LNG carrier vessel calls to export that output to buyers.

Description of the Pipeline

The Pipeline will be a 36-inch diameter natural gas transmission pipeline constructed and operated from interconnections with the existing Ruby Pipeline LLC and Gas Transmission Northwest LLC systems near Malin, Oregon to the LNG terminal. The Pipeline will be about 235 miles in length and run through parts of Klamath, Jackson, Douglas, and Coos counties, Oregon. A compressor station near Malin will also be built.

Direct Employment

Direct employment is defined as the annual, full-time jobs of Oregonians working for and being paid by the Project. Table 1 shows that the Project will directly employ 215 workers in 2024.

Table 1: Project Employment in Oregon for Operations, 2024

Operating Entity	City	County	Direct Employees
Terminal Operations:			
Operations	Coos Bay	Coos	180
Company Office	Portland	Multnomah	20
Terminal Workers			200
Pipeline Operations			
Terminal operations	Coos Bay	Coos	6
Compressor station	Malin	Klamath	4
Pipeline office	Medford	Jackson	5
Pipeline workers			15
Oregon Total			215

Source: JCLNG

Economic Impact Analysis

An economic impact analysis measures the effects of a project's purchases of goods, services, and labor, as those initial effects trigger further job creation and spending. As the effects ripple throughout an economy, they gradually diminish as some money in each transaction is taxed, saved, or spent outside the economy. Once this occurs, there are no further economic impacts.

This analysis measures only those economic impacts from the Project that will occur in Oregon in 2024. Since the economy is defined by the state's geography, any purchases from out-of-state suppliers or hiring of non-residents are not counted as triggering impacts in Oregon.

IMPLAN

ECONorthwest estimated economic impacts using an input-output model of the Oregon economy. This model relies on industry and Census data to estimate flows of spending and hiring. ECONorthwest built the model using the economic modeling software IMPLAN (Impact Analysis for Planning).

IMPLAN is a widely used tool that estimates economic impacts. The U.S. Forest Service, in cooperation with Federal Emergency Management Agency, developed IMPLAN in 1972. Other potential effects that are not economic transactions, such as environmental and social, are outside the scope of the economic impact analysis. IMPLAN does not measure those effects.

IMPLAN is a production model. It measures how businesses in an economy respond (the impacts) to demand for their products and services. IMPLAN calculates economic impacts in a transparent manner using well-known and robust data sources for its calculations.

SINGLE YEAR IMPACTS

IMPLAN uses annual Census, Department of Labor, and other government data collected from businesses and consumers. Because of this, IMPLAN models measure economic impacts that occur in a one-year period. It should be noted that these economic impacts would occur again each year in the future as the Project continues operating.

In addition, through its local spending and payments to local governments and schools, the Project will stimulate additional investment spending, improvements in local education, and the formation of new businesses. These cause future impacts, or what economists refer to as "dynamic impacts." They are multi-year effects and are not forecast by IMPLAN.

ECONOMIC AREA

ECONorthwest modeled the economic impacts of spending and employment for Oregon during operations, which is the affected economic area.

YEAR OF ANALYSIS

Since the Project will reach its long-run stabilized level of production in 2024, this report describes the economic impacts that will occur that year. These impacts will reoccur in future years as the Project continues to operate.

INFLATION

Monetary values in this report are expressed in nominal dollars and, thus, forecasts include the effects of inflation. The assumed annual inflation rate is 2½ percent.

IMPLAN VERSION

ECONorthwest used the current version (2015) of Oregon IMPLAN data. JCLNG provided ECONorthwest with estimated expenditures and payrolls for the Pipeline in 2020 dollars. For the Terminal, JCLNG provided data in 2016 dollars. ECONorthwest converted these dollar values into 2015 dollars using the assumed inflation factor. Results from the IMPLAN analysis were inflated to 2024 dollars so that the tables in this report are consistent with the year 2024.

TYPES OF IMPACTS

IMPLAN estimates the impacts on the economy of a project using one of several economic measures. The four used in this report, and brief definitions of each, are:

- *Output* is the dollar value of production, whether it is physical goods or services.
- *Labor Income* is total compensation. For a paid employ, it is the employer's cost of wages, salaries, commissions, bonuses, payroll taxes, health insurance, retirement benefits, life insurance, and other benefits. IMPLAN also counts earnings of self-employed persons in labor income.
- *Jobs*, according to IMPLAN's methodology, are measured in terms of full-year-equivalents (FYE). One FYE job equals work over twelve months in a given industry (this is the same definition used by the federal government's Bureau of Labor Statistics). For example, two jobs that last six months each count as one FYE job. A job can be full-time or part-time, seasonal or permanent; IMPLAN counts jobs based on the duration of employment, not the number of hours a week worked. IMPLAN also includes work done by people who are self-employed as jobs.
- *Value Added* is the net contribution of industries on the economy. The value added of an industry is also referred to as the industry's gross domestic product (GDP). The sum of these contributions from all industries in a county equals the economy's GDP or, when measured for a smaller geography, the regional gross domestic product.

STAGES OF ECONOMIC IMPACTS

IMPLAN calculates three stages of impacts. They are:

- *Direct impacts* are those directly occurring at the project being studied.
- *Indirect impacts* are those that arise from a project's spending on goods and services bought from other industries, those industries' purchases from their suppliers, and so on. With each round of spending, the size of impacts diminishes. Indirect impacts are driven by business spending and are called the supply-chain impacts.
- *Induced impacts* start from the spending of labor income by a project's employees and self-employed persons, and continue as rounds of subsequent, albeit diminishing, spending resulting in more jobs created. Induced impacts are consumer driven or consumption-driven impacts.

Impact Data Sources and Methods

ECONorthwest used forecasts of the Project to calculate the impacts of operations on the Oregon economy.

The lack of government data on LNG terminals and other limitations of standard IMPLAN analyses compelled ECONorthwest to use an expenditures approach of IMPLAN, rather than the simpler, more common output method.

As with all IMPLAN modeling, ECONorthwest excluded some input data and included others so as to correctly estimate impacts in 2024 from the operation of the LNG Terminal and PCGP.

Method

Most impact analyses start with a project's output and use that to run IMPLAN and rely on one of the program's 536 standard industry sectors. Because there are so few LNG terminals and none in the western U.S., IMPLAN does not have an LNG industry sector. Therefore, ECONorthwest could not use the standard IMPLAN method.

Instead, ECONorthwest used a common alternative of measuring impacts using the expenditures approach. In this technique, IMPLAN is run using Project spending and payroll estimates for 2024. For consistency, this method was used for both the Pipeline and LNG Terminal.

ADVANTAGES AND LIMITATIONS OF THE EXPENDITURES APPROACH

Calculating impacts using expenditures has a significant advantage. It tailors the analysis to fit the actual spending behavior of a project in its specific location. The results are decidedly more accurate than allowing IMPLAN data to approximate how much a project would spend, where it would buy goods and services, how many workers it would employ, and how much it would pay workers.

A limitation of the expenditures approach is that it does not provide direct output or value added, since IMPLAN is run off of spending and not production value. As such, ECONorthwest cannot report direct output or value added. However, direct jobs, spending, and labor are reported as are all indirect and induced impacts affecting the Oregon economy.

Inputs

Indirect and induced impacts are triggered by the Project's local purchases and employment. In addition, this analysis also includes two indirect impact sources unique to the LNG Terminal that, but for the LNG Terminal's operations, would not otherwise occur in Oregon. They are:

- Local spending by LNG vessel operators for supplies, services, and fees
- Government emergency services paid for by the Terminal (*e.g.*, security, fire safety, and emergency planning).

EXCLUDED SPENDING

Not all spending causes indirect and induced impacts. Output (the production of goods and services) and payrolls initiate economic impacts. Paying off debt or general taxes does not increase output. IMPLAN excludes general taxes, debt repayments, and interest expenses because they are not purchases of goods or services.

This analysis excludes spending on supplies, services, and labor from outside of Oregon. This ensures that only indirect and induced impacts on the economic area (Oregon) are measured.

Since the purpose of this report is to forecast impacts in a typical year of output, one-time expenditures anticipated for 2024 by JCLNG were excluded.

PROJECT OPERATING COSTS

Jordan Cove LNG, LLC provided 2024 operating cost data to ECONorthwest for the LNG Terminal and Pipeline. The data also include spending at Pipeline support locations.

ECONorthwest estimated the operating costs and payrolls for the Project office in Portland using IMPLAN data for the "Management of companies and enterprises" industry sector. Marine operations, such as port fees, tug charters, and vessel services that LNG vessel operators and crews pay for directly are included. Included in Table 2 under "Terminal goods and services" are funds provided by the Project each year to fund local government emergency services.

Table 2: First Year Operating Expenditures, 2024

Expenditure	Total Expenditures	Excluded from Analysis: Out-of-State Spending, One-Time Charges & Debt Service	Excluded from Analysis: Property Taxes	Net Spending Triggering Impacts in Oregon
Terminal				
Labor	$41,425,699	$0	$0	$41,425,699
Community Enhance Plan	40,000,000	-	40,000,000	-
Terminal Goods & Services	81,572,074	14,530,222	-	67,041,852
Marine Operations*	38,481,724	9,256,468	-	29,225,256
Pipeline				
Labor	$3,106,328	$0	$0	$3,106,328
Property Taxes	20,000,000	-	20,000,000	-
Pipeline Goods & Services	8,704,470	-	-	8,704,470
Portland Office				
Labor	$3,395,325	$0	$0	$3,395,325
Operating Expenses	2,837,687	0	0	2,837,687
Total	$239,523,307	$23,786,690	$60,000,000	$155,736,617

** Marine operations include spending by LNG vessel operators and crews on locally provided services. These charges will be incurred as port fees per LNG vessel ship call. One-time charges and debt service payments are excluded.*
Source: JCLNG.

Table 2 shows 2024 total expenditures for the Project to be about $239.5 million. Spending out of state, on one-time charges, and interest and debt payments total about $23.8 million. This spending, in addition to $20 million in average annual property taxes for PCGP and $40 million towards a Community Enhancement Plan for JCLNG, was excluded from the analysis. The remainder is approximately $155.7 million. This is the sum of all purchases on goods, services, and labor from Oregon sources including amounts paid by LNG vessel owners and crews in 2024.

Direct spending by the Project and LNG vessels on Oregon labor, goods, and services will trigger economic impacts on the state's economy. Of the approximately $155.7 million in net spending about $47.9 million will go towards paying Oregon labor and about $107.8 million will go towards purchases from Oregon businesses. The IMPLAN model uses those inputs to forecast all of the indirect and induced economic impacts on Oregon's economy.

Section 3: Economic Impact Results

As inputs into the Oregon IMPLAN model, ECONorthwest used the Project employment forecast from Table 1 and detailed, by industry, net spending on goods and services—the totals of which are shown on Table 2.

As discussed on Page 7, ECONorthwest used the expenditures method. Because of this approach, ECONorthwest could not calculate the direct output and direct value added of the Terminal and Pipeline. In their absence, the tables show the term "not calculated".

Economic Impacts from LNG Terminal Operations

Table 3 shows the economic impacts on Oregon that will result from operations at the LNG Terminal, spending on the potentially 120 LNG vessel calls, as well as spending and payrolls for the company office in 2024. These impacts would reoccur each year beyond 2024, assuming that JCEP continues to export an average of about 7.5 mtpa of LNG annually.

Table 3: Oregon Economic Impacts of the LNG Terminal, Vessel Calls, and Offices, 2024

Impact Stage	Output	Value Added	Labor Income	Jobs
Direct	not calculated	not calculated	$44,821,024	200
Indirect	$131,816,393	$76,550,130	59,317,012	843
Induced	85,195,212	48,514,755	28,200,832	560
Total	not calculated	not calculated	$132,338,868	1,602

Source: ECONorthwest IMPLAN analysis.

JCLNG will employ approximately 200 people in Oregon for the LNG Terminal and offices. Total labor compensation at both locations (Coos Bay and Portland), including benefits and payroll taxes, will exceed $44.8 million in 2024. This direct employment in combination with LNG Terminal associated spending on Oregon sourced goods and services will impact the rest of the economy, especially in Coos County.

Including indirect and induced employment, the operations of the Terminal will account for 1,602 FYE jobs in Oregon with total compensation in excess of $132.3 million in 2024. Expressed in 2017 dollars, that equals approximately $111.3 million or $69,477 per job

Impacts of the LNG Terminal on the Rest of the Economy

IMPLAN allows economists to calculate how the direct spending by projects causes additional spending and job creation throughout a state. Those broader, community-wide effects are the indirect and induced impacts. Table 4 summarizes these broader impacts.

Table 4: Impacts of the Terminal, Vessel Calls, and Company Office on Businesses and Employment Elsewhere in Oregon, 2024

Type of Impact	Induced & Indirect total
Output	$217,011,604
Value Added	$125,064,885
Labor Income	$87,517,844
Jobs	1,402

Source: ECONorthwest IMPLAN analysis.

Businesses other than the Terminal and company office will see approximately $217.0 million in additional output arising from all of the spending by the Terminal and company office employees. This equals approximately $125.1 million in value added to Oregon's economy, fully 1,402 jobs, and labor income exceeding $87.5 million in 2024. These statewide impacts will reoccur each year the Terminal operates.

Economic Impacts from Pipeline Operations

Table 5 summarizes the economic impacts in Oregon that will be tied to PCGP operations in 2024. Pipelines require fewer employees to operate than LNG Terminals. PCGP will have approximately 15 direct employees in Oregon and their total wages, benefits, and other compensation will be about $3.1 million in 2024. However, pipelines employ many contractors. For example, PCGP will hire pilots that will monitor the pipeline right of way and seasonal workers that will help maintain the right of way. These are indirect hires.

Table 5: Oregon Economic Impacts of Pipeline Operations, 2024

Impact Stage	Output	Value Added	Labor Income	Jobs
Direct	not calculated	not calculated	$3,106,328	15
Indirect	$10,882,276	$7,212,987	5,822,756	113
Induced	7,307,943	4,161,788	2,418,894	52
Total	not calculated	not calculated	$11,347,979	180

Source: ECONorthwest IMPLAN analysis.

Statewide, in 2024, there will be approximately 113 jobs created in Oregon due to the Pipeline for people working at businesses indirectly impacted, including pipeline contractors and seasonal workers. Another approximately 52 jobs will be supported by the spending of households whose incomes in whole or in part are tied to the operations of the Pipeline. In total, approximately 180 jobs in Oregon will be traced back to PCGP operations in 2024. Total labor income, including benefits and taxes, will be about $11.3 million (in 2024 dollars). Expressed in 2017 dollars, that equals approximately $9.5 million or $53,200 per job.

Impacts of the Pipeline on the Rest of the Economy

Using the IMPLAN results, the annual impacts on the broader Oregon economy were calculated for Pipeline operations in 2024. Shown in Table 6, businesses, both large and small, in Oregon will see almost $18.2 million in annual output attributable to the Pipeline's operations.

Table 6: Impacts of Pipeline Operations on Businesses and Employment Elsewhere in Oregon, 2024

Type of Impact	Induced & Indirect total
Output	$18,190,219
Value Added	$11,374,775
Labor Income	$8,241,651
Jobs	165

Source: ECONorthwest IMPLAN analysis.

From the indirect and induced output, almost $11.4 million in value added will result. The Pipeline will support approximately 165 jobs earning over $8.2 million (2024 dollars). In 2017 dollars, that equals $42,134 per job. Many of these jobs will be in the four counties where the Pipeline will employ its workers, hire contractors, and buy supplies.

Total Economic Impacts of Project Operations

The combined impacts for all Project operations in Oregon for the first full year of production are shown in Table 7. The Project will directly employ approximately 215 FYE workers that will reside in Oregon.[1]

[1] Job impacts do not include staff from parent company offices visiting Oregon.

Table 7: Oregon Economic Impacts of All Project Operations, 2024

Impact Stage	Output	Value Added	Labor Income	Jobs
Direct	not calculated	not calculated	$47,927,352	215
Indirect	$142,698,669	$83,763,117	65,139,768	956
Induced	92,503,154	52,676,543	30,619,726	611
Total	not calculated	not calculated	$143,686,847	1,782

Source: ECONorthwest IMPLAN analysis.

The IMPLAN results reflect high indirect impacts because of the Project's reliance on Oregon based suppliers and local purchases by visiting LNG vessels. Indirect impacts will account for about $142.7 million in economic output, $83.8 million in value added, 956 FYE jobs, and $65.1 million in labor income.

All the jobs and labor income linked to the Project impacts associated household spending. For example, a person employed by the LNG Terminal and living in Coos County will spend most of their earnings in Oregon. Their spending causes induced impacts. In Table 7, total induced impacts result in another approximately $92.5 million in output, $52.7 million in value added, 611 FYE jobs, and $30.6 million in labor income contributed to Oregon's economy.

In total, the Project, in 2024 alone, will have an impact of approximately 1,782 jobs in Oregon. Those workers will earn approximately $143.7 million in wages, salaries, and benefits.

Statewide, each year the Project operates, Oregon businesses other than the Project itself, will see approximately $235.2 million in output (2024 dollars), which will contribute approximately $136.4 million to value added, as shown on Table 8.

Table 8: Impacts of All Project Operations on Businesses and Employment Elsewhere in Oregon, 2024

Type of Impact	Induced & Indirect total
Output	$235,201,823
Value Added	$136,439,659
Labor Income	$95,759,495
Jobs	1,567

Source: ECONorthwest IMPLAN analysis.

Total labor income earned by those working in Coos County and the rest of Oregon but not for the Project itself will garner $95.8 million in total compensation in 2024. That equals, in 2017 dollars, over $51,400 for every FYE job linked to the Project's operations.

Economic Impacts of Project Operations on Other Industries

Spending by businesses and jobholders that will originate as a result of the Project will spread throughout the economy. Many industries in Coos County, the rest of southern Oregon, and elsewhere in the state will feel the impacts. Table 9 shows the annual contributions to local businesses by major industry.

Table 9: Impacts of Project Operations on Other Industries in Oregon, 2024

Industry	Annual Output	Jobs	Labor Income
Restaurants, hotels, & other accommodations	$5,245,000	61	$1,899,000
Retail stores	10,745,000	131	5,254,000
Arts, entertainment & recreation	1,793,000	22	544,000
Healthcare & social services	14,552,000	99	8,372,000
Professional & technical services	22,834,000	172	13,559,000
Government services	9,406,000	28	3,887,000
Personal care & other services	44,901,000	282	24,362,000
Transportation, warehousing, & wholesaling	44,067,000	277	16,616,000
All other industries	81,658,823	492	21,266,495
Total	$235,201,823	1,567	$95,759,495

Source: ECONorthwest IMPLAN analysis.

Many of the industries that will experience large effects from the Project serve households, especially households living in the five counties where the Project will have business locations.

For example, over $5.2 million in output a year would be attributable to the Project at area restaurants, hotels, and similar businesses. That will require 61 employees earning nearly $1.9 million in 2024 alone. Millions of dollars in sales at retail stores, healthcare providers, personal care businesses, and the like will be attributable to the Project's operations.

There will be large economic contributions in industries that cater more towards businesses than households. For example, the transportation, warehousing, and wholesaling industries would have $44.1 million in output, need 277 employees, and pay over $16.6 million in compensation.

Project Operations Financial Support to Local Communities

The Project will pay property taxes and contribute to a Community Enhancement Plan in Coos County. As noted on Page 8, such payments are not purchases of goods and services, so they do not engender economic output or cause subsequent economic impacts. But such payments benefit local communities, can create jobs, and stimulate economic growth.

An example of how pipelines stimulate economic growth was seen with the Ruby Pipeline, a section of which was built in 2011, and added $3.1 million in revenue for Lake County and $1.5 million for Klamath County.[2] Lake County used some of the property taxes from the pipeline to finish construction of the Lakeview Library—a project long stalled because of a lack of funding.[3]

JCLNG estimates that the Pipeline will pay an average of $20.0 million in property taxes, per year, during the initial 20 years of operations. Using geographic data and 2016-17 tax code rates from county assessors, ECONorthwest determined the amounts that taxing districts will receive from the Pipeline. Table 10 is a summary showing how counties and types of taxing districts would split the $20.0 million in 2024. In addition to this, the LNG Export Terminal will pay a Community Service Fee of about $40.0 million per year during operations, as part of the CEP.

Table 10: Project Property Tax and Community Enhancement Plan Payments by District Type and County, 2024

Property Tax by District Type and Community Enhancement Plan	Coos	Douglas	Jackson	Klamath	4 County Total
Property Taxes:					
County government	$634,853	$691,673	$1,141,872	$1,346,605	$3,815,002
Public safety, fire, and hospitals	455,559	170,378	254,704	616,035	1,496,676
Local K-12 schools and ESDs	2,525,525	3,471,416	3,277,518	2,559,274	11,833,732
Community colleges	337,297	282,974	351,196	237,596	1,209,063
Libraries	350,400	-	272,936	282,784	906,120
Other local districts	353,687	37,307	47,764	300,647	739,405
Property Tax Subtotal	$4,657,322	$4,653,748	$5,345,989	$5,342,941	$20,000,000
Community Enhancement Plan	40,000,000	-	-	-	40,000,000
Total Payments	$44,657,322	$4,653,748	$5,345,989	$5,342,941	$60,000,000

Sources: JCLNG and ECONorthwest analysis of 2016/17 tax code area data from county assessors.

Community Enhancement Plan

The Terminal will be in an enterprise zone (EZ) created by the Coos County Urban Renewal District as a way to attract capital investment and employment opportunities to an economically depressed area. The Urban Renewal District is composed of representatives of Coos County, the cities of Coos Bay and North Bend, the International Port of Coos Bay, and elected representatives at-large ("Zone Sponsors").

JCEP will request a 15-year Long-Term EZ exemption. Subject to receiving the exemption, JCEP will enter into an agreement with the Zone Sponsors pursuant

[2] Collison, M. "The H&N View: Pipeline's impact a good example of vital need for economic growth." The Herald & News Review (Klamath Falls). October 16, 2011.

[3] "Ruby Pipeline tax revenue will help complete Lake County Library." The Herald & News Review (Klamath Falls). April 22, 2012.

to which JCEP will pay an annual Community Service Fee ("CSF") to a defined group of local government and civic organizations (the "CEP Parties"). Under this arrangement, JCEP would provide the financial benefit of the difference between the Standard EZ Exemption and the Long Term EZ Exemption to the Community Enhancement Plan Parties.

In broad terms, approximately half of the CSF payments will be allocated to local education programs with the balance going to local development programs. The CSF is a means of getting money to local public schools rather than having school property tax dollars sent to the state in accordance with equalization.

EXHIBIT MM

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Doc#: J1-RGL-LET-JCL-LCG-00001-19

April 24, 2019

Attn: Henry O. Hearley, Assistant Planner

Lane Council of Governments

859 Willamette Street, Suite 500

Eugene, OR 97401

Re: LNG Carrier Transit Energy Conservation with NRI's in Place: Navigation Reliability Improvements; City of Coos Bay Land Use Application #187-18-000153

This Technical Memorandum is submitted into the public record on behalf of Jordan Cove Energy Project, L.P. (JCEP) with regard to one of four Navigation Reliability Improvements ("NRIs") sought pursuant to land use applications, City of Coos Bay Land Use Application #187-18-000153 (hereafter, "*City of Coos Bay NRI Applications*"). The *City of Coos Bay NRI Applications* will facilitate limited dredging activity in one of four NRI areas (adjacent to the existing federally authorized Coos Bay Navigation Channel) in order to provide improved efficiency and navigability. Three other related NRIs are sought pursuant to land use applications, Coos County File Nos. AM-18-011/RZ-18-007/HBCU-18-003 ("*Coos County NRI Applications"*).

This technical memorandum evaluates energy efficiency related to the NRIs subject to the *City of Coos Bay NRI Applications* and *Coos County NRI Applications*.

Assessment

Jordan Cove LNG has analyzed the transit of LNG Carriers both into and out of the Port of Coos Bay. This includes the reliability of LNG shipping as impacted by the environmental condition limits set by the USCG for the port under the Waterway Suitability Assessment process. A comparison between the environmental condition limits and historical environmental data was used in determining the average transit delay of LNG Carriers into and out of the port during each month of the year.

The dredging of the four NRI's will expand the environmental window within which LNG Carriers can make a safe transit of the Coos Bay Port channel by allowing the USCG and the Pilots to expand the environmental condition limits within which an LNG Carrier (and other types of ocean-going ships) can safely and reliably make these transits. This is in support of the Project Purpose and Need of a facility to produce and export 7.8 mtpa of LNG.

The average reduction in the total delay related to the LNG Carrier transit was 7 hours per port call. Average total delay includes inbound environmental delays and outbound environmental delays and berth unavailability (berth occupied by LNGC awaiting outbound transit).

	Without NRIs	With NRIs	Reduction due to NRIs
Average total delay hours per port call (hrs)	23	16	7

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Assuming that an LNG Carrier scheduled to load at the Jordan Cove marine terminal will arrive offshore Coos Bay on schedule, the arriving LNG Carrier will need to wait offshore steaming around in a large circle during at least part of the delay period at a sufficient speed to consume the boil off gas that is normally generated during the ballast voyage to keep the ship's cargo tanks in a cold condition. The other large part of the delay period occurs with the LNG Carrier that is fully loaded at the marine terminal berth and is awaiting the window for a safe departure transit. Typically, the total delay time is split evenly between inbound transit delay and outbound transit delay. We have assumed a 50% split.

During this delay period the LNG Carrier is forced to consume energy needlessly. One of the large benefits of the NRIs is to reduce this consumption of energy by the LNG Carrier or other large vessel accessing the International Port of Coos Bay.

The following table shows the total amount of energy saved on a per port call and annual basis by dredging the four NRIs which will allow a safe and reliable LNG Carrier inbound and outbound transit under a wider environmental window than without the NRIs in place. This table only applies to LNG Carriers. Additional savings will be realized by other types of larger ocean-going vessels calling at the Port of Coos Bay, which the USCG and Pilots will allow to take advantage of the wider environmental window. The average energy savings per LNG Carrier port call is 50,750 kW-hours. At an average number of 115 LNG Carrier calls at the JCLNG facility per year this equates to an average energy consumption savings of 5,836 megawatt-hours (mWh) per year. For context 5,836 mWh is enough energy to supply power to 6,484 US homes for a month

LNG Carrier Energy Consumption	**Power Consumption (Kw)**	**Delay Time (Hours)**	**Total Energy (kWh)**
Offshore steaming in circles to consume gas boiloff awaiting transit window	13000	3.5	45500
At JCLNG terminal berth awaiting departure transit window	1500	3.5	5250
Total Energy Savings per port call with NRI's			50750
Total Average Energy Savings per year with NRI's (megawatt hours) mWh	5836 mWh		

Based on the foregoing analysis, there is a net energy efficiency gained from construction of the NRIs.

Author: Peter Schaedel, P.E.

Position: Project Engineer

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Date: 19-Apr-2019

References

Attachment A (Citations to *Coos County NRI Applications* Public Record), attached.

TECHNICAL MEMORANDUM

DATE:	04/23/2019
ATTENTION:	Henry O. Hearley, Assistant Planner
GOVERNMENT BODY:	Lane Council of Governments
ADDRESS:	859 Willamette Street, Suite 500, Eugene, Oregon 97401
FROM:	Melinda Schulze, AECOM
SUBJECT:	**Marine Mammals Baseline Information, Potential Impacts and Mitigation: Navigation Reliability Improvements; City of Coos Bay Land Use Application #187-18-000153**
PROJECT NAME:	Jordan Cove Energy Project, L.P.

Introduction

This Technical Memorandum is submitted into the public record on behalf of Jordan Cove Energy Project, L.P. (Jordan Cove or JCEP) with regard to one of four Navigation Reliability Improvements ("NRIs") sought pursuant to land use applications, City of Coos Bay Land Use Application #187-18-000153 (hereafter, "*City of Coos Bay NRI Applications*"). The *City of Coos Bay NRI Applications* will facilitate limited dredging activity in one of four NRI areas (adjacent to the existing federally authorized Coos Bay Navigation Channel) in order to provide improved efficiency and navigability. Three other related NRIs are sought pursuant to land use applications, Coos County File Nos. AM-18-011/RZ-18-007/HBCU-18-003 ("*Coos County NRI Applications*).

This technical memorandum identifies the documents, reports and studies that have previously been provided into the public record for the *Coos County NRI Applications* (as specifically identified in Attachment A, hereto) with regard to ***marine mammals baseline information, potential impacts and mitigation*** and are relevant to the four NRIs subject to the *City of Coos Bay NRI Applications* and *Coos County NRI Applications*.

Assessment

Based on my education and experience, the documents identified in Attachment A, hereto, adequately address baseline information, potential impacts, and proposed mitigation related to marine mammals, and it is my professional judgment that the NRI activities subject to the *City of Coos Bay NRI Applications* will not have a significant impact on marine mammals (including, for example, Pacific harbor seal, Steller sea lion, California sea lion, killer whale, or harbor porpoise).

A potential impact on marine mammals from the NRIs would be through operational noise from dredging and potential oil/lubrication spills from dredging equipment. All marine mammals are protected under the federal Marine Mammal Protection Act (MMPA), which requires an

authorization from the National Marine Fisheries Service (NMFS) for incidental harassment of marine mammals. NMFS has established sound threshold guidance used to estimate incidental harassment of marine mammal species. The Federal Energy Regulatory Commission (FERC) Draft Environmental Impact Statement for the Jordan Cove Energy Project (March 2019) (DEIS) characterized maintenance dredging as an "operational acoustic effect" and opined that "maintenance dredging would generate underwater sounds pressure levels that could elicit responses in aquatic organisms" but that generally "response to changes in noise levels would be behavioral and perceptual, and not physiological in nature, as fish and marine mammals would tend to avoid the area during periods of high noise output. We conclude that operational noise would not have significant adverse effects on aquatic resources." (DEIS @4-263). Sound levels from dredging are not expected to exceed the NMFS thresholds established as causing behavioral harassment to marine mammals in the estuary such that they cause changes to, for example, their breeding, foraging, migrating or sheltering patterns. Only temporary avoidance of the immediate area where dredging is taking place would be expected due to in-water noise generation. Such dredging is also similar to ongoing annual maintenance dredging conducted by the U.S. Army Corps of Engineers in the Coos Bay Federal Navigation Channel (which is immediately adjacent to the NRIs), so marine mammals in the area may be acclimated to avoiding dredging activities in Coos Bay.

If temporary pilings are to be installed (e.g., as anchors for dredging barges or equipment), acute noise from pile driving activities is also a potential impact on marine mammals. Temporary piles that are proposed for supporting the NRIs would be installed using vibratory methods (if feasible), which generate less sound than impact driving. Additionally, limiting in-water pile driving activities to the approved Oregon Department of Fish and Wildlife in-water construction window would further mitigate potential impacts on marine mammals. (See DEIS @ 4-320; 4-250 to 4-254). JCEP would be required to conduct all such activities in accordance with the MMPA, as enforced by NMFS, and in accordance with all other regulatory agency requirements including the use of appropriate sound attenuation measures, as necessary.

With regard to potential spills from dredging and pile driving equipment, JCEP's plan to include a Spill Prevention Control and Countermeasures Plan (SPCCP) would be an appropriate measure to ensure that any accidental spills could be immediately responded to and mitigated. In light of the above, the NRIs should not cause any significant impacts on marine mammals. Accordingly, baseline information, potential impacts and appropriate mitigation of such potential impacts on marine mammals have been appropriately addressed in the record.

References

Attachment A (Citations to Coos County NRI Applications Public Record), attached.

Federal Energy Regulatory Commission (FERC) Draft Environmental Impact Study for the Jordan Cove Energy Project. March, 2019.

Author CV/Resume, attached.

JORDAN COVE - NAVIGATION RELIABILITY IMPROVEMENTS - COOS COUNTY FILE NOS. AM-18-011/RZ-18-007/HBCU-18-003

ATTACHMENT A

PUBLIC COMMENT ISSUE	BASELINE DATA/INFORMATION (Addressed in Record)	POTENTIAL IMPACTS (Addressed in Record)	PROPOSED MITIGATION (Addressed in Record)	NOTES
Marine Mammals				
1. Marine Mammals (Generally)	◦ EX 17.A.3, See p. 35. ◦ EX 17.A.2, See p. 18 (to be addressed in the EIS). ◦ EX 17.A.5, See p. 5 (to be addressed in the BA and IHA), p. 6 (survey results throughout Section 3.1.3 and Section 3.4.1.5), pp. 15-16, 20-21, 27-29, 48, 50, 59, 67-68, 91, 94-95, 110-112, 124, 126, 151, 222, 325, 340, 601, 603, 638, 707-708. ◦ EX 17.B, See pp. 8, 22, 24, 62-63, 66-67, 156, 159, 167, 169-173. ◦ EX 17.C	◦ EX 17.A.3, See pp. 35-36. ◦ EX 17.A.2, See p. 18 (to be addressed in the EIS). ◦ EX 17.A.5, See p. 5 (to be addressed in the BA and IHA), pp. 30, 39-40, 48-49, 116, 121-122. ◦ EX 17.B, See pp. 62-63, 65. ◦ Ex 17.E, See p. 77.	◦ EX 17.A.3, See pp. 35-36. ◦ EX 17.A.2, See p. 18 (to be addressed in the EIS). ◦ EX 17.A.5, See p. 5 (to be addressed in the BA and IHA), pp. 39-41, 48-49. ◦ EX 17.B, See pp. 62-63, 65.	
2. Harbor seals	◦ EX 17.A.5, See pp. 27-29, 48, 341. ◦ EX 17.B, See p. 27.	◦ EX 17.A.5, See pp. 39-40.	◦ EX 17.A.5, See pp. 39-40.	
3. Steller sea lions	◦ EX 17.A.5, See pp. 27-29, 48.	◦ EX 17.A.5, See pp. 48, 50, 325.	◦ EX 17.A.5, See pp. 48, 50, 325.	
4. California Sea Lions	◦ EX 17.A.5, See pp. 27-28, 48.	◦ EX 17.A.5, See p. 48.		
5. Orcas	◦ EX 17.A.5, See pp. 27-29, 48, 94-95, 112, 126.	◦ EX 17.A.5, See p. 95.	◦ EX 17.A.5, See p. 95.	

6. Noise	◦ EX 17.A.2, See p. 22 (to be addressed in the EIS). ◦ EX 17.A.3, See pp. 11, 13, 16, 38, 46, 55-56, 67-70, 72-75, 77-79. ◦ EX 17.A.5, See pp. 5-6, 39-40, 48, 63-64, 66-67, 117, 120-122, 124-125, 151, 206-207, 298, 318, 357, 556-567, 589, 591. ◦ EX 17.A.6, See pp. 15, 89, 118. ◦ EX 17.A.11, See pp. 2-3, 5-7, 9.3.1, 9.4.1, 9.4.2, 33. ◦ Ex DD. ◦ EX 17.B, See pp. 10-16, 62, 66-67, 79, 86, 108-109, 124, 146-147, 150, 153-166, 170-174, 176-179, 181-187, 189, 193, 198-204, 207, 216-218, 220, 224-225, 236, 253-255, 257-265, 281-282, 305, 308, 311, 321, 337-342, 344, 346, 386, 389, 409-411, 415-418, 421-423, 426-428, 453-455, 480-488, 495-497, 501-503, 507-509, 534-535, 538-540, 596, 659-660, 678-680, 690, 693-695, 762, 790, 820, 850, 948-949, 964-865, 980-981, 985, 1000-1001, 1079-1084.	◦ EX 17.A.3, See p. 35. ◦ EX 17.A.5, See pp. 40, 125. ◦ EX 17.A.11, See pp. 41-43, 48, 506, 509, 511, 515, 517-518, 522-525, Appendix A. ◦ Ex DD. ◦ EX 17.B, See pp. 219, 225, 678-680, 980.	◦ EX 17.A.3, See p. 35. ◦ EX 17.A.5, See pp. 40, 125. ◦ EX 17.A.11, See pp. 41-43, 48, 506, 509, 511, 515, 517-518, 522-525, Appendix A. ◦ Ex DD. ◦ EX 17.B, See pp. 219, 225, 678-680, 980.	

AECOM

Melinda Schulze, CPESC, QSD/P, STS-C

Senior Environmental Planner

Professional History

AECOM, Senior Environmental Planner, 2014-present

Brown and Caldwell, Environmental Scientist, 2008-2014

SCA Environmental Inc. Environmental Scientist, 2006- 2008

Education

BS/Environmental Science with emphasis in Biology/2003/ University of California, Berkeley

Licenses/Certification

Certified Project Manager (AECOM)
Qualified SWPPP Developer/ Qualified SWPPP Practitioner, QSD/QSP, No. 01252
Certified Professional in Erosion Control, CPESC, No. 5822
Safety Trained Supervisor - Construction

Years of Experience

With AECOM (formerly URS)	4 years
With Other Firms	8.5 years

Professional Associations

Association of Environmental Professionals – SF Bay Chapter
The Wildlife Society – Western and SF Bay Chapters

Training and Certifications

First Aid/CPR trained
40-hour HAZWOPER
10-hour OSHA Construction Training
Fall Protection Training (Caltrans)

Ms. Schulze brings over 12 years of experience in environmental services, permitting and storm water and environmental compliance management on small and large scale projects. She has worked directly with various regulatory agencies, municipalities and local governments as well as with prime contractors and their subcontractors. Ms. Schulze has extensive experience managing and coordinating staff for large scale monitoring projects and with a multitude of permit compliance requirements. She has experience overseeing compliance with CEQA and NEPA mitigation monitoring requirements and regulatory permit requirements during construction and design phases of multi-faceted projects.

Jordan Cove Energy Project, Jordan Cove LNG, LLC., Coos Bay Oregon. (Project Manager). Providing NMFS Incidental Harassment Authorization permitting and NMFS Biological Assessment support for the design and construction of a liquid natural gas terminal and pipeline located in Coos Bay, Oregon. The project is highly complex and involves coordination with the Federal Energy Regulatory Commission, NMFS, Oregon Department of Fish and Wildlife, USACE and USFWS. Also managing the USACE permitting support out of the AECOM Oregon office. (2017 – present)

Water Emergency Transportation Authority, Downtown Ferry Terminal Expansion Project, San Francisco County, (Environmental Planner): Prepared the Incidental Harassment Authorization application for coverage to incidentally harass marine mammals under the Marine Mammal Protection Act during pile driving and dredging work for the expansion of the downtown ferry terminal in San Francisco. Prepared the application and consulted regularly with NFMS Office of Protected Resources (OPR) analysts in Maryland to get the permit in time for the next in-water work window. Is in the process of preparing a second application for Year 2 of construction at the ferry terminal and has begun coordination with NMFS OPR. (2016-2017)

Water Emergency Transportation Authority, Central Bay Operations and Maintenance Facility Project, Alameda County, (Environmental Planner): Prepared the Incidental Harassment Authorization application for coverage to incidentally harass marine mammals under the Marine Mammal Protection Act during pile driving. Prepared the marine mammal monitoring program as part of the application. Worked closely with NMFS OPR to negotiate monitoring protocol and take allowances of authorized species, including obtaining Level A PTS coverage for Pacific harbor seal for a unique situation involving a near-by haul-out platform.

Successfully secured permit in time for construction to start at the beginning of the in-water work window. (2016-2017)

Caltrans, San Francisco-Oakland Bay Bridge East Span Seismic Safety Project (SFOBB), San Francisco, CA (Environmental Compliance Manager): Provides expert support for biological permit compliance on this $6.4B project to build a new east span portion of the San Francisco-Oakland Bay Bridge and the dismantling of the old span. Ms. Schulze was the Environmental Compliance Manager for AECOM staff and subcontractors (up to 40 staff) during the in-water controlled implosions of sixteen marine foundations of the old SFOBB east span. She currently assists with ensuring compliance with and making modifications to various environmental permits for the SFOBB project, including those issued by the Regional Water Quality Control Board, SF Bay Conservation and Development Commission (BCDC), US Fish and Wildlife Service, California Department of Fish and Wildlife, Army Corps of Engineers, US Coast Guard and the National Marine Fisheries Service (NMFS). In particular, she oversees the preparation of the Incidental Harassment Authorization with NMFS Office of Protected Resources for the project on an annual basis and has provided expert support for recommendations on marine mammal deterrents, monitoring strategies and permitting processes. She coordinates all biological monitoring efforts, including bird, hydroacoustics and marine mammal monitoring during the dismantling of the old east span. She also oversees the preparation of and reviews the biological monitoring reports as required by the project permits. (2015 – present)

Caltrans, Doyle Drive IJKL Outfall Replacement Project, San Francisco, CA (Environmental Compliance Manager): As part of the project management team, Ms. Schulze coordinated the biological monitoring efforts during the replacement of an outfall at Chrissy Beach in San Francisco, CA. The site is ecologically sensitive and construction work was occurring on-land and in-water and required full time monitoring for both terrestrial species, including the western snowy plover and aquatic marine mammal species. Ms. Schulze also coordinated the hydroacoustic monitor for monitoring sound level during in-water pile driving. (2015)

Chevron Pipe Line Company, Geotechnical Investigation and HDD, BAPL Mallard Farms Pipeline Replacement Project, Suisun Marsh, Solano County, (Environmental Planner): Chevron Pipe Line Company plans to replace a section of pipeline beneath the Suisun Marsh using horizontal directional drilling. Ms. Schulze prepared the application for a BCDC minor permit to allow for overwater borings within the Suisun Marsh, a managed wetland under BCDC jurisdiction, as part of a geotechnical investigation. Subsequent to the geotechnical investigation, Ms. Schulze has prepared the regulatory permit applications for the Horizontal Directional Drilling (HDD) work within the Suisun Marsh, including preparing the BCDC portion and assisting with a Joint Aquatic Resource Permit Application (JARPA). (2016)

Hi-Tech Confidential Client, Various Sites, US and Canada. Program Manager. Environmental Compliance and Program Manager for nationwide site selection and due diligence natural resources contract. Manages due diligence efforts for biological and cultural resources for confidential client's site selection process for sites in Nevada, Oregon, Tennessee, Ohio, and in Quebec, Canada. Oversees "Pipeline" projects which is a high-level desktop reconnaissance effort for multiple sites

throughout the nation. Manages staff and budget to perform desktop reviews and conduct reconnaissance level field surveys. Manages additional tasks involving USACE 404 wetland permitting and wetland delineations, in addition to NHPA Section 106 SHPO consultation. Currently managing cultural Phase I survey efforts in Tennessee on over 500 acres of potential parcels for development. Manages local field teams for special status species surveys, including bats, salamanders and protected vegetation. Effectively navigates local regulations including state-specific laws to better inform client of potential risks during development. Works closely with design teams to ensure minimal impacts to protected resources to minimize permitting and compliance costs long-term. (2017- present)

SFPUC, Mountain Tunnel Access and Adits Improvement Project, Groveland, CA (Environmental Compliance Manager): Coordinates compliance specialty monitoring for biological resources and cultural resources and environmental inspections during construction. Reviews and submits environmental and specialty monitoring reports and attends weekly coordination meetings with SFPUC and the contractor. (2016)

SFPUC, San Joaquin-Tesla Valve House Rehabilitation Project, Stanislaus County (Environmental Compliance Manager): Coordinates compliance specialty monitoring for biological resources and cultural resources and environmental inspections during construction. Reviews and submits environmental and specialty monitoring reports and attends weekly coordination meetings with SFPUC and the contractor. Coordinated with subcontractors to perform crack monitoring at sensitive cultural structures near the construction work and reviewed associated reports. (2016)

SFPUC, Cherry Lake Dam Valve Replacement Project, Tuolumne County, CA (Environmental Compliance Manager): Coordinated compliance specialty monitoring for cultural resources. Reviews and submitted specialty monitoring reports and coordinated with SFPUC and the contractor. (2017)

Alliance Residential Company, The Villas at Auto Row, Oakland, California. (Deputy Project Manager). Prepared a CEQA Addendum/Exemption for the development of two parcels in the City of Oakland to be as mixed use properties. Managing the preparation of the technical studies for inclusion in the CEQA checklist analysis. (2016)

Coastal Conservancy, South Bay Salt Ponds Phase II, South San Francisco Bay, CA. (**Environmental Planner)**. Prepared the Water Quality Certification application for submittal to the Regional Water Quality Control Board for Phase II of the South Bay Salt Ponds at the Refuge Restoration Project, a multi-agency effort to restore tidal marsh habitat, reconfigure managed pond habitat, maintain or improve flood protection, and provide recreation opportunities and public access in 15,100 acres of former salt-evaporation ponds purchased from and donated by Cargill Incorporated (Cargill) in 2003. (2016)

Federal Transit Administration, Potomac Yard Metroline Station, FEIS, City of Alexandria, Virginia. (Environmental Planner). Project responsibilities included assisting with the preparation of the Section 4(f)/6(f) Chapter, to finalize the Draft EIS. The proposed project involves the construction of a Potomac Metroline Station in the City of Alexandria.

Many historical and recreational properties within the Study Area were assessed for compliance with 23 CFR 774 or Section 4(f). (2015)

Federal Railroad Administration, Durham-Orange Light Rail Train Project, DEIS, Triangle Transit Authority, Chapel Hill and Durham, North Carolina. (Environmental Planner). Project responsibilities included assisting with the preparation of the Section 4(f)/6(f) Chapter, and assisting with the Parks and Recreational impacts section of the Draft EIS. The proposed project involves the construction of a light rail system connecting Chapel Hill and Durham in Durham and Orange Counties in North Carolina. (2015)

Pacific Gas &Electric Company, North American Electric Reliability Council (NERC) Alert Program, Northern California (Environmental Compliance Supervisor): Responsible for management of environmental compliance inspection, biological monitoring and reporting (PG&E SAP-EC), Worker Environmental Awareness Program (WEAP) and training, and development/implementation of the Environmental Compliance Management Program (ECMP) during maintenance work on the state-wide electrical transmission system. (2014-2015)

City of Berkeley, Berkeley Flow Attenuation Project, City of Berkeley, CA. (Project Planner). The City of Berkeley received five applications for administrative use permits (AUPs). Reviewed three applications for completeness and zoning conformance, recommended action, made findings, and prepared the Notice of Determination. (2015)

Silicon Ranch Corporation, Preliminary Environmental Constraints Analysis, East Camden, AK. (Environmental Planner/Specialist). Ms. Schulze served as an Environmental Specialist assisting in the coordination and preparation of an environmental constraints analysis for a potential solar photovoltaic site in East Camden, Arkansas. (2015)

Charleston Business Park, Nearon Enterprise, Mountain View, CA, (Project Scientist): Field Team Leader for remediation and monitoring activities at a commercial complex to address subsurface conditions impacted with chlorinated hydrocarbons. Implemented quarterly groundwater monitoring events to evaluate the effectiveness of in-situ chemical reduction treatment. Prepared reports for submittal to the Regional Water Board as part of the Voluntary Cleanup Program. (2012-2014)

Caltrans, District 4, Caltrans, San Francisco, CA (Storm water Compliance Manager, QSD/QSP): Oversaw storm water compliance for Caltrans and provided expert support for the Construction General Permit (CGP) compliance on various District 4 construction projects as a QSD/QSP. Conducted District-rated SWPPP inspections across District 4 and provided oversight for Best Management Practices (BMP) selection and implementation. Worked with contractor's Qualify SWPPP Developer and Qualified SWPPP Practitioners to correct BMPs and ensure all required reporting was completed in compliance with the CGP. Reviewed SWPPP documents, SWPPP amendments, Dewatering & Discharge Plans, Active Treatment System Plans and Material Containment & Collection Handling Plans. Acted as the Regional Water Quality Control Board liaison and main point of contact on SFOBB SWPPP related matters. Worked closely with Caltrans to develop a comprehensive erosion and sediment control plan on Yerba Buena Island where there were highly erodible soils and multiple drainage courses that drained directly to the SF Bay. (2009-2014)

US Army Corps of Engineers, Former Sacramento Army Depot, Sacramento, CA, (Project Scientist): Field Team Leader for long term groundwater monitoring program at the former Sacramento Army Depot in Sacramento, CA. Headed field work that included groundwater monitoring, water level measurements and extraction well and treatment plant lysimeter sampling. She was the project scientist for the report preparation and her duties included data entry into a historical project database, data verification and validation from the analytical laboratories, groundwater isoconcentration and contour diagram preparation, statistical analysis using Mann-Kendall graphs, time vs. concentration histograph preparation and report submission to various regulatory agencies, including the Environmental Protection Agency and DTSC. (2006-2013)

Port of Oakland, As-Needed Environmental Services, Oakland, CA (Project Scientist) Field team leader for projects at Port of Oakland Maritime facilities and Oakland International Airport including annual storm water sampling and reporting and storm drain inventory for Multiple Sanitary Storm Sewer System (MS4) permit application; soil and groundwater site investigations; and well installation and abandonment at Port properties including on the North Field airport facilities and Maritime facilities. (2006-2008)

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EXHIBIT JJ

April 23, 2019

Attn: Henry O. Hearley, Assistant Planner

Lane Council of Governments

859 Willamette Street, Suite 500

Eugene, Oregon 97401

Re: Birds (e.g., Snowy Plover, Blue Heron, Marbled Murrelet, Diving Waterfowl) Baseline Information, Potential Impacts and Mitigation: Navigation Reliability Improvements; City of Coos Bay Land Use Application #187-18-000153;

This Technical Memorandum is submitted into the public record on behalf of Jordan Cove Energy Project, L.P. (Jordan Cove or JCEP) with regard to one of four Navigation Reliability Improvements ("NRIs") sought pursuant to land use applications, City of Coos Bay Land Use Application #187-18-000153 (hereafter, "*City of Coos Bay NRI Applications*"). The *City of Coos Bay NRI Applications* will facilitate limited dredging activity in one of four NRI areas (adjacent to the existing federally authorized Coos Bay Navigation Channel) in order to provide improved efficiency and navigability. Three other related NRIs are sought pursuant to land use applications, Coos County File Nos. AM-18-011/RZ-18-007/HBCU-18-003 ("*Coos County NRI Applications"*).

This technical memorandum identifies the documents, reports and studies that have previously been submitted into the public record for the *Coos County NRI Applications* (as specifically identified in Attachment A, hereto). This technical memorandum addresses public comments, and provides additional information into the record, with regard to: ***birds (e.g., Snowy Plover, Great Blue Heron, Marbled Murrelet, diving waterfowl) baseline information, potential impacts and mitigation*** and are relevant to the four NRIs subject to the *City of Coos Bay NRI Applications* and *Coos County NRI Applications*.

Assessment

Based on my education and experience, the documents identified in Attachment A, hereto, adequately address baseline information, potential impacts, and proposed mitigation with regard to birds (as discussed herein) and it is my best professional judgment that the NRI activities subject to the *City of Coos Bay NRI Applications* will not have a significant impact on birds or related habitat in NRI areas.

Regarding the NRI dredging activities, commenters raised questions about the potential impacts to various bird species including Snowy Plover (*Charadrius nivosus*), Great Blue Heron (*Ardea herodias*), Marbled Murrelet (*Brachyramphus marmoratus*), and diving waterfowl (Surf Scooters [*Melanitta perspicillata*], Loons [*Gavia spp*.], Guillemots [*Cepphus spp*.], diving ducks). The documents cited in Attachment A, and information provided below, support the following general conclusions.

Snowy Plover - The location of the NRIs has some potential for impact from hammer noise (if used to install temporary pilings) which might be above ambient levels that may disturb

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wintering western snowy plovers (if present) along the eastern edge of the primary nesting area on the North Spit, which is within 0.25-miles of NRI dredge area 1. (DEIS at 4-322). Dredging operations would take place within the ODFW in-water work window (October 1 to February 15) (DEIS at 2-48 to 2-50) which is outside of the nesting period for western Snowy Plovers (DEIS at 4-198 and DEIS at 4-217). Dredging will not affect nesting habitat and dredging noise is unlikely to affect wintering Snowy Plovers approximately 0.25 miles away. (DEIS at 4-323).

Great Blue Heron - NRIs would be conducted during the in-water work window (October 1 to February 15) (DEIS at 2-48 to 2-50). Bird nesting season is generally March 1 to September 30 (DEIS at 4-217). At least two historic Great Blue Heron rookeries occur close to the Jordan Cove LNG terminal site area. One rookery is located about 2,000 feet to the east of the LNG terminal site and about 300 feet from Jordan Cove Road (on both sides of Trans-Pacific Parkway) (LBJ 2006). The other historical rookery is located adjacent to the LNG terminal site on the south side of Henderson Marsh (BLM 2006a). No evidence of Great Blue Heron breeding in the area was observed during the 2005, 2006, 2012, or 2013 surveys. In the event that historic rookeries become occupied, NRIs would not likely affect nesting because timing of impacts would not overlap with the nesting period. The DEIS did not determine that there were any likely impacts from the NRIs on either of these historic rookeries or generally to Great Blue Heron. (DEIS at 4-183). Any potential loss of foraging habitat would be offset by the creation of in-kind mitigation areas at the Kentuck project (DEIS at 4-190) which will restore and enhance foraging areas.

Marbled Murrelet – NRIs would be conducted during the in-water work window (October 1 to February 15) (DEIS at 2-48 to 2-50). Marbled Murrelet nesting period is April 1 to September 15 (APDBA at 3-123 and DEIS at 4-324). Marbled Murrelet nesting habitat is inland habitat and foraging is in the vast coastal marine environment which may include the estuary. Since Marbled Murrelets do not nest during the in-water work window, then NRI disturbance in the estuary will not interfere with foraging needed to support a chick. The marine foraging area is vast and the small and temporary impacts of the NRIs may affect, but would not be a limiting factor to, Marbled Murrelet survivorship. Underwater noise harassment or potential injury to Marbled Murrelet could occur from pile driving associated with in-water temporary piles within the estuarine analysis area. However, the low abundance and density of Murrelets and the limited number and area of in-water pile installation would make these effects unlikely. (APDBA at 3-114). NRI dredging activities unlikely to adversely impact marbled Murrelet, a finding consistent with the DEIS. (DEIS at 4-322 to 4-326).

Diving Waterfowl - Neither the DEIS nor the Applicant-Prepared Draft Biological Assessment and Essential Fish Habitat Assessment for the Jordan Cove Energy and Pacific Connector Gas Pipeline Project (APDBA) (Revised September 2018)[1] found potential impacts from the NRIs on diving waterfowl. However, because diving birds forage over a wide area, their ability to move from harm's way, the depth of the NRIs (all below -15 to -25 feet) and the historic adjacent dredging of the Federal Navigation Channel, the temporary dredging of the NRIs is not anticipated to create any significant impact on diving waterfowl.

[1] No species of diving waterfowl in the area of the Terminal are listed species and therefore were not considered in the Applicant-Prepared Draft Biological Assessment.

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Jay Lorenz, PhD, Senior Ecologist

References

Applicant-Prepared Draft Biological Assessment (APDBA) and Essential Fish Habitat Assessment for the Jordan Cove Energy and Pacific Connector Gas Pipeline Project (Revised September 2018).

Attachment A (Citations to Coos County NRI Applications Public Record), attached.

BLM. 2006a. Personal communication with LBJ Enterprises during site visit. November 1, 2006. (DEIS at P-6)

Federal Energy Regulatory Commission (FERC) Draft Environmental Impact Study for the Jordan Cove Energy Project. March, 2019.

LBJ (LBJ Enterprises). 2006.2006 Pre-construction Wildlife Surveys for Proposed Jordan Cove Liquefied Natural Gas Plant, Coos Bay, Oregon. May 10, 2006, revised December 26, 2006. (DEIS at P-38).

JORDAN COVE - NAVIGATION RELIABILITY IMPROVEMENTS - COOS COUNTY FILE NOS. AM-18-011/RZ-18-007/HBCU-18-003

ATTACHMENT A

PUBLIC COMMENT ISSUE	BASELINE DATA/INFORMATION (Addressed in Record)	POTENTIAL IMPACTS (Addressed in Record)	PROPOSED MITIGATION (Addressed in Record)	NOTES
Birds				
1. Birds (including snowy plover, heron, marbled murrelet, diving waterfowl, et al.)	◦ EX 17.A.3, pages 3–4, 19 ◦ EX 17.A.5, pages 19, 28, 58–59, 67–70, 91–92, 102–108, 283–293, 297, 298–300, 333–336, 337–339, 352–366, 368–369, 504–792 ◦ EX 17.A.7, page 95 ◦ EX 17.B, pages 9, 11, 24, 27, 142, 204–390 ◦ EX 17.C, pages 56, 179	◦ EX 17.A.2, page 22 ◦ EX 17.A.5, page 66–67, 71–74, 119–124 ◦ EX 17.B, page 8, 23, 66, 109, 206–208, 216–223, 225–226, 253–299, 304–306, 310–311, 337–385, 389–390, 976, 1079	◦ EX 17.A.5, page 61, 62, 119–124, 300–303 ◦ EX 17.B, page 47, 61, 129, 130, 219, 223–224, 253–299, 307–310, 386–388	

Jordan Cove LNG A Pembina Company	**Recreation Baseline Information, Potential Impacts and Mitigation: Navigation Reliability Improvements; City of Coos Bay Land Use Application #187-18-000153**	DAVID EVANS AND ASSOCIATES INC.
	Document Number: J1-760-TEC-TNT-DEA-00005-00	
	Rev. A / **Rev. Date: 04/23/2019**	

TECHNICAL MEMORANDUM

DATE:	04/23/2019
ATTENTION:	Henry O. Hearley, Assistant Planner
GOVERNMENT BODY:	Lane Council of Governments
ADDRESS:	859 Willamette Street, Suite 500, Eugene, Oregon 97401
FROM:	David Evans and Associates, Inc.
SUBJECT:	**Recreation Baseline Information, Potential Impacts and Mitigation: Navigation Reliability Improvements; City of Coos Bay Land Use Application #187-18-000153**
PROJECT NAME:	Jordan Cove Energy Project, L.P.

Introduction

This Technical Memorandum is submitted into the public record on behalf of Jordan Cove Energy Project, L.P. (Jordan Cove or JCEP) with regard to one of four Navigation Reliability Improvements ("NRIs") sought pursuant to land use applications, City of Coos Bay Land Use Application #187-18-000153 (hereafter, "*City of Coos Bay NRI Applications*"). The *City of Coos Bay NRI Applications* will facilitate limited dredging activity in one of four NRI areas (adjacent to the existing federally authorized Coos Bay Navigation Channel) in order to provide improved efficiency and navigability. Three other related NRIs are sought pursuant to land use applications, Coos County File Nos. AM-18-011/RZ-18-007/HBCU-18-003 ("*Coos County NRI Applications*).

This technical memorandum identifies the documents, reports and studies that have previously been submitted into the public record for the *Coos County NRI Applications* (as specifically identified in Attachment A, hereto), and provides an additional memorandum (attached as Attachment B) with regard to: ***recreation baseline information, potential impacts and mitigation*** and are relevant to the four NRIs subject to the *City of Coos Bay NRI Applications* and *Coos County NRI Applications*.

References

Attachment A (Citations to Coos County NRI Applications Public Record), attached.

Attachment B, (David Evans and Associate Memorandum, Jordan Cove Energy Project NRIs-Recreation Impacts, April 17, 2019), attached.

JORDAN COVE - NAVIGATION RELIABILITY IMPROVEMENTS - COOS COUNTY FILE NOS. AM-18-011/RZ-18-007/HBCU-18-003

ATTACHMENT A

PUBLIC COMMENT ISSUE	BASELINE DATA/INFORMATION (Addressed in Record)	POTENTIAL IMPACTS (Addressed in Record)	PROPOSED MITIGATION (Addressed in Record)	NOTES
Recreation				
1. Recreation	◦ EX 17.A.2, See p. 82 ◦ EX 17.A.4, See p. 1263, 1558 ◦ EX 17.A.5, See p. 22, 26-27, 106, 123, 162, 163, 164, 165, 168, 170, 172, 173, 176-77, 178, 179, 183, 185, 190, 192, 194, 195, 196, 197, 198, 207, 218 ◦ EX 17.A.6, See p. 23 ◦ EX 17.A.7, See p. 8, 13, 15-16, 24, 78, 79, Section 2.2.1 (p. 90-94), Section 2.2.4 (p. 100-101), Section 2.2.5 (p. 101-02), Appendix B (p. 113) ◦ EX 17.A.10, See p. 15-16, 16-17, Section 8.3 (p. 22-29), p. 51 (map) ◦ EX 17.D, See p. 15, 181, 2198, 2202-03, 2374, 2375, 2376, 2379, 2381, 2383, 2384, 2387, 2389, 2390, 2394, 2396, 2401, 2403, 2405, 2406, 2407, 2408, 2409, 2429 ◦ Ex 17.G3., See p. Section 2.2.1 (p. 23-28), Section 2.2.4 (p. 34-35), Section 2.2.5 (p. 36), Appendix B (p. 113) ◦ Ex 17.F, See p. 80-81, 332	◦ EX 17.A.7, See p. 24, 25, 27, 28, 47, Section 3.2.1 (p. 105-107), Section 3.3 (p. 109) ◦ EX 17.A.10, p. 32-33, 33-34, 35, 36, 37 ◦ EX 17.D, See p. 303, 306, 329-330, 2418, ◦ Ex 17.G.3., See p. Section 3.2.1 (p. 39-41), Section 3.3 (p. 44 ◦ Ex 17.F, See p. 80-81	◦ EX 17.A.7, See p. 27	

DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE: April 18, 2019

TO: Jordan Cove Energy Project L.P.

FROM: David Evans and Associates, Inc.

SUBJECT: Jordan Cove Energy Project, Navigation Reliability Improvements

PROJECT: JLNG0000-0003
Jordan Cove Energy Project

CC: N/A

Purpose

This memorandum presents the sections of the Federal Energy Regulatory Commission, Office of Energy Projects Draft Environmental Impact Statement for the Jordan Cove Energy Project, Docket Nos. CP17-494-000 and CP17-495-000, FERC/DEIS-0292D (March 2019) ("DEIS") that relate to recreation, both related specifically to the Navigation Reliability Improvements (NRIs), subject to applications filed in Coos County (Coos County File Nos. AM-18-011/RZ-18-007/HBCU-18-003), and to the Terminal and associated facilities in general. As documented in the citations below, the NRIs would have only temporary effects, if any, on recreation during actual dredging activities when dredged areas (and related surface water) would experience temporary turbidity and would temporarily be unavailable for recreational boating or other activities.

Preparers/Subject Matter Experts

The DEIS identifies the preparers (subject matter experts) in Appendix O as:

Federal Energy Regulatory Commission
Fink, Jennifer – Land Use, Recreation and Visual Resources,
M.S., Environmental Policy, 2015, George Washington University B.S., Environmental Science, 2010, University of Delaware

Tetra Tech, Inc.
Dadswell, Matt – Socioeconomics, Transportation, Land Use, Recreation
Post-Masters Study (ABD), Economic Geography, 1997, University of Washington
M.A., Economic Geography, 1990, University of Cincinnati
B.A., (Joint Honours) Economics and Geography, 1988, Portsmouth Polytechnic, England

Relevant DEIS Sections

4.8 Recreation and Visual Resources

4.8.1 Recreation and Public Use Areas

4.8.1.1 Jordan Cove LNG Project

Parks and Other Recreational Use Areas

[Not included, as this subsection is a description of the recreational facilities in the project area.]

DATE:	April 18, 2019	**FROM:**	David Evans and Associates, Inc.
TO:	Jordan Cove Energy Project L.P.	**SUBJECT:**	Jordan Cove Energy Project, Navigation Reliability Improvements

Impacts on Parks and Other Recreational Use Areas

Increased Demand from Construction Workers

The temporary influx of non-local construction workers could potentially increase demand for recreational activities at the parks and other recreational use areas located near the Jordan Cove LNG Project. An estimated average of 802 non-local workers are expected to be employed over the 53-month-long construction phase, with the number of non-local workers expected to peak at 1,568 workers during month 30. Assuming that a portion of the workforce temporarily relocating to the area would be accompanied by family members, temporary increases in population would range from the equivalent of 3.4 percent to 6.6 percent of the combined populations of Coos Bay and North Bend in 2016 (section 4.9). A share of these workers and family members may seek recreational opportunities near the Jordan Cove LNG Project. Demand would primarily be limited to periods when workers are not employed, primarily weekend days, and would be temporary and short term. Given the large amount of public lands in the region and the relatively low levels of current use, this potential short-term increase in demand is not expected to result in significant effects on parks and other recreational areas.

Noise

Construction and operation of the Jordan Cove LNG Project could result in increases in the ambient sound environment for people recreating in the immediate vicinity, including users of the North Spit Overlook, coastal beaches, BLM RMAs, and ODNRA. Noise modeling (discussed in more detail in section 4.12 of this EIS) indicates that expected Project construction noise levels at the closest noise sensitive area (REC 1, which is located about 0.7 mile from the LNG terminal and is representative of the closest areas of federally managed lands on the North Spit) would temporarily result in noise levels increasing from ambient levels of approximately 55 A-weighted decibels (dBA)to 57 dBA. OHVs that are allowed on the beach and dune trails contribute to the ambient noise levels on the North Spit. The noise limit for OHVs in the ODNRA is 93 dBA at 20 inches from the exhaust outlet (Forest Service 2013). For OHV riders and other people in close proximity, OHV sound levels would exceed the predicted Project's construction and operational noise levels. Distance, topography, coastal winds, and vegetation would help to minimize Project construction and operational noise in the portions of the ODNRA where OHVs are not allowed (between the Trans-Pacific Parkway and Horsfall Beach Access Road).

Recreation Access and Driving for Pleasure:

There may be some conflicts between recreational drivers on the Trans-Pacific Parkway and construction traffic traveling to and from the Jordan Cove LNG Project. Recreational drivers in this context could include recreationists using the Trans-Pacific Parkway to access recreation sites, including the ODNRA, as well as people recreating by driving for pleasure.

Traffic counts conducted in support of the Traffic Impact Analysis prepared on behalf of Jordan Cove (David Evans & Associates, Inc. [DEA] 2017b) counted a total of 232 vehicles passing through the intersection of the Trans-Pacific Parkway and Horsfall Beach Road from 4:30 p.m. to 6:30 p.m. on a Friday afternoon in August 2015. DEA (2017b) estimates that the number of vehicles traveling to and from the Jordan Cove LNG Project would peak in 2021, with 945 workers driving to the site in two staggered shifts each day, and 140 long haul truck trips each day to and from U.S. 101 via the Trans-Pacific Parkway to the site/north laydown yard, and 2

long haul trips each day to and from U.S. 101 via Ferry Road to the south laydown yard. DEA (2017b) assumed that the truck trips would occur throughout the day. Although the number of construction workers employed on-site would be higher in 2022, the number of passenger vehicles traveling to and from the terminal site would decrease with the addition of the temporary workforce housing facility on South Dunes, and external park and ride lots. The addition of construction-related traffic could cause potential delays at key intersections as discussed in section 4.10 during peak hours. Mitigation measures, also discussed in section 4.10, are expected to reduce potential effects, and recreationists could avoid delays by traveling outside of peak commuting hours. Mitigation would likely include staggered work shifts, construction of a dedicated eastbound left-turn lane at the intersection of U.S. 101 at the Trans-Pacific Parkway, and implementation of a temporary signal at the intersection for the duration of construction activities (see section 4.10).

Hunting

Hunting activities are managed by the ODFW. Big game, waterfowl, and fur-bearing animals are hunted in the public areas of the North Spit and within the Siuslaw National Forest during hunting seasons. The influx of Jordan Cove workers to the area could add to the number of people who would hunt on public lands in the region during hunting seasons. However, this potential increase would be temporary and short term. The total construction period would be about 53 months and most construction jobs would last for less than two years. As noted with respect to overall project related demand for recreation, workers temporarily relocating to the area would have limited time available to hunt, primarily weekend days.

Clamming and Crabbing in Coos Bay

Recreational clamming and crabbing activities occur in Coos Bay near the Jordan Cove LNG Project. Coos Bay was the third most productive clamming estuary in Oregon as of 2008 and an annual average of 15,000 crabbing trips took place between 2008 and 2011 (Ainsworth and Vance 2009; Ainsworth et al. 2012). Sites for clamming include the mud flats on the bay side of the North Spit, the northern reaches of South Slough, in Haynes Inlet and the eastern side of the bay north of the McCullough Bridge. Crabbing takes place from the docks in Charleston and Empire, from boats, and on the bay side of the North Spit.

Dredging in the bay to create the access channel for the Jordan Cove LNG Project could potentially affect recreational clamming and crabbing. Potential effects related to dredging are assessed in section 4.3.2.1 of this EIS, which concludes that dredging of the access channel would only have temporary effects on bay water quality, and increased sedimentation from dredging would be limited in extent. The limited time and extent of dredging siltation is not expected to result in long-term or population wide effects on clams and crabs near the Jordan Cove LNG Project. Further, as mitigation for wetland effects, Jordan Cove would create new eelgrass beds in Coos Bay that could serve as nursery habitat for crabs and Jordan Cove would also create new wetlands at Kentuck Slough.

Wakes from LNG carriers in the Federal Navigation Channel are not expected to cause major shoreline erosion beyond natural waves. Further, due to the relatively low transit speed and the required minimum underkeel clearance distance, propeller wash from LNG carriers is not expected to greatly disturb the channel bottom or affect clam and crab harvest in Coos Bay (see section 4.3.2.1).

Recreational clamming and crabbing that takes place outside the navigation channel would not be directly affected by LNG carrier traffic transiting the waterway to and from the LNG terminal. Effects would be similar

to those presently experienced during the passage of other deep-draft ships. However, if crabbing or clamming activities were to occur within the established security zones, those activities may be required to cease, with attending vessels required to temporarily move out of the security zone while the LNG carrier in transit moves by. The requirement for any commercial or recreational boat operating within the security zone near the channel, but not impeding the safe navigation of the LNG carrier in the channel, to move and vacate the security zone area would be up to the Coast Guard on-scene commander and decided on a case-by-case basis. The Coast Guard has informed Jordan Cove that the degree of security zone enforcement would be based on the threat level in effect at the time and the specific perceived threat of any vessel in the security zone. Crab pots outside of the navigation channel should not be affected by LNG carrier traffic in the waterway. Passive equipment, such as crab pots, would be permitted to remain within the security zone while an LNG carrier is present.

Boating and Fishing

Data collected by the Oregon State Marine Board (OSMB) identified approximately 105,000 boatuse days in Coos County in 2013 (Lesser et al. 2014). The data did not identify the share of these trips that originated in Coos Bay, but information collected as part of a similar survey in 2007 indicated that recreational boaters took a total of 31,552 boat trips in Coos Bay for a total of 35,950 activity days. Fishing accounted for 91 percent of these days, sailing for 8 percent, and recreational cruising for 1 percent (OSMB 2008). Sixty-eight percent of the boating activities in Coos Bay in 2007 originated from the Charleston Marina and the Empire ramp, 19 percent at the California Street boat ramp, and 4 percent at the North Spit ramps. Charleston Marina, the Empire ramp, and North Spit ramp are located approximately 7.3 miles, 3.3 miles, and 2.1 miles southwest of the Jordan Cove LNG Project; the California Street boat ramp is about 2.5 miles southeast.

Popular fish species caught by recreational anglers out of Coos Bay include Coho and Chinook salmon. Other recreational catch species include various species of perch, rockfish, flatfish, sturgeon, Pacific herring, and California halibut. Much of the recreational angling for salmon in Coos Bay occurs in late summer and fall. Bank angler access on the North Spit is limited. Boat angling occurs throughout the bay, but angling is limited in some areas at times by exposure to winds.

Jordan Cove proposes to construct the slip and LNG carrier berth structures while the slip is kept isolated from Coos Bay by an earthen berm. The excavation and dredging of the slip would occur in isolation from the bay, with no restrictions placed on recreational boating in the construction site area. Recreational boating would, however, be discouraged around the construction area during the final phase in the slip construction, which would involve removing the earthen berm and connecting the excavated/dredged slip area to the bay. Recreational boating would also be discouraged during excavation of the access channel. Construction would also involve dredging within Coos Bay and would include the excavation of the four submerged areas adjacent to the existing Federal Navigation Channel as part of the Navigation Reliability Improvements. Excavation and dredging activities are expected to occur during the in-water work period from October through February 15. Excavation of the berm and the four submerged areas as part of the

Navigation Reliability Improvements would occur during a single in-water work period. Dredging of the access channel is expected to occur over two in-water work periods.

DATE:	April 18, 2019	**FROM:**	David Evans and Associates, Inc.
TO:	Jordan Cove Energy Project L.P.	**SUBJECT:**	Jordan Cove Energy Project, Navigation Reliability Improvements

The Coast Guard and OSMB would provide Notice to Mariners to avoid the affected areas during the construction period. In addition, Jordan Cove would post signs on the shoreline, at the boat ramps and marinas, and on buoys or fixed navigation aids in the bay to notify boaters of the planned construction activity and the duration of the activity. All floating and submerged dredging equipment operating in the bay would be clearly marked with day signals and light signals at night in accordance with the U.S. Inland Rules of the Road. If the signage and notices are not sufficient to prevent recreational boaters from avoiding the construction areas, some form of physical barrier, such as a continuous string of highly visible soft material floats, could be extended across the mouth of the slip or around the construction area. Construction safety inspectors would also be responsible for warning any recreational boaters who enter the construction area.

Potential effects on recreational boaters during construction of the slip, access channel, and the four Navigation Reliability Improvement areas would be temporary and affect a limited area. Coos Bay is extensive (20 square miles or 12,800 acres) and recreational boating opportunities would continue to be available in other portions of the bay during construction, with existing boat ramps remaining open during construction. The construction dredging areas are limited in size and boaters could avoid these areas by moving to the south and east side of the bay.

During construction of the Project, Jordan Cove would have large pieces of equipment brought in via water transport, using the existing Federal Navigation Channel. Jordan Cove anticipates that the terminal would receive approximately 70 water deliveries over a 2-year period. Deliveries would be via a mix of ocean-going vessels and barges. In addition, during construction of the access channel about two barges per day would transport dredged materials from Ingram Yard to the Kentuck project site. The addition of these vessels is not expected to have adverse effects on other bay users, including recreational boaters.

During operation of the Project, recreational boaters would have to avoid LNG carriers in transit within the waterway. Jordan Cove anticipates that up to 120 LNG carriers would visit the LNG terminal each year. Recreational boaters using the bay at the same time that an LNG carrier is in transit within the waterway may encounter delays due to the moving security zone requirements around an LNG carrier, as specified in Jordan Cove's Waterway Suitability Assessment (WSA) and the Coast Guard's Waterway Suitability Report (WSR) and LOR. Jordan Cove estimated that it may take an LNG carrier up to 90 minutes to transit the waterway from the buoy to the terminal at speeds between 4 and 10 knots. Pilots guiding commercial ships in the Federal Navigation Channel currently encounter approximately six recreational boats during the transit into and out of the Port. These numbers are typically lower in winter and on weekdays than during the summer and on weekends. The Coast Guard and OSMB would continue to remind boaters of their obligation not to impede deep draft ships, regardless of the cargo. LNG carriers may take up to 30 minutes to pass resulting in limited potential delays to recreational boaters.

Other Public and Special Use Areas:

The LNG terminal would be approximately 0.9 mile from the Southwest Oregon Regional Airport. Potential effects of the LNG terminal on the airport are addressed in section 4.10.

4.8.1.4 Conclusions

Constructing and operating the Jordan Cove LNG Project would not have direct adverse effects on nearby recreational areas, including the ODNRA and BLM RMAs, but may have indirect effects. As described in the

preceding sections, temporary indirect impacts during construction would include construction-related noise and short-term delays to recreationists using the Trans-Pacific Parkway to access recreation sites, including the ODNRA. Indirect impacts during operation include short-term delays for recreational boaters required to avoid LNG carriers in transit within the waterway. Constructing and operating the Pacific Connector Pipeline Project would result in impacts on recreation resources as described in the preceding sections. Based on the proposed construction, mitigation, and operation procedures the Project would not significantly affect recreation resources or areas.

4.14.1 Cumulative Effects

4.14.1.6 Visual Resources and Recreation

…

As described in comments to the Commission about the Project, Coos Bay provides numerous recreational opportunities including boating, fishing, crabbing, hiking, bird watching, and scenic viewing. The cumulative impacts of the Project and the other projects in Coos Bay on water quality, aquatic resources, and transportation, all of which affect recreational use of the bay would not be significant, so the cumulative impact on recreation in Coos Bay would not be significant.

Recreational users of Coos Bay may be inconvenienced by delays associated with the increased use of the channel by LNG carriers and other Project-related marine traffic; however, no other additional long-term marine traffic has been identified as occurring in the bay. Dredging activities associated with the other projects in Coos Bay would temporarily increase traffic in the channel, but any cumulative impact would not be significant as the dredging activities would be temporary and periodic. These inconveniences when added to existing marine traffic would contribute to a cumulative impact; but this impact would not significantly impair a user's ability to participate in recreation activities in the bay.

…

5.0 Conclusions and Recommendations

5.1 Conclusions of the Environmental Analysis

5.1.8 Recreation and Visual Resources

5.1.8.1 Recreation

Constructing and operating the Project could temporarily affect recreational use of areas located near the LNG terminal and pipeline. The Project could also affect nearby recreational services. Recreational areas near the LNG terminal could experience a temporary increase in noise. Some views from these areas would now include the LNG terminal and carriers. Individuals using recreational resources in the area could experience increased traffic and greater travel times. Visitors could also find that temporary accommodations (e.g., hotels, camp sites, and RV parks) in the Coos Bay area have less vacancy. During operation, recreational boaters may experience delays due to LNG carriers transiting to and from the LNG terminal; otherwise, no significant impacts are expected to occur to water-based recreation.

…

DATE:	April 18, 2019	**FROM:**	David Evans and Associates, Inc.
TO:	Jordan Cove Energy Project L.P.	**SUBJECT:**	Jordan Cove Energy Project, Navigation Reliability Improvements

5.2 FERC Staff's Recommended Mitigation

[None relevant to recreation.]

Attachments/Enclosures: N/A

File Path: Document4

Jordan Cove LNG A Pembina Company	**Eelgrass Baseline Information, Potential Impacts and Mitigation: Navigation Reliability Improvements; City of Coos Bay Land Use Application #187-18-000153**	DAVID EVANS AND ASSOCIATES INC.
	Document Number: J1-760-TEC-TNT-DEA-00006-00	
	Rev. A **Rev. Date:** 04/23/2019	

TECHNICAL MEMORANDUM

DATE:	04/23/2019
ATTENTION:	Henry O. Hearley, Assistant Planner
GOVERNMENT BODY:	Lane Council of Governments
ADDRESS:	859 Willamette Street, Suite 500, Eugene, Oregon 97401
FROM:	Jim Starkes, Senior Scientist, David Evans and Associates, Inc.
SUBJECT:	**Eelgrass Baseline Information, Potential Impacts and Mitigation: Navigation Reliability Improvements; City of Coos Bay Land Use Application #187-18-000153**
PROJECT NAME:	Jordan Cove Energy Project, L.P.

Introduction

This Technical Memorandum is submitted into the public record on behalf of Jordan Cove Energy Project, L.P. (Jordan Cove or JCEP) with regard to one of four Navigation Reliability Improvements ("NRIs") sought pursuant to land use applications, City of Coos Bay Land Use Application #187-18-000153 (hereafter, "*City of Coos Bay NRI Applications*"). The *City of Coos Bay NRI Applications* will facilitate limited dredging activity in one of four NRI areas (adjacent to the existing federally authorized Coos Bay Navigation Channel) in order to provide improved efficiency and navigability. Three other related NRIs are sought pursuant to land use applications, Coos County File Nos. AM-18-011/RZ-18-007/HBCU-18-003 ("*Coos County NRI Applications*).

This technical memorandum identifies the documents, reports and studies that have previously been submitted into the public record for the *Coos County NRI Applications* (as specifically identified in Attachment A, hereto), and additional studies (as cited herein) with regard to: ***eelgrass baseline information, potential impacts on eelgrass, and mitigation*** and are relevant to the four NRIs subject to the *City of Coos Bay NRI Applications* and *Coos County NRI Applications*.

Assessment

Based on my education and experience, the documents identified in Attachment A, hereto, and additional studies (as cited herein), adequately address baseline information, potential impacts, and proposed mitigation for eelgrass. It is my best professional judgment that the NRI activities subject to the *City of Coos Bay NRI Applications* will not have a significant impact on eelgrass or related habitat.

Based on review of available past eelgrass surveys, and more recent surveys conducted by JCEP in 2017 and 2018, no eelgrass beds have been documented in any of the NRI dredge areas in Coos County (Dredge Areas 1-3), or at locations planned for the temporary dredge lines related to these NRIs. As depicted in Figure 2, eelgrass within Coos Bay grows from elevations of approximately +3.0 to -5.0 feet mean lower-low water (MLLW) (Thom et al. 2003). All of the proposed NRI dredge areas are adjacent to the Federal Navigation Channel at substantially greater depths (-15.0 MLLW or lower) than eelgrass can colonize in Coos Bay. While eelgrass mitigation is planned for other aspects of the JCEP project (as referenced in Attachment, A, and below) no eelgrass mitigation is necessary at the proposed NRI dredge areas since these areas do not involve eelgrass habitat. Accordingly, the NRI dredging areas do not impact existing eelgrass or areas with conditions that would be conducive to becoming established eelgrass habitat.

Mitigation efforts for temporary dredge lines related to ***other*** (i.e., not related to the Coos County NRIs) aspects of the JCEP project are not directly relevant to the Coos County NRI Applications, but may cross some eelgrass areas for which appropriate mitigation will be provided, including the following (described herein for reference purposes only):

- **Eelgrass Mitigation Site Temporary Dredge Line**. The Temporary Dredge Line that would extend from the Eelgrass Mitigation site near the airport crosses a dense bed of eelgrass (Figure 3). This area has also been identified as a donor bed for transplanting the Eelgrass Mitigation Site, as well as a Reference bed for evaluating the success of eelgrass mitigation during the post-construction period. Subject to ongoing design feasibility, potential temporary impacts to the existing eelgrass beds shown in Figure 3 can be completely avoided by shifting the alignment of the Temporary Dredge Line further to the north as it extends westerly from the Eelgrass Mitigation Site before turning to the southwest to the Temporary Dredge Loading Area. Because the northern limits of these eelgrass beds are depth limited (i.e., too shallow), areas along this alignment should remain free of eelgrass while the Temporary Dredge Line is in use.

- **APCO Temporary Dredge Line**. The Temporary Dredge Line that will lead from the Temporary Dredge Off-Loading Area to APCO Site 2 crosses a narrow eelgrass bed (~100 feet wide) situated between -1 and -5 feet MLLW (Figure 4). This is a relatively small and temporary impact. The feasibility of moving the alignment of the Temporary Dredge Line to an open **area** currently void of eelgrass approximately 500 feet to the south will be evaluated prior to construction in order to avoid potential impacts to the narrow eelgrass bed. Since eelgrass contracts and expands annually, it will be most efficient to confirm the alignment of the Temporary Dredge Line by conducting an eelgrass survey during the season prior to its placement. This will allow the contractor to be provided with GPS coordinates of an open corridor for siting the temporary dredge line.

- **Kentuck Temporary Dredge Transfer Line.** The Temporary Dredge Transfer Line will extend from the Temporary Dredge Off-Loading Area (adjacent to APCO Site 1) across a narrow eelgrass bed to Kentuck Inlet. Crossing this narrow eelgrass bed can be avoided by shifting the Temporary Dredge Off-Loading Area and alignment of the Temporary Dredge Transfer Line approximately 400 feet to the south. Based on recent observations, eelgrass in this general area was found to be discontinuous, but widespread, and much more so than what was surveyed in 2016 (Figure 4). The corridor between the Temporary Dredge Off-Loading Area and Kentuck Inlet will be surveyed again just prior to placement of the Temporary Dredge Transfer Line to confirm a preferred alignment where eelgrass impacts can be avoided.

Accordingly, eelgrass impacts have been appropriately addressed in the record.

References

Attachment A (Citations to Coos County NRI Applications Public Record), attached.

Figures 1-4, attached.

DEA 2017. Resource Report No. 3. Fish, Wildlife, and Vegetation. Jordan Cove Energy Project. September, 2017.

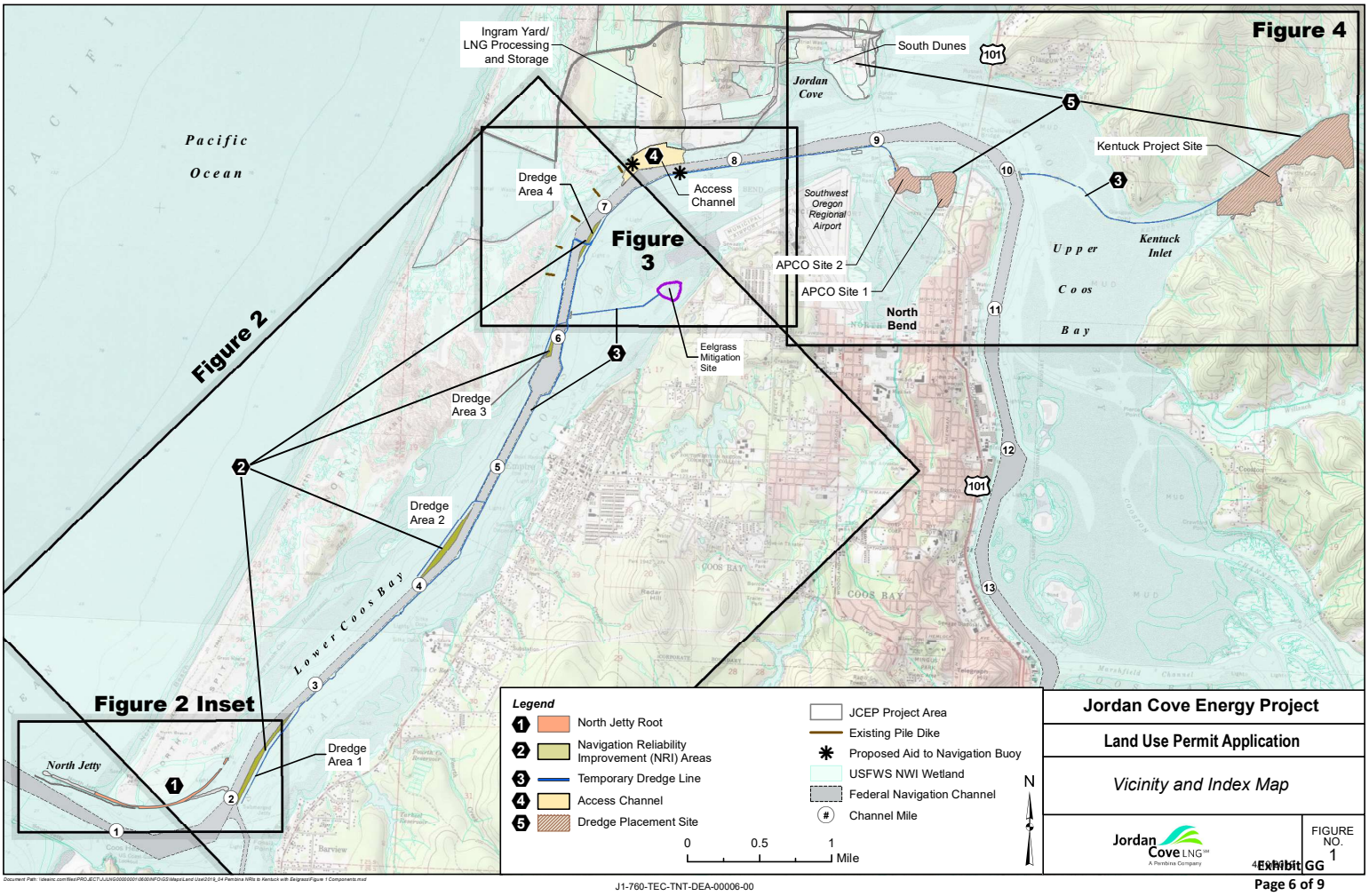
Gaumer, T.F., G.P. Robart, and A. Geiger. 1978. Oregon bay clam distribution, abundance, planting sites and effects of harvest. Annual Report, October 1, 1977 to September 30, 1978. ODFW.

Thom. R.M., A.B. Borde, S. Rumrill, D. L. Woodruff, G. D. Williams, J. A. Southard, S.L. Sargeant. 2003. Factors influencing spatial and annual variability in eelgrass (Zostera marina L.) meadows in Willapa Bay, Washington, and Coos Bay, Oregon, estuaries. Estuaries and Coasts, Vol 26:4, pp 1117-1129.

JORDAN COVE - NAVIGATION RELIABILITY IMPROVEMENTS - COOS COUNTY FILE NOS. AM-18-011/RZ-18-007/HBCU-18-003

ATTACHMENT A

PUBLIC COMMENT ISSUE	BASELINE DATA/INFORMATION (Addressed in Record)	POTENTIAL IMPACTS (Addressed in Record)	PROPOSED MITIGATION (Addressed in Record)	NOTES
Eelgrass				
1. Eelgrass.	◦ EX 17.A.2, see p. 82. ◦ EX 17.A.3, see pp.28-29, 35-36. ◦ EX 17.A.4, see pp. 22, 46-48, 782-783. ◦ EX 17.A.5, see pp. 3, 18-20, 26, 34, 54-55, 58, 161-164, 215, 217-218, 225. ◦ EX 17.A.7, see p. 32. ◦ EX 17.B, see pp. 46, 62, 64-65, 68, 256, 457, 489-490, 664, 680-681, 683, 951-952, 981-982. ◦ Ex 17.E, see p. 29. ◦ Ex 17.H, see pp. 4, 7, 12, 18, 21, 35-37. ◦ EX 17.C, see pp. 10-12, 16-17. ◦ Ex 17.F (Dredged Material Management Plan in R-F Application). ◦ Ex 17.F (Part 1, Att A.1, Section 6.3.4 and 6.3.5). ◦ Ex 17.F, see pp. 78, 80, 159-160, 212, 526. ◦ Ex 17.F (Att A.5). ◦ Ex 17.F (Att A.7). ◦ EX 17.D, see pp. 13, 15, 27-29, 38, 46-50, 54, 56, 62-67, 93-94, 129, 197, 319, 326, 692-694, 769-770, 775, 2195, 2206-2209, 2212, 2226, 2230-2231, 2318, 2373, 2410-2411, 2413, 2416-2417, 2431, 2436, 3384, 3412. ◦ Ex 17.J, see pp. 9, 15, 20, 24, 40-44, 132-133, 317, 323.	◦ EX 17.A.2, see pp. 30, 98. ◦ EX 17.A.3, see pp. 35-36. ◦ EX 17.A.4, see p. 44. ◦ EX 17.A.5, see pp. 30-33, 35, 57, 63, 71, 73, 144, 199-200, 202, 205-206, 214, 216, 219-220, 225. ◦ EX 17.B, see pp. 6, 15-16, 33, 62, 64-65, 67-68, 490, 496, 642-643, 663, 680, 967-968, 982, 1002. ◦ Ex 17.E, see pp. 10, 18. ◦ Ex 17.H, see pp. 4, 7, 12, 18, 21, 35-37. ◦ EX 17.C, see pp. 10-12, 16-17. ◦ Ex 17.F (Dredged Material Management Plan in R-F Application). ◦ Ex 17.F (Part 1, Att A.1, Section 6.3.4 and 6.3.5). ◦ Ex 17.F, see pp. 86, 107-112, 115-118, 163, 166, 184, 340-341, 508-509, 719, 895. ◦ Ex 17.F (Att A.5). ◦ Ex 17.F (Att A.7).	◦ EX 17.A.2, see p. 98. ◦ EX 17.A.3, see pp. 35-36. ◦ EX 17.A.4, see pp. 123, 129. ◦ EX 17.A.5, see pp. 31, 35, 49-50, 62, 73, 142, 217, 220, 223, 341. ◦ EX 17.B, see pp. 6, 15-16, 33, 62, 64-65, 67-68, 490, 496, 642-643, 663, 780, 968, 983, 1000. ◦ Ex 17.H, see pp. 4, 7, 12, 18, 21, 35-37. ◦ EX 17.C, see 1.2.1, 1.3.1, 2.2.1, 4.1.1, 4.2.1, 4.3.1, 4.3.2, 4.4.1, 4.5.1, 4.6.1, 6.2.1, 7.1.1, 7.4.1; see also Appendix D at 1276 and Appendix E at 1293. ◦ Ex 17.F (Dredged Material Management Plan in R-F Application). ◦ Ex 17.F (Part 1, Att A.1, Section 6.3.4 and 6.3.5). ◦ Ex 17.F, see pp. 75, 86-87, 93, 97-104, 124-129, 254, 265, 331, 340, 508, 582, 909, 1043, 1129-1133, 1137. ◦ Ex 17.F (Att A.5). ◦ Ex 17.F (Att A.7).	

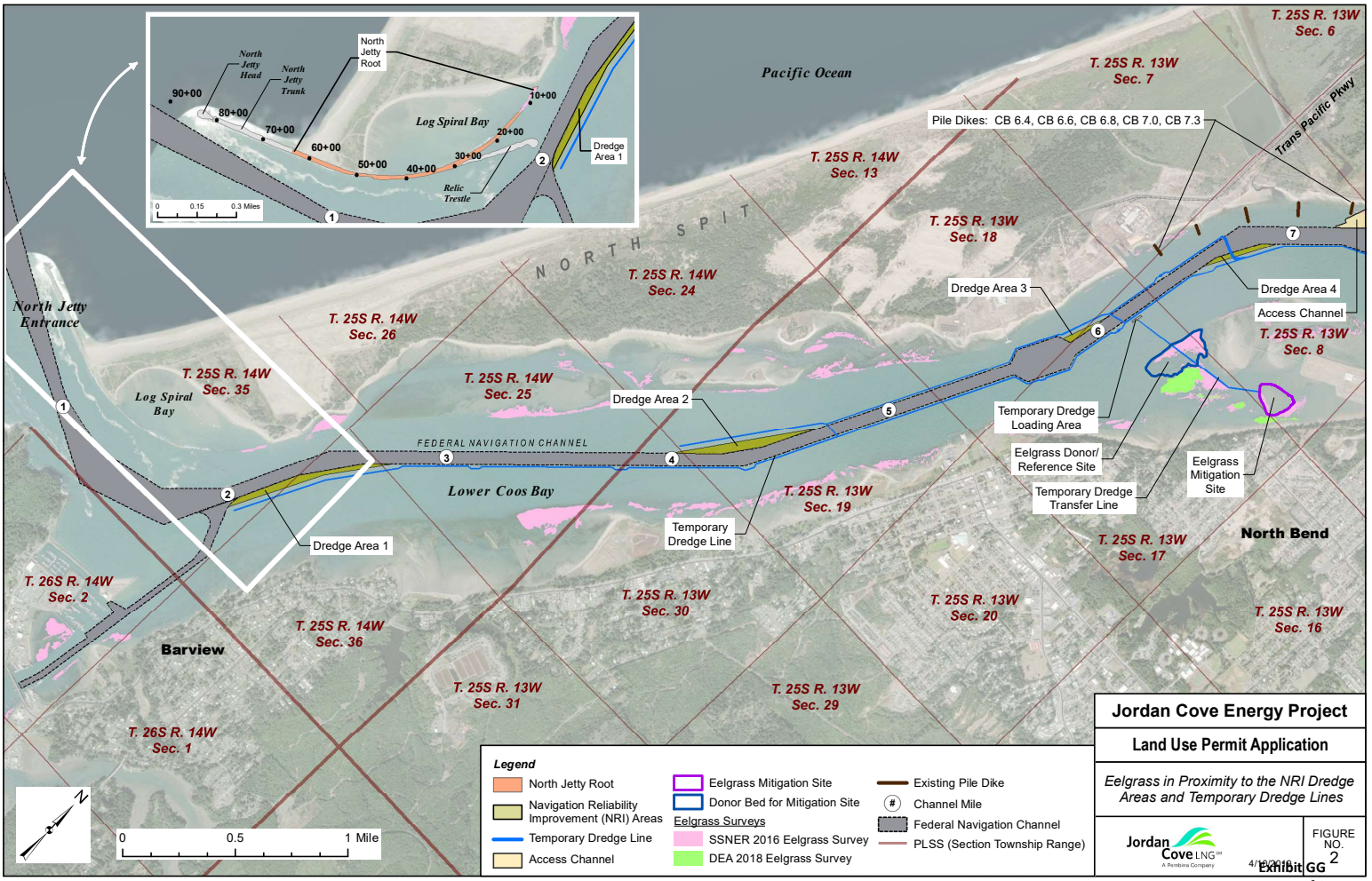


Jordan Cove Energy Project

Land Use Permit Application

Vicinity and Index Map

FIGURE NO. 1



Jordan Cove Energy Project

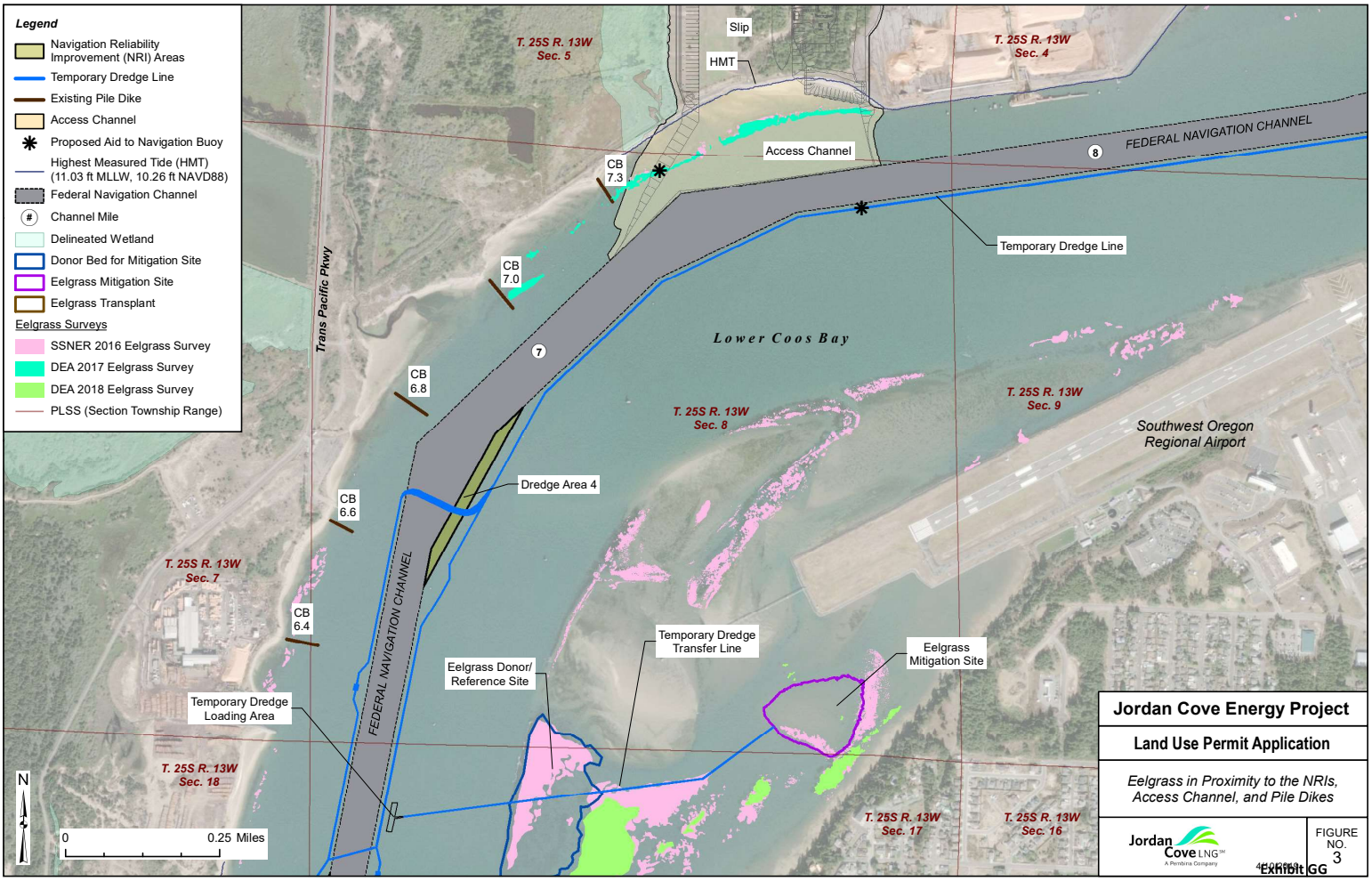
Land Use Permit Application

Eelgrass in Proximity to the NRI Dredge Areas and Temporary Dredge Lines

Jordan Cove LNG
A Pembina Company

FIGURE NO. 2

4/10/2020



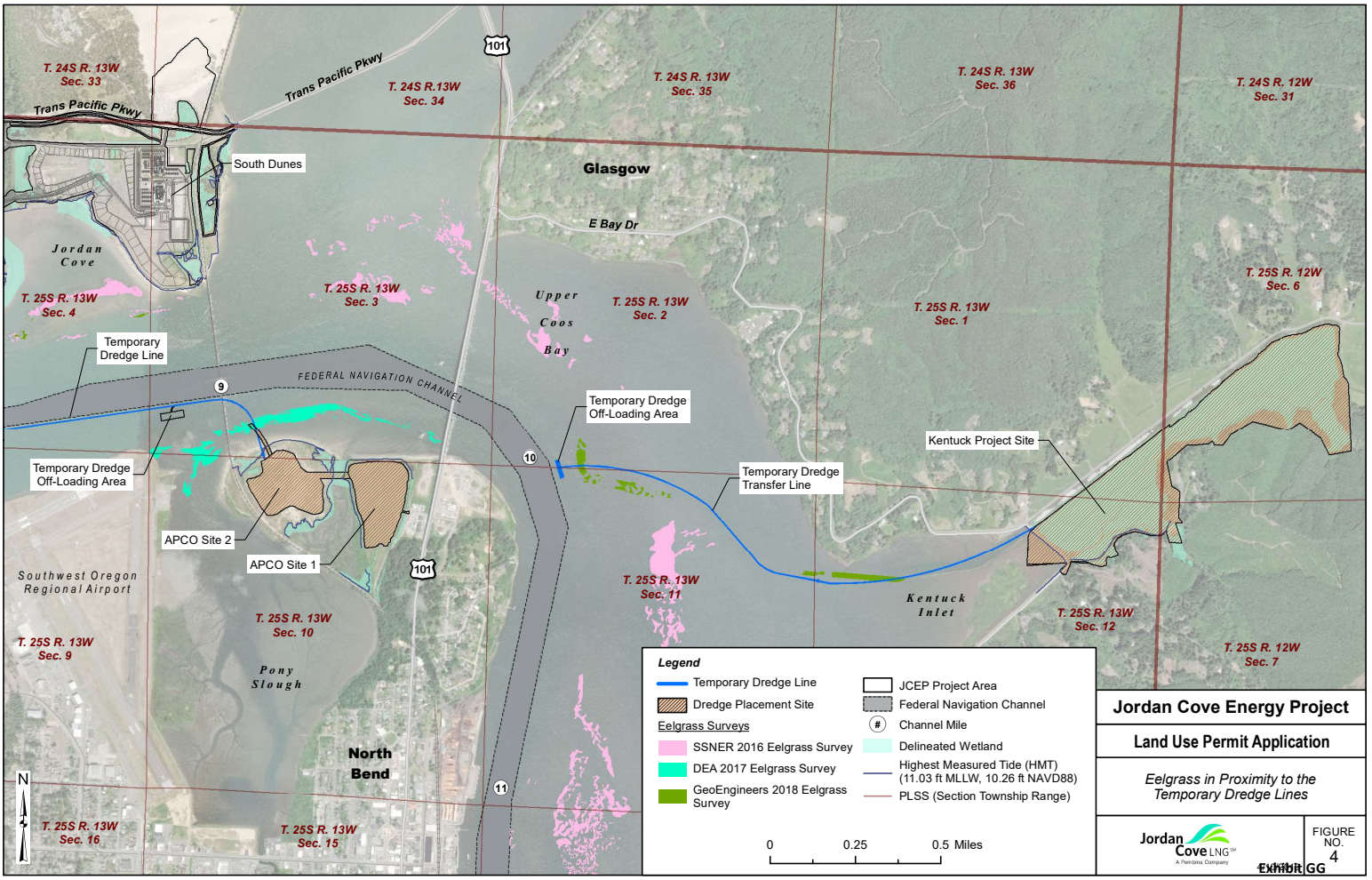
Jordan Cove Energy Project

Land Use Permit Application

Eelgrass in Proximity to the NRIs, Access Channel, and Pile Dikes

Jordan Cove LNG

FIGURE NO. 3



Jordan Cove Energy Project

Land Use Permit Application

Eelgrass in Proximity to the Temporary Dredge Lines

Jordan Cove LNG
A Pembina Company

FIGURE NO. 4

Jordan Cove LNG A Pembina Company	**Crustacean and Shellfish Baseline Information, Potential Impacts and Mitigation: Navigation Reliability Improvements; City of Coos Bay Land Use Application #187-18-000153**	DAVID EVANS AND ASSOCIATES INC.
	Document Number: J1-760-TEC-TNT-DEA-00009-00	
	Rev. A / **Rev. Date: 04/23/2019**	

TECHNICAL MEMORANDUM

DATE:	04/23/2019
ATTENTION:	Henry O. Hearley, Assistant Planner
GOVERNMENT BODY:	Lane Council of Governments
ADDRESS:	859 Willamette Street, Suite 500, Eugene, Oregon 97401
FROM:	Jim Starkes, Senior Scientist, David Evans and Associates, Inc.
SUBJECT:	**Crustacean and Shellfish Baseline Information, Potential Impacts and Mitigation: Navigation Reliability Improvements; City of Coos Bay Land Use Application #187-18-000153**
PROJECT NAME:	Jordan Cove Energy Project, L.P.

Introduction

This Technical Memorandum is submitted into the public record on behalf of Jordan Cove Energy Project, L.P. (Jordan Cove or JCEP) with regard to one of four Navigation Reliability Improvements ("NRIs") sought pursuant to land use applications, City of Coos Bay Land Use Application #187-18-000153 (hereafter, "*City of Coos Bay NRI Applications*"). The *City of Coos Bay NRI Applications* will facilitate limited dredging activity in one of four NRI areas (adjacent to the existing federally authorized Coos Bay Navigation Channel) in order to provide improved efficiency and navigability. Three other related NRIs are sought pursuant to land use applications, Coos County File Nos. AM-18-011/RZ-18-007/HBCU-18-003 ("*Coos County NRI Applications*).

This technical memorandum identifies the documents, reports and studies that have previously been submitted into the public record for the *Coos County NRI Applications* (as specifically identified in Attachment A, hereto) with regard to: ***crustaceans (e.g., crabs, shrimp) and shellfish (e.g., clams, oysters) baseline information, potential impacts and mitigation*** and are relevant to the four NRIs subject to the *City of Coos Bay NRI Applications* and *Coos County NRI Applications*.

Assessment

Based on my education and experience, the documents identified in Attachment A, hereto, and studies further cited, below, adequately address baseline information, potential impacts, and proposed mitigation with regard to crustaceans and shellfish, and it is my best professional judgment that the NRI activities subject to the *City of Coos Bay NRI Applications* will not have a

significant impact on crustaceans (e.g., crabs, shrimp) and shellfish (e.g., clams, oysters) or related habitat.

While studies within the Federal Navigation Channel or deeper adjacent habitats are limited, the Federal Energy Regulatory Commission (FERC) Draft Environmental Impact Study (March 2019) ("DEIS") for the Jordan Cove Energy Project found that "[t]he four navigation channel modifications are not located in known clamming or crabbing areas, or shrimp or oyster habitat." (DEIS at 4-248).

Gaumer et al. (1978) presents a distribution map of invertebrates (clams and crabs) in Coos Bay, none of which are associated with any of the NRI areas (*see* Figure 3.1-2; Jordan Cove Resource Report No. 3). However, according to the Oregon Department of Fish and Wildlife, popular recreational crabbing areas may overlap with the federal navigation channel, particularly in the lower bay (ODFW unpublished). Given the mobile nature of Dungeness crab (*Metacarcinus magister*) and other crab species, its offshore nature, and presence throughout the lower bay, some crabs may have occasion to be present within NRIs 1, 2, or 3. Based on the frequency of maintenance dredging, the population of clam species may be less abundant within the navigation channel and areas adjacent because of frequent removal and disturbances. Species such as cockles (*Cardiidae*) typically occupy shallow water habitats with greater abundances in eelgrass and other marine macro vegetation, so would be less likely found in the NRIs. The DEIS found that while NRI dredging would remove some benthic organisms (e.g., worms, clams, benthic shrimp, starfish, and vegetation) from the bay bottom within the NRIs, some mobile organisms (such as crabs, many shrimp, and fish) could move away from the region during the dredging process, although some will be affected. (DEIS @ 4-269). Recovery of the benthic community in mud substrates after dredging have estimated recovery in four weeks. (McCauley et al. 1977, as cited in Wilber and Clarke 2007). However, recovery in estuarine channel muds has been reported after dredging to be typically six to eight months (Newell et al. 1998). In the lower Columbia River, McCabe et al. (1997, 1998) noted benthic organism recovery in three months. Studies of a dredged sandy substrate area in Yaquina Bay Oregon found recovery of benthos took one year. (DEIS @ 248). Abalone are unlikely to be found in the NRI areas, typically occupying, rocky intertidal to shallow subtidal habitats and the NRIs are primarily deep habitats. See ODFW 2018 (Summary of information regarding Oregon's red abalone recreational fishery. ODFW, Charleston Field Office, Charleston, OR).

Specifically concerning Dungeness crab, one commenter cited a brief study, *Potential Impact of Jordan Cove LNG Terminal Construction on the Nursery Habitat of Dungeness Crab,* Yamada (2016), generally states that dredging will impact nursery habitat of Dungeness crab. Eelgrass habitat can be considered a surrogate for juvenile crab habitat because juvenile Dungeness crab prefer these areas. As previously cited in this Technical Memorandum, the NRI areas are not eelgrass habitat and so dredging these areas would not cause the impacts asserted in Yamada (2016). Dr. Yamada also cites the paper Chang and Levings (1978) as evidence that dredging causes mortality in Dungeness Crab. The Chang and Levings (1978) paper is not relevant to what JCEP proposes in the NRIs, as Chang and Levings (1978) examines the potential effects of burial

from open water dredge disposal; JCEP plans to dispose of dredged materials from the NRIs upland at the APCO sites.

The DEIS determined that for the NRIs, "[e]ffects would be minimized by the current in-water work windows (October 1 to February 15) and by maintaining the cutterhead near the bottom if a hydraulic dredge is used" and concluded that "[a]s with all dredging, there would be an initial loss of benthic resources from the dredging of the navigation channel that would recover over time. Overall habitat structure of the bay would remain essentially unchanged from the widening of the channel in these areas." (DESI @4-249). Through appropriate BMPs and mitigation (as provided in Attachment A), the impacts from the NRIs on crabs and shellfish should be limited and the benthic community should recover after dredging events. Accordingly, crustaceans and shellfish have been appropriately addressed in the record.

References

Attachment A (Citations to Coos County NRI Applications Public Record), attached.

Attachment B (Jim Starkes resume), attached.

Federal Energy Regulatory Commission (FERC) Draft Environmental Impact Study for the Jordan Cove Energy Project. March, 2019.

Chang, B.D. and C.D. Levings, (1978). Effects of burial on the heart cockle Clinocardium nuttallii and the Dungeness crab Cancer magister. Estuarine and Coastal Marine Science, Volume 7, Issue 4, October 1978, Pages 409-412

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JORDAN COVE - NAVIGATION RELIABILITY IMPROVEMENTS - COOS COUNTY FILE NOS. AM-18-011/RZ-18-007/HBCU-18-003

ATTACHMENT A

PUBLIC COMMENT ISSUE	BASELINE DATA/INFORMATION (Addressed in Record)	POTENTIAL IMPACTS (Addressed in Record)	PROPOSED MITIGATION (Addressed in Record)	NOTES
Crustacean & Shellfish				
1. Crabbing/Crabs	◦ EX 17.A.3, See p. 38 ◦ EX 17.A.5, See pp. 17, 18, 19, 20, 21, 22, 23-24, 26-27, 110, 143 (map), 160, 162, 163, 186, 190, 194-95, 196, 197-98, 210, 212, 217, 218, 222, ◦ EX 17.A.7, See pp. 16, 92, 93, 95 ◦ EX 17.A.10, See p. 24, 25, 28, 29 ◦ EX 17.B, See pp. 27, 63, 64, 221, 490, 673-74, 680, 982, ◦ Ex 17.F, See p. 80 ◦ EX 17.D, See pp. 15, 329, 2193, 2194, 2195, 2196-97, 2198, 2200, 2202-03, 2319, 2371, 2373, 2374, 2397, 2401, 2405-06, 2407, 2408-09, 2421, 2423, 2428, 2429, 2433	◦ EX 17.A.5, See pp. 35, 46, ◦ EX 17.A.7, See p. 25, p. 27 ◦ EX 17.A.10, See pp. 32-33, 36, 37 ◦ EX 17.B, See pp. 62, 491, 983 ◦ Ex 17.F, p. 81 ◦ EX 17.D, See pp. 2211, 2222	◦ EX 17.A.10, See pp. 32-33	
2. Shellfish	◦ EX 17.A.3, See pp. 38, 52, 58 ◦ EX 17.A.4, See pp. 18, 22, 28, 783 ◦ EX 17.A.5, See pp. 11, 17, 22, 24, 26, 136, 140, 143, 160, 164, 174, 176, 186, 190, 191, 194, 195, 196, 198, 211, 227, 230, 236, 237, 262, 264, 588 ◦ EX 17.A.7, See pp. 2, 90, 101 ◦ EX 17.A.10, See pp. 40 ◦ EX 17.B, See pp. 671, 673, 674, 1072 ◦ EX 17.D, See pp. 15, 329, 349, 664, 668, 1412, 2198, 2200, 2202, 2312, 2313, 2316, 2319, 2371, 2375, 2397, 2401, 2402, 2403, 2405, 2408, 2409, 2422, 2438, 2447, 2448 ◦ Ex 17.F, See pp. 80, 526, 719 ◦ EX 17.J, See pp. 33, 133, 317 ◦ EX 17.K, See p. 47 ◦ EX 17.G.3, See pp. 23, 26, 36	◦ EX 17.A.4, See p. 22 ◦ EX 17.A.5, See p. 30, 57, 190, 202, 204, 205 ◦ EX 17.A.7, See pp. 25, 27 ◦ EX 17.A.10 ◦ EX 17.B, See pp. 475, 976 ◦ Ex 17.C, See pp. 56, 182 ◦ Ex 17.D, See pp. 2206, 2233, 2413, 2415, 2416 ◦ Ex 17.F, See pp. 1176, 1302 ◦ EX 17.J, See pp. 34, 317	◦ EX 17.A.4, See p. 783 ◦ EX 17.A.5, See p. 30, 57, 204 ◦ EX 17.A.7, See p. 25 ◦ EX 17.A.10 ◦ Ex 17.C, See pp. 56, 182 ◦ Ex 17.D, See pp. 1412, 2233, 2415, 2416 ◦ Ex 17.F, See pp. 1176, 1302 ◦ EX 17.J, See p. 317	

3. Clamming/Clams	◦ Ex. 17.A.3, See p. 38 ◦ Ex. 17.A.5, See pp. 17, 18, 20, 22, 24, 26, 27, 28 143, 160, 162, 163, 164, 174, 190, 191, 192, 195, 197, 198, 212, 218, 227, 228, 230, 232, 237, 261, 262, 264 ◦ Ex. 17.A.7, See pp. 92, 95 ◦ Ex 17.A.10, See pp. 24, 25, 28, 29 ◦ Ex. 17.B, See pp. 221, 1043 ◦ Ex 17.D, See pp. 15, 329, 2193, 2194, 2196, 2198, 2200, 2202, 2203, 2319, 2371, 2373, 2374, 2375, 2401, 2402, 2403, 2406, 2408, 2409, 2410, 2415, 2422, 2423, 2429, 2436, 2438, 2439, 2441, 2443, 2448, 2472, 2473, 2475 ◦ Ex 17.F, See p. 80 ◦ Ex 17.G.3, See pp. 25, 26	◦ Ex. 17.A.5, See pp. 30, 35, 119, 199, 204, 211, 225 ◦ Ex 17.A.7, See p. 24 ◦ Ex 17.A.10, See pp. 32, 33, 36, 37 ◦ Ex 17.B, See pp. 490, 491, 504, 681, 686, 982, 984 ◦ Ex 17.D, See pp. 2206, 2211, 2295	◦ Ex. 17.A.5, See pp. 30, 119, 199, 204, 225 ◦ Ex 17.A.10, See pp. 32,33 ◦ Ex 17.D, See pp. 2206, 2436	
4. Benthic Community	◦ Ex. 17.A.5, See pp. 98, 125, 129, 133, 140, 193, 225, 229, 230, 232, 235 ◦ Ex. 17.B, See pp. 450, 452, 514, 558, 643, 644, 955, 956, 957, 958, 1015, 1020, 1022, 1031, 1032, 1072 ◦ Ex. 17.C, See pp. 19, 179 ◦ Ex 17.D, See pp.99, 2274, 2305, 2309, 2316, 2375, 2404, 2427, 2440, 2441, 2443, 2446,3545, 3548 ◦ Ex 17.F, See pp. 168, 1139 ◦ Ex 16.K, entire doc provides a summary of benthic community and dredging	◦ Ex. 17.A.5, See pp. 30, 31, 35, 36, 44, 116, 125, 200, 202, 203, 204, 216 ◦ Ex. 17.B, See pp. 15, 16, 51, 63, 64, 417, 419, 422, 427, 463, 464, 476, 490, 491, 504, 506, 542, 579, 592, 665, 673, 681, 682, 697, 741, 742, 757, 791, 792, 818, 821, 821, 847, 848, 851, 967, 968, 969, 976, 982, 983, 984, 997, 1002 ◦ Ex 17.D, See pp. 82, 83, 89, 2206, 2207, 2211,2212, 2220, 2292, 2301, 2411, 2413, 2414, 2415, 2416, 2436 ◦ Ex 17.F, See pp. 144, 151, 340	◦ Ex. 17.A.5, See pp. 30, 35, 36 ◦ Ex. 17.B, See pp. 63, 64, 573, 594, 735, 757, 759, 816, 845, 846, 848, 968, 983, 1000 ◦ Ex 17.D, See pp. 89, 2212, 2436 ◦ Ex 17.F, See pp. 340	

DAVID EVANS AND ASSOCIATES INC.

Jim Starkes

Project Manager III, Senior Scientist

Education
BS, Fisheries, University of Washington

Certifications
Sr. Author, WSDOT Biological Assessment Program, 2013

Marbled Murrelet Survey Certification, US Fish and Wildlife Service, 2018

Forage Fish Spawn Survey Certification, WA Dept. of Fish and Wildlife, 2016

Floodplain Habitat Assessment Training Workshop, NOAA/FEMA (2017)

Sea Level Rise Projections Training Workshop. WA Sea Grant/WA Dept. Ecology (2018)

Electrofishing Certificate of Achievement, Smith Root, 2010

Transportation Worker Identification Credential

40 hr HAZWOPER Certification (1990), plus annual 8 hr. Refreshers

Project Management Training (2005)

Professional Affiliations
American Fisheries Society

Years of Experience
28

Jim has over 28 years of experience as a marine scientist, evaluating the effects of anthropogenic activities on marine organisms and their habitats and the design of ecologically functional restoration alternatives. He has conducted numerous assessments to determine habitat limiting factors to juvenile salmon productivity and to optimize habitat conditions in restoration projects. One of his principal roles in habitat restoration is to work closely with design engineers to produce cost-effective and ecologically meaningful restorations and mitigation actions to offset the impacts of development.

Jordan Cove Energy Project, Permitting and Mitigation Support, Coos Bay, OR
Mitigation lead for the design of a program to salvage 2.3 acres of eelgrass that currently occupies areas proposed for dredging, and transplanting it to nearby recipient sites. Managed eelgrass investigations to identify, select, and design an eelgrass mitigation site that will be graded to optimal elevations and planted with eelgrass. Conducted extensive eelgrass surveys to delineate eelgrass beds within the project area, identify donor and reference sites, and develop a 5-year post-construction monitoring and adaptive management program.

Mt Baker Terminal Beach Restoration, Everett, WA.
Task and field Manager for design and environmental investigations of a 61,000 SF pier in Port Gardner, WA. Provided ecological function analyses for the design of an 800 foot beach and riparian zone as mitigation for the pier. Implemented post-construction monitoring investigating eelgrass colonization, beach substrate migration, juvenile salmon use, crab production, epibenthic recolonization, forage fish spawning, and saltmarsh/riparian growth. All performance criteria for the beach were met and a 20 year monitoring program was reduced to 10 years.

South Fork Skagit River Estuarine Off-Channel Habitat Design and Feasibility Study, Skagit County, WA
Project manager designing off-channel habitats to optimize juvenile salmon rearing within tidal reaches of the Skagit River. Final design analyses included use of carrying capacity models to optimize ecological functions for juvenile salmonids, hydrologic modeling and geotechnical analyses to optimize channel stability, maximizing channel inundation, grading for natural wetland colonization, and determining risks to agricultural lands.

Elliott Bay Seawall Replacement Project, Seattle Department of Transportation, Seattle, WA
Habitat Lead on the engineering team to replace the 7,000-foot Elliott Bay seawall along the Seattle waterfront. Responsible for the design of several habitat features including a pocket beach and a unique juvenile salmon habitat bench along the new seawall. Given the highly urban nature of the area, used ecological function models to prioritize design alternatives to maximize benefits to juvenile salmon production.

Livingston Bay Pocket Beach Restoration, Camano Island, WA
Task Manager providing design assistance and permitting to restore a 10-acre pocket beach for The Nature Conservancy. Designs were prepared for the restoration of a poorly functioning, low flushing pocket beach on Port Susan. The project restored tidal flow via dike breaching, improved access for juvenile salmonids, restored salt marsh habitats, and restored natural hydrologic and shoreline processes in a manner that was ecologically sustainable.

Port of Everett Strategic Mitigation Report, Everett, WA
Project Manager assisting the Port of Everett in the strategic assessment of future mitigation needs. Identified over 20 potential compensatory mitigation sites on, mapped and calculated mitigation areas using GIS, and developed a ranking system and criteria. Criteria included maximizing ecological function for juvenile salmon use and production, cost, ease of construction, and mitigation benefit. Sites were ranked and prioritized for mitigation benefit.

Jordan Cove LNG A Pembina Company	**Fish (e.g., Salmon, Sturgeon, Herring, Candlefish) Baseline Information, Potential Impacts and Mitigation: Navigation Reliability Improvements; City of Coos Bay Land Use Application #187-18-000153**	DAVID EVANS AND ASSOCIATES INC.
	Document Number: J1-760-TEC-TNT-DEA-00007-00	
	Rev. A / **Rev. Date: 04/23/2019**	

TECHNICAL MEMORANDUM

DATE:	04/23/2019
ATTENTION:	Henry O. Hearley, Assistant Planner
GOVERNMENT BODY:	Lane Council of Governments
ADDRESS:	859 Willamette Street, Suite 500, Eugene, Oregon 97401
FROM:	David Evans and Associates, Inc.
SUBJECT:	**Fish (e.g., Salmon, Sturgeon, Herring, Candlefish) Baseline Information, Potential Impacts and Mitigation: Navigation Reliability Improvements; City of Coos Bay Land Use Application #187-18-000153**
PROJECT NAME:	Jordan Cove Energy Project, L.P.

Introduction

This Technical Memorandum is submitted into the public record on behalf of Jordan Cove Energy Project, L.P. (Jordan Cove or JCEP) with regard to one of four Navigation Reliability Improvements ("NRIs") sought pursuant to land use applications, City of Coos Bay Land Use Application #187-18-000153 (hereafter, "*City of Coos Bay NRI Applications*"). The *City of Coos Bay NRI Applications* will facilitate limited dredging activity in one of four NRI areas (adjacent to the existing federally authorized Coos Bay Navigation Channel) in order to provide improved efficiency and navigability. Three other related NRIs are sought pursuant to land use applications, Coos County File Nos. AM-18-011/RZ-18-007/HBCU-18-003 ("*Coos County NRI Applications*).

This technical memorandum identifies the documents, reports and studies that have previously been submitted into the public record for the *Coos County NRI Applications* (as specifically identified in Attachment A, hereto) with regard to: ***fish (including salmon, sturgeon, herring, candlefish) baseline information, potential impacts and mitigation*** and are relevant to the four NRIs subject to the *City of Coos Bay NRI Applications* and *Coos County NRI Applications*.

Assessment

The documents identified in Attachment A, hereto, adequately address baseline information, potential impacts, and proposed mitigation with regard to relevant fish species (as addressed below). The NRI activities subject to the *City of Coos Bay NRI Applications* will not have a significant impact on fish species including salmon (*Oncorhynchus spp*.), green sturgeon (*A. medirostris*), Pacific herring (*Clupea pallasii*), candlefish (*Thaleichthys pacificus*).

Commenters raised questions about potential impacts to various fish species at the NRIs including, salmon, sturgeon, herring, Pacific sand lance (candlefish), and others. Such impacts would primarily result from dredging conducted at the four NRI sites along the federal navigation channel (FNC). Dredging operations would result in temporary and localized increases in turbidity; cause noise-related behavioral disturbance; entrain egg/larval/juvenile life stages of fishes and other bottom dwelling marine species; and pose potential risks from spills of fuel, oil, and lubricants.

The Federal Energy Regulatory Commission (FERC) Draft Environmental Impact Statement (DEIS) for the Jordan Cove Energy Project (March 2019) characterized maintenance dredging as an "operational acoustic effect" and opined that "maintenance dredging would generate underwater sound pressure levels that could elicit responses in aquatic organisms" but that generally "response to changes in noise levels would be behavioral and perceptual, and not physiological in nature, as fish and marine mammals would tend to avoid the area during periods of high noise output. We conclude that operational noise would not have significant adverse effects on aquatic resources." (DEIS @4-263). Turbidity from the NRI (and other) dredging has also been modelled, and the DEIS opines: "[d]uring the dredging process, some small fish (such as sand lance), larvae, and fish eggs could be entrained. Larger fish would be able to avoid this process and would likely actively avoid the area during the dredging disturbance process. In a review of many maintenance dredge studies through 1998, Reine and Clarke (1998) concluded that "much of the available evidence suggests that entrainment is not a significant problem for many species of fish and shellfish in many bodies of water that require periodic dredging." (DEIS @ 4-247). Although elevated total suspended solids (TSS) from dredging could impact salmon (and other anadromous fish), the DEIS states that: "[e]ffects on estuarine organisms and their habitat are expected to be slight and not measurable due to the limited area affected and the short duration of dredging operations, and limitations on construction periods. Rearing and migrating salmonids including ESA listed salmon, which should be uncommon in Coos Bay during the in-water work window, would likely avoid active work areas." (DEIS @ 4-247).

Where temporary pilings are installed (e.g., as anchors for dredging barges or equipment), acute noise from impact hammers also could result in potential impacts on fish. As the DEIS notes, however, "Jordan Cove would implement sound attenuation measures in accordance with NMFS guidelines as needed, and fish are mobile and unlikely to remain in areas where cumulative noise levels would result in injury. All in-water pile driving would be limited to the ODFW-approved in-water construction window of October 1 to February 15, established to avoid noise injury to most salmonids. (DEIS @ 4-253).

Herring are known to spawn on eelgrass in the eelgrass meadows in Coos Bay. (see DEIS @ 4-241). Since eelgrass habitat does not exist in the deeper subtidal waters along the FNC where the NRI work would be conducted, dredging in these areas would not affect eelgrass or herring spawning habitat. Furthermore, prevention and control measures implemented to manage turbidity and accidental releases of fuel, oil, and lubricants during dredging as part of the Dredging Pollution Control Plan at the NRIs would reduce potential impacts to water quality and

marine habitat. During NRI dredging (October 1 through February 15), adult anadromous salmonids, green sturgeon, and possibly candlefish would be present (ODFW 2007b). (DEIS @ 4-267). The presence of Pacific eulachon in Coos Bay estuary has not been conclusively confirmed based on surveys conducted in recent decades (DEIS @ 4-337-338). Furthermore, no critical habitat for Pacific eulachon has been designated in the NRI project areas. Potential impacts to Green Sturgeon from temporary, localized turbidity and loss of food sources due to entrainment of bottom dwelling marine life, will require mitigation to reduce such impacts. (DEIS @ 5-5).

With regard to potential spills from dredging equipment, JCEP will implement an approved Spill Prevention Control and Countermeasures Plan (SPCCP) to ensure any accidental spills that may occur are immediately responded to and mitigated. In light of the above, dredging at the NRIs will result in minor impacts on fish.

References

Attachment A (Citations to Coos County NRI Applications Public Record), attached.

Federal Energy Regulatory Commission (FERC) Draft Environmental Impact Study for the Jordan Cove Energy Project. March, 2019.

Applicant-Prepared Draft Biological Assessment and Essential Fish Habitat Assessment for the Jordan Cove Energy and Pacific Connector Gas Pipeline Project (Revised September 2018).

JORDAN COVE - NAVIGATION RELIABILITY IMPROVEMENTS - COOS COUNTY FILE NOS. AM-18-011/RZ-18-007/HBCU-18-003

ATTACHMENT A

PUBLIC COMMENT ISSUE	BASELINE DATA/INFORMATION (Addressed in Record)	POTENTIAL IMPACTS (Addressed in Record)	PROPOSED MITIGATION (Addressed in Record)	NOTES
Potential Impacts + Mitigation				
1. Fishing/Fish	◦ EX 17.A.2, page 82, ◦ EX 17.A.3, page 34–36, 38, 45, 58 ◦ EX 17.A.4, pages 21, 783 ◦ EX 17.A.5, pages 16–27, 97, 100, 101, 128–130,133–137, 140, 164–186, 189, 194, 196, 197, 198, 228–237, 239, 240, 242, 245, 249, 253, 254, 258, 266 ◦ EX 17.A.6, pages 23, 34, 36 ◦ EX 17.A.7, pages 16, 24, 92, 93, 94, 100, 101, 102, 105, 106, 107 ◦ EX 17.A.10, pages 15, 16, 24, 26, 27, 28, 29, 36 ◦ EX 17.A.11, pages 515, 516 EX 17.A.13, pages 47, 48, 49, 52 EX 17.A.14, pages 86, 440, 441, 446, 461, 462, 464, 465, 487, 496, 497, 503, 520, 559, 560, 561, 618, 619–24, 692 ◦ EX 17.B, pages 14, 15, 25, 26, 27, 28, 221, 222, 453, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961 ◦ EX 17.D, pages 14, 15, 325, 329, 336, 2191–2203, 2273, 2268, 2273, 2292–2295, 2377–2399, 2400, 2401, 2407–2409, 2425, 2426, 2453–2454, 2464–2465, ◦ EX 17.E, pages 35–75, 141–207 ◦ Ex 17.F, pages 79–81 ◦ EX 17.G.3, pages 23, 25, 26, 30, 32, 33, 35, 36, 41, 43 EX 17.K, pages 3,	◦ EX 17.A.2, pages 49 EX 17.A.3, page 35 ◦ EX 17.A.4 ◦ EX 17.A.5, page 31, 41, 45, 116, 117, 118, 199, 201, 202, 205, 206, 207, 210, 211, 215, 218, 220, 225, 226 ◦ EX 17.A.7, pages 25 (LNG), 28 (LNG), 108 ◦ EX 17.A.10, pages 36 (LNG) EX 17.A.11, pages 41, 43, 44, 518, 522, 524, 525, 545 EX 17.A.14, pages 448 (LNG), 449 (LNG), 459 (LNG), 460 (LNG), 464 (LNG), 465 (LNG), 466 (LNG), 468 (LNG), 672, 692 (LNG) ◦ EX 17.B, pages 9, 13, 15, 16, 51, 62, 63, 64, 65, 66, 67, 68, 96, 254, 458, 459, 461, 462, 463, 475, 476, 477, 480, 481, 482, 483, 484, 485, 489, 490, 491, 497, 504, 505, 507, 508, 538, 539, 662, 663, 664, 671, 678, 679, 680, 681, 682, 948, 949, 964, 965, 966, 967, 976, 977, 978, 979, 980, 981, 982, 983, 984, 1002, 1079–1082, 1084 EX 17.D, pages 2212, 2292–2295, 2412–2413, 2411–17, 2426–2427, 2429–2431 ◦ Ex 17.F (Part 1, Att A.1, Section 6.3.4 and 6.3.5) ◦ Ex 17.F, pages 81, 331, 332 EX 17.J, pages 20, 32 ◦ EX 17.K, pages 25–31	◦ EX 17.A.2, pages 49, 93, 94, 98, 109 ◦ EX 17.A.3, page 35, ◦ EX 17.A.4 ◦ EX 17.A.5, page 31, 41, 49, 50, 61, 116, 117, 118, 225, 226 ◦ EX 17.A.6, pages 97, 121 EX 17.A.9, pages 616, 619, 623, 631, 1218 ◦ EX 17.A.10, pages 15 EX 17.A.11, pages 518 EX 17.A.14, pages 467 (LNG), 616–18 (LNG), 692 (LNG) ◦ EX 17.B, pages 45, 46, 52, 53, 57, 63, 64, 66, 67, 68, 481, 483, 489, 490, 504, 664, 671, 678, 679, 683, 781, 976, 977, 999, 1000, 1002, 1083–1083 EX 17.C, 21, 30 ◦ EX 17.D, pages 95, 96, 192–193, 197, 2225, 2237, 2436, 3351 EX 17.E, page 126 ◦ Ex 17.F (Part 1, Att A.1, Section 6.3.4 and 6.3.5) ◦ Ex 17.F, pages 154, 163, 164, 479, 531, 946–947, 1061–1101, 1141, 1300–1302 EX 17.J, pages 14, 15, 20, 32, 322 ◦	

2. Herring;	EX 17.A.5, pages 17, 19, 20, 21, 26, 27, 28, 113, 162, 163, 174, 182, 186, 187, 211, 217, 238, 242 EX 17.A.14, pages 619, 620, 623 EX 17.B, pages 490, 680, 982 EX 17.C, pages 179, 182 EX 17.D, pages 2193, 2393, 2453		EX 17.F, page 1302	
3. Sturgeon;	EX 17.A.4, pages 18, 19 EX 17.A.5, pages 16, 21, 22, 26, 97, 101, 119, 128, 132, 133, 135, 138, 140, 166, 173, 174, 175, 176, 185, 196, 207, 227, 229, 233, 235, 237, 237 EX 17.A.11, page 515 EX 17.A.14, pages 619, 623, 451 EX 17.B, pages 8, 12, 22, 23, 25, 28, 110, 451, 452 EX 17.D, pages 2192, 2268, 2277, 2295, 2385–2387, 3555, 3557, 3558, 3559, 3561 EX 17.E, pages 35–39, 41, 142–143, 145 EX 17.F, pages 1061	EX 17.A.5, pages 92, 119 EX 17.B, pages 445–453, 455–459, 475, 476, 476, 480, 481, 484, 490, 491, 494, 495, 496, 497, 503, 504 EX 17.F, page 331	EX 17.A.5, pages 119 EX 17.B, pages 490, 496, 497 EX 17.F, page 331	
4. Candlefish (Eulachon);	EX 17.5, pages 100, 185 EX 17.A.14, pages 620, 623 EX 17.B, pages 8, 12, 22, 23, 25, 498–502 EX 17.D, pages 2276, 2396, 2294–2295, 2396 EX 17.E, page 142 EX 17.F, page 79	EX 17.B, pages 502–504, 507, 508–510, 1083 EX 17.D, pages 2268, 2276 EX 17.F, page 331	EX 17.B, pages 507, 509 EX 17.D, page 331	
5. Salmon	Ex 17.A.2, page 88 EX 17.A.4, pages 18, 19 EX 17.A.5, pages 16, 18–27, 30, 97, 98, 99, 129, 132, 133, 134, 136, 137, 138, 140, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 176, 184, 185, 189, 196, 197, 205, 206, 214, 215, 216, 217, 221, 227, 228, 230, 231, 232, 233, 235, 236, 237, 238, 239, 240, 242, 244 EX 17.A.6, pages 16, 92, 93, 107 EX 17.A.11, page 515 EX 17.A.14, pages 440, 462,	Ex 17.A.2, page 49 EX 17.A.5, page 45, 46, 47, 92, 116, 117, 118, 201, 202, 206, 215, 218, 220 EX 17.B, pages 51, 534, 661–665, 671, 678, 679, 680, 681, 949, 967, 976, 981 EX 17.D, pages 2293–2294, 2412–2413, 2416–2417, 2429 EX 17.F, page 81, 331	EX 17.A.5, pages 35, 37, 38, 41, 92, 119, 202, 206, 207, 210, 211, 220, 223 EX 17.A.6, page 97, 121 EX 17.A.9, page 1217, 1218 EX 17.B, pages 45, 682, 999–1002 EX 17.C, pages 20, 22, 26, 30, 45, 179, 180, 181 EX 17.D, 91–92, 310, 2213-2214, 2431, 2434, 3449–3450 EX 17.F, page 153, 331, 712, 717, 946–947, 1140–1141, 1150, 1165–1166, 1300–1302 EX 17.D, page 126, 131	

	465, 467, 487, 560, 619, 620, 622, 623, 629–630 EX 17.B, pages 8, 12, 13, 14, 15, 16, 22, 23, 25, 27, 28, 110, 510–33, 949, 961–963 EX 17.D, pages 2192, 2199, 2200, 2201, 2202, 2217, 2268, 2273–2275, 2293, 2377–2381, 2395–2397, 2400, 2453, 2456, 3555 EX 17.E, pages 35, 142–143 EX 17.F, pages 79, 1061 EX 17.G.3, pages 25, 26, 41			
6. Lost River Sucker	EX 17.B, pages 793–834 EX 17.D, page 3593–3594	EX 17.B, pages 812–827, 833–834	EX 17.B, pages 828–833	
7. Shortnose Sucker	EX 17.B, pages 834–863 EX 17.D, page 3593–3594	EX 17.B, pages 843–857, 863	EX 17.B, pages 845–846, 857–863	

Jordan Cove LNG SM
A Pembina Company

Dredging Pollution Control Plan (Navigation Reliability Improvements, Kentuck, APCO)

REV	DATE	DESCRIPTION	BY	CHKD	APPVD	COMPANY APPROVAL
0	04/08/19	Issued for Use	G. Millar	M&N	M. Wert	
B	04/03/19	Issued for Review	G. Millar	M&N	M. Wert	
A	03/18/19	Issued for Review	G. Millar	M&N	M. Wert	

IP SECURITY	☐ Confidential		Total amount of pages including coversheet:			85
FOR CONTRACTOR DOCUMENTS	Contract No.		Contractor Document No.			Contractor Rev.
	DEA-041, SO 1030		571			2
JCL DOCUMENT NUMBER	Proj. Code	Unit / Location	Discipline	Doc. Type	Orig. Code	Sequence No.	Sheet No.
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Jordan Cove LNG

Dredging Pollution Control Plan (Navigation Reliability Improvements, Kentuck, APCO)

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A separate Dredging and Pollution Control Plan (DPCP) has been prepared for the LNG Terminal site which, in many cases, follows similar plans and objectives for dredging and pollution control as described herein. Furthermore, performance-based dredging and pollution control by the Engineering Procurement Construction (EPC) Contractor will reflect additional information developed during and after final design is completed. This will include more specific detail on dredging operations, means, methods, and the equipment and water quality monitoring plans to be implemented to assure compliance with state water quality standards.

1. INTRODUCTION

Jordan Cove Energy Project L.P. (JCEP) is seeking authorization from the Federal Energy Regulatory Commission (FERC or Commission) under Section 3 of the Natural Gas Act (NGA) to site, construct, and operate a natural gas liquefaction and liquefied natural gas (LNG) export facility (LNG Terminal), located on the bay side of the North Spit of Coos Bay, Oregon.

This Dredging Pollution Control Plan (DPCP) has been prepared to provide information requested from Oregon Department of Environmental Quality (ODEQ) pertaining to construction dredging, sequence, schedule, pollution control, and dredge material disposal associated with four specific elements of the Jordan Cove Energy Liquefied Natural Gas (LNG) Terminal Project (Project). Collectively referred to as the Owner's Scope elements, these include four Navigation Reliability Improvements (NRIs), the Eelgrass Mitigation site, the Kentuck Project site, and the APCO 2 dredge disposal site.

This DPCP does not address construction excavation and dredging activities required to construct the marine slip, access channel and Material Offloading Facility (MOF), and temporary barge berth (TMBB) all of which are subject to future approvals as described separately (KBJ, 2019). In addition, maintenance dredging during Project operations will be addressed separately subject to future plans and approvals.

Water quality protection measures associated with upland activities at the dredge material disposal sites (i.e., the Kentuck Project Site and APCO 2 Site) are described in respective Erosion and Sediment Control Plans (ESCPs) for those sites. The ESCPs address stormwater controls, best management practices (BMPs), and water quality monitoring during the course of dredge disposal and related construction activities on these land surfaces. Because these ESCPs address the management and control of runoff into Coos Bay, including the implementation of land-based water pollution controls and BMPs during construction-related excavation and dredging, they are attached in Appendix A-1 and Appendix A-2 to this DPCP.

Part 1 – Dredging Area Descriptions, Sequence, and Schedule

2. CONSTRUCTION DREDGING OPERATIONS

2.1 OVERVIEW, DESCRIPTION, AND LOCATION OF NRIS, EELGRASS MITIGATION SITE, AND KENTUCK PROJECT SITE

The following sections provide further detail on dredging activities for the Owner's Scope elements of the Project. All elevations presented herein are in reference to the North American Vertical Datum of 1988 (NAVD88), unless otherwise noted. Appendix B depicts the locations of the Owner's Scope elements within the Coos Bay project area.

2.1.1 NRIs

The purpose of the NRIs is to permanently improve the width of the Federal Navigational Channel (FNC) by performing dredging in four specific areas within the first seven river miles of the Coos Bay FNC. This will provide safe access for LNG carriers through the FNC in Lower Coos Bay to the Jordan Cove Project site. Dredge material removed from these four sites will be transported and stockpiled at the APCO 2 Site. NRI Sites 1 and 4 are located on the east side of the FNC. NRI Sites 2 and 3 are located on the west side of the FNC, as shown in Appendix B. The minimum depth of dredging required at these sites is -39 ft MLLW, which includes 2 feet of Advanced Maintenance dredge depth. The composition of dredge material is anticipated to consist of sand, silt, sandstone and siltstone. The dredge slurry will be transported to the APCO 2 Site for dewatering and stockpiling. Disposal area berms, internal dewatering berms, and other water control structures will be established on the APCO 2 Site to facilitate dredge material dewatering, consistent with regulatory requirements.

2.1.2 Eelgrass Mitigation site

The Eelgrass Mitigation site, as detailed in the Compensatory Wetland Mitigation Plan, is located on the western side of Coos Bay just south of the west end of the Southwest Oregon Regional Airport (SORA) east-west runway (see Appendix B) (DEA, 2018). The Eelgrass Mitigation site has been chosen to offset impacts to eelgrass habitat resulting from construction of the JCEP. The site is a locally high area bordered by eelgrass beds southeast of the SORA. Since site elevations are currently too high to support eelgrass, initial mitigation activities will include lowering the existing grade to approximately -2 ft MLLW to match the surrounding eelgrass beds. Subsequently, the site will be allowed to stabilize, then it will be transplanted with eelgrass stock from other nearby donor sites.

2.1.3 Kentuck Project site

The Kentuck Project, also detailed in the Compensatory Wetland Mitigation Plan, involves a roughly 140 acre area that will be transformed to a wetland mitigation and coho salmon habitat rehabilitation site (DEA, 2018). It is located on the western shore of Coos Bay at the mouth of the Kentuck Slough, as shown in Appendix B. Construction activities at the Kentuck Project include importing approximately 300,000 cubic yards of dredge material to re-establish tidal connection to the former golf course site. This will raise the subgrade to a profile conducive to establishing appropriate estuarine and freshwater habitats.

2.2 CONSTRUCTION DREDGING SEQUENCING AND METHODS

2.2.1 Description of Dredging Activities and Methods

Equipment and construction sequencing for the NRIs, Eelgrass Mitigation site, and Kentuck Project site are detailed below.

2.2.1.1 NRIs

Potential methods that will be considered for dredging the NRIs involve the use of hydraulic cutter-suction equipment or mechanical processes (i.e., clamshell or other mechanical equipment).

Method No. 1: Hydraulic Cutter Suction. In hydraulic cutter section dredging, material is loosened (using a rotating cutter head) from its in-situ state and lifted through a pipe system connected to a centrifugal pump. The sediment-water slurry is pumped from the channel bottom through a transport pipeline to a barge or upland disposal site. Hydraulic dredging is most efficient when working with fine materials and sands which are easily held in suspension. Coarser materials, including gravel, and soft rock, may be hydraulically dredged; however, these materials require a greater demand of pump power and can cause greater wear on pumps and pipes.

Cutter suction dredges are generally rated based on the size of the discharge pipe, which ranges from 6 to 30 inches. For the NRIs, which includes soft rock (sandstone and siltstone) at NRI Site 1 2, a 27-30 inch size hydraulic dredge (depending on available equipment on the West coast) is assumed to allow for availability of a dredge with sufficient cutter-head power for cutting into the rock. Disposal of the dredged material will be via hydraulic pumping (slurry transport line) to APCO Site 2.

The temporary slurry transport line (pipeline) will be laid on the bottom within a corridor outside the FNC limits, between the NRIs and APCO Site 2. Navigation markers will be used where the pipeline crosses the FNC. The crossing depth will be such that obstructions to vessel traffic at the -37 feet MLLW depth will be mitigated. Booster pumps will be located on to moored (anchored/spudded) barges, or on temporary pile-supported platforms. At each booster pump station, the submerged pipeline will be raised from the channel bottom to the surface where it will connect to the booster pump before returning to the channel bottom and continuing to the next booster station and, ultimately, the APCO 2 Site. As the submerged pipeline approaches the APCO 2 Site, it will be elevated on a temporary pile supported structure, or tire floats, to avoid direct contact with existing eelgrass beds. A floating pipeline also may be used for portions of the alignment as determined during final design.

Table 1 provides a listing of equipment included in Method No. 1.

Figure 1 shows a typical hydraulic cutter suction dredge.

Table 1: Method No. 1 Major Equipment

Equipment Type	Estimated Equipment Quantity
Hydraulic suction dredge (27-30 inch) with cutter head	1
Booster pumps	2-3
Work boat	1
Anchor scows / temporary platforms	2-3
Slurry transport line (submerged line)	Up to 7 miles
Slurry transport line (floating line)	~500 ft

Equipment number and type dependent on Contractor's means and methods

Figure 1: Typical Hydraulic Cutter Section Dredge

Method No. 2: Mechanical Dredging. Mechanical dredging excavates in-situ sediments with a grab or bucket from land or water-based structure such as a barge. The most common type of mechanical dredge is the clamshell dredge, which is named for the type of bucket used in the operation and shown in Figure 2. The dredging process consists of lowering the bucket to the seafloor, closing the bucket and raising it back to the water surface. The dredge material is then deposited into a scow or, if appropriate, directly into an adjoining disposal site. Mechanical dredges are often used in tightly confined areas, such as harbors, around docks and piers, and in relatively protected channels.

Mechanical dredging for the NRIs will consist of either a barge-mounted crane with a clamshell or an excavator on a barge. The mechanical dredge will be outfitted with a heavy duty clamshell. There are several mechanical dredges of this approximate size that are typically located on the West Coast. Although an excavator is better suited for dredging in-situ soft rock with its higher breakout capacities, outfitting the mechanical dredge with the heavy duty rock clamshell bucket with pick point teeth will support rock dredging. The mechanical dredge might need to chisel the harder rock if the clamshell bucket is not heavy enough to break out the rock. After excavation, the sand or rock material at the NRIs will be placed in a scow or on a deck barge and transported, with the assistance of a tugboat, to a Temporary Dredge Off-Loading area near the APCO 2 Site. The scow capacity and size could potentially range from between 3,000 to 5,000 cubic yards (CY). By using a series of scows, a clamshell dredge can proceed continuously. As one scow is being filled, another can be towed to the placement site. However, mechanical offloading will require the scow or barge be moored at a Temporary Dredge Off-Loading area with a suitable depth of water (approximately 20 feet depth).

For all mechanical dredging, a pile supported slurry transport pipeline will extend from the Temporary Dredge Off-Loading area near the APCO 2 Site above and across any adjacent eelgrass beds to the disposal site onshore.

Table 2 provides a listing of equipment included in Method No. 2. Figure 2 shows a typical mechanical clamshell dredge.

Table 2: Method No. 2 Major Equipment

Equipment Type	Estimated Equipment Quantity
Clamshell dredge	1
Dredge material transport scows / barges	2-3
Work boat	1
Service Tug boat	1-2

Equipment number and type dependent on Contractor's means and methods

Figure 2: Typical Mechanical Clamshell Dredge

2.2.1.2 Eelgrass Mitigation site

At the Eelgrass Mitigation site, a shallow-water hydraulic dredge is planned that will lower areas currently too shallow to support eelgrass. A temporary slurry transport line will be placed along the bottom in areas void of eelgrass beds connecting the hydraulic dredge to the Temporary Dredge Loading area comprised of a barge and scow moored by anchors or spuds. The Temporary Dredge Loading area will be located adjacent to the FNC in a minimum 20-foot water depth to allow for a safe approach as depicted in Appendix B.

Table 3 provides a listing of equipment for dredging the Eelgrass Mitigation site.

Table 3: Major Equipment for Dredging the Eelgrass Mitigation site

Equipment Type	Estimated Equipment Quantity
Shallow-water hydraulic dredge	1
Booster Pumps	1-2
Loader platform barge(s)	1
Anchor scows / temporary platforms	2
Work boat	1
Service Tug boat	1
Dredge material transport scows / barges	2

Equipment number and type dependent on Contractor's means and methods

2.2.1.3 Kentuck Project Site

There are no dredging activities proposed at the Kentuck Project site. Approximately 300,000 CY of material will be removed from the Marine Slip and Access Channel as described in KBJ's Dredging Plan (KBJ 2019).

2.2.2 Alternative Methods

The dredging methods previously described are standard industry practice suitable for the materials that will be dredged and the shore and bottom composition in the nearby vicinity. These tried and true methods have been selected to meet production rate expectations while also achieving Oregon water quality compliance standards.

2.3 QUANTITIES

Final Dredging. The total amount of dredged material to be removed from the NRIs, to achieve a design depth of -39 ft MLLW including 2 feet of Advanced Maintenance, and overdredge, is 584 thousand CY (TCY). This quantity is made up of 79 TCY of sand, and 505 TCY of sandstone and siltstone. At the Eelgrass Mitigation site, 38 TCY of sand will be removed to achieve a design depth of -2 ft MLLW. These are preliminary dredge quantities that will be confirmed in final design.

2.4 DREDGING SCHEDULE

To achieve an in-service date of the first half of 2024, construction proposed dredging activities are expected to begin in the second half of 2020 after the Federal Energy Regulatory Commission (FERC) order and other applicable permits and approvals are issued. Dredging of NRIs is expected to be completed in up to four seasons of In-Water Work Windows (IWWW) that extend from October 1 to February 15.

The Interim Readiness Date (IRD) assumes that the APCO 2 Site is ready to receive dredge material from the NRIs on October 1, 2020.

All installation, use, and removal of the temporary unloader, loader, elevated sections of pipeline over existing eelgrass beds, booster pump station platforms, and submerged slurry transport line, will occur during the IWWW.

Dredging of the Eelgrass Mitigation site will occur during the allowable IWWW (October 1 through February 15). Notice to Proceed (NTP) is anticipated to be the second half of 2020.

Work in the Kentuck Inlet associated with the Kentuck Project site will occur during the allowable IWWW. The annual IWWW within the Kentuck Slough upstream of the existing East Bay Drive tide gate extends from July 1 through September 15th. The NTP for site construction is anticipated to be in mid - 2020. IRD assumes that the site is ready to receive dredge material on October 2021.

Part 2 – Water Pollution Control Plan

3. DREDGE MATERIAL TRANSPORT AND DISPOSAL

3.1 DISPOSAL ACTIVITIES, METHODS AND LOCATIONS

Dredged material from the NRIs and Eelgrass Mitigation site will be transported to the APCO 2 Site, as described below.

3.1.1 NRIs

Dredged material from the NRIs will be placed on the APCO 2 Site for dewatering within disposal area berms. Dredged material removed with a hydraulic cutter suction dredge from NRI 1 and 4 will be pumped directly to the APCO 2 Site through a submerged slurry transport pipeline aligned outside east side of the FNC. Dredged material removed with a hydraulic cutter suction dredge from NRI 2 and 3 will be pumped directly to the APCO 2 Site through a submerged slurry transport pipeline located outside the west side of the FNC that will cross the FNC to the east side. The crossing depth will be such that obstructions to vessel traffic at the -37 feet MLLW depth will be mitigated.

Dredged material removed with mechanical dredges will be placed in barges. Loaded barges will deliver the material to the Temporary Dredge Off-Loading area near APCO 2 Site where it will be hydraulically transported through a partially pile-supported pipeline over existing eelgrass beds to the onshore disposal area for dewatering.

Refer to Appendix B for the location of the NRIs, and APCO 2 Site.

3.1.2 Eelgrass Mitigation site

Dredged material from the Eelgrass Mitigation site will be placed on the APCO 2 Site for dewatering within disposal area berms. Dredged material removed with a shallow-water hydraulic dredge will be pumped via a slurry transport line to the Temporary Dredge Loading area. From the Temporary Dredge Loading area, the dredge material will be loaded onto barges that will be towed by a service tug to the Temporary Dredge Off-Loading area near the APCO 2 Site where it will be hydraulically transported through a partially pile-supported pipeline that will extend above and across existing eelgrass beds to the onshore disposal area for dewatering.

Refer to Appendix B for the location of the Eelgrass Mitigation site. Appendix C shows the Temporary Dredge Loading facility, Temporary Off-Loading facility near the APCO 2 Site, and the pipeline alignment that will extend from the Temporary Dredge Off-Loading are to the disposal area on the APCO 2 Site.

3.1.3 Kentuck Project site

As previously described, dredged material from the Marine Slip and Access Channel will be placed on barges and transported by tug to the hydraulic unloader and scow mooring facility at the Kentuck Project site. The dredge material will be hydraulically transported from the Unloader through a pipeline to the desired location on the Kentuck site. The slurry will be discharged from the pipeline into bermed disposal areas constructed of dry material. The disposal areas and berms will be sized to accommodate the dredge material delivery method and flow rate. The slurry pipe that discharges to the disposal areas will be relocated frequently to allow for the even distribution of dredge spoils and the collection and removal of decant water.

Refer to Appendix B for the location of the Kentuck Project site.

3.1.4 Temporary Dredge Off-Loading Area (near APCO 2 site)

A hydraulic unloader will operate from a moored (anchored/spudded) barge, or Temporary Dredge Off-Loading area located close to the APCO 2 Site, in a location that provides sufficient area and depth for mooring and a safe approach and departure of tug-towed barges.

Refer to Appendix C for the location of the Temporary Dredge Off-Loading facility near APCO 2 Site.

3.1.5 Slurry Transport Pipeline and Booster Pumps

For the hydraulic cutter suction dredging of NRI 1 and 4, the submerged slurry transport pipeline will extend from the dredging site to the APCO 2 Site. The slurry pipeline, which will consist of 27 to 30-inch diameter steel pipe, polypropylene pipe, or similar, will be aligned along the estuary bed following the east or south side of the FNC. Booster pumps, located on a moored (anchored/spudded) barges or on temporary pile-supported platforms, will be stationed intermittently along the alignment as necessary. The pipeline will be elevated above the water to join the booster pumps and then return to the bottom until reaching the next booster pump or the APCO 2 Site. For dredging of NRI areas 2 and 3, the submerged

Temporary Dredge Transfer Line will extend from the hydraulic cutter suction dredge across the FNC at the Jarvis Turn or Upper Jarvis Range(s), to the APCO 2 Site utilizing booster pump(s) as previously described.

For all mechanical dredge operations, dredge material delivered by barges to the Temporary Dredge Off-Loading area near the APCO 2 Site will be transferred to the disposal areas onshore via the pile-supported slurry transport pipeline.

Based on mapping of existing eelgrass beds, the submerged slurry pipeline extending from the Eelgrass Mitigation site will be aligned across bedlands void of eelgrass, will be raised from the bottom to join booster pumps stationed on barges or pile-supported platforms and then will terminate at the barge-mounted hydraulic loading facility stationed near the FNC. The slurry pipeline is expected to consist of 14-inch diameter high density polyethylene (HDPE) pipe. Dredge material delivered by barge to the Temporary Dredge Off-Loading area near the APCO 2 Site will be transferred to disposal areas onshore via the Temporary Dredge Transfer Line.

Subject to final design, floating dredge line may be used for portions of the transport distance, such as between booster stations, or in order to link the pipeline on the west side of the FNC (for NRI 2 and 3) to the east side (for NRI 1 and 4).

When hydraulic transport of all dredge slurry has been completed, the pipelines will be drained, flushed with clean water, and cut apart only in those areas where any residual material in the pipeline would not be released into the bay, wetlands, or other receiving waters.

Refer to Appendix C for the locations of the Temporary Dredge Transfer lines, sections of floating pipeline, and the booster pump stations.

3.2 EXISTING HYDROLOGY

Coos Bay is the second largest estuary in Oregon, accounting for about 27 percent of the state's estuarine resources. The surface area of the bay is approximately 11,000 acres at high tide and approximately 5,800 acres at low tide, with tidelands covering approximately 4,600 acres (2,700 acres of tidal marsh and 1,400 acres of eelgrass beds). The Coos Bay and Coos River Basin are located within Oregon's South Coast Basin, Hydrologic Unit Code (HUC) 171003. Coos Bay drains a total of 605 square miles in southwestern Oregon, and its HUC is 17100304.

3.3 NATIVE SOILS

Soils in the vicinity of the LNG Terminal are classified by the Natural Resources Conservation Service (NRCS) as Hydrologic Soil Groups A, B, C, and D. The primary soil types found are Heceta and Waldport sands. These are well-drained soils in Hydrologic Soil Group A. On-site infiltration testing was performed in November 2018 in the vicinity of the Terminal. Soil conditions and infiltration characteristics at APCO 2 and Kentuck are being investigated.

3.4 GROUNDWATER

The North Spit of Coos Bay is at the southern edge of the 19.5 square mile (12,480 acre) Dune Sand Aquifer. The Dune Sand Aquifer is an unconfined (having no overlying impervious rock layer), unconsolidated deposit aquifer composed primarily of loosely compacted and uncemented fine- to medium-grained sand with areas of discontinuous silt and clay. In the vicinity of the LNG Terminal, the sand aquifer extends to a depth of 160 feet below sea level, and groundwater elevations have varied from a high of approximately El 18 feet to approximately El 1 foot. The groundwater levels fluctuate seasonally in response to rainfall and have varied by up to approximately 4 feet. Groundwater elevations increase with distance to the north away from Coos Bay. Groundwater levels fluctuate with the Coos Bay tides and fluctuate seasonally in response to rainfall.

Site specific geotechnical analysis and recommendations at APCO 2 is ongoing. At Kentuck, the purpose of the Project is a tidal influenced mitigation site inundated with salt-water flows.

3.5 DISPOSAL SITE WATER POLLUTION CONTROLS

3.5.1 Structural Controls

Material from the hydraulic cutter suction dredges will be suspended in water and pumped as a slurry via submerged Temporary Dredge Line laid on the bed. Short sections of the dredge line will be raised to the water surface to connect to booster pumps stationed in temporary barges or on pile-supported platforms. The dredge lines will have welded or heat fused joints, resulting in negligible risk of leakage and, therefore, will not have local spill inspection measures installed.

The slurry will be discharged from the Temporary Dredge Transfer Line into bermed disposal areas constructed of dry material at the APCO 2 Site or Kentuck Project site. The disposal areas and berms will be sized to accommodate the dredge material delivery method and flow rate. The Temporary Dredge Transfer Line that discharges to the disposal areas will be relocated frequently to allow for the even distribution of dredge spoils and the collection and removal of decant water.

Mechanical loading, using a clamshell, reduces the amount of water transferred with the dredge material into barges. Decant water in barges that meets water quality standards will be discharged into the bay so that mostly dry material is transported to the APCO 2 or Kentuck sites.

At the APCO 2 Site or Kentuck Project site, decant water received from Temporary Dredge offloading facilities will be treated through settling and infiltration in the disposal area. At a low point within the disposal area a vertical riser will be installed to allow decant water that meets water quality standards will be discharged to Coos Bay via a decant return line. Decant water that does not meet water quality standards will be further treated prior to discharge to Coos Bay. The decant water return pipeline will consist of 18-to-20-inch-diameter fused polypropylene pipe or a similar material.

Turbidity will be monitored in accordance with Section 4.0, Water Pollution Control Practices. Dredge spoils within the disposal areas will be protected to prevent sediment or turbid water from discharging to surface waters. Additional details on sediment and erosion control BMPs to be utilized at the dredge

disposal sites are described in the Erosion and Sediment Control Plans for APCO 2 Site and the Kentuck Project site (see Appendix A-2 and Appendix A-1).

3.5.2 Operational Controls

The cutter suction dredge and Temporary Dredge Lines will be operated well under their respective design pressure capacities. Before dredging is initiated, the pipeline will be pressure tested to ensure the quality of all welded or heat fused joints and connections. During dredge operations, meters will be used to measure the flow rate. In addition, the dredging operator will continuously monitor the meters to reduce the likelihood that a blockage or leakage will occur.

Upon surfacing from the water, the head of the mechanical dredge (clamshell or excavator bucket) will be swung over the barges fitted with turbidity barriers to ensure turbid dredge materials are transferred to the barge and not discharged directly into Coos Bay. The dredge will be operated well under its design capacity for weight and reach. Meters will be used to measure hydraulic pressure.

3.5.3 Monitoring Protocols

The dredge and associated equipment will be inspected by a qualified person prior to being entered into service to ensure they are in safe and operating condition. Visual inspections of the booster pump stations and pipeline connections will be conducted periodically by a qualified ESCP inspector per ODEQ requirements. Since the submerged and above-water sections of the Temporary Dredge Line have heat-fused joints, leaks are not anticipated. Furthermore, hydraulic pressures in the pipeline will be monitored to detect any potential leaks.

The location of the Temporary Dredge Transfer lines/Offloading areas, booster stations, and any floating dredge line connections will be clearly marked and will display appropriate lights at night and when visibility is restricted.

3.6 DREDGED MATERIAL CHARACTERIZATION PROTOCOL

Based on previous in-water sediment sampling conducted in Coos Bay, the material to be dredged has been characterized as clean, and therefore, is eligible for placement in upland areas. A comprehensive sediment sampling and analysis program (SAP) protocol was approved by the U.S. Army Corps of Engineers on October 12, 2006. The SAP was developed based on procedures outlined in the Lower Columbia River Management Area Dredged Material Evaluation Framework (DMEF) (USACE et al. 1998). The sediment SAP followed the DMEF Tier IIB approach for physical and chemical evaluation of the proposed dredged material.

Between 1989 and 2015, approximately 20 sediment sampling and characterization events took place in various locations within the vicinity of proposed activities associated with the Jordan Cove Liquefied Natural Gas (LNG) Terminal. This information is summarized in Attachment B (Sediment Sampling History within JCEP Project Area) of JCEP-PCGP Section 404/10 Response to USACE PSET Data Request, 07/02/2018. The physical characterization of material in the FNC RM 6 to RM 9.2 (which includes NRI 4) was determined to be generally course-grained indicated low likelihood that contaminants are present. For the remainder of the FNC (including NRI 1, 2 and 3), sediment grain size

was found to vary depending on location in estuary. In-bay sediments from RM 1 to 12 are mixed sand, concentrations of all chemicals of concern were below marine screening levels (SLs).

In late 2016, the Portland Sediment Evaluation Team (PSET), a multi-agency review team, reviewed the status of sediment analysis work conducted for the Project. The USACE summarized the results of the PSET review in a January 19, 2016, memo (USACE 2016). The PSET determined that the sediment sampled within the FNC (in the vicinity of the NRIs and Eelgrass Mitigation site) is clean, suitable for unconfined aquatic disposal.

4. WATER POLLUTION CONTROL PRACTICES

4.1 TURBIDITY

Ambient turbidity, controls, and monitoring measures are described in detail below.

4.1.1 Turbidity Levels

Ambient Turbidity Levels. The ambient turbidity levels in the waters of Coos Bay (generated by flows, waves, and ship traffic) create a background level of turbidity ranging by season from 3.7 to 18.1 nephelometric turbidity units (NTUs). Ambient levels of total suspended solids (TSS) at the North Spit-BLM boat ramp gauge near the proposed LNG Terminal has been calculated to be 40 mg/L (Moffatt & Nichol 2016).

Impacts Caused by NRI and Eelgrass Mitigation site Dredging. Construction dredging of the NRIs and the eelgrass mitigation site will result in temporary suspended sediment release similar to those that currently occur during maintenance dredging activities by USACE for the existing FNC. It is anticipated that the increases in turbidity will be temporary and localized, and will be taking place in areas where such increases will not depart substantially from ambient turbidity levels. The turbidity created by dredging is expected to be temporary, occurring only during and immediately after dredging activities take place within the authorized in-water work window.

Moffatt & Nichol performed turbidity plume dispersion modeling associated with dredging of the NRIs and Eelgrass Mitigation site. The analysis also was conducted for the marine slip, access channel, and MOF. The results for these sites are discussed in the Turbidity Analysis Memo (Moffatt & Nichol 2017) and KBJ's Dredging Plan (KBJ 2019). The modeling considered both hydraulic cutter suction and mechanical clamshell dredge methods. A number of simulation cases were assessed. The results of the modeling at the NRIs show that both dredge methods produce a similar turbidity plume that moves with the direction of the current (upstream or downstream). All plumes are localized to the point of dredging and disperse relatively quickly. At the eelgrass mitigation site, elevated turbidity (10 NTU above background) was determined to be localized.

Impacts Caused by Kentuck Project Dredge Material Placement. The dredge material will be hydraulically transported from the Temporary Dredge Off-Loading area through an onsite Dredge Transfer Line that will extend to desired locations on the Kentuck Site. The slurry will be discharged

from the onsite Dredge Transfer Line into bermed disposal areas constructed of dry material. The disposal areas and berms will be sized to accommodate the dredge material delivery method and flow rate. The onsite Dredge Transfer Line that discharges to the Kentuck disposal areas will be relocated frequently to allow for the even distribution of dredge spoils and the collection and removal of decant water. Water quality protection measures associated with upland activities are addressed in the Erosion and Sediment Control Plans (ESCPs) for the Kentuck Project site, attached in Appendix A-1 to this DPCP.

Impacts Causes by Disposal at APCO 2 Site. The dredge material hydraulically transported to APCO 2 Site will be discharged from the pipeline into bermed disposal areas constructed of dry material. Similar to the Kentuck Project site, the disposal areas and berms will be sized to accommodate the dredge material delivery method and flow rate. The slurry pipe that discharges to the disposal areas will be relocated frequently to allow for the even distribution of dredge spoils and the collection and removal of decant water. Decant water received will be treated through settling and infiltration in the disposal area, and discharged (when it meets water quality requirements) to Coos Bay via a decant return line. Water quality protection measures associated with upland activities are addressed in the Erosion and Sediment Control Plans (ESCPs) for the APCO 2 Site, attached in Appendix A-2 to this DPCP.

4.1.2 Description of Turbidity Controls

4.1.2.1 Structural Controls

Similar to the structural controls discussed in Section 3.3.1, structural controls for turbidity include the use of welded or heat-fused joints in the slurry transport line. This will result in negligible leakage thereby mitigating the risk of elevated turbidity. The slurry will be discharged from the pipeline into bermed disposal areas constructed of dry material at the APCO 2 Site or Kentuck Project site. Thus, no release of material with potential to cause elevated turbidity in Coos Bay will occur.

For mechanical loading, disposal barges will allow decant water to settle to appropriate water quality standards prior to discharge into the bay. Turbidity will be monitored in accordance with Section 4.0, Water Pollution Control Practices. Dredge spoils within the disposal areas will be protected to prevent sediment or turbid water from discharging to surface waters. Additional details on sediment and erosion control BMPs, that may impact turbidity, to be utilized at the dredge disposal sites are described in the Erosion and Sediment Control Plans for APCO 2 Site and the Kentuck Project site (see Appendix A-2 and Appendix A-1).

4.1.2.2 Operational Controls

In addition to upland controls as defined in the ESCP (refer to Appendix A-1 and Appendix A-2), operational controls include ceasing dredging (refer to Subsection 4.1.3 discussing turbidity monitoring controls), decreasing cutter head speed, decreasing suction flow rate, using a different size or type of dredge, and/or avoiding stockpiling during peak ebb conditions. Monitoring will be conducted at the dredge site to ensure that turbidity levels are within allowable exceedance levels as discussed below and in Table 4.1. All of the above measures may be used as dictated by Appendix D (BMP Flow Chart).

Operational controls will also be provided by conducting all dredging activities within the in-water work window (IWWW), between October 1 and February 15.

In terms of discharge controls to surface waters, the water used to hydraulically convey the dredge material from the stationed unloader near APCO 2 to the onshore disposal areas will be recycled, and not released directly into the bay.

The following is a description of possible additional operational controls and practices that may be implemented in addition to the actions presented in Appendix D to reduce turbidity that may be implemented during dredging activities:

- Schedule, sequence, or phase work activities to minimize dredging-related disturbance and duration of activities that take place below ordinary high water;
- Employing an experienced operator;
- No dumping of partial or full buckets of material back into the bay;
- Adjusting the volume, speed, or both of loads of hydraulic suction equipment; and
- Limiting number and location of bay access events with equipment;

Control Application. A flow chart of how and when BMPs will be applied during dredging activities is presented in Appendix D.

4.1.3 Monitoring Controls

Turbidity monitoring will be conducted during all daylight dredging operations. The basis for monitoring controls and compliance requirements are sourced from ODEQ's 401 Water Quality Certification (WQC) General Conditions technical memorandum and are described in the following sections.

4.1.3.1 Turbidity Monitoring

When dredging in areas where the expected sediment is comprised of more than 20 percent fine-grained material, or is expected to degrade and release more than 20 percent fine-grained material, a turbidity meter shall be used to collect quantitative data measured in NTUs. Meter data and/or visual data will be recorded on a daily log (refer to Appendix E).

In general, no more than a 10 percent increase in project-caused turbidity above background levels should occur with the implementation of BMPs (OAR 340-041-0036); however, according to the rule, if all reasonably available BMPs are implemented, turbidity exceedances of more than 10 percent above background are allowed for limited times depending on the severity of the increase (refer to Table 4-1).

Background Location. The background location will be taken at a relatively undisturbed location, approximately 100 feet up-current from the dredging activity.

Compliance Location. The compliance location will be down-current from the dredging activity at approximately mid-depth with any visible plume at a distance of the lesser of 100 feet or maximum surface dimension from the dredging activity.

Compliance Determination. At the start of work, turbidity will be measured at both the background and compliance locations at a frequency directed in Table 4-1 and 4.2 and recorded in the daily log (refer to Subsection 4.1.3.2 for more detail on recordkeeping), depending on the type of monitoring chosen (turbidity meter or visual). Turbidity measurements must be representative of water body turbidity when the dredging activities are being conducted. Measurements cannot be taken during cessation of activity.

If dredging-caused turbidity is elevated above background, additional controls must be implemented and both compliance and background locations monitored. A description of the additional controls and the date, time, and location where they are implemented must be recorded in the daily log as discussed in Subsection 4.1.3.2. All reasonable available controls and practices will be implemented to minimize turbidity during dredging activities. Such control measures are further described in Section 4.1.2 and shown in Appendix D.

Table 4-1 Turbidity Meter Monitoring Protocol

Turbidity Meter Monitoring		
ALLOWABLE EXCEEDANCE TURBIDITY LEVEL	**ACTION REQUIRED AT FIRST MONITORING INTERNAL**	**ACTION REQUIRED AT SECOND MONITORING INTERNAL**
0 to 5 NTU above background	Continue to monitor every 4 hours	Continue to monitor every 4 hours
5 to 29 NTU above background	Modify controls and continue to monitor every 4 hours	Stop work[1] after 8 hours at 5 to 29 NTU above background
30 to 49 NTU above background	Modify controls and continue to monitor every 2 hours	Stop work[1] after 2 confirmed hours at 30 to 49 NTU above background
50 NTU or more above background	Stop work	Stop work

1. Stop work order for 24-hours through procedures that consider safety procedures, clearing lines, and protecting equipment. Criteria for starting back up will be addressed in detailed design

Table 4-2 Visual Monitoring Protocol

Visual Monitoring		
No plume observed	Continue to monitor every 4 hours	Continue to monitor every 4 hours
Plume observed within compliance distance	Modify controls and continue to monitor every 4 hours	Stop work[1] after 8 hours with an observed plume within compliance distance
Plume observed beyond compliance distance	Stop work	Stop work

1. Stop work order for 24-hours through procedures that consider safety procedures, clearing lines, and protecting equipment. Criteria for starting back up will be addressed in detailed design

Shutdown procedures will be immediately initiated to stop work for the remainder of the 24-hour period if any of the following occurs:

- A visible turbidity plume extends beyond the compliance distance; or
- Turbidity is measured at the compliance point at the following:
    - 50 NTU or more over background at any time;
    - 30 NTU over background for 2 hours; or
    - 5 to 29 NTU over background for 8 hours.

Work may continue if the following occurs:

- No visible plume is observed;
- Turbidity measured at the compliance point is no more than 0 to 5 NTU above background; or
- Additional control measures can be applied to keep the visible plume within the compliance distance, measured turbidity ranges, and durations listed in the tables above.

4.1.3.2 Record Keeping and Reporting

Data will be collected and recorded daily during active dredging, and will include the following in a daily turbidity log:

- Date and time.
- Background and compliance location and coordinates.
- Background and compliance observation/measurements.
- Tidal stage (incoming, outgoing, slack).
- Sunrise and sunset times.
- All controls and BMPs implemented at the start of work.
- Pertinent weather information.
- Presence or absence of a turbidity plume.
- Actual NTU readings from turbidity meter(s).
- Calibration records
- Any additional controls and practices implemented, including date, time, and location of implementation.
- A narrative discussing all exceedances, work stoppages, and any other actions taken.

A copy of the daily log to be used is presented in Appendix E. Copies of daily logs for turbidity monitoring will be made available to DEQ and other regulatory agencies upon request.

5. SPILL RESPONSE PROCEDURES

5.1 EMERGENCY SHUT-OFF PROCEDURES

Emergency shut-off procedures will be tailored toward the equipment selected which will be finalized during final design and based on the dredging contractor selected. For example, any dredge pumps below the waterline will be equipped with a bilge alarm or will automatically shut down in the event of a leak. Project personnel will be properly trained on all emergency shut down procedures prior to commencing work.

5.2 SPILL RESPONSE, CONTROL AND REPORTING

Marine equipment will strictly follow U.S. Coast Guard procedures for spill prevention and controls, including secondary containment and clean-up supplies. The Spill Prevention, Control, and Countermeasure (SPCC) Plan for Construction Activities addresses construction activities for the Project and will be amended whenever there is a change in facility design or construction activity that materially affects the facility's potential for the discharge of oil into or upon the waters of the United States or adjoining shorelines or into or upon the water of the contiguous zone, or in connection activities under the Outer Continental Shelf Lands Act or the Deepwater Port Act of 1974, or that may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States (including resources under the Magnuson-Stevens Fishery Conservation and Management Act).

Should an incident occur, personnel will immediately implement the following spill control measures:

- Perform a hazard assessment.
- Establish site security.
- Establish incident command.
- Evacuate injured or exposed.
- Stop the source of the spill or leak with the use of emergency shut-off valves or turning off the equipment.

Containment activities will be initiated as soon as possible to prevent spreading of the spilled material. Containment techniques include, but are not limited to, the following:

- Trenching and diking.
- Filter fences.
- Spill booms.
- Turbidity curtain (releases of dredging materials).

5.2.1 Initiate Clean-up

Job superintendent or designee will be responsible for reporting any spills or hazardous substances releases and will follow-up with complete documentation. The responsible person will immediately

notify the Facility Response Personnel, as well as the required Federal, State, and local authorities if a reportable quantity is released into the environment.

Agencies and contact phone numbers in the case of reportable release to the environment are as follows:

Oregon Emergency Response Service (OERS)	(800) 452-0311
National Response Center (NRC)	(800) 424-8802
Fire/Police/Ambulance (local response)	911
USCG Sector North Bend	(541) 756-9220
USACE Coos County Contact	(541) 756-2097
EPA Region 10	(800) 424-4372
ODEQ	(800) 997-7888
Coos County Emergency Management	(541) 396-7790

Spill emergency information will be documented in the Spill Emergency Initial Report Form found in Appendix E.

In addition to their reporting responsibilities, the job superintendent or designee will have responsibility for implementing and supervising the containment and cleanup efforts during their shift.

After all craft and staff have mobilized to the Project site, but prior to the start of work, all site personnel will be trained on spill response procedures and appropriate environmental contacts. This training will be documented and signed by all personnel.

Materials and equipment that are planned to be carried on the barge for spill containment and pickup operations include the following:

- Oil containment boom in 10-foot sections.
- Spill kit barrels.
- Oil only diapers.
- Dark grey diapers.

These materials will be available on all dredges and barges readily for use in the event of an in-water spill. Additional materials will be keep in the Contractor's site facility. If spill containment and cleanup operations cannot be completed with materials provided on the vessels, additional materials and support will be utilized by local contractors who have previously confirmed their availability and capacity to respond.

6. REFERENCES

CH2M HILL. 2008. Record of Decision (ROD): Weyerhaeuser Export Services Site, North Bend

David Evans and Associates (DEA), 2018. Compensatory Wetland Mitigation Plan, Rev H. JCLNG Document Control Number: J1-000-TEC-PLN-DEA-00002-00.

KBJ, 2019. LNG Terminal Dredge Pollution Control Plan.

Attachments/Enclosures:

Figure 1: Typical Hydraulic Cutter Suction Dredge

Figure 2: Typical Mechanical Clamshell Dredge

Figure 3: Typical Shallow-Water Hydraulic Dredge

Appendix A-1: ESCP for the Kentuck Project site

Appendix A-2: ESCP for the APCO 2 site

Appendix B: Project Area

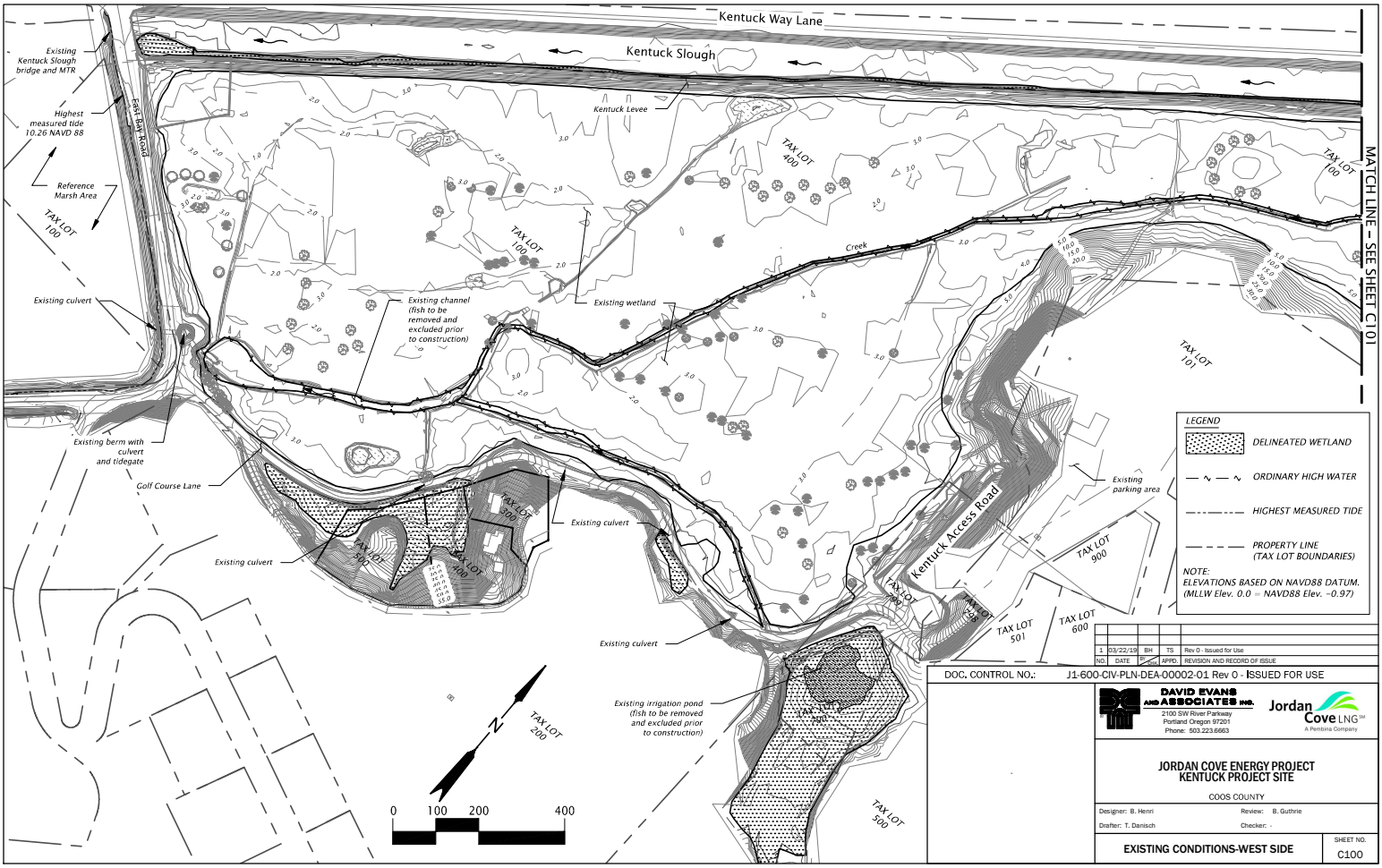
Appendix C: Temporary Dredge Line Location

Appendix D: BMP Flow Chart

Appendix E: Water Pollution Control and Spill Response Forms

7. APPENDICES

APPENDIX A-1: ESCP FOR THE KENTUCK PROJECT SITE



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A Pembina Company

JORDAN COVE ENERGY PROJECT
KENTUCK PROJECT SITE

COOS COUNTY

Designer: B. Henri | Review: B. Guthrie
Drafter: T. Danisch | Checker: -

EXISTING CONDITIONS-WEST SIDE

SHEET NO. C100

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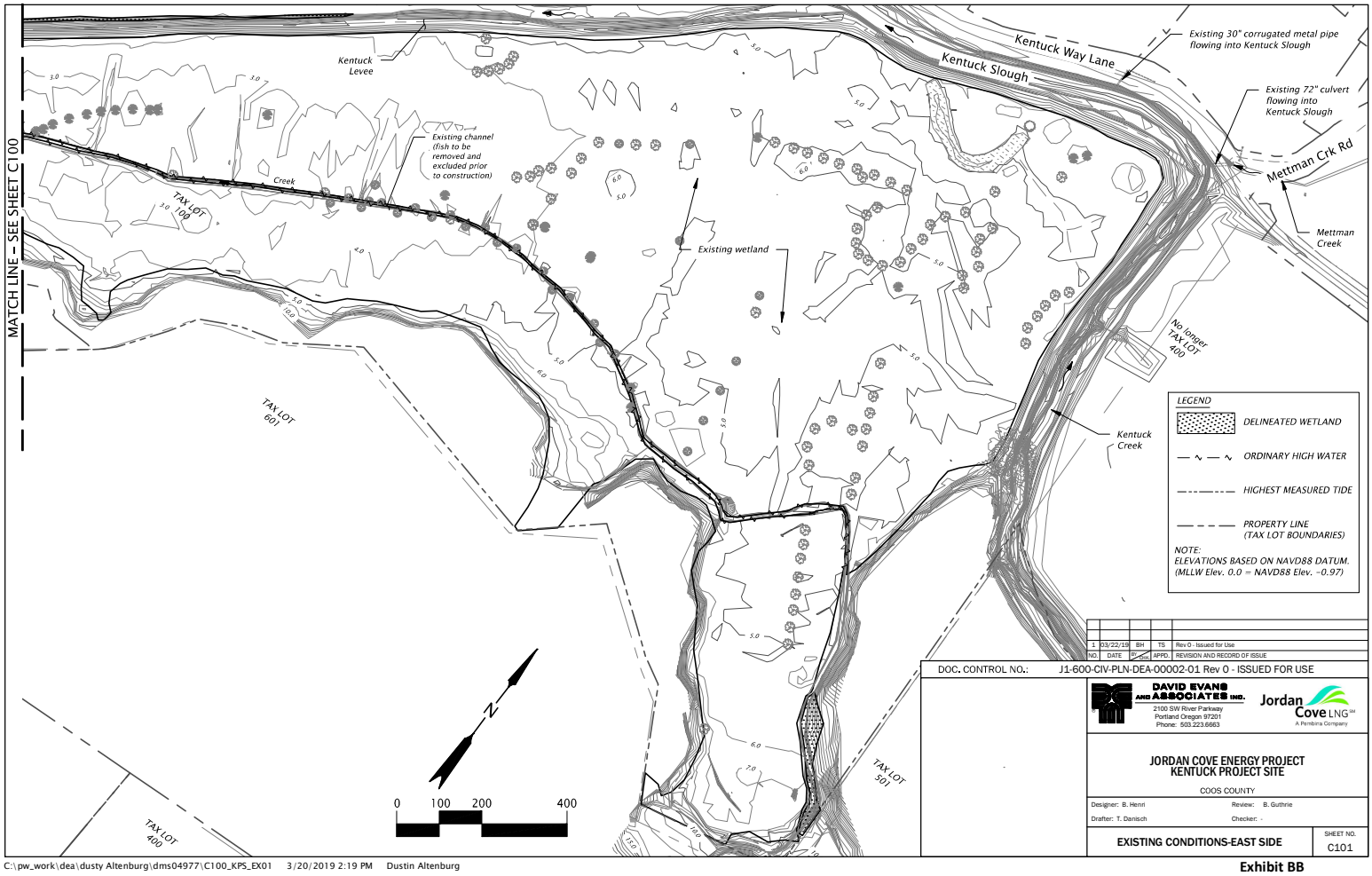

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EXISTING CONDITIONS-EAST SIDE

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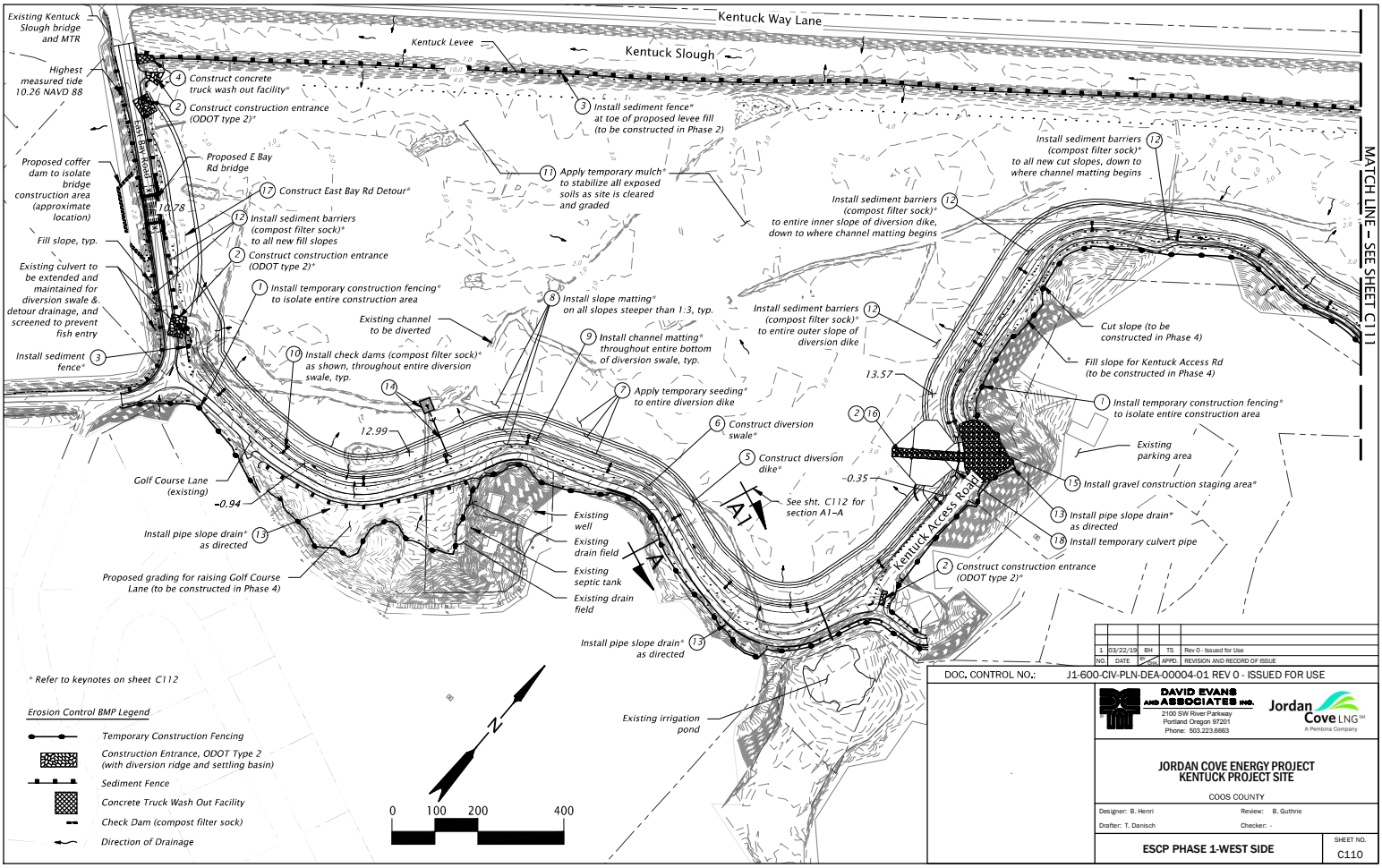
ESCP - PHASE 1 - STRIPPING & TEMP GRADING OF SITE, CONSTRUCTION OF TEMP STREAM DIVERSION, CONSTRUCTION OF E BAY RD AND BRIDGE



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Drafter: T. Danisch | Checker: -

ESCP PHASE 1-WEST SIDE | SHEET NO. C110

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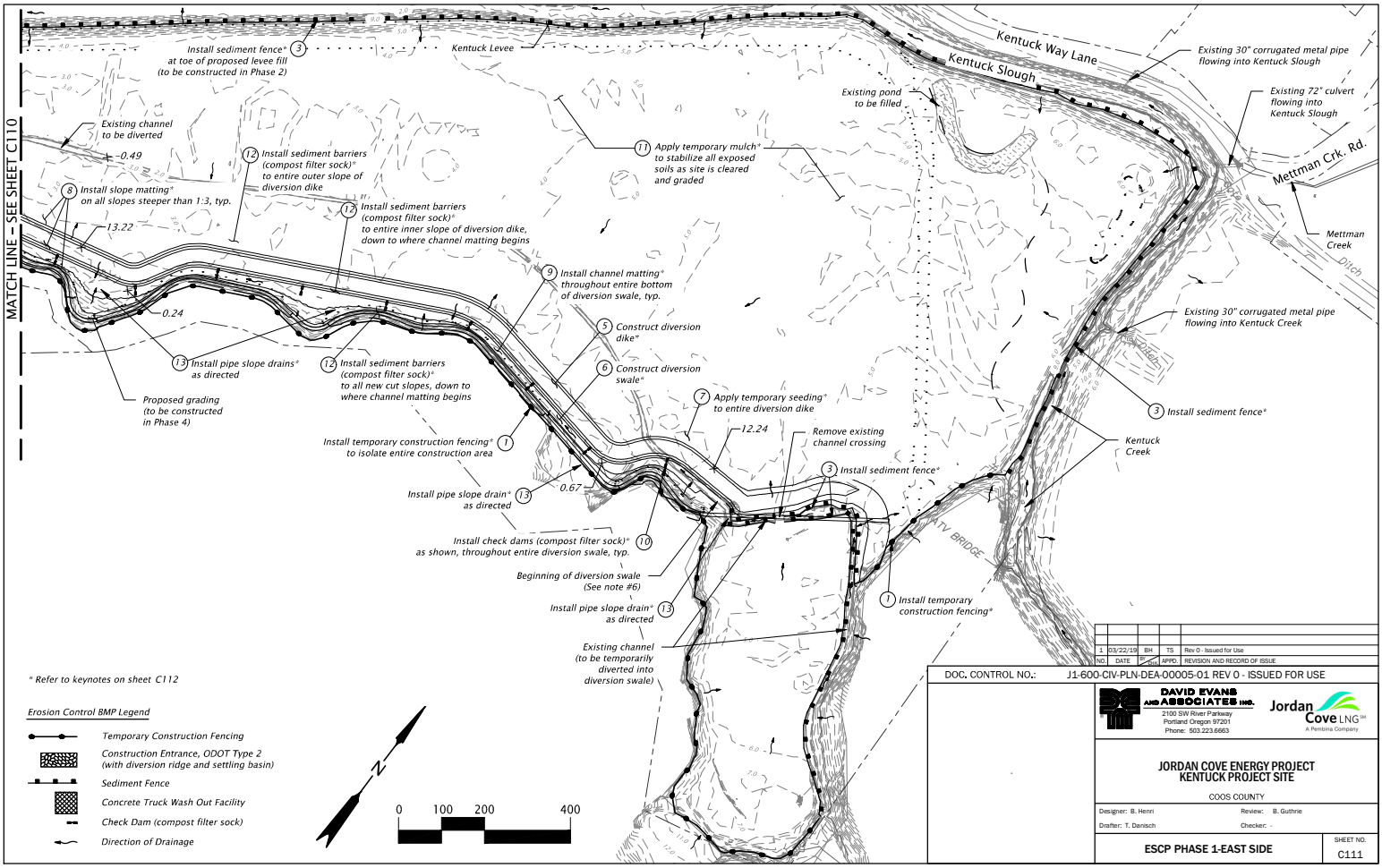
\\deainc.com\files\PROJECT\O\ODOT00000895\0700BLD\Olalla Creek Bridge 2017 - 14957\As Constructed Plans\Olalla_As_Built\18700_Olalla Creek Bridge Replacement

ESCP - PHASE 1 - STRIPPING & TEMP GRADING OF SITE, CONSTRUCTION OF TEMP STREAM DIVERSION, CONSTRUCTION OF E BAY RD AND BRIDGE



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ESCP PHASE 1-EAST SIDE | SHEET NO. C111

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Phase 1 Construction Notes

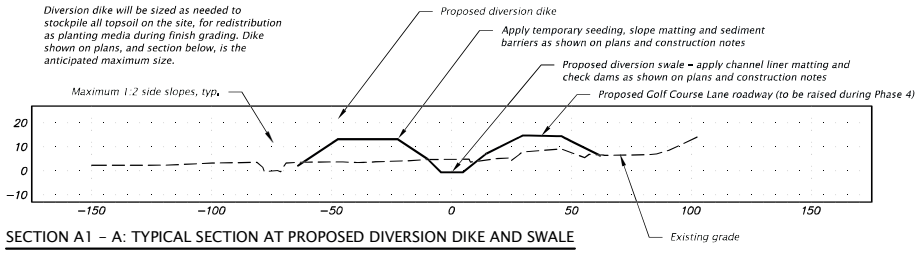
1. *Install temporary construction fencing (See specifications section ____)*
2. *Construct construction entrance, ODOT type 2 (See ODOT drawing no. RD1000)*
3. *Install sediment fence, ODOT type 1 where site conditions permit trenching. Install ODOT type 2 where rock or tree roots prevent trenching. (See ODOT drawing no. RD1040) On existing Kentuck Levee, install sediment fence at toe of proposed fill to be constructed in Phase 2 (See section B1 - B, sht. C123)*
4. *Construct concrete truck wash out facility (See ODOT drawing no. RD1070)*
5. *Construct diversion dike as shown on plans (See CWS drawings no. 850 and typical section, sht. C112)*
6. *Construct diversion swale as shown on plans (See CWS drawings no. 850 and typical section, sht. C112)*
7. *Apply temporary seeding to entire diversion dike. Apply before installation of slope matting. (See specifications section ____)*
8. *Install slope matting on slopes steeper than 3:1, where shown (See ODOT drawing no. RD1055)*
9. *Install channel matting on diversion swale bottom, extending a minimum of 4' up channel sides (See ODOT drawing no. RD1055)*
10. *Install check dam, compost filter sock, in diversion swale as shown on plans (200' on center, typ.) (See ODOT drawing no. RD1006)*
11. *Install temporary mulch to stabilize exposed soils as temp. grading progresses (See specs sections ____ and ____ for soil stabilization and mulching requirements)*
12. *Install sediment barrier (compost filter sock) parallel to contours. Place on slopes according to spacing table on ODOT drawing. (See ODOT drawing no. RD1032)*
13. *Install pipe slope drain as directed, to be field located where required during construction of temp. stream diversion (See CWS drawing no. 815)*
14. *Install temporary outfall structure*
15. *Install gravel construction staging area*
16. *Access with gravel construction access*
17. *Construct East Bay Rd. Detour*
18. *Construct temporary 24" CMP culvert pipe at construction entrance.*

Note

Any BMPs shown outside the property or easement lines are for graphic clarity. All BMPs to be located within the project property or easements.

Note

Diversion dike will be sized as needed to stockpile all topsoil on the site, for redistribution as planting media during finish grading. Dike shown on plans, and section below, is the anticipated maximum size.



SECTION A1 - A: TYPICAL SECTION AT PROPOSED DIVERSION DIKE AND SWALE

SCALE: 1" = 40'

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ESCP PHASE 1 NOTES & KEYNOTES

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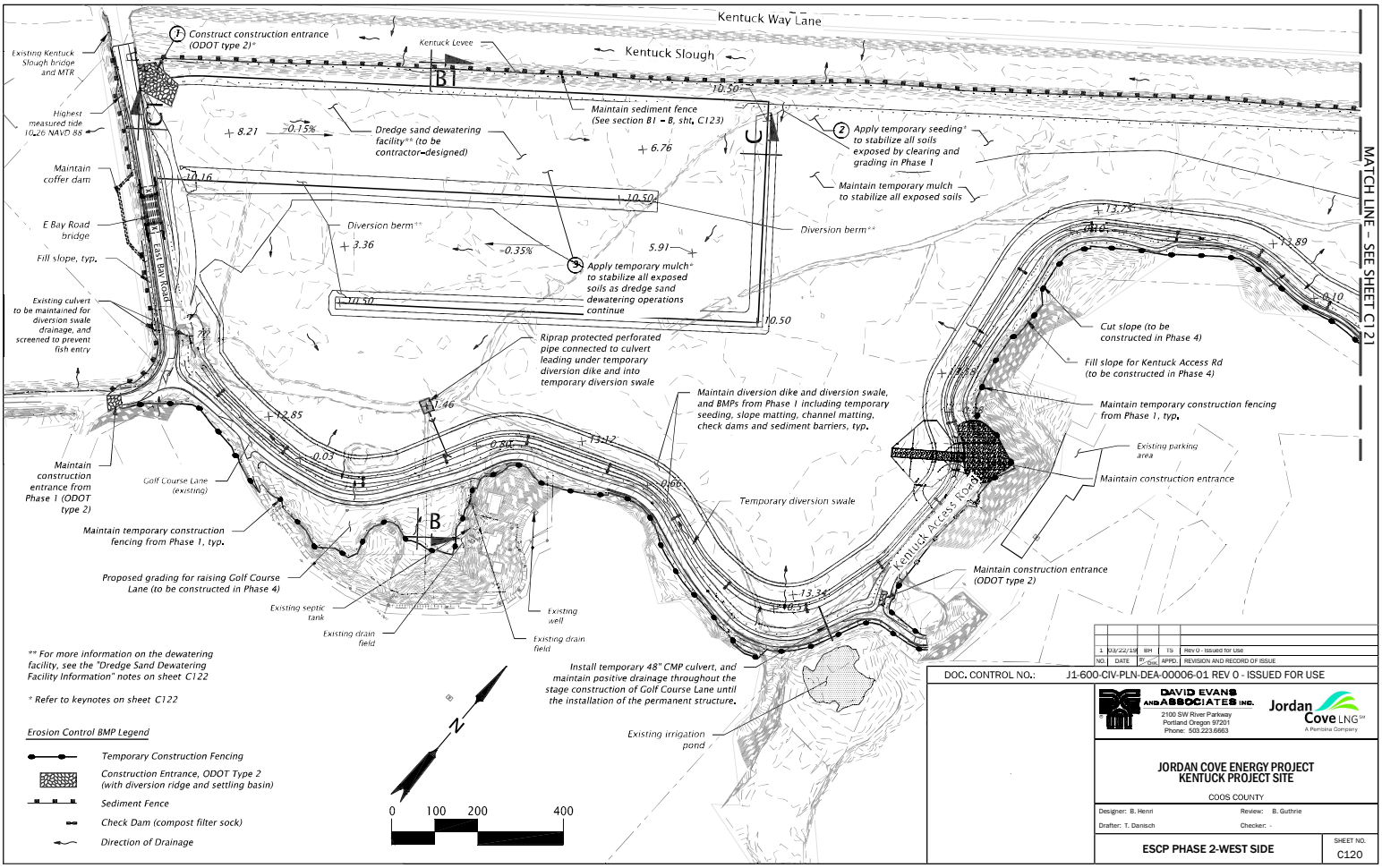

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ESCP PHASE 2-WEST SIDE

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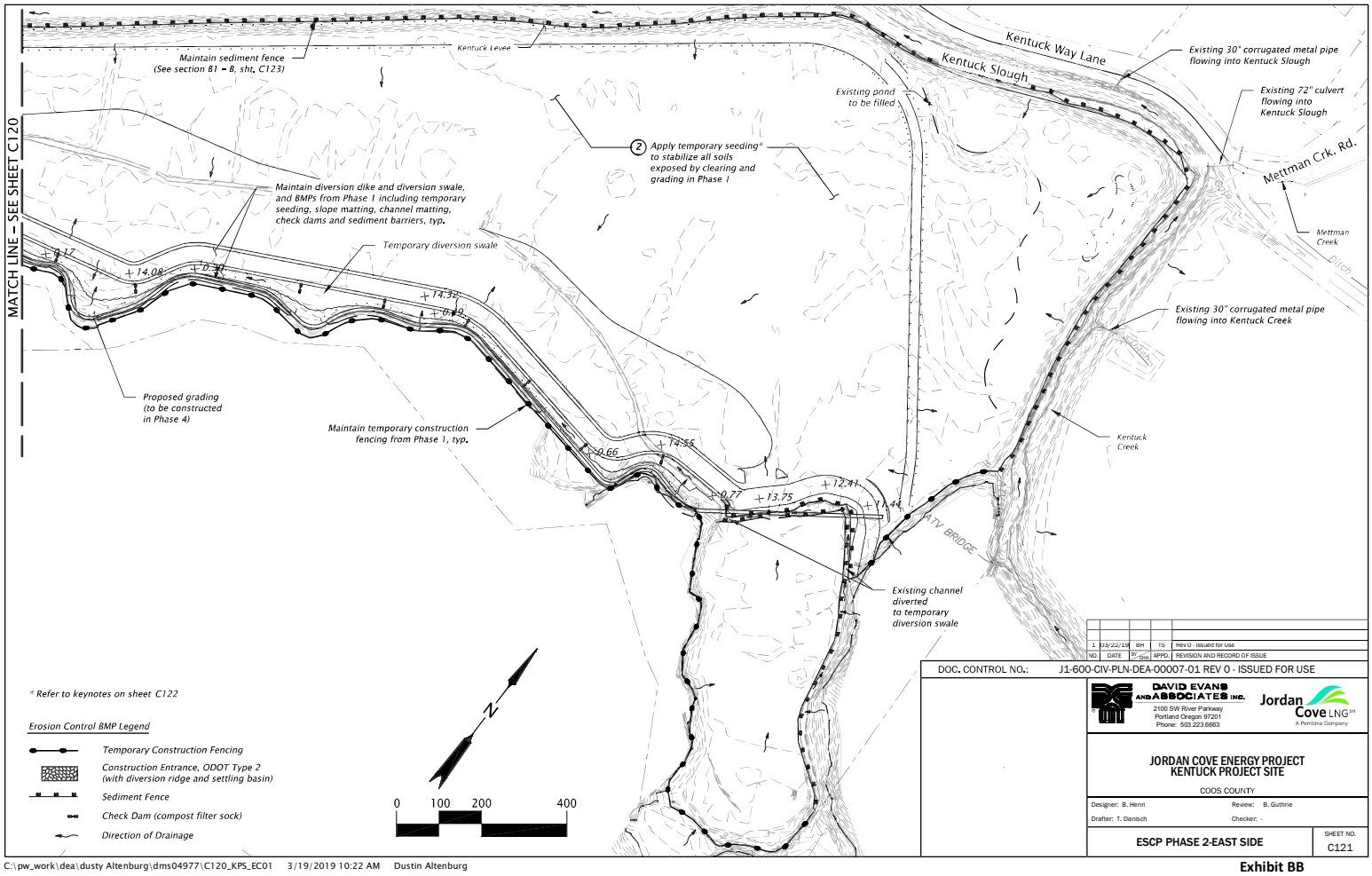

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Phase 2 Construction Notes

1. *Construct construction entrance, ODOT type 2 (See ODOT drawing no. RD1000)*
2. *Apply temporary seeding (See specifications section ____)*
3. *Install temporary mulch to stabilize exposed soils as temp. grading progresses (See specs sections _____ and _____ for soil stabilization and mulching requirements)*

Note

Any BMPs shown outside the property or easement lines are for graphic clarity. All BMPs to be located within the project property or easements.

Dredge Sand Dewatering Facility information:

The dewatering facility will be constructed to dewater dredge sand material, which will be used on site for mass grading. The facility is designed with diversion berms and swales, graded to direct runoff out of the complex.

Dredge sand material will be delivered to the project site via temporary pipeline, anticipated to cross through the intersection of East Bay Road and the Kentuck Levee. Saturated dredge sand material will be placed within the dewatering facility in lifts.

Fully dewatered material will be excavated from the dewatering complex, and deposited throughout the Kentuck site via access along the existing Kentuck Levee. The dewatered dredge sand material will be used in mass grading as it becomes available, to be followed by stockpiled topsoil which will be layered above it for mitigation planting.

Runoff from the dewatering facility will be treated as it leaves the facility, travelling through a temporary sedimentation swale and into a riprap protected perforated pipe. The pipe will be installed to penetrate the temporary diversion berm which was constructed for temporary stream diversion. Through this pipe, runoff will be conveyed out of the complex and into the temporary stream diversion swale, where the runoff will travel through several check dams before leaving the site through the existing culvert at the southwest corner of the site.

The dredge sand dewatering facility, as shown on sheet C120, is conceptual and is shown for illustrative purposes. The dewatering complex will be placed and constructed according to contractor means and methods, and may be relocated within the site to accommodate construction sequencing. Runoff and sediment control BMPs must be effectively applied, ensuring that facility runoff is free of sediment before leaving the project site.

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ESCP PHASE 2 NOTES & KEYNOTES

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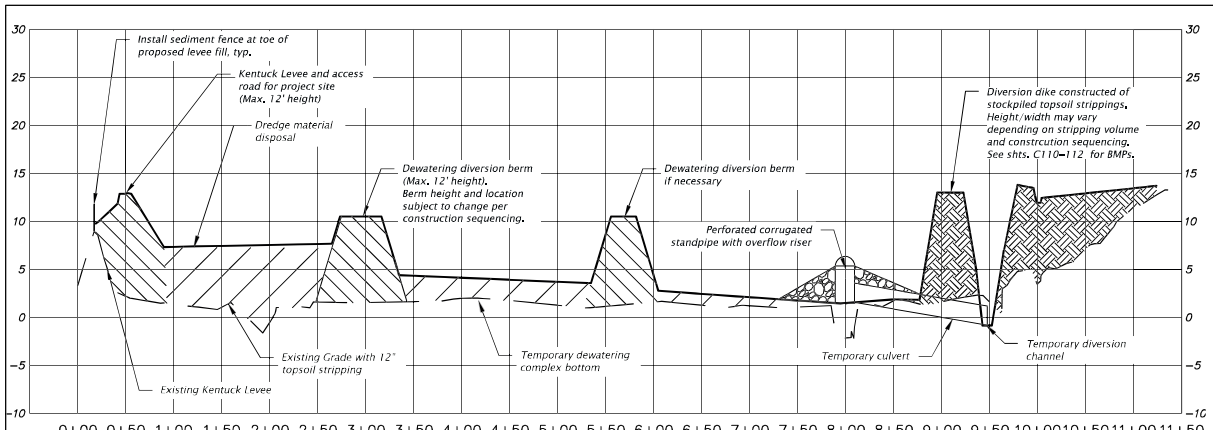

SECTION B1 – B: DIVERSION COMPLEX SECTION

SCALE: HORIZONTAL 1" = 100', VERTICAL 1"=10'

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ESCP PHASE 2 PROFILES

SHEET NO. C123

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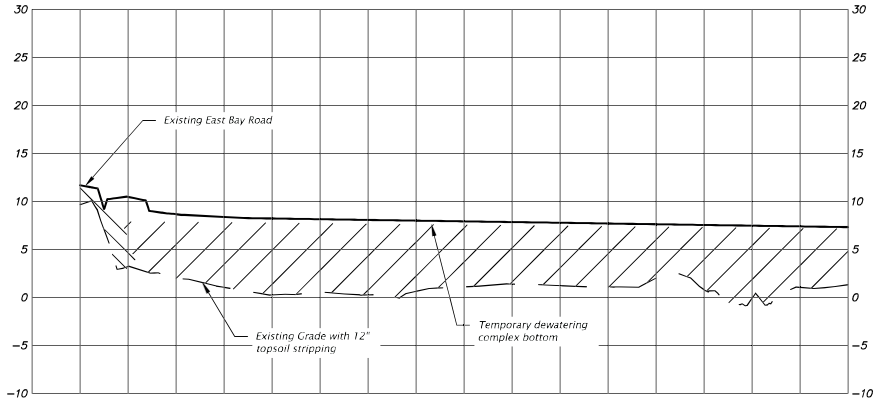
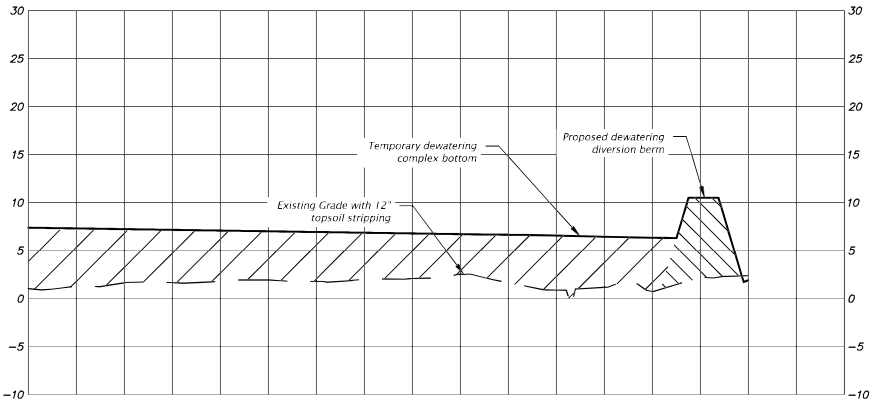


SECTION C1 – C: DIVERSION COMPLEX PROFILE 1

SCALE: HORIZONTAL 1" = 100', VERTICAL 1"=10'



SECTION C1 – C: DIVERSION COMPLEX PROFILE 2

SCALE: HORIZONTAL 1" = 100', VERTICAL 1"=10'

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2100 SW River Parkway
Portland Oregon 97201
Phone: 503.223.6663

Jordan Cove LNG
A Pembina Company

JORDAN COVE ENERGY PROJECT
KENTUCK PROJECT SITE

COOS COUNTY

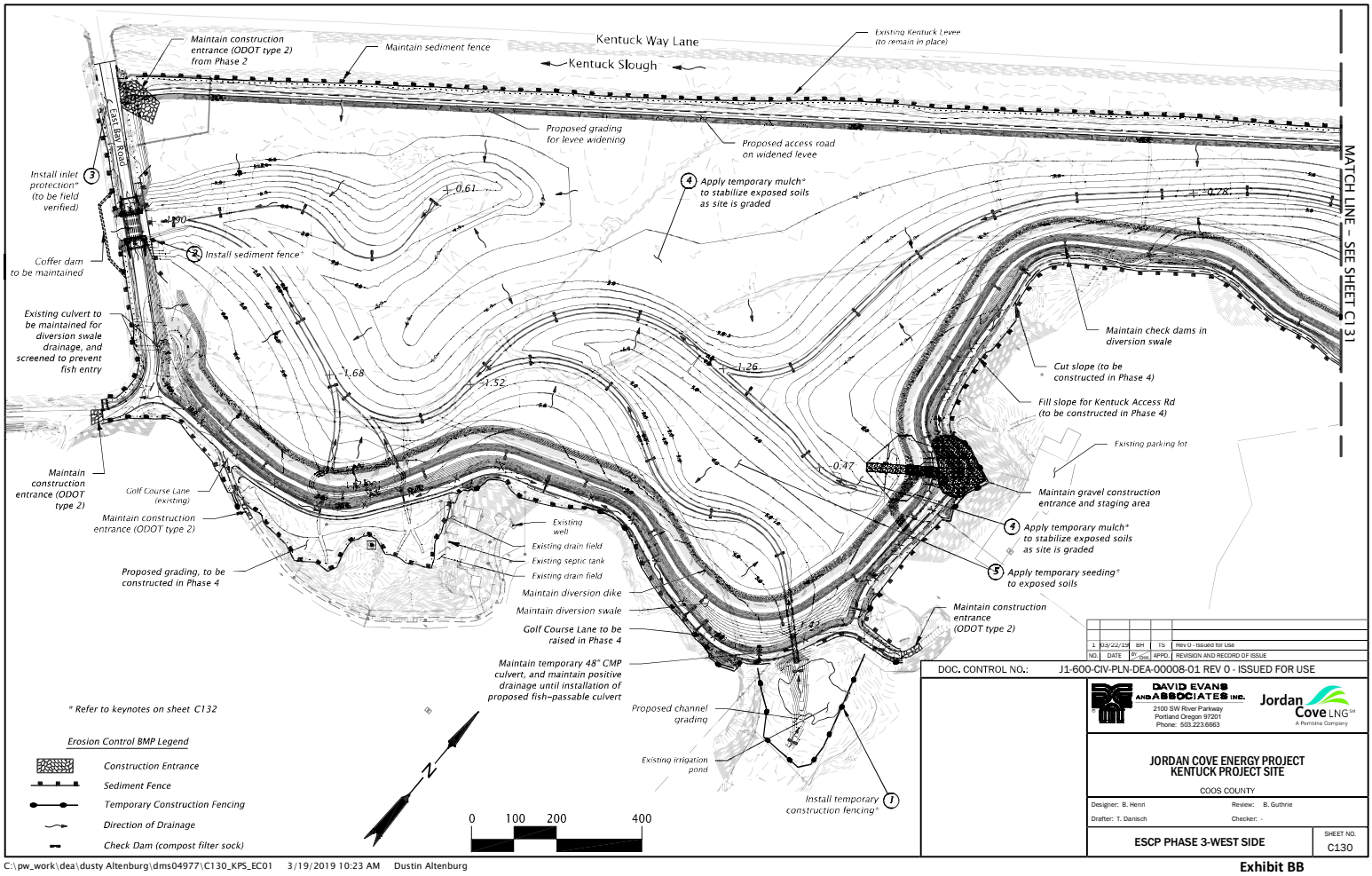
Designer: B. Henri | Review: B. Guthrie
Drafter: T. Danisch | Checker: -

ESCP PHASE 2 PROFILES

SHEET NO. C124

C:\pw_work\dea\dusty Altenburg\dms04977\C120_KPS_EC02 3/19/2019 10:23 AM Dustin Altenburg

ESCP – PHASE 3 – MASS GRADING AND LEVEE WIDENING/RELOCATION



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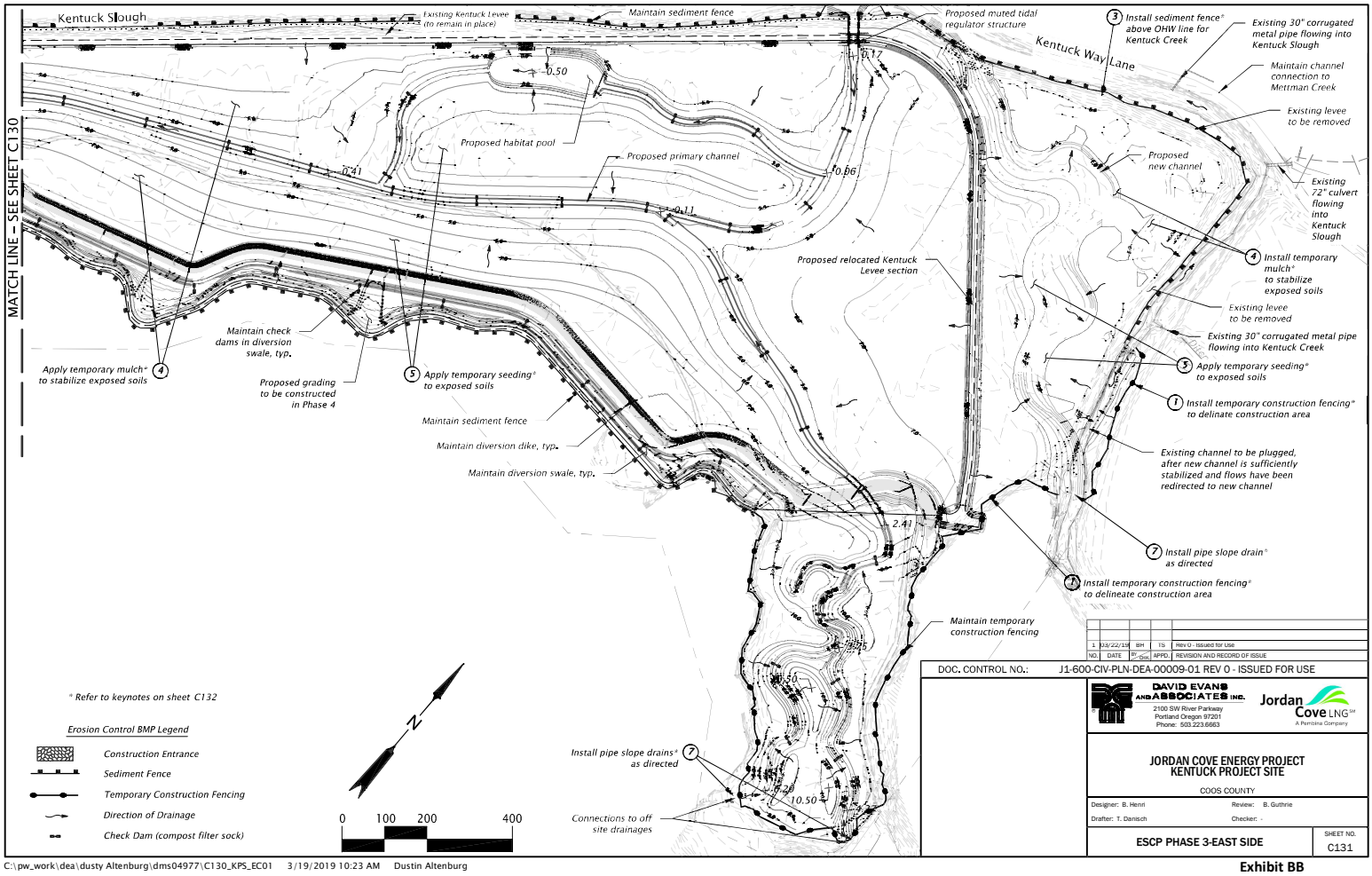
COOS COUNTY

Designer: B. Henri | Review: B. Guthrie
Drafter: T. Danisch | Checker: -

ESCP PHASE 3-WEST SIDE | SHEET NO. C130

C:\pw_work\dea\dusty Altenburg\dms04977\C130_KPS_EC01 3/19/2019 10:23 AM Dustin Altenburg

ESCP – PHASE 3 – MASS GRADING AND LEVEE WIDENING/RELOCATION



NO.	DATE	BY	CHK	APPD.	REVISION AND RECORD OF ISSUE
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DOC. CONTROL NO.: J1-600-CIV-PLN-DEA-00009-01 REV 0 - ISSUED FOR USE

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ESCP PHASE 3-EAST SIDE | SHEET NO. C131

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Phase 3 Construction Notes

1. *Install temporary construction fencing (See specifications section ____)*
2. *Install sediment fence (See ODOT drawing no. RD1040)*
3. *Install sediment barrier, ODOT type 1, where site conditions permit trenching. install ODOT type 2 where rock or tree roots prevent trenching. (See ODOT drawing no. RD1032)*
4. *Apply temporary mulch to stabilize exposed soils as needed, while final grading progresses (See specs sections ____ and ____ for soil stabilization and mulching requirements)*
5. *Apply temporary seeding to exposed soils as needed, while final grading progresses (See specs sections _____ and _____ for soil stabilization and seeding requirements)*
6. *Install sediment barrier (compost filter sock) parallel to contours. Place on scopes according to spacing table on ODOT drawing. (See ODOT drawing no. RD1032)*
7. *Install pipe slope drain as directed, to be field located where required during Phase 3 grading to prevent off site drainages from entering unstabilized construction areas (See CWS drawing no. 815)*

Note

Any BMPs shown outside the property or easement lines are for graphic clarity. All BMPs to be located within the project property or easements.

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KENTUCK PROJECT SITE

COOS COUNTY

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ESCP PHASE 3 NOTES & KEYNOTES

SHEET NO. C132

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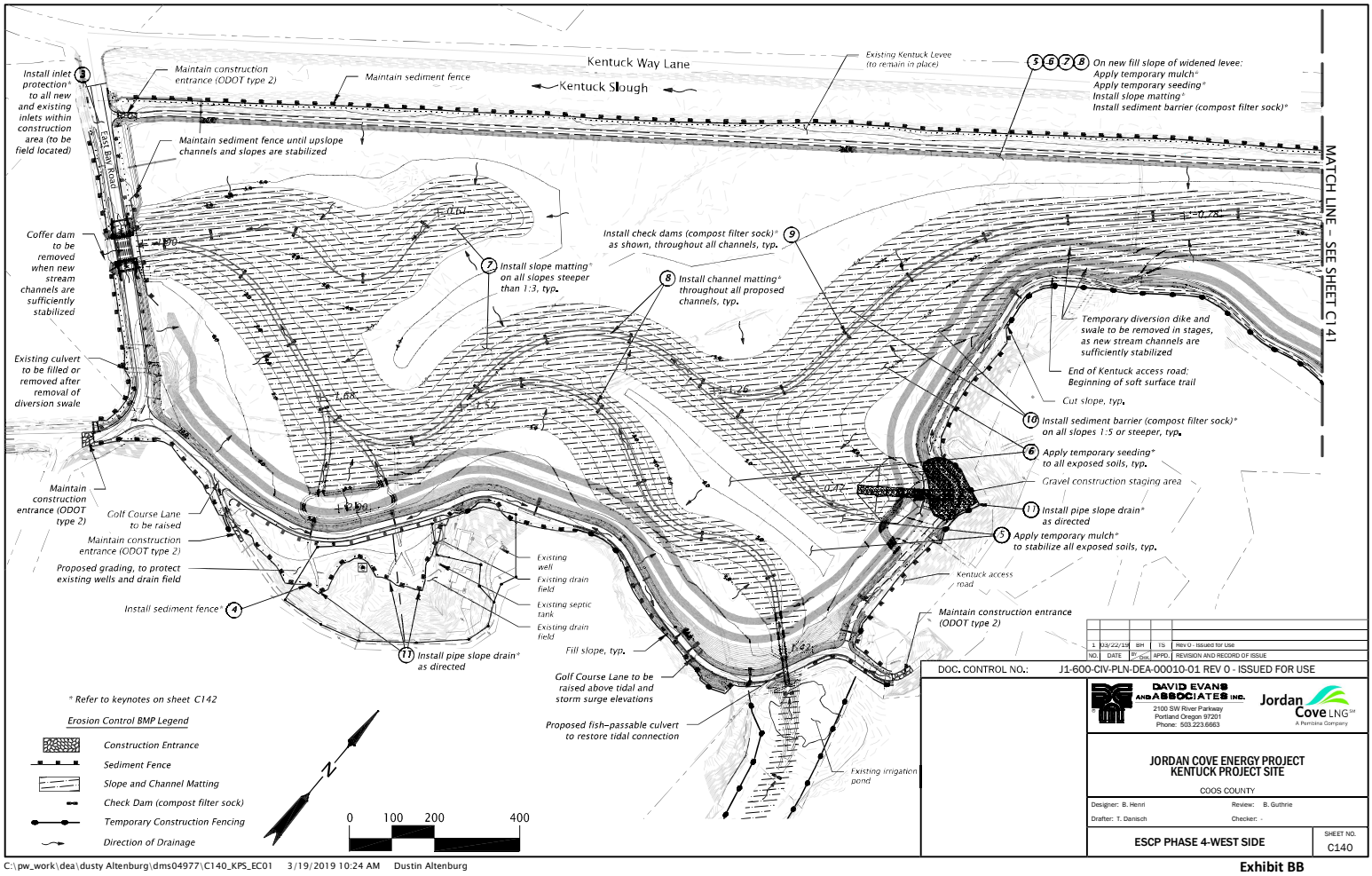
ESCP - PHASE 4 - SITE STABILIZATION, GOLF COURSE LANE CONSTRUCTION, TRAIL AND BOARDWALK CONSTRUCTION, REMOVAL OF TEMP STREAM DIVERSION



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DOC. CONTROL NO.: J1-600-CIV-PLN-DEA-00010-01 REV 0 - ISSUED FOR USE

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KENTUCK PROJECT SITE

COOS COUNTY

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Drafter: T. Danisch | Checker: -

ESCP PHASE 4-WEST SIDE

SHEET NO. C140

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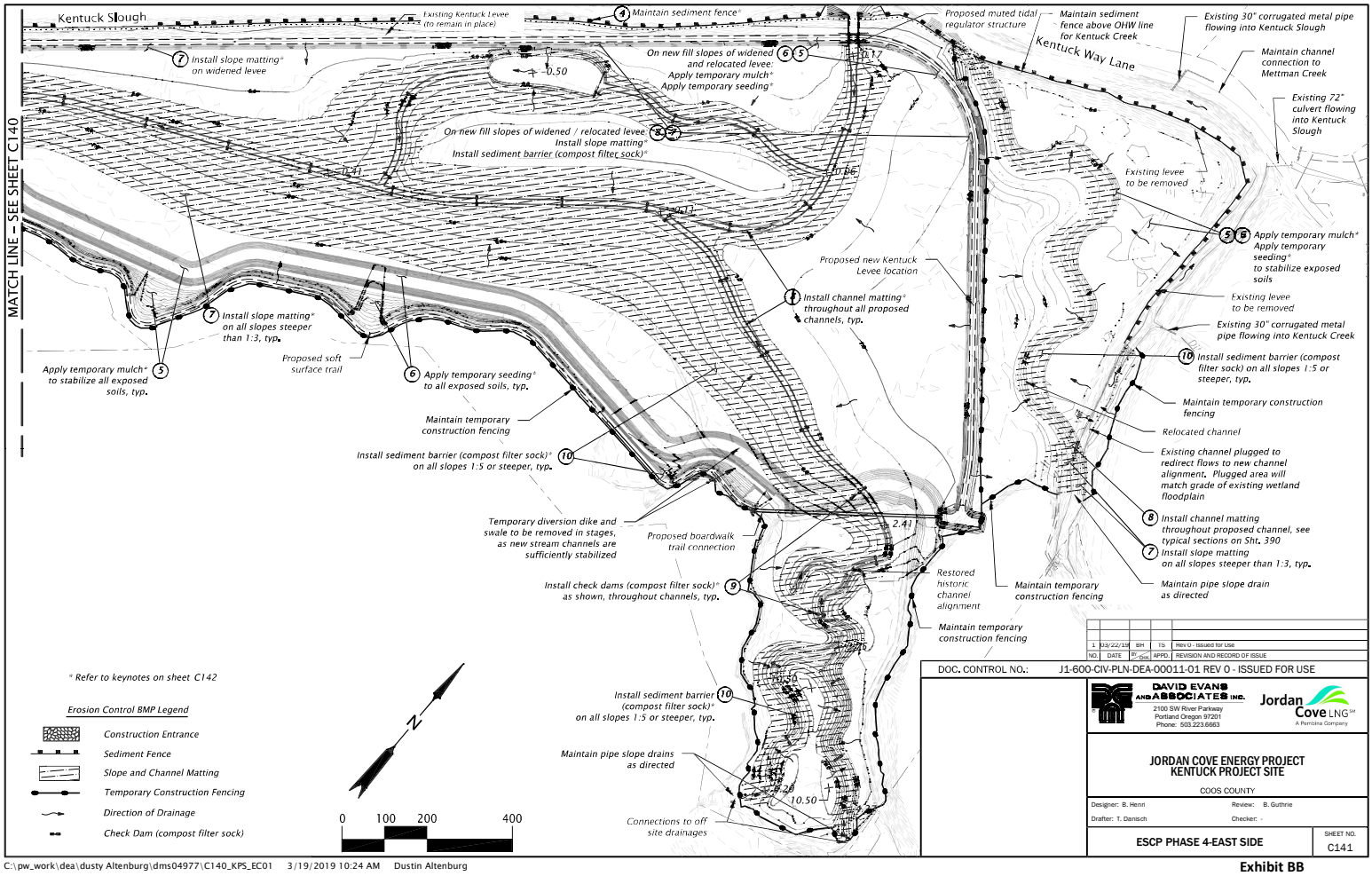

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ESCP - PHASE 4 - SITE STABILIZATION, GOLF COURSE LANE CONSTRUCTION, TRAIL AND BOARDWALK CONSTRUCTION, REMOVAL OF TEMP STREAM DIVERSION

Phase 4 Construction Notes

1. *Install temporary construction fencing (See specifications section _____)*
2. *Construct construction entrance, ODOT type 2 (See ODOT drawing no. RD1000)*
3. *Install sediment fence (See ODOT drawing no. RD1040)*
4. *Install sediment barrier, ODOT type 1, where site conditions permit trenching. install ODOT type 2 where rock or tree roots prevent trenching. (See ODOT drawing no. RD1032)*
5. *Apply temporary mulch to stabilize exposed soils as final grading progresses (See specs sections _____ and _____ for soil stabilization and mulching requirements)*
6. *Apply temporary seeding to exposed soils. Apply after installation of temporary mulch, and before installation of slope or channel matting, as applicable. (See specifications section _____)*
7. *Install slope matting on slopes steeper than 3:1, where shown. (See ODOT drawing no. RD1055)*
8. *Install channel matting on channel bottom extending a minimum of 4' up channel sides (See ODOT drawing no. RD1055 and typical section, sheet __)*
9. *Install check dam, compost filter sock, as shown on plans (200' on center, typ.). Check dams to be removed after final mitigation establishment and re-establishment of stream flow. (See ODOT drawing no. RD1006)*
10. *Install sediment barrier (compost filter sock) parallel to contours. Place on scopes according to spacing table on ODOT drawing. (See ODOT drawing no. RD1032)*
11. *Install pipe slope drain as directed, to be field located where required during Phase 4 grading and removal of temp. stream diversion (See CWS drawing no. 815)*

Note

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KENTUCK PROJECT SITE

COOS COUNTY

Designer: B. Henri | Review: B. Guthrie
Drafter: T. Danisch | Checker: -

ESCP PHASE 4 NOTES & KEYNOTES

SHEET NO. C142

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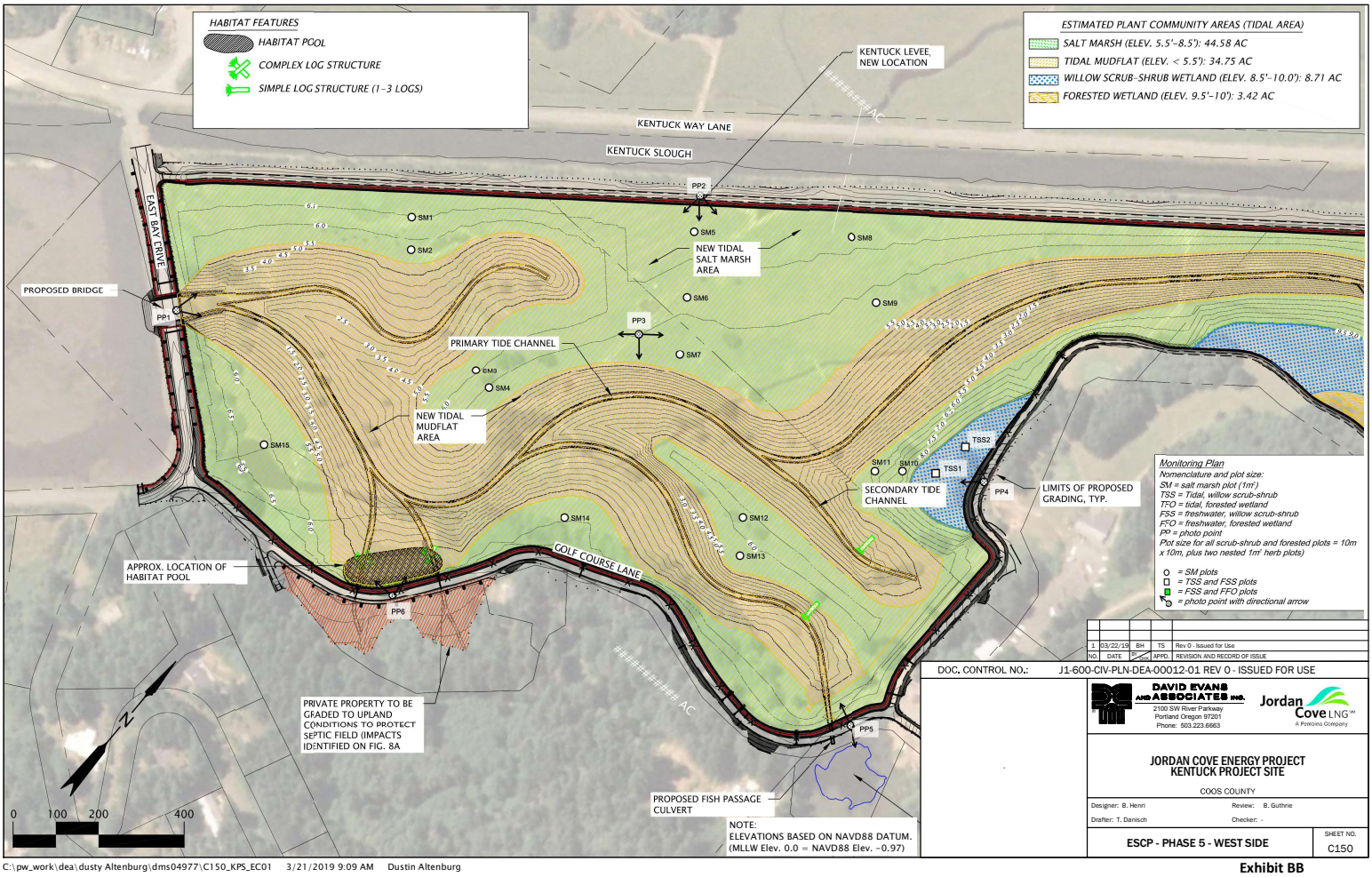
ESCP - PHASE 5 - PERMANENT STABILIZATION AND COMPENSATORY WETLAND MITIGATION PLAN



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DOC. CONTROL NO.: J1-600-CIV-PLN-DEA-00012-01 REV 0 - ISSUED FOR USE

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KENTUCK PROJECT SITE

COOS COUNTY

Designer: B. Henri | Review: B. Guthrie
Drafter: T. Danisch | Checker: -

ESCP - PHASE 5 - WEST SIDE

SHEET NO. C150

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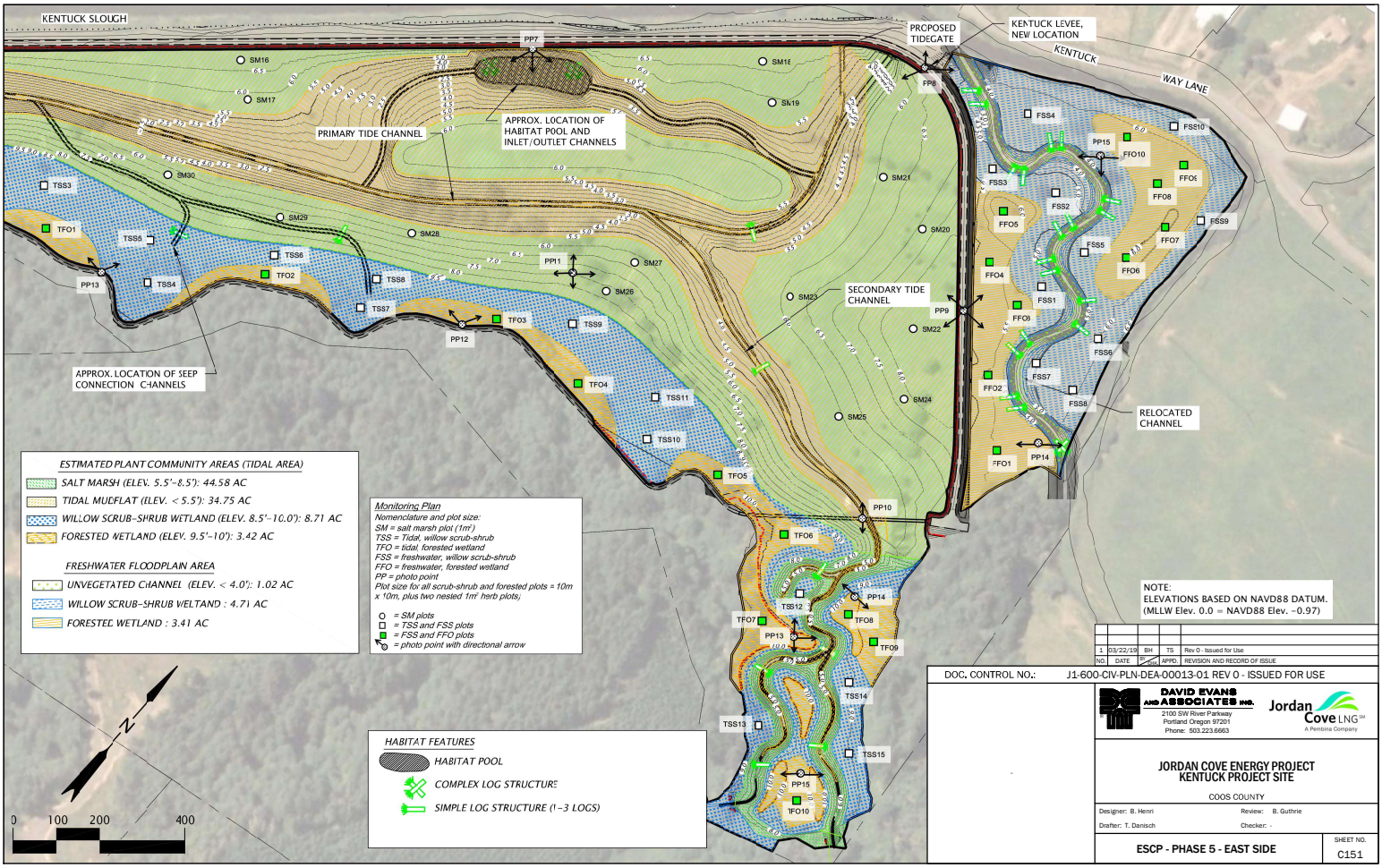
ESCP - PHASE 5 - PERMANENT STABILIZATION AND COMPENSATORY WETLAND MITIGATION PLAN



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DOC. CONTROL NO.: J1-600-CIV-PLN-DEA-00013-01 REV 0 - ISSUED FOR USE

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KENTUCK PROJECT SITE
COOS COUNTY

Designer: B. Henri | Review: B. Guthrie
Drafter: T. Danisch | Checker: -

ESCP - PHASE 5 - EAST SIDE | SHEET NO. C151

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Kentuck Site Proposed Planting List

-species subject to change per design refinements and availability

Kentuck Site (Salt Marsh- Plantings and Estimated Volunteer Recruitment)				
Deschampsia cespitosa	*Tufted hairgrass*	*FACW*		
Hordeum brachyantherum	*Meadow barley*	*FACW*		
Carex lyngbei	*Lyngby's sedge*	*OBL*		
Grindelia integrifolia	*Gumweed*	*FACW*		
Argentina egedii	*Pacific silverweed*	*OBL*		
Distichlis spicata	*Saltgrass*	*FACW*		
Scirpus americanus	*American threesquare*	*OBL*		
Salicornia virginica	*Pickleweed*	*OBL*		
Schoenoplectus pungens	*Common threesquare*	*OBL*		
Kentuck Site (Freshwater Wetland Plantings)			Forest Community	Willow Scrub-Shrub
Alnus rubra	*Red alder*	*FAC*	*X*	
Picea sitchensis	*Sitka spruce*	*FAC*	*X*	*X (low density)*
Myrica californica	*California wax myrtle*	*FACW*	*X*	*X*
Malus fusca	*Oregon crab apple*	*FACW*	*X*	
Salix hookeriana	*Hooker's willow*	*FACW*	*X*	*X (high density)*
Lonicera involucrata	*twinberry*	*FAC*	*X*	*X*
Spiraea douglasii	*Douglas spirea*	*FACW*	*X*	*X*
Rubus spectabilis	*salmon berry*	*FAC*	*X*	
Carex obnupta	*slough sedge*	*OBL*	*X*	*X*
Juncus ensifolius	*daggerleaf rush*	*FACW*	*X*	*X*
Scirpus microcarpus	*small-fruited bulrush*	*OBL*	*X*	
Argentina egedii	*Pacific silverweed*	*OBL*	*X*	*X*
Distichlis spicata	*Salt grass*	*FACW*	*X*	*X*
Hordeum brachyantherum	*Meadow barley*	*FACW*	*X*	*X*
Deschampsia caespitosa	*tufted hairgrass*	*FACW*	*X*	*X*

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A Pembina Company

JORDAN COVE ENERGY PROJECT
KENTUCK PROJECT SITE

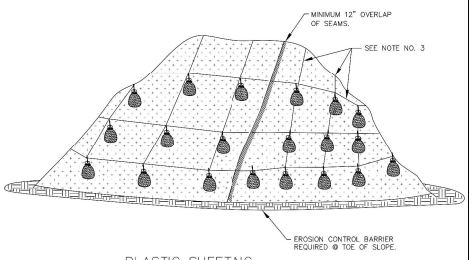
COOS COUNTY

Designer: B. Henri | Review: B. Guthrie
Drafter: T. Danisch | Checker: -

ESCP - PHASE 5 PLANT LIST

SHEET NO. C152

FOR FURTHER INFORMATION
ON DESIGN CRITERIA SEE
CHAPTER 4 OF CLEAN WATER
SERVICES EROSION PREVENTION
AND SEDIMENT CONTROL
PLANNING AND DESIGN MANUAL.



PLASTIC SHEETNG

NOTES:

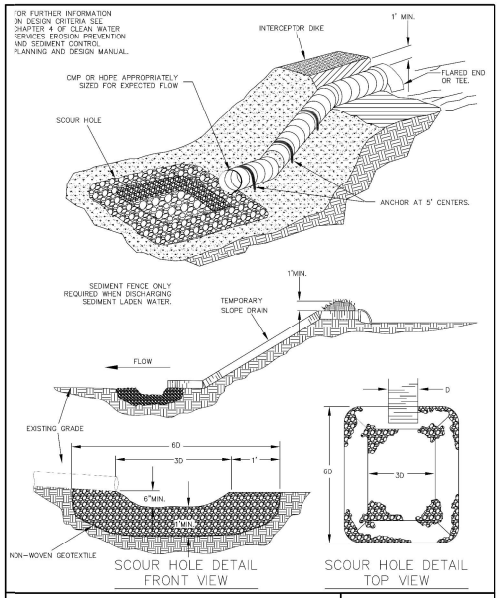
1. MINIMUM 12" OVERLAP OF ALL SEAMS REQUIRED.
2. BARRIER REQUIRED @ TOE OF STOCK PILE.
3. COVERING MAINTAINED TIGHTLY IN PLACE BY USING SANDBAGS OR APPROVED EQUAL ON ROPES WITH A MAXIMUM 10' GRID SPACING IN ALL DIRECTIONS.
4. PLASTIC TO EXTEND MINIMUM 1' BEYOND TOE OF SLOPE.

PLASTIC SHEETING

DRAWING NO. 810 REVISED 12-16

CleanWater Services

FOR FURTHER INFORMATION
ON DESIGN CRITERIA SEE
CHAPTER 4 OF CLEAN WATER
SERVICES EROSION PREVENTION
AND SEDIMENT CONTROL
PLANNING AND DESIGN MANUAL.



SCOUR HOLE DETAIL
FRONT VIEW

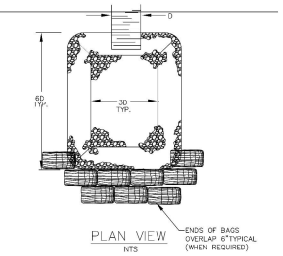
SCOUR HOLE DETAIL
TOP VIEW

PIPE SLOPE DRAIN

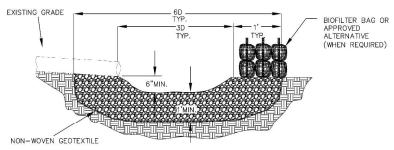
DRAWING NO. 815 REVISED 12-16

CleanWater Services

FOR FURTHER INFORMATION
ON DESIGN CRITERIA SEE
CHAPTER 4 OF CLEAN WATER
SERVICES EROSION PREVENTION
AND SEDIMENT CONTROL
PLANNING AND DESIGN MANUAL.



PLAN VIEW
NTS



PROFILE

NOTES:

1. BIO BAGS ONLY REQUIRED WHEN DISCHARGING SEDIMENT LADEN WATER.
2. STAKING OF BAGS REQUIRED WITH EITHER METHOD USING (2) 1"x 2" WOOD STAKES OR APPROVED EQUAL PER BAG.

OUTLET PROTECTION
RIP RAP

DRAWING NO. 820 REVISED 12-16

CleanWater Services

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KENTUCK PROJECT SITE

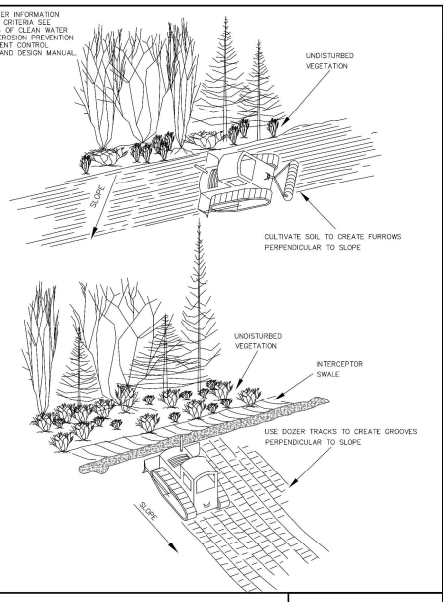
COOS COUNTY

Designer: B. Henri Review: B. Guthrie
Drafter: T. Danisch Checker: -

EROSION CONTROL DETAILS

SHEET NO. C700

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

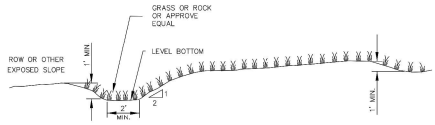


SURFACE ROUCHENING CAT TRACKING

DRAWING NO. 830 REVISED 12-16

CleanWater Services

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.



BOTTOM WIDTH	2 FEET MINIMUM; THE BOTTOM WIDTH SHALL BE LEVEL
DEPTH	1 FOOT MINIMUM
SIDE SLOPE	2H:1V OR FLATTER
GRADE	MAXIMUM 5 PERCENT, WITH POSITIVE DRAINAGE TO A SUITABLE OUTLET (SUCH AS SEDIMENTATION POND)

DIVERSION SWALE

TEMPORARY DIVERSION DIKE

SLOPE	SPACING
<5%	300 FEET
5-10%	200 FEET
10-40%	100 FEET

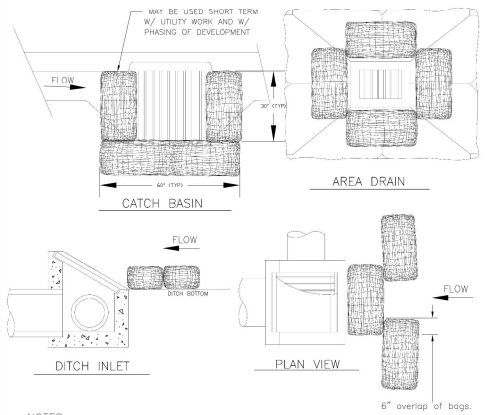
NOTES:

1. IMMEDIATELY UPON CONSTRUCTION, ESTABLISHED VEGETATION OR EROSION CONTROL BLANKETS ARE REQUIRED.

DIVERSION DIKE / SWALE

DRAWING NO. 850 REVISED 12-16

CleanWater Services



NOTES:

1. ADDITIONAL MEASURES MUST BE CONSIDERED DEPENDING ON SOIL TYPES.
2. BIO-FILTER BAGS SHOULD BE STAKED WHERE APPLICABLE USING (2) 1"x2" WOODEN STAKES OR APPROVED EQUAL PER BAG.
3. WHEN USING 30" BIO-BAGS TO PROTECT A CATCH BASIN YOU MUST HAVE 4 BAGS AND THEY SHALL BE OVERLAPPED BY 6".

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

INLET PROTECTION TYPE 4

DRAWING NO. 915 REVISED 12-16

CleanWater Services

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Portland Oregon 97201
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Jordan Cove LNG
A Pembina Company

JORDAN COVE ENERGY PROJECT
KENTUCK PROJECT SITE

COOS COUNTY

Designer: B. Henri Review: B. Guthrie
Drafter: T. Danisch Checker: -

EROSION CONTROL DETAILS SHEET NO. C701

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

SPACING FOR CHECK DAMS

DITCH GRADE	6 INCH	12 INCH	18 INCH
6%	NOT ALLOWED	16 FT O.C.	26 FT O.C.
5%	NOT ALLOWED	20 FT	30 FT
4%	NOT ALLOWED	26 FT	40 FT
3%	15 FT	33 FT	50 FT
2%	25 FT	50 FT	80 FT

BARRIER SPACING FOR GENERAL APPLICATION

INSTALL PARALLEL ALONG CONTOURS AS FOLLOWS		
% SLOPE	SLOPE	MAXIMUM SPACING ON SLOPE
10% OR FLATTER	10:1 OR FLATTER	300 FT
>10% OR <15%	>10:1 OR <7.5:1	150 FT
>15% OR <20%	>7.5:1 OR <5:1	100 FT
>20% OR <30%	>5:1 OR <3.5:1	50 FT
>30% OR <50%	>3.5:1 OR <2:1	25 FT

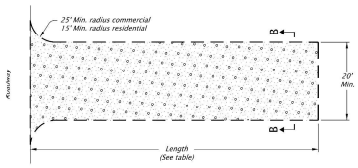
NOTES:

1. FOR MORE INFORMATION REGARDING THESE TABLES SEE CHAPTER 4 TABLES 4-3 AND 4-7 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL DESIGN MANUAL.

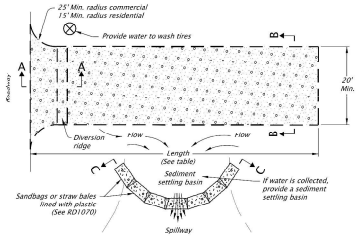
SPACING TABLES

DRAWING NO. 940 REVISED 12-16

CleanWater Services



CONSTRUCTION ENTRANCE – TYPE 1



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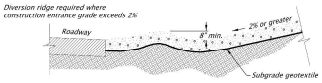
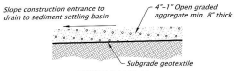
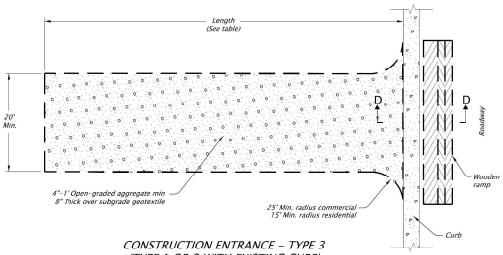


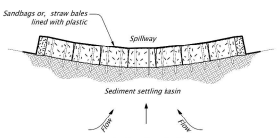
SECTION A–A



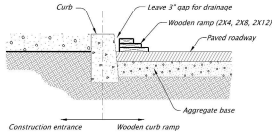
SECTION B–B



CONSTRUCTION ENTRANCE – TYPE 3
(TYPE 1 OR 2 WITH EXISTING CURB)



SECTION C–C



WOODEN CURB RAMP SECTION D–D

Notes:

1. The type 1 entrance is a simple entrance without a diversion ridge or settling basin.
2. The wooden ramp may be used on either type 1 or type 2 entrances in situations where there is curb and the curb is not removed for the construction entrance.

CONSTRUCTION ENTRANCE TABLE MINIMUM LENGTH	
Length (FT)	Area Of Exposed Soil (Acre)
20	0.25
50	0.25 < A < 1.0
100	A > 1.0

CALC. BOOK NO. 6408 BASELINE REPORT DATE July 2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

CONSTRUCTION ENTRANCES

2018

DATE	REVISION DESCRIPTION

Effective Date: December 1, 2018 - May 31, 2019 RD1000

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Portland Oregon 97201
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A Pembina Company

JORDAN COVE ENERGY PROJECT
KENTUCK PROJECT SITE

COOS COUNTY

Designer: B. Henri Review: B. Guthrie
Drafter: T. Danisch Checker: -

EROSION CONTROL DETAILS SHEET NO. C702

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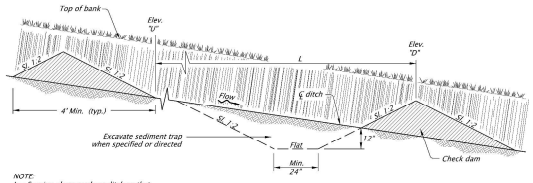
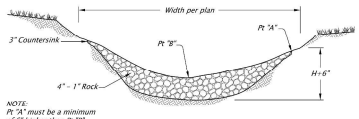


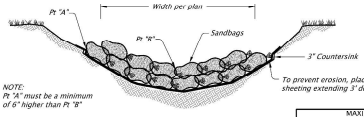
NOTE:
L = Spacing along swale or ditch so that Elevation "U" equals Elevation "D".

TYPICAL PROFILE SECTION CHECK DAMS (SHOWN WITH AGGREGATE)



NOTE:
Pt "A" must be a minimum of 6" higher than Pt "B"

AGGREGATE CHECK DAM – TYPE 1



NOTE:
Pt "A" must be a minimum of 6" higher than Pt "B"

To prevent erosion, place 10 mil. polyethylene plastic sheeting extending 3' downslope for energy dissipation

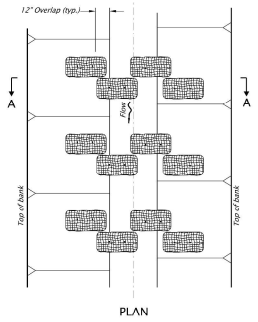
SANDBAG CHECK DAM – TYPE 4

NOTES:

1. Type 3 – stake biofilter bags with two 2" X 2" X 18" (min.) wood stakes per bag. Drive stakes a minimum of 6" into the ground and flush with the top of the bags. Omit stakes if placed over paved surfaces. Overlap bags 6" min at each joint.
2. Type 4 – Tightly abut or overlap ends of sandbags at each joint.
3. Spacing between check dams for all check dam types shall comply with the typical profile section shown above.

MAXIMUM CHELK DAM SPACING 'L'				
Ditch Grade 10%	H=8"	H=12"	H=18"	H=24"
9%	* *	* *	15'	20'
8%	* *	* *	16'	22'
7%	* *	* *	18'	25'
6%	* *	* *	21'	28'
5%	* *	16'	25'	33'
4%	16'	20'	30'	40'
3%	22'	33'	50'	66'
2%	33'	50'	75'	100'

* * Not Allowed H = Min. dam height



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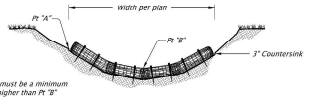

NOTE:
Pt "A" must be a minimum of 6" higher than Pt "B"

SECTION A–A

BIOFILTER BAG CHECK DAM – TYPE 3

CALC. BOOK NO. 6407

BASELINE REPORT DATE November 2017

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

CHECK DAMS TYPE 1. 3 AND 4

2018

DATE	REVISION DESCRIPTION

RD1005

rd1005.dgn 11-29-2017

RD1005

Effective Date: December 1, 2018 - May 31, 2019

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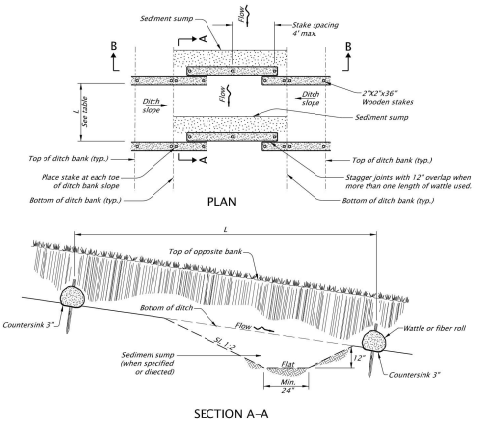
COOS COUNTY

Designer: B. Henri Review: B. Guthrie
Drafter: T. Danisch Checker: -

EROSION CONTROL DETAILS

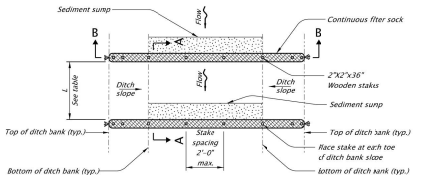
SHEET NO. C703



PLAN

SECTION A-A

WATTLE / FIBER ROLL CHECK DAM - TYPE 2



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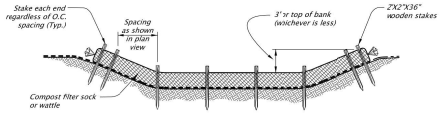
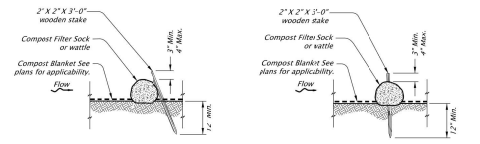


SECTION B-B

Note: For stacking options refer to RD1032.

COMPOST FILTER SOCK CHECK DAM - TYPE 6



ALTERNATIVE 1 (Staking) ALTERNATIVE 2 (Staking)

FIBER ROLL STAKING

MAXIMUM CHECK DAM SPACING "L"

Ditch Grade	H=8"	H=12"	H=18"	H=24"
10%	* *	* *	15'	20'
9%	* *	* *	16'	22'
8%	* *	* *	18'	25'
7%	* *	* *	21'	28'
6%	* *	16'	25'	33'
5%	* *	20'	30'	40'
4%	16'	25'	37'	50'
3%	22'	33'	50'	66'
2%	33'	50'	75'	100'

* * Not Allowed H = Min dam height

CALC. BOOK NO.: 6402, 6406, 6407

BASELINE REPOR' DATE: November 2017

NOTE: All material and workmanship shall be in accordance with the current Oregon Standara Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDAFD DRAWINGS

CHECK DAMS TYPE 2 AND 6

2018

DATE	REVISION DESCRIPTION

Effective Date: December 1, 2018 - May 31, 2019

RD1006

RD1006

rd1006.dgn 11-29-2017

NO.	DATE	BY	CHK'D	APPD.	REVISION AND RECORD OF ISSUE
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COOS COUNTY

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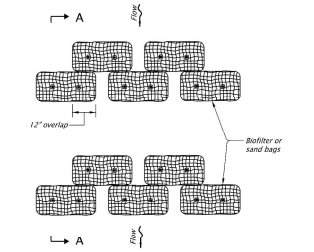
Drafter: T. Danisch Checker: -

EROSION CONTROL DETAILS SHEET NO. C704



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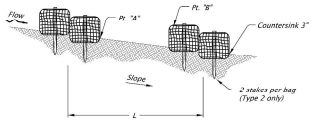
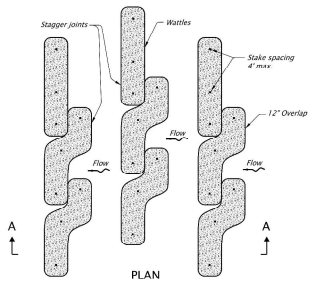


SECTION A–A

BIOFILTER BAG / SAND BAG BARRIER – TYPE 2 AND 4



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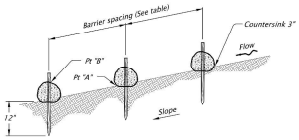

SECTION A–A

FIBER ROLL BARRIER – TYPE 3

Notes:

1. *For type 2 barrier, drive stakes flush with top of bag and into undisturbed ground a min. of 12". Omit stakes if bags are placed on paved surface.*
2. *For type 2 and 4 barrier, space bags (L) so that the elevation of point "A" is less than or equal to the elevation of point "B".*

Type 2 - Biofilter bags
Type 3 - Wattles
Type 4 - Sand bags

BARRIER SPACING

INSTALL PARALLEL ALONG CONTOURS AS FOLLOWS		
% SLOPE	: SLOPE	MAXIMUM SPACING ON SLOPE
10% Flatter	1:10 or Flatter	300'
$10 > \% \geq 15$	$10 > X \geq 7.5$	150'
$15 > \% \geq 20$	$7.5 > X \geq 5$	100'
$20 > \% \geq 30$	$5 > X \geq 3$	50'
Steeper than 30%	Steeper than 1:3	25'

CALC. BOOK NO. 6402, 6406, 6407

BASELINE REPORT DATE January 2016

NOTE: *All material and workmanship shall be in accordance with the current Oregon Standard Specifications*

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

SEDIMENT BARRIER TYPE 2, 3 AND 4

2018

DATE	REVISION DESCRIPTION

RD1030

Effective Date: December 1, 2018 - May 31, 2019

RD1030

rd1030.dgn 06-01-2017

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COOS COUNTY

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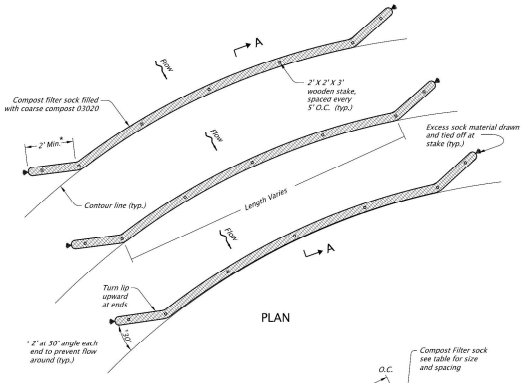
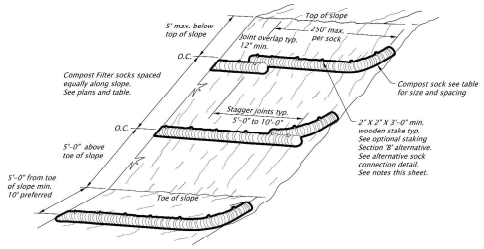
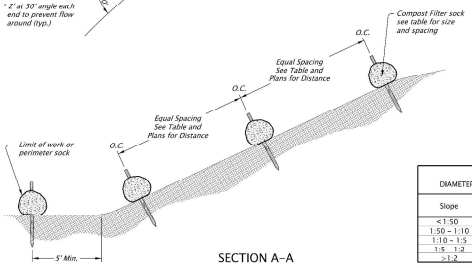
Drafter: T. Danisch Checker: -

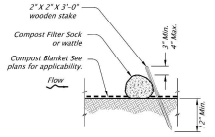
EROSION CONTROL DETAILS

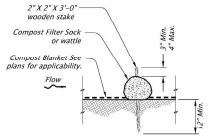
SHEET NO. C705











COMPOST FILTER SOCK DIAMETER AND SPACING BASED ON SLOPE		
Slope	Spacing (ft)	Diameter (in)
< 1:50	250	8
1:50 – 1:10	125	12
1:10 – 1:5	100	12
1:5 – 1:2	50	18
>1:2	25	18

COMPOST FILTER SOCK

CALC. BOOK NO. 6403, 6404, 6405

BASELINE REPORT DATE July 2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

SEDIMENT BARRIER TYPE 8

2018

DATE	REVISION DESCRIPTION

RD1032

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COOS COUNTY

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Drafter: T. Danisch | Checker: -

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rd1032.dgn 06-01-2017

RD1032

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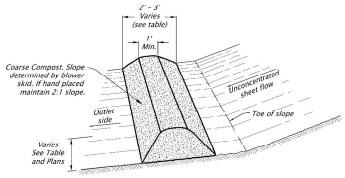


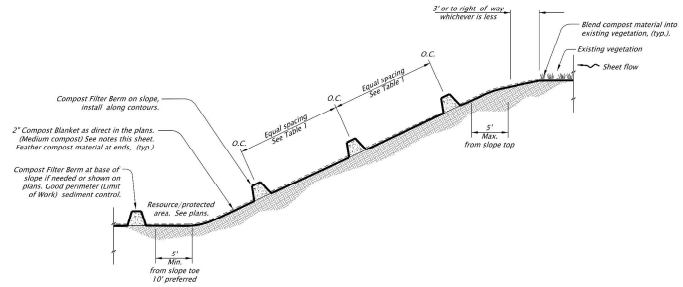
COMPOST FILTER BERM – TYPE 9

COMPOST FILTER BERM
DIMENSIONS AND SPACING BASED ON SLOPE

Slope	Berm Spacing	Berm Dimensions		
		Height	Bottom width	Top width
< 50:1	250 ft	1 ft	2 ft (min.)	1 ft
50:1 – 10:1	125 ft	1 ft	2 ft (min.)	1 ft
10:1 – 5:1	100 ft	1 ft	2 ft (min.)	1 ft
3:1 – 2:1	50 ft	1.3 ft	2.6 ft (min.)	1 ft
> 2:1		1.5 ft	3 ft (min.)	1 ft

Compost Filter Berm General Notes

1. *Compost filter berms are sediment control devices for areas where runoff occurs as sheet flow. See Section 00280, Oregon Standard Specifications.*
2. *The maximum drainage area for a continuous berm shall be 1/4 acre per 100 linear feet of filter berm.*
3. *Where possible, berms should be placed away from the toe of slopes a minimum of 5 feet (10 feet preferred) to allow for energy dissipation and sediment storage.*
4. *Direct the outlet side of filter berm, located at base of slope, onto a stabilized area, such as vegetation and/or aggregate.*
5. *Place filter berms along or on the ground contour with the ends of the filter berm turned up slope per details. Adequate area shall be provided behind berm for ponding.*
6. *Compost filter berms may be vegetated with temporary or permanent seeding after placement.*
7. *If placed in area with existing ground vegetation, cut vegetation to 2 -4 inches above grade at berm footprint. Do not remove existing vegetation or cut back outside berm footprint unless directed by Agency.*
8. *If soils are exposed apply compost blanket per details and specifications.*



COMPOST FILTER BERM SERIES

RD1033

rd1033.dgn 06-01-2017

CALC. BOOK NO. 6403, 6404, 6405	BASELINE REPORT DATE July 2014
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	OREGON STANDARD DRAWINGS
	SEDIMENT BARRIER TYPE 9
	2018
DATE	REVISION DESCRIPTION

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COOS COUNTY

Designer: B. Henri Review: B. Guthrie
Drafter: T. Danisch Checker: -

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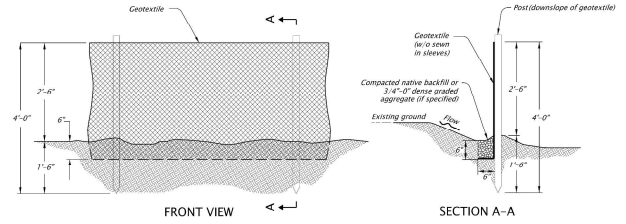
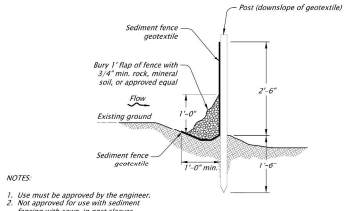
rd1040.dgn 11-08-2017

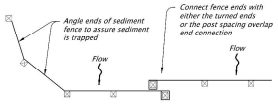


SEDIMENT FENCE AND GEOTEXTILE BURY DETAIL - TYPE 1

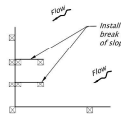


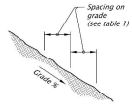
NOTES:
1. Use must be approved by the engineer.
2. Not approved for use with sediment fencing with sewn-in post sleeves.

ALTERNATE SEDIMENT FENCE W/O TRENCHING - TYPE 2



PLAN VIEW





TERMINATION AT CORNER OR PROPERTY LINE

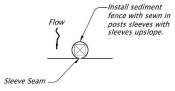
NOTES:
1. Use 2"X 2" wood fence posts.
2. Posts to be installed on downhill side of sediment fence geotextile. Position posts to prevent separation from geotextile.
3. Compact filter fabric trench backfill and soil on uphill side of fence.
4. Locate fence no closer than three feet to the toe of a slope.
5. Wing spacing shall comply with table 1.

TABLE 1
FENCE SPACING
FOR GENERAL APPLICATION

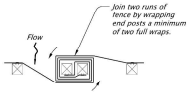
INSTALL PARALLEL ALONG CONTOURS AS FOLLOWS	
GRADE	MAXIMUM SPACING ON GRADE
Grade <10%	300'
10% ≤ Grade <15%	150'
15% ≤ Grade <20%	100'
20% ≤ Grade <30%	50'
30% ≤ Grade	25'

TABLE 2
POST SPACING

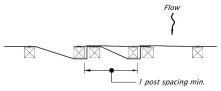
6'	Sediment Fence with Geotextile elongation less than 50%
4'	Sediment Fence with Geotextile elongation 50% or more



GEOTEXTILE WITH POST SLEEVES



TURNED ENDS CONNECTION



POST SPACING OVERLAP CONNECTION

GEOTEXTILE END CONNECTIONS

CALC. BOOK NO. 6403, 6404, 6405	BASELINE REPORT DATE November 2017
The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.	NOTE: *All material and workmanship shall be in accordance with the current Oregon Standard Specifications*
	OREGON STANDARD DRAWINGS
	SEDIMENT FENCE
	2018
DATE	REVISION DESCRIPTION

RD1040

Effective Date: December 1, 2018 - May 31, 2019

RD1040

NO.	DATE	BY	CHK'D	APP'D.	REVISION AND RECORD OF ISSUE
1	03/22/19	BH		TS	Rev 0 - Issued for Use

DOC. CONTROL NO.: J1-600-CIV-DTL-DEA-00009-01 REV 0 - ISSUED FOR USE

DAVID EVANS AND ASSOCIATES INC.
2100 SW River Parkway
Portland Oregon 97201
Phone: 503.223.6663

Jordan Cove LNG
A Pembina Company

JORDAN COVE ENERGY PROJECT
KENTUCK PROJECT SITE

COOS COUNTY

Designer: B. Henri | Review: B. Guthrie
Drafter: T. Danisch | Checker: -

EROSION CONTROL DETAILS

SHEET NO. C708

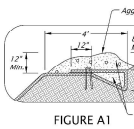


FIGURE A1

TOP OF BANK ANCHOR TRENCH, H>3' AND TERMINAL SLOPE

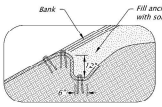


FIGURE A2

TOP OF BANK ANCHOR TRENCH, H<3'

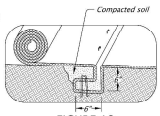


FIGURE A3

CHANNEL CHECK SLOT

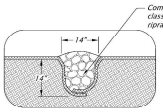


FIGURE A4

CHANNEL CHECK SLOT WITH ROCK BACKFILL

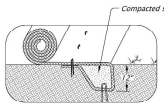
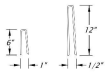
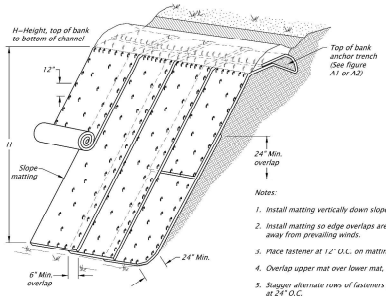


FIGURE A5

INITIAL CHANNEL ANCHOR TRENCH



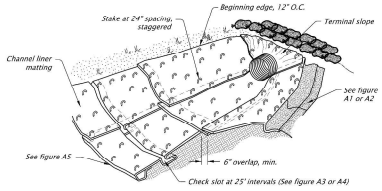
STAPLES



SLOPE ISOMETRIC VIEW

Notes:

1. Install matting vertically down slope.
2. Install matting so edge overlaps are shingled away from prevailing winds.
3. Place fastener at 12' O.C. on matting edges
4. Overlap upper mat over lower mat, and fasten.
5. Stagger alternate rows of fasteners placed at 24" O.C.
6. Extend mat 24" beyond toe of slope; fold mat back under 4" and fasten.



CHANNEL ISOMETRIC VIEW

Notes:

1. Install channel liner matting, in the direction of water flow. Anchor upstream end of mat with check slot for culvert outfalls, place mat under pipe 12" minimum upstream from pipe outlet.
2. Construct check slots across channel bottom at 25' spacing and at the end of each mat (Fig. A3 or A4).
3. Overlap side channel liner matting edges 6" over the center channel liner matting and fasten edges 12" O.C. Continue overlap and stapling pattern for each additional side channel liner mat.
4. Lap upstream matting end 12" over beginning edge of downstream matting. Fasten 12" O.C.
5. Anchor top edge of side channel matting in trench and fasten 12" O.C. (Fig. A2).
6. Fasten matting interior at 24" O.C. with staggered spacing.
7. Construct initial anchor trench at downstream end of matting and terminal slope anchor at upstream end.

CALC. BOOK NO. 6403, 6404, 6405

BASELINE REPORT DATE July 2014

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

SLOPE AND CHANNEL MATTING

2018

DATE	REVISION DESCRIPTION

RD1055

rd1055.dgn 06-01-2017

RD1055

Effective Date: December 1, 2018 - May 31, 2019

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Jordan Cove LNG
A Pembina Company

JORDAN COVE ENERGY PROJECT
KENTUCK PROJECT SITE

COOS COUNTY

Designer: B. Henri | Review: B. Guthrie

Drafter: T. Danisch | Checker: -

EROSION CONTROL DETAILS

SHEET NO. C709

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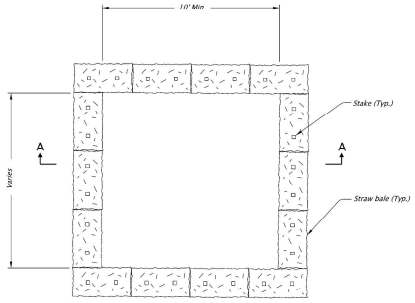

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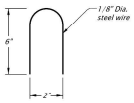
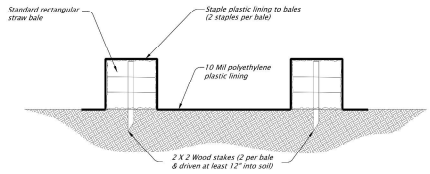


STAPLE DETAIL



SECTION A–A

CONCRETE TRUCK WASH OUT FACILITY

rd1070.dgn 06-01-2017

RD1070

CALC. BOOK NO. 6403, 6404, 6405	BASELINE REPORT DATE July 2014
The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.	NOTE: *All material and workmanship shall be in accordance with the current Oregon Standard Specifications*
	OREGON STANDARD DRAWINGS
	CONCRETE TRUCK WASH OUT
	2018
	DATE / REVISION DESCRIPTION

Effective Date: December 1, 2018 - May 31, 2019 RD1070

NO.	DATE	BY	CHK'D	APP'D	REVISION AND RECORD OF ISSUE
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2100 SW River Parkway
Portland Oregon 97201
Phone: 503.223.6663

Jordan Cove LNG
A Pembina Company

JORDAN COVE ENERGY PROJECT
KENTUCK PROJECT SITE

COOS COUNTY

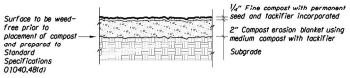
Designer: B. Henri Review: B. Guthrie
Drafter: T. Danisch Checker: -

EROSION CONTROL DETAILS SHEET NO. C710

COMPOST BLANKET

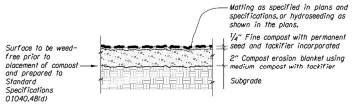
Note: See Standard Specifications 03020 for compost specifications.

APPLICATION - TEMPORARY/PERMANENT MULCHING
N.T.S.



Note: See Standard Specifications 03020 for compost specifications.

APPLICATION - TEMPORARY/PERMANENT VEGETATIVE COVER
N.T.S.



Note: See Standard Specifications 03120 for compost specifications.
See plans and specifications for matting when required.

APPLICATION - STEEP SLOPES, SHALLOW DITCHES & BIO-SWALES
N.T.S.

The selection and use of this detail, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON DEPARTMENT OF TRANSPORTATION
TECHNICAL SERVICES
DETAILS

COMPOST BLANKET

DETAIL NO. DET6017

DET6017

de6917.dgn 03-Nov-2015

NO.	DATE	BY	CHK.	APPD.	REVISION AND RECORD OF ISSUE
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Jordan Cove LNG
A Pembina Company

JORDAN COVE ENERGY PROJECT
KENTUCK PROJECT SITE

COOS COUNTY

Designer: B. Henri
Drafter: T. Danisch
Review: B. Guthrie
Checker: -

EROSION CONTROL DETAILS

SHEET NO. C711

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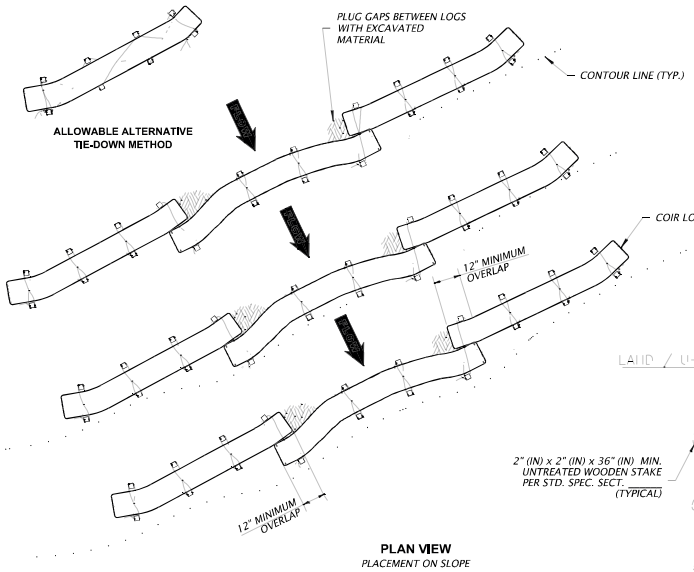
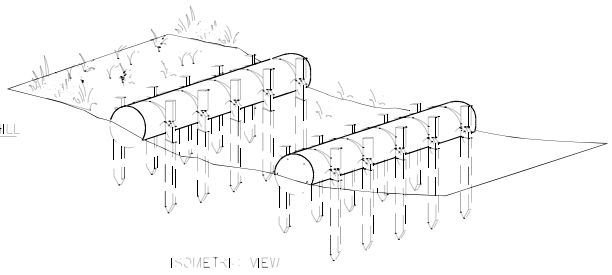


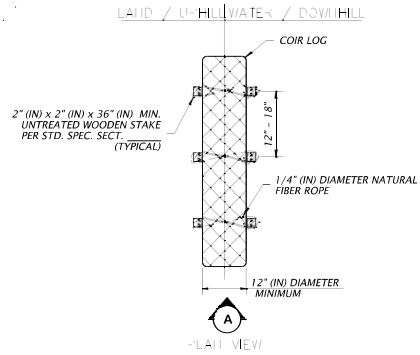
PLAN VIEW
PLACEMENT ON SLOPE

NOTES

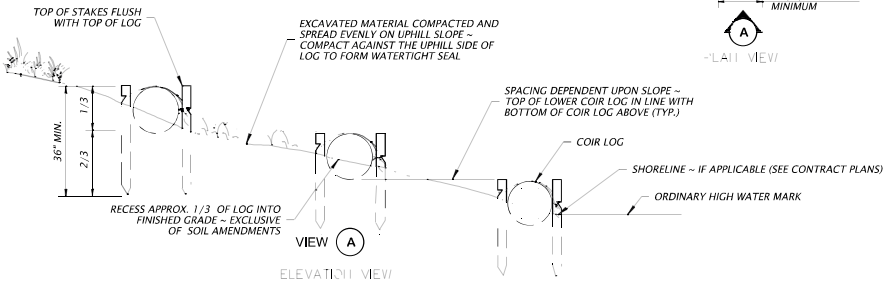
1. *Coir logs shall be installed starting at the bottom of the slope and working uphill.*
2. *Excavated material shall be spread evenly along the uphill slope and compacted by hand tamping or other methods approved by the Engineer.*
3. *Overlap Coir log ends by 12" (in) to prevent water from moving between logs.*
4. *Always install Coir log perpendicular to slope along contour lines. Ends shall angle uphill to prevent flow around the Coir log.*
5. *Use an adequate number of stakes to ensure logs are secure.*
6. *Coir logs shall be in accordance with Standard Specification Section _____, and be installed in accordance with Standard Specification Section _____.*
7. *Perform maintenance in accordance with Standard Specification Section _____.*



ISOMETRIC VIEW



PLAN VIEW



ELEVATION VIEW
COIR LOG PLACEMENT

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A Pembina Company

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KENTUCK PROJECT SITE
COOS COUNTY

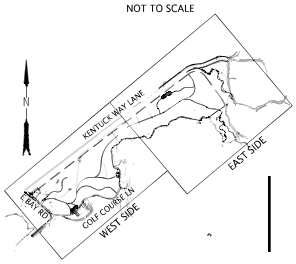
Designer: B. Henri | Review: B. Guthrie
Drafter: T. Danisch | Checker: -

EROSION CONTROL DETAILS

SHEET NO. C712

SITE AND KEY MAP

NOT TO SCALE



VICINITY MAP

NOT TO SCALE

T.25S, R.12W, Sec. 6, 7;
T.25S, R.13W, Sec. 1, 12 W.M.

PROJECT LOCATION:

Located east of North Bend, Oregon (Township 25 South, Range 12 West, Sections 6 and 7; Township 25 South, Range 13 West, Sections 1 and 12, Willamette Meridian).

Latitude: 43.426073
Longitude: -124.180924

PROPERTY DESCRIPTION:

The Kentuck Project site is located east of North Bend, Oregon (Township 25 South, Range 12 West, Sections 6 and 7; Township 25 South, Range 13 West, Sections 1 and 12, Willamette Meridian). Tax maps and lots are: 25s12w06c lot 100, 25s13w12a lot 100, and 25s13w1d lot 400.

ATTENTION EXCAVATORS:

Oregon law requires you to follow rules adopted by the Oregon Utility Notification Center. Those rules are set forth in OAR 952-001-0010 through OAR 952-001-0090. You may obtain copies of these rules from the center by calling 503-232-1987. If you have any questions about the rules, you may contact the center. You must notify the center at least two business days, before commencing an excavation. Call 503-246-6699.

The permittee is required to meet all the conditions of the 1200-C permit. This ESCP and general conditions have been developed to facilitate compliance with the 1200-C permit requirements. In cases of discrepancies or omissions, the 1200-C permit requirements supercede requirements in this plan. (Refer to State of Oregon DEQ 1200-C General Permit, NPDES Stormwater Discharge Permit.) Furthermore, this ESCP has been developed to meet the Federal Energy Regulatory Commission (FERC) Upland Erosion Control, Revegetation, and Maintenance Plan (May 2013 Version).

ESC PLAN FOR SITES OVER 5 ACRES

OWNER/DEVELOPER

Fort Chicago LNG II U.S. LLC /Jordan Cove LNG.
111 SW 5th Ave, Ste 1100
Portland, Oregon 97204
(971) 940-7800
Contact: Natalie Eades, Lead Environmental Advisor
Email: neades@pembina.com

CIVIL ENGINEER

David Evans And Associates, Inc.
2100 SW River Parkway
Portland, Oregon 97201
(503) 499-0470
Contact: Brady Berry, PE
Email: brady.berry@deainc.com

NARRATIVE DESCRIPTIONS

EXISTING SITE CONDITIONS:

Located east of North Bend, Oregon, the project site historically provided estuarine habitats (i.e., salt marsh, mudflats, tide channels, and fringing freshwater wetlands) that were hydrologically connected to the Kentuck Slough and Coos Bay estuary systems. However, circa the 1920s, the Kentuck Project site was diked and converted to agricultural uses. Eventually the site was converted into an 18-hole golf course before reverting back to agricultural use (i.e., pasture) in 2009.

DEVELOPED CONDITIONS:

The mitigation concept involves restoration activities to return the Kentuck Project site to its natural potential, given existing on-site and off-site constraints that include local transportation systems, access to and protection of adjacent private property, and Kentuck Drainage District requirements. Mitigation activities will establish a combination of habitat types including tidal mudflat, salt marsh, and wetlands that will interact to provide a holistic coastal ecosystem, will result in an uplift in ecosystem functions, and are expected to be particularly beneficial to coho salmon recovery and support of Chinook salmon. Socio-cultural benefits will be incorporated into the site to the extent feasible. Proposed improvements consist of construction of a new bridge in East Bay Drive, removal or plugging of existing culverts, levee augmentation with MTR installation, construction of a fish-passage culvert/structure, habitat establishment, and installation of a publicly accessible trail.

INSPECTION FREQUENCY:

SITE CONDITION	MINIMUM FREQUENCY
1. Active period	Daily when stormwater runoff, including runoff from snow melt, is occurring. At least once every fourteen (14) calendar days regardless of whether stormwater runoff is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than fourteen (14) consecutive calendar days	Once every month.
4. Periods during which the site is inaccessible due to inclement weather	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.
5. Periods during which discharge is unlikely due to frozen conditions	Monthly. Resume monitoring immediately upon melt, or when weather conditions make discharges likely.

**Hold a pre-construction meeting of project construction personnel that includes the inspector to discuss erosion and sediment control measures and construction limits. (Schedule A.8.c.i.(3), 1200-C General Permit)*
**All inspections must be made in accordance with DEQ 1200-C permit requirements.*
**Inspection logs must be kept in accordance with DEQ's 1200-C permit requirements.*
**Retain a copy of the ESCP and all revisions on site and make it available on request To DEQ, agent, or the local municipality. During inactive periods of greater than seven (7) consecutive calendar days, retain the ESCP at the construction site or at another location. (Schedule B.2.a, 1200-C General Permit)*

NATURE OF CONSTRUCTION ACTIVITY:

Erosion and sediment control measures installation, clearing activities, site prep for dredge material delivery	*10/2020-9/2021*
Mass grading, dewatering of dredge material, begin construction of permanent and temporary infrastructure improvements	*4/2022-4/2024*
Dewatering of dredge material, continued construction of infrastructure improvements	*7/2021-10/2022*
Final grading and habitat structures, final stabilization, channel connection	*4/2024-10/2024*

Total site area: 106 acres
Total disturbed area: 106 acres

SOIL CLASSIFICATIONS:

12 Coquille silt loam (0-1% slopes, very poorly drained)
41 Nestucca silt loam (0-3% slopes, somewhat poorly drained)

RECEIVING WATER BODIES:

Kentuck Slough
Kentuck Creek
Coos Bay Estuary

PERMITTEE'S SITE INSPECTOR:

Name: TBD
Company/Agency: --
Phone Number: --
Fax Number: --
E-Mail Address: --
Description Of Experience:
15 Years Experience In Construction Inspection, Certified CESCL in Oregon State.

SHEET INDEX

G004	*Erosion and Sediment Control (ESC) Cover Sheet*
G005	*ESC Notes*
G006	*ESC Legend, ESC Details List*
C100 - C101	*Existing Conditions Plan*
C110 - C112	*Phase 1*
C120 - C124	*Phase 2*
C130 - C132	*Phase 3*
C140 - C142	*Phase 4*
C150 - C152	*Phase 5*
C700 - C712	*ESC Details*

BMP MATRIX FOR CONSTRUCTION PHASES

Refer to DEQ Guidance Manual for a comprehensive list of available BMPs.

	PHASE 1 *see description*	PHASE 2 *see description*	PHASE 3 *see description*	PHASE 4 *see description*	PHASE 5 *see description*	WET WEATHER (OCT 1 - MAY 31)
EROSION PREVENTION						
SOIL TACKIFIERS		X	X	X	X	X
TEMPORARY MULCH		X	X	X	X	X
PLASTIC SHEETING						X
SLOPE AND CHANNEL MATTING		X	X	X	X	
COMPOST BLANKET				X	X	X
PERMANENT SEEDING/PLANTING				X	X	
SEDIMENT CONTROL						
PERIMETER SEDIMENT CONTROL	**X	X	X	X		X
SEDIMENT FENCE (INTERIOR)		X	X	X		X
SEDIMENT BARRIERS		X	X	X		X
DIVERSION DIKES/SWALES	X	X	X	X		X
STOCKPILE MANAGEMENT		X	X	X		X
DUST CONTROL		X	X			
RUN OFF CONTROL						
CONSTRUCTION ENTRANCE	**X	X	X	X	X	X
PIPE SLOPE DRAIN	X	X	X	X		X
ENERGY DISSIPATERS	X	X	X	X		X
OUTLET PROTECTION	X	X	X	X		X
UNPAVED ROADS GRAVELED, OR OTHER BMP ON THE ROAD	X	X	X	X		X
CHECK DAMS		X	X	X	X	X
COIR LOGS				X	X	
POLLUTION PREVENTION						
CONCRETE TRUCK WASHOUT	X					
PROPER SIGNAGE	X	X	X	X	X	X
HAZ WASTE MGMT	X	X	X	X	X	X
SPILL KIT ON-SITE	X	X	X	X	X	X

*** Signifies BMP that will be installed prior to any ground disturbing activity.*

PHASES OF CONSTRUCTION:
** PHASE 1: Stripping & temp grading of site, construction of temp stream diversion, construction of E Bay Road and bridge*
** PHASE 2: Dewatering of dredge sands*
** PHASE 3: Mass grading and levee widening*
** PHASE 4: Site stabilization, Golf Course Lane construction, trail and boardwalk construction, removal of temp stream diversion*
** PHASE 5: Permanent seeding & planting*
** For details on construction phasing, See ESC Plan Phasing Notes on sht. C003.*

RATIONALE STATEMENT

A comprehensive list of available best management practices (BMP) options based on DEQ's guidance manual has been reviewed to complete this erosion and sediment control plan. Some of the above listed BMP's were not chosen because they were determined to not effectively manage erosion prevention and sediment control for this project based on specific site conditions, including soil conditions topographic constraints, accessibility to the site, and other related conditions, as the project progresses and there is a need to revise the ESC plan, an action plan will be submitted.

Initial

NO.	DATE	BY	CHK'D	APPD.	REVISION AND RECORD OF ISSUE
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DAVID EVANS AND ASSOCIATES INC.
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Jordan Cove LNG
A Pembina Company

JORDAN COVE ENERGY PROJECT
KENTUCK PROJECT SITE
COOS COUNTY

Designer: B. Henri | Review: B. Guthrie
Drafter: T. Danisch | Checker: -

ESCP COVER SHEET | SHEET NO. G004

PRE-CONSTRUCTION, CLEARING, AND DEMOLITION NOTES

1. All base ESC measures (perimeter sediment control, construction entrances, inlet protection, etc.) must be in place, functional, and approved in an initial inspection, prior to commencement of construction activities.
2. Sediment barriers approved for use are shown in the standard details and drawings listed on sheet G006.
3. Sensitive resources including, but not limited to, trees, wetlands, and riparian protection areas shall be clearly delineated with orange construction fencing or chain link fencing in a manner that is clearly visible to anyone in the area. No activities are permitted to occur beyond the construction barrier.
4. Construction entrances shall be installed at the beginning of construction and maintained for the duration of the project. Additional measures including, but not limited to, street sweeping and vacuuming, may be required to insure that all paved areas are kept clean for the duration of the project.
5. Run-on and run-off controls shall be in place and functioning prior to beginning substantial construction activities. Run-on and run-off control measures are listed in the BMP matrix on sheet G004, and are shown in the standard details and drawings listed on sheet G006.

STANDARD EROSION AND SEDIMENT CONTROL PLAN DRAWING NOTES *(Refer to Oregon DEQ 1200-C General Permit, NPDES Stormwater Design Permit)*

1. Hold a pre-construction meeting of project construction personnel that includes the inspector to discuss erosion and sediment control measures and construction limits. (Schedule A.8.c.i.(3))
2. All inspections must be made in accordance with DEQ 1200-C permit requirements. (Schedule A.12.b and Schedule B.1)
3. Inspection logs must be kept in accordance with DEQ's 1200-C permit requirements. (Schedule B.1.c and B.2)
4. Retain a copy of the ESCP and all revisions on site and make it available on request to DEQ, Agent, or the local municipality. During inactive periods of greater than seven (7) consecutive calendar days, the above records must be retained by the permit registrant but do not need to be at the construction site. (Schedule B.2.c)
5. All permit registrants must implement the ESCP. Failure to implement any of the control measures or practices described in the ESCP is a violation of the permit. (Schedule A 8.a)
6. The ESCP must be accurate and reflect site conditions. (Schedule A.12.c.i)
7. Submission of all ESCP revisions is not required. Submittal of the ESCP revisions is only under specific conditions. Submit all necessary revision to DEQ or Agent within 10 days. (Schedule A.12.c.iv. and v)
8. Phase clearing and grading to the maximum extent practical to prevent exposed inactive areas from becoming a source of erosion. (Schedule A.7.a.iii)
9. Identify, mark, and protect (by construction fencing or other means) critical riparian areas and vegetation including important trees and associated rooting zones, and vegetation areas to be preserved. Identify vegetative buffer zones between the site and sensitive areas (e.g., wetlands), and other areas to be preserved, especially in perimeter areas. (Schedule A.8.c.i.(1) and (2))
10. Preserve existing vegetation when practical and re-vegetate open areas. Re-vegetate open areas when practicable before and after grading or construction. Identify the type of vegetative seed mix used. (Schedule A.7.a.v)
11. Maintain and delineate any existing natural buffer within the 50-feet of waters of the state. (Schedule A.7.b.i.and (2(a)(b))
12. Install perimeter sediment control, including storm drain inlet protection as well as all sediment basins, traps, and barriers prior to land disturbance. (Schedule A.8.c.i.(5))
13. Control both peak flow rates and total stormwater volume, to minimize erosion at outlets and downstream channels and streambanks. (Schedule A.7.c)
14. Control sediment as needed along the site perimeter and at all operational internal storm drain inlets at all times during construction, both internally and at the site boundary. (Schedule A.7.d.i)
15. Establish concrete truck and other concrete equipment washout areas before beginning concrete work. (Schedule A.8.c.i.(6))
16. Apply temporary and/or permanent soil stabilization measures immediately on all disturbed areas as grading progresses. Temporary or permanent stabilizations measures are not required for areas that are intended to be left unvegetated, such as dirt access roads or utility pole pads.(Schedule A.8.c.ii.(3))
17. Establish material and waste storage areas, and other non-stormwater controls. (Schedule A.8.c.i.(7))
18. Prevent tracking of sediment onto public or private roads using BMPs such as: construction entrance, graveled (or paved) exits and parking areas, gravel all unpaved roads located onsite, or use an exit tire wash. These BMPs must be in place prior to land-disturbing activities. (Schedule A 7.d.ii and A.8.c.i(4))
19. When trucking saturated soils from the site, either use water-tight trucks or drain loads on site. (Schedule A.7.d.ii.(5))
20. Control prohibited discharges from leaving the construction site, i.e., concrete wash-out, wastewater from cleanout of stucco, paint and curing compounds. (Schedule A.6)
21. Use BMPs to prevent or minimize stormwater exposure to pollutants from spills; vehicle and equipment fueling, maintenance, and storage; other cleaning and maintenance activities; and waste handling activities. These pollutants include fuel, hydraulic fluid, and other oils from vehicles and machinery, as well as debris, fertilizer, pesticides and herbicides, paints, solvents, curing compounds and adhesives from construction operations. (Schedule A.7.e.i.(2))
22. Implement the following BMPs when applicable: written spill prevention and response procedures, employee training on spill prevention and proper disposal procedures, spill kits in all vehicles, regular maintenance schedule for vehicles and machinery, material delivery and storage controls, training and signage, and covered storage areas for waste and supplies. (Schedule A. 7.e.iii.)
23. Use water, soil-binding agent or other dust control technique as needed to avoid wind-blown soil. (Schedule A 7.a.iv)
24. The application rate of fertilizers used to reestablish vegetation must follow manufacturer's recommendations to minimize nutrient releases to surface waters. Exercise caution when using time-release fertilizers within any waterway riparian zone. (Schedule A.9.b.iii)
25. If an active treatment system (for example, electro-coagulation, flocculation, filtration, etc.) for sediment or other pollutant removal is employed, submit an operation and maintenance plan (including system schematic, location of system, location of inlet, location of discharge, discharge dispersion device design, and a sampling plan and frequency) before operating the treatment system. Obtain plan approval before operating the treatment system. Operate and maintain the treatment system according to manufacturer's specifications. (Schedule A.9.d)
26. Temporarily stabilize soils at the end of the shift before holidays and weekends, if needed. The registrant is responsible for ensuring that soils are stable during rain events at all times of the year. (Schedule A 7.b)
27. As needed based on weather conditions, at the end of each workday soil stockpiles must be stabilized or covered, or other BMPs must be implemented to prevent discharges to surface waters or conveyance systems leading to surface waters. (Schedule A 7.e.ii.(2))
28. Construction activities must avoid or minimize excavation and bare ground activities during wet weather. (Schedule A.7.a.i)
29. Sediment fence: remove trapped sediment before it reaches one third of the above ground fence height and before fence removal. (Schedule A.9.c.i)
30. Other sediment barriers (such as biobags): remove sediment before it reaches two inches depth above ground height and before BMP removal. (Schedule A.9.c.i)
31. Catch basins: clean before retention capacity has been reduced by fifty percent. Sediment basins and sediment traps: remove trapped sediments before design capacity has been reduced by fifty percent and at completion of project. (Schedule A.9.c.ii& iv)
32. Within 24 hours, significant sediment that has left the construction site, must be remediated. Investigate the cause of the sediment release and implement steps to prevent a recurrence of the discharge within the same 24 hours. Any in-stream clean-up of sediment shall be performed according to the Oregon Department of State Lands required timeframe. (Schedule A.9.b.i)
33. The intentional washing of sediment into storm sewers or drainage ways must not occur. Vacuuming or dry sweeping and material pickup must be used to cleanup released sediments. (Schedule A.9.b.ii)
34. The entire site must be temporarily stabilized using vegetation or a heavy mulch layer, temporary seeding, or other method should all construction activities cease for 30 days or more. (Schedule A.7.f.i)
35. Provide temporary stabilization for that portion of the site where construction activities cease for 14 days or more with a covering of blown straw and a tackifier, loose straw, or an adequate covering of compost mulch until work resumes on that portion of the site. (Schedule A.7.f.ii)
36. Do not remove temporary sediment control practices until permanent vegetation or other cover of exposed areas is established. Once construction is complete and the site is stabilized, all temporary erosion controls and retained soils must be removed and disposed of properly, unless doing so conflicts with local requirements. (Schedule A.8.c.iii(1) and D.3.c.ii and iii)

GRADING, STREET AND UTILITY EROSION AND SEDIMENT CONSTRUCTION NOTES

1. Seed used for temporary or permanent seeding shall be composed of one of the following mixtures, unless otherwise authorized:
   A. Permanently seeded areas require native seed mixes. Permanent seeding will be shown on the mitigation planting plans.
   B. Standard temporary seeding mix (min. 100 lb./ac.)
      1. Annual Ryegrass (40% by weight)
      2. Creeping Red Fescue (60% by weight)
2. Slope to receive temporary or permanent seeding shall have the surface roughened by means of track-walking or the use of other approved implements. Surface roughening improves seed bedding and reduces run-off velocity.
3. Long term slope stabilization measures shall include the establishment of permanent vegetative cover via seeding with approved mix and application rate.
4. Temporary slope stabilization measures shall include: covering exposed soil with plastic sheeting, straw mulching, wood chips, or other approved measures.
5. Stockpiled soil or strippings shall be placed in a stable location and configuration. During "wet weather" periods, stockpiles shall be covered with plastic sheeting or straw mulch. Sediment fence is required around the perimeter of the stockpile.
6. Exposed cut or fill areas shall be stabilized through the use of temporary seeding and mulching, erosion control blankets or mats, mid-slope sediment fences or wattles, or other appropriate measures. Slopes exceeding 25% may require additional erosion control measures.
7. Areas subject to wind erosion shall use appropriate dust control measures including the application of a fine spray of water, plastic sheeting, straw mulching, or other approved measures.
8. Construction entrances shall be installed at the beginning of construction and maintained for the duration of the project. Additional measures including, but not limited to, tire washes, street sweeping, and vacuuming may be required to insure that all paved areas are kept clean for the duration of the project.
9. Active inlets to storm water systems shall be protected through the use of approved inlet protection measures. All inlet protection measures are to be regularly inspected and maintained as needed.
10. Saturated materials that are hauled off-site must be transported in water-tight trucks to eliminate spillage of sediment and sediment-laden water.
11. An area shall be provided for the washing out of concrete trucks in a location that does not provide run-off that can enter the storm water system. If the concrete wash-out area cannot be constructed greater than 50' from any discharge point, secondary measures such as berms or temporary settling pits may be required. The wash-out shall be located within six feet of truck access and be cleaned when it reaches 50% of the capacity.
12. Sweepings from exposed aggregate concrete shall not be transferred to the storm water system. Sweepings shall be picked up and disposed in the trash.
13. Avoid paving in wet weather when paving chemicals can run-off into the storm water system.
14. Use BMPs such as check-dams, berms, and inlet protection to prevent run-off from reaching discharge points.
15. Cover catch basins, manholes, and other discharge points when applying seal coat, tack coat, etc. to prevent introducing these materials to the storm water system.

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Jordan Cove LNG
A Pembina Company

JORDAN COVE ENERGY PROJECT
KENTUCK PROJECT SITE

COOS COUNTY

Designer: B. Henri | Review: B. Guthrie
Drafter: T. Danisch | Checker: -

ESCP NOTES

SHEET NO. G005

ESC PLAN BMP LEGEND

- Temporary Construction Fencing
- Construction Entrance
- Sediment Fence
- Concrete Truck Wash Out Facility
- Slope and Channel Matting
- Check Dam (compost filter sock)

CWS STANDARD DETAILS

CWS Drawing No.

- 810 – Plastic sheeting
- 815 – Pipe slope drain
- 820 – Outlet protection, rip rap
- 830 – Surface roughening, cat tracking
- 850 – Diversion dike / swale
- 915 – Inlet protection, bio-filter bags
- 940 – Spacing tables

ODOT STANDARD DRAWINGS

- RD0364 - Concrete inlets type G-1, G-2, G-2M, & G-2MA
- RD0365 - Frames and grates for concrete inlets
- RD1000 - Construction entrances
- RD1005 - Aggregate, sandbag, and biofilter bag check dams
- RD1006 - Wattle / fiber roll and compost filter sock check dams
- RD1030 - Biofilter bag / sand bag sediment barrier and fiber roll sediment barrier
- RD1032 - Compost filter sock sediment barrier
- RD1033 - Compost filter berm series sediment barrier
- RD1040 - Sediment fence
- RD1055 - Slope and channel matting
- RD1060 - Tire Wash
- RD1070 - Concrete truck wash out facility

STANDARD DETAILS

- DET6017 - Compost erosion blanket
- Sediment barrier, coir log

Note:
Some of the BMPs in the Standard Details and Standard Drawings currently listed may not be shown on the ESC plans at this time. These BMPs will be available to the contractor for use during construction, specified in the final ESC design or required for Emergency and Wet Weather stockpiled materials.

ESC PLAN PHASING NOTES**

PHASE 1:
Construction activities include the reconstruction (raising the elevation) of E Bay Rd, construction of the new bridge at E Bay Rd, clearing and grubbing the site, performing temporary grading, and building the diversion dike and swale for the tempoary stream diversion. Perimeter controls, including temporary construction fencing, construction entrances, perimeter sediment fence and inlet protection, will be installed prior to beginning construction. A temporary coffer dam, to be designed by the bridge engineers, will be installed between the E Bay Rd bridge and the bay, isolating the construction area from tidal influence. Fish will be removed and excluded from work area. The temporary coffer dam will be installed and removed during the approved ODFW in-water work window.

Topsoil throughout the site will be excavated, and stockpiled in the form of the temporary diversion berm.
All disturbed soils will be stabilized according to the requirements set out in the ESC notes and plans. Temporary pipe slope drains will be used to divert existing streams to undisturbed areas while the diversion dike and swale are under construction. The diversion swale will be stabilized with channel matting and check dams before existing streams are diverted to the swale, to ensure that flows will be clean and free of sedimentation by the time they leave the site through the existing culvert. The site is otherwise isolated by existing topography and perimeter controls, and construction activities will be fully contained.

PHASE 2:
Construction activities include construction and operation of the dredge sand de-watering facility, which will be located on the west end of the site. (The dredge sand de-watering facility is described in more detail on the Phase 2 Notes and Keynotes sheet, C122.)

Runoff from the dredge sand de-watering facility will be free of most sediment by the time it leaves the vicinity of the facility itself, but the flows will be directed, through an upturned pipe penetrating the diversion dike, into the temporary diversion swale at a point where the runoff must flow through several check dams before leaving the site. The intent is that this will remove any remaining fine particles from the dredge sands runoff, before the water exits the site through the existing culvert.

PHASE 3:
Construction activities consist of mass grading throughout the site, widening of the existing Kentuck Levee (on the interior side), relocation of the levee at the east end of the site, construction of the Muted Tidal Regulator (MTR) tide gate in the levee, and ongoing dredge sand de-watering. The relocation of the levee in the western portion of the site is proposed to create a freshwater mitigation area and restore historic channels of Kentuck Creek. Mass grading will occur as dredge sand becomes available for use from the de-watering facility. The Pacific Connector Gas Pipe (PCGP) line, which will run through the site underground, is anticipated to be installed during this phase, prior to completion of mass grading. When mass grading and de-watering are complete, the de-watering facility will be removed and the area will be graded according to the grading plan.

Disturbed soils will be stabilized with temporary mulch and seeding as required, while grading activities progress. Perimeter BMPs will be maintained, and installed in new areas as required. The diversion swale will be isolated from construction activities by the stabilized diversion dike, and it will continue to provide diversion for existing streams and treat sediment-laden water from the dredge sand de-watering facility. Fish will be removed and exluded from irrigation pond and excluded from work area. The top 12" of soil removed from the irrigation pond will be removed and disposed of per the contaminated soil plan.

PHASE 4:
Construction includes the regrading (raising) of Golf Course Ln, construction of the soft surface trail and boardwalk along the southern edge of the site, and stabilization of all graded areas. Permanent stream stabilization and bio-engineering features, including coir soil lifts and habitat structures, will be installed following mass grading. Streambed gravels will be placed in the bottom of the freshwater channel, northeast of the relocated dike. The diversion dike and swale will be removed in stages, as the new channels become sufficiently stabilized, with the help of proposed pipe slope drains throughout the process, and the coffer dam between E Bay Bridge and the bay will be removed. As the diversion dike and swale are removed, those areas will be graded according to the proposed grading plan, and those soils will be stabilized. Perimeter controls, including construction entrances, sediment fence, temporary construction fence and inlet protection, will remain in place until permanent stabilization is established.

PHASE 5:
This phase consists of permanent stabilization through mitigation planting.

**Phases described are the anticipated order of construction activities. The construction sequencing may be changed according to contractor "means and methods." However, all specified BMPs are required for corresponding construction activities as shown on the plans.

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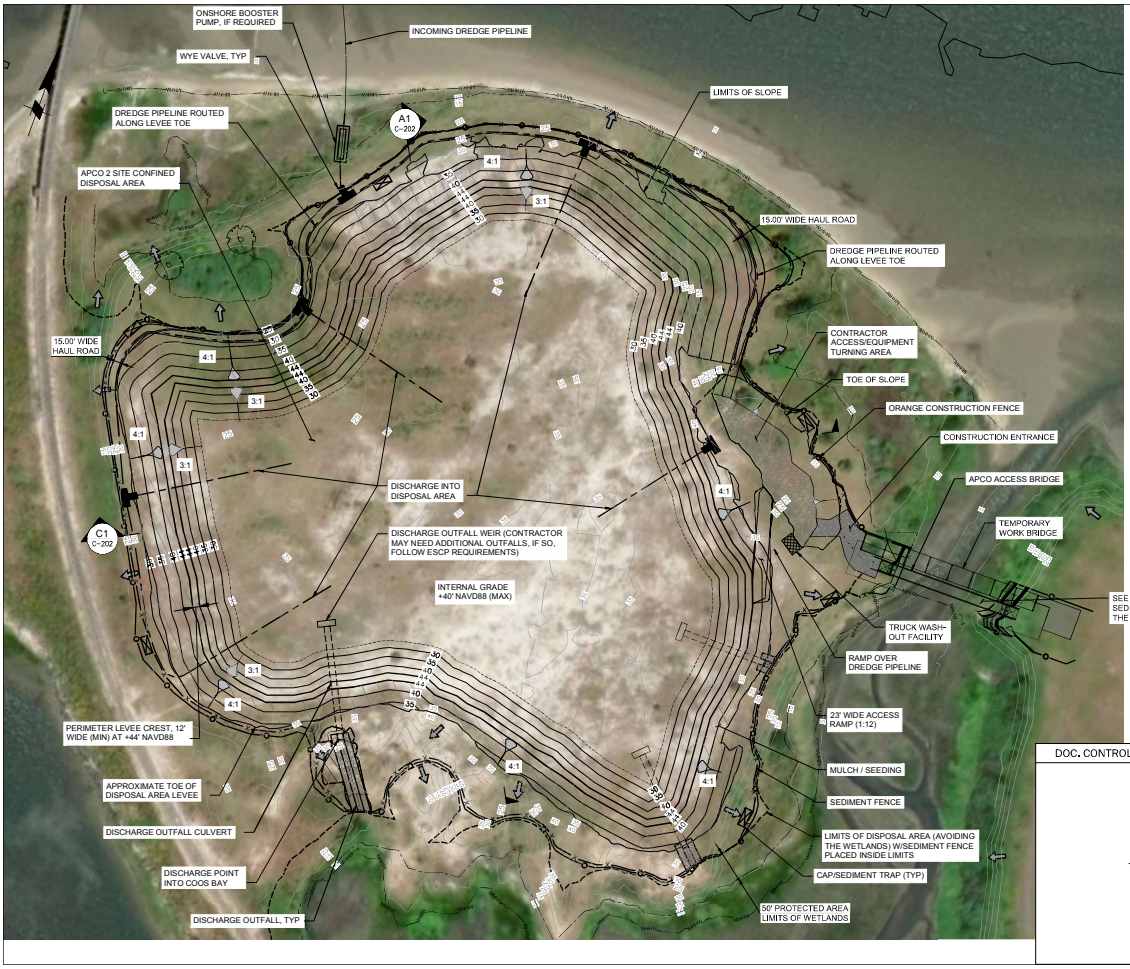
COOS COUNTY

Designer: B. Henri | Review: B. Guthrie
Drafter: T. Danisch | Checker: -

ESCP LEGEND & DETAILS LIST | SHEET NO. G006

APPENDIX A-2: ESCP FOR THE APCO 2 SITE



LEGEND:

- EXISTING GROUND CONTOUR (5 FT)
- EXISTING GROUND CONTOUR (25 FT)
- EXISTING TREE TO REMAIN
- EXISTING TREE TO BE REMOVED
- SEDIMENT FENCE (PERIMETER)
- SEDIMENT BARRIER (INTERIOR)
- ORANGE CONSTRUCTION FENCE
- SEDIMENT TRAP
- CONTRACTOR STORAGE AREA
- CONSTRUCTION ENTRANCE
- DRAINAGE FLOW DIRECTION
- MULCH / GEOTEXTILE / SEEDING
- DIVERSION SWALE (ROCK-LINED)
- MEAN HIGHER HIGH WATER (MHHW) = 7.62 FEET (DATUM, MLLW = 0 FEET)
- LIMITS OF WETLANDS

Permanent Seeding Mix *

Botanical Name	Common Name	Lbs per Acre
Hordeum brachyantherum	Meadow Barley	43.50
Bromus carinatus	California Brome	26.16
Festuca idahoensis roemerii	Roemer's Fescue	6.98
Deschampsia caespitosa	Tufted Hairgrass	1.31
Agrostis exerata	Spike Bentgrass	0.87
Trifolium fragiferum	Strawberry Clover	4.80
Clarkia amonea	Farewell to Spring	1.74
Oenothera elata hookerii	Hooker's Evening Primrose	1.74
	TOTAL (Lbs per Acre):	87.20

* Sunmark Native Salt Tolerant Mix, or similar

80' 0' 80' 160'
SCALE: 1"=80'

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moffatt & nichol

Jordan Cove LNG™ A Pembina Company

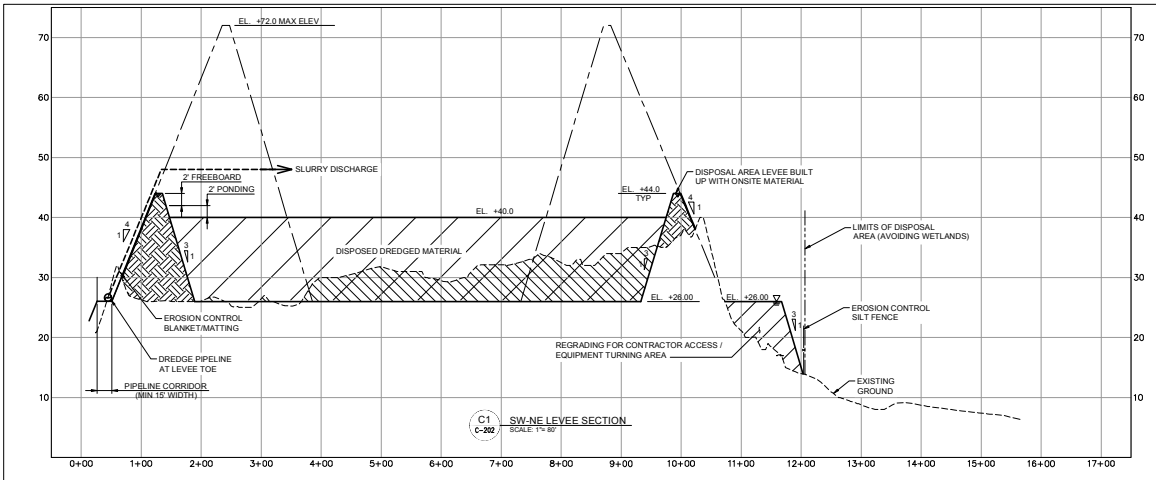
JORDAN COVE ENERGY PROJECT
APCO 2 SITE
EROSION AND SEDIMENT CONTROL PLAN

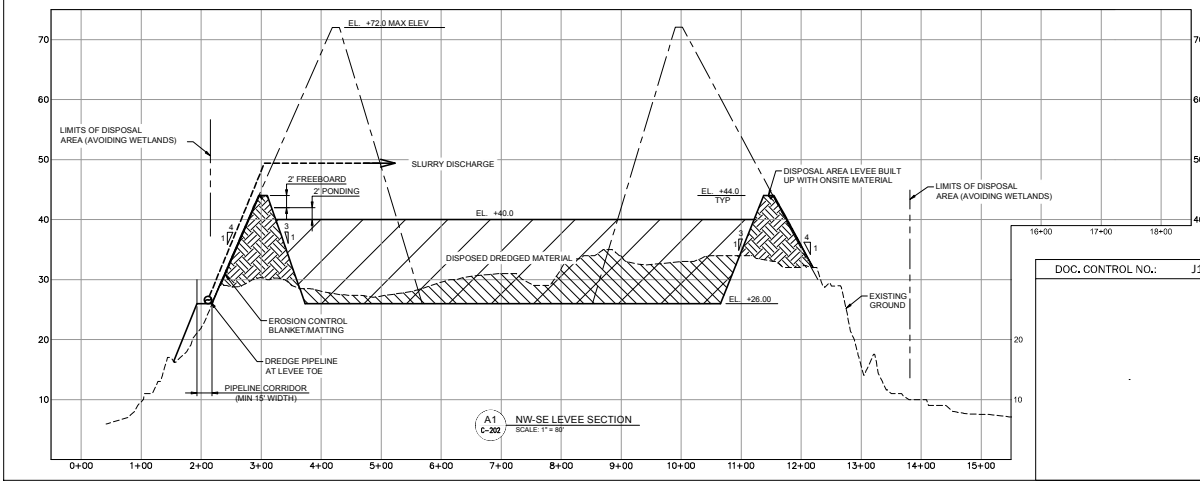
COOS COUNTY

Designer: R DEVLIN Review: M KC
Drafter: D CORCORRAN Checker: W GERKIN

SITE PLAN SHEET NO. C-201

Q:\HO\9929-06 JCLNG Navigation Reliability Improvement\CADD_Active_SheetSet\992906-C-201 3/19/2019 4:04 PM Corcorran, Darwin





LEGEND:

- EXCAVATE AND RE-USE IN BERM CONSTRUCTION
- REGRADING FOR CONTRACTOR WORK AREA
- DISPOSED DREDGED MATERIAL
- CONTAINMENT BERM
- PROJECTED MAXIMUM HEIGHT OF BERM

NOTES:

1. All elevations relative to NAVD88.

HORIZONTAL SCALE: 1"=80'

VERTICAL SCALE: 1"=8'

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Jordan Cove LNG

JORDAN COVE ENERGY PROJECT
APCO 2 SITE
EROSION AND SEDIMENT CONTROL PLAN

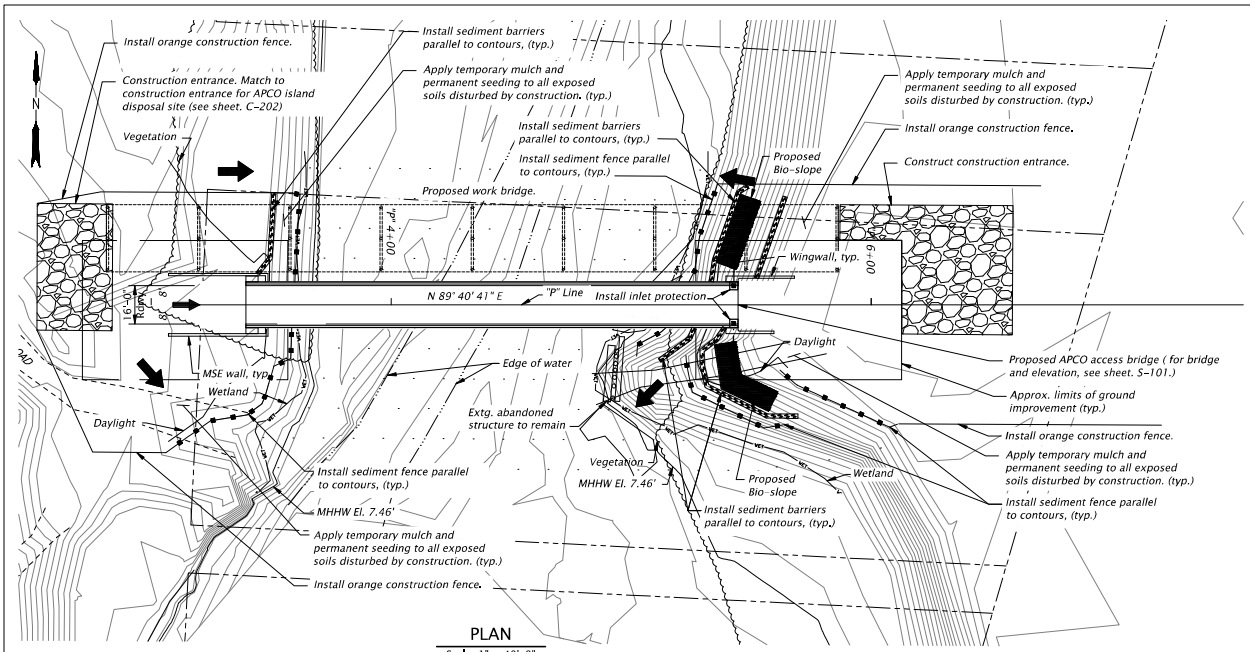
COOS COUNTY

Designer: R DEVLIN | Review: M KC
Drafter: D CORCORRAN | Checker: W GERKIN

LEVEE SECTIONS

SHEET NO. C-202

Q:\HO\9929-06 JCLNG Navigation Reliability Improvement\CADD_Active_SheetSet\992906-C-202 3/19/2019 4:04 PM Corcorran, Darwin



PLAN

Scale: 1" = 40'-0"

Notes:
Elevations are based on North American Vertical Datum 1988 (NAVD88).

MHHW = Mean Higher High Water.

LEGEND:

- EXISTING GROUND CONTOUR (2 FT)
- EXISTING GROUND CONTOUR (10 FT)
- SEDIMENT FENCE (PERIMETER)
- SEDIMENT BARRIER (INTERIOR)
- ORANGE CONSTRUCTION FENCE
- CONSTRUCTION ENTRANCE
- INLET PROTECTION
- DRAINAGE FLOW DIRECTION

NOTE:
FOR PERMANENT SEEDING, USE SUNMARK NATIVE SALT TOLERANT MIX. (SEE SHT. C-202 FOR SEED MIX)

0 40' 80' 120'

SCALE: 1"=40'-0"

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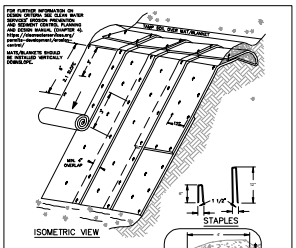
JORDAN COVE ENERGY PROJECT
APCO 2 SITE
EROSION AND SEDIMENT CONTROL PLANS
COOS COUNTY

Designer: B. Henri | Review: Jim Culpepper
Drafter: CJ Chavez | Checker: Terry Stones

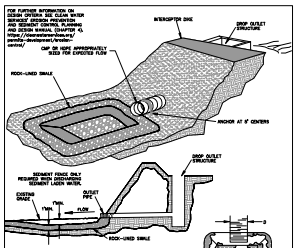
APCO ACCESS BRIDGE ESC PLAN

SHEET NO. C-203



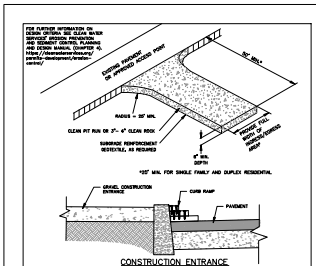
MATTING SLOPE INSTALLATION

DRAWING NO. 805 REVISED 12-16



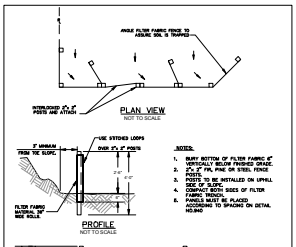
ROCK-LINED SWALE

DRAWING NO. ___ REVISED 12-16



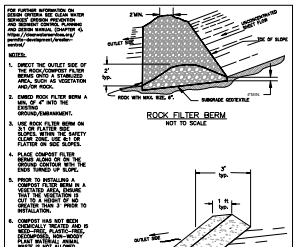
CONSTRUCTION ENTRANCE

DRAWING NO. 855 REVISED 12-16



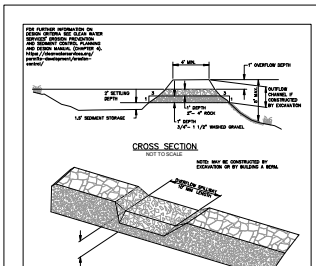
SEDIMENT FENCE

DRAWING NO. 875 REVISED 12-16



FILTER BERMS
ROCK/COMPOST

DRAWING NO. 890 REVISED 12-16



SEDIMENT TRAP

DRAWING NO. 930 REVISED 12-16

RELEVANT NOTES FOR STANDARD DRAWING DETAILS:

CONSTRUCTION & INSPECTION/MAINTENANCE DETAILS

BUFFER ZONE/ORANGE CONSTRUCTION FENCE

Clearly establish construction limits with orange construction safety fence and signs spaced 100 feet apart.

PIPE SLOPE DRAIN/ROCK LINED RIP RAP SWALE

1. Minimize disturbance during installation
2. Pipe should be staked securely to prevent movement with slope anchor.
3. Immediately stabilize any area disturbed during installation or maintenance.
4. Securely connect the standard flared end section at the entrance to the pipe, using watertight connecting bands.
5. Stabilize the area below the outlet following the energy dissipater.
6. Regularly check the inlet and outlet points, especially following heavy rains. If there are signs of undercutting or water is going around the point of entry, reinforce with compacted earth or sand bags.
7. Regularly check at connection points for signs of erosion. Tighten fittings and repair erosion as needed.
8. Immediately repair and install appropriate protection if erosion occurs at the outlet.

CONSTRUCTION ENTRANCE

1. Install geotextile under rock when subgrade is not stable or is 'pumping' up into the pad.
2. Minimum Depth: 8 in. - all construction sites.
3. Rock Size: 3-6 in. - all other construction sites
4. Do not install rock on paved surfaces. (Use wood curb ramps.)
5. Wood Curb ramps should be made out of 2x6 material, nailed together.
6. Requires ongoing inspection
7. Immediately sweep up and remove or stabilize onsite any sediment that is tracked onto pavement.
8. Add or replace rock as needed to maintain the specified dimensions.
9. Immediately remove any rock, which gets carried from the pad to the roadway.

SEDIMENT FENCE

1. Standard or heavy-duty sediment fence filter fabric shall have manufactured stitched loops with 2'x 2'x4' posts. Stitched loops shall be installed on the uphill side of the sloped area.
2. Sediment fences should be installed a minimum of 3 feet from toe of slope in order to maximize storage.
3. A trench should be excavated 6 inches deep along the line of the posts.
4. Trench should be backfilled, and the soil compacted on both sides of the sediment fence.
5. Posts should be spaced a maximum of 6 feet apart and driven securely into the ground a minimum of 12 inches.
6. When sediment fence approaches its termination point, turn fence uphill and extend one full panel (6 ft).
7. When joining two or more sediment fences together, join the two end stakes by wrapping the two ends at least one and one half turns and driving the joined stakes into the ground together.
8. Height of a sediment fence should not exceed 3 feet. Storage height and ponding height should never exceed 1.5 feet.
9. Immediately repair any damage.
10. Remove accumulated sediment once it has reached 1/3 the height of the sediment fence or 1 ft maximum.
11. Inspect for channel formation parallel to the fence, which indicates the geotextile is acting as a flow barrier.
12. Replace deteriorated or clogged geotextile.
13. Check for under cutting or piping under fence.

SEDIMENT TRAP

1. Construct prior to any upslope clearing and grading.
2. Locate in a low area where the trap will intercept all or most of the runoff from the disturbed area before it enters a waterway, considering safety in case structure fails.
3. Locate the trap so that it is readily accessible for maintenance.
4. Provide for diversion dikes and ditches, as needed, to collect and divert water toward the trap.
5. Sediment storage volume should be calculated using the USLE assuming a minimum one-year sediment accumulation period for design purposes. To convert tons of sediment as calculated to cubic feet, multiply 0.05 tons per cubic foot.
6. Determine the bottom surface area of the sediment trap using the calculated sediment volume and the maximum 1.5 depth.
7. Design the trap with a level bottom, 3:1 or flatter side slopes and a L:W ratio of 3.
8. Construct the trap as the first step in the clearing and grading of the site.
9. Form the trap by excavation or by construction of compacted embankment. If the trap is formed by embankment; the designer should note that dam safety regulation may apply to heights exceeding 5 feet. The embankment should be stabilized using a cover method such as seeding, mulching or erosion control matting.
10. Water temperature in the trap may be too high for direct release. Always moderate the water temperature before it drains into a lake, stream, wetland or waterway. Whenever possible, release the trap discharge onsite onto a relatively level, densely grassed area at least 50 feet from a waterway or wetland.
11. Evaluate the release areas on a site-by-site basis in order to determine appropriate locations for and methods of releasing runoff. Do not use vegetated wetlands for this purpose.
12. Constant maintenance is essential for proper functioning.
13. Remove sediment from the trap when it reaches one-third the storage capacity.
14. Repair any damage to the trap, the embankments or the slopes.

NO.	DATE	BY	CHKD	APPD.	REVISION AND RECORD OF ISSUE
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DOC. CONTROL NO.: J1-650-CIV-DTL-DEA-00001-01 Rev 0: ISSUED FOR USE

moffatt & nichol

Jordan Cove LNG™ A Pembina Company

JORDAN COVE ENERGY PROJECT
APCO 2 SITE
EROSION AND SEDIMENT CONTROL PLAN

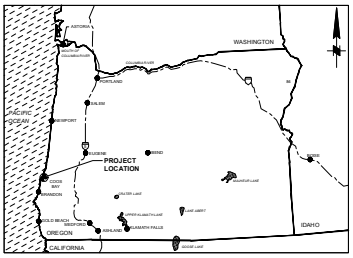
COOS COUNTY

Designer: R DEVLIN Review: M KC

Drafter: D CORCORRAN Checker: W GERKIN

DETAILS SHEET NO. CD-501

COOS BAY, OR
JORDAN COVE
ENERGY PROJECT



VICINITY MAP
SCALE: NTS

LOCATION MAP
SCALE: NTS

PROJECT LOCATION:

Near 2800 Chappel Pkwy, North Bend, OR 97459.
Erosion and Sediment Control Plan at APCO 2 Site for dredged material placement for JCLNG Terminal, east of the South West Oregon Airport, Coos County, Oregon
Latitude=43.4224 N, Longitude=124.2310 W

ATTENTION EXCAVATORS:

Oregon law requires you to follow rules adopted by the Oregon Utility Notification Center. Those rules are set forth in OAR 952-001-0010 through OAR 952-001-0090. You may obtain copies of these rules from the center by calling 503-232-1987. If you have any questions about the rules, you may contact the center. You must notify the center at least two business days before commencing an excavation. Call 503-246-6699.

DEVELOPER

Owner/Developer: Jordan Cove LNG LLC
Contact: Natalie Eades
Address 1: 111 SW 5TH Avenue, Suite 1100
Address 2: Portland, Oregon 97204
Phone: 971-940-7800
Email: neades@pembina.com

PLANNING / ENGINEERING / SURVEYING FIRM

Engineering & Survey Firm: Moffatt & Nichol
Contact: Bill Gerken, P.E.
Address 1: 600 University Street, Suite 610
Address 2: Seattle, WA 98101
Phone: 206-622-0222
Fax: 206-622-4764
Email: bgerken@moffattnichol.com

NOTE:

This ESCP meets Federal Energy Regulatory Commission's (FERC's) wetland and waterbody construction and mitigation procedures & upland erosion control, revegetation, and maintenance plan.

NARRATIVE DESCRIPTIONS

EXISTING SITE CONDITIONS

APCO 2 Site is an undeveloped island used as dredge spoil placement site, partially vegetated with variations in topography, ranging from elevations between +24 ft. and +45 ft. NAVD88.

DEVELOPED CONDITIONS

Placement of capital dredged material (sandstone, sand & siltstone) from the Navigation Reliability Improvements with increase in elevation.

NATURE OF CONSTRUCTION ACTIVITY AND ESTIMATED TIME TABLE

- Clearing
- Mass grading

} over first four months before first in-water work window

- Final Stabilization

} over last three months after last in-water work window

Total Site Area = 1,109,961 sf = 25.48 acres

Total Disturbed Area = 895,403 sf = 20.55 acres

SITE SOIL CLASSIFICATION:

The incoming dredged filling (erodible soils) consists of following material:

Dredging Location	Material	Volume (cy)
NRI No. 1	Sandstone	345,900
NRI No. 1	Sand	4,300
NRI No. 2	Siltstone	159,400
NRI No. 2	Sand	24,800
NRI No. 3	Sand	25,000
NRI No. 3	Rock	200
NRI No. 4	Sand	24,900
Eelgrass Mitigation Site	Sand	38,000

RECEIVING WATER BODIES:

Nearest water body: Coos Bay Federal Navigation Channel

PERMITTEE'S SITE INSPECTOR: TBD .
Company/Agency:_____
Phone:_____
Fax:_____
Email:_____
Description of Experience:_____

Inspection Frequency:

#	SITE CONDITION	MINIMUM FREQUENCY
1	Active period.	Daily when stormwater runoff, including runoff from snow melt, is occurring. At least once every 14 days, regardless of whether stormwater runoff is occurring.
2	Prior to the site becoming inactive or in anticipation of site inacessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3	Inactive periods greater than fourteen (14) consecutive calendar days.	Once every month.
4	Periods during which the site is inaccessible due to inclement weather.	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.
5	Periods during which discharge is unlikely due to frozen conditions.	Monthly. Resume monitoring immediately upon melt, or when weather conditions make discharges likely.

SHEET INDEX

EROSION AND SEDIMENT CONTROL PLAN

G-001	ESCP COVER SHEET
G-002	GENERAL NOTES
C-201	SITE PLAN
C-202	LEVEE SECTIONS
C-203	APCO ACCESS BRIDGE ESC PLAN
CD-501	DETAILS

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moffatt & nichol

Jordan Cove LNG
A Pembina Company

JORDAN COVE ENERGY PROJECT
APCO 2 SITE
EROSION AND SEDIMENT CONTROL PLAN

COOS COUNTY

Designer: R DEVLIN Review: M KC
Drafter: D CORCORRAN Checker: W GERKIN

ESCP COVER SHEET

SHEET NO. G-001

Q:\HO\9929-06 JCLNG Navigation Reliability Improvement\CADD_Active_SheetSet\992906-G-001 3/19/2019 4:03 PM Corcorran, Darwin

STANDARD EROSION AND SEDIMENT CONTROL PLAN DRAWING NOTES:

* 'Schedule' refers to the schedule published in 1200-C Stormwater Discharge Permit of Oregon Department of Environmental Quality.

1. Hold a pre-construction meeting of project construction personnel that includes the inspector to discuss erosion and sediment control measures and construction limits. (Schedule A.8.c.i.(3))
2. All inspections must be made in accordance with DEQ 1200-C permit requirements. (Schedule A.12.b and Schedule B.1)
3. Inspection logs must be kept in accordance with DEQ'S 1200-C permit requirements. (Schedule B.1.c and B.2)
4. Retain a copy of the ESCP and all revisions on site and make it available on request to DEQ, Agent, or the local municipality. During inactive periods of greater than seven (7) consecutive calendar days, the above records must be retained by the permit registrant but do not need to be at the construction site. (Schedule B.2.c)
5. All permit registrants must implement the ESCP. Failure to implement any of the control measures or practices described in the ESCP is a violation of the permit. (Schedule A.8.a)
6. The ESCP must be accurate and reflect site conditions. (Schedule A.12.c.i)
7. Submission of all ESCP revisions is not required. Submittal of the ESCP revisions is only under specific conditions. Submit all necessary revision to DEQ or Agent within 10 days. (Schedule A.12.c.iv. and v)
8. Phase clearing and grading to the maximum extent practical to prevent exposed inactive areas from becoming a source of erosion. (Schedule A.7.a.iii)
9. Identify, mark, and protect (by construction fencing or other means) critical riparian areas and vegetation including important trees and associated rooting zones, and vegetation areas to be preserved. Identify vegetative buffer zones between the site and sensitive areas (e.g., wetlands), and other areas to be preserved, especially in perimeter areas. (Schedule A.8.c.i.(1) and (2))
10. Preserve existing vegetation when practical and re-vegetate open areas. Re-vegetate open areas when practicable before and after grading or construction. Identify the type of vegetative seed mix used. (Schedule A.7.a.v)
11. Maintain and delineate any existing natural buffer within the 50-feet of waters of the state. (Schedule A.7.b.i and (2(a)(b))
12. Install perimeter sediment control, including storm drain inlet protection as well as all sediment basins, traps, and barriers prior to land disturbance. (Schedule A.8.c.i.(5))
13. Control both peak flow rates and total stormwater volume, to minimize erosion at outlets and downstream channels and streambanks. (Schedule A.7.c)
14. Control sediment as needed along the site perimeter and at all operational internal storm drain inlets at all times during construction, both internally and at the site boundary. (Schedule A.7.d.i)
15. Establish concrete truck and other concrete equipment washout areas before beginning concrete work. (Schedule A.8.c.i.(6))
16. Apply temporary and/or permanent soil stabilization measures immediately on all disturbed areas as grading progresses. Temporary or permanent stabilizations measures are not required for areas that are intended to be left unvegetated, such as dirt access roads or utility pole pads.(Schedule A.8.c.ii.(3))
17. Establish material and waste storage areas, and other non-stormwater controls. (Schedule A.8.c.i.(7))
18. Prevent tracking of sediment onto public or private roads using BMPS such as: construction entrance, graveled (or paved) exits and parking areas, gravel all unpaved roads located onsite, or use an exit tire wash. These BMPS must be in place prior to land-disturbing activities. (Schedule A 7.d.ii and A.8.c.(4))
19. When trucking saturated soils from the site, either use water-tight trucks or drain loads on site. (schedule A.7.d.ii.(5))
20. Control prohibited discharges from leaving the construction site, i.e., concrete wash-out, wastewater from cleanout of stucco, paint and curing compounds. (Schedule A.6)
21. Use BMPS to prevent or minimize stormwater exposure to pollutants from spills; vehicle and equipment fueling, maintenance, and storage; other cleaning and maintenance activities; and waste handling activities. These pollutants include fuel, hydraulic fluid, and other oils from vehicles and machinery, as well as debris, fertilizer, pesticides and herbicides, paints, solvents, curing compounds and adhesives from construction operations. (Schedule A.7.e.i.(2))
22. Implement the following BMPS when applicable: written spill prevention and response procedures, employee training on spill prevention and proper disposal procedures, spill kits in all vehicles, regular maintenance schedule for vehicles and machinery, material delivery and storage controls, training and signage, and covered storage areas for waste and supplies. (Schedule A.7.e.iii.)
23. Use water, soil-binding agent or other dust control technique as needed to avoid wind-blown soil. (Schedule A.7.a.iv)
24. The application rate of fertilizers used to reestablish vegetation must follow manufacturer's recommendations to minimize nutrient releases to surface waters. Exercise caution when using time-release fertilizers within any waterway riparian zone. (Schedule A.9.b.iii)
25. If an active treatment system (for example, electro-coagulation, flocculation, filtration, etc.) for sediment or other pollutant removal is employed, submit an operation and maintenance plan (including system schematic, location of system, location of inlet, location of discharge, discharge dispersion device design, and a sampling plan and frequency) before operating the treatment system. Obtain plan approval before operating the treatment system. Operate and maintain the treatment system according to manufacturer's specifications. (Schedule A.9.d)
26. Temporarily stabilize soils at the end of the shift before holidays and weekends, if needed. The registrant is responsible for ensuring that soils are stable during rain events at all times of the year. (Schedule A.7.b)
27. As needed based on weather conditions, at the end of each workday soil stockpiles must be stabilized or covered, or other BMPS must be implemented to prevent discharges to surface waters or conveyance systems leading to surface waters. (Schedule A.7.e.ii.(2))
28. Construction activities must avoid or minimize excavation and bare ground activities during wet weather. (Schedule A.7.a.i)
29. Sediment fence: remove trapped sediment before it reaches one third of the above ground fence height and before fence removal. (Schedule A.9.c.i)
30. Other sediment barriers (such as biobags): remove sediment before it reaches two inches depth above ground height and before BMP removal. (Schedule A.9.c.i)
31. Catch basins: clean before retention capacity has been reduced by fifty percent. Sediment basins and sediment traps: remove trapped sediments before design capacity has been reduced by fifty percent and at completion of project. (Schedule A.9.c.ii & iv)
32. Within 24 hours, significant sediment that has left the construction site, must be remediated. Investigate the cause of the sediment release and implement steps to prevent a recurrence of the discharge within the same 24 hours. Any in-stream clean-up of sediment shall be performed according to the Oregon Division of State Lands required timeframe. (Schedule A.9.b.i)
33. The intentional washing of sediment into storm sewers or drainage ways must not occur. Vacuuming or dry sweeping and material pickup must be used to cleanup released sediments. (Schedule A.9.b.ii)
34. The entire site must be temporarily stabilized using vegetation or a heavy mulch layer, temporary seeding, or other method should all construction activities cease for 30 days or more. (Schedule A.7.f.i)
35. Provide temporary stabilization for that portion of the site where construction activities cease for 14 days or more with a covering of blown straw and a tackifier, loose straw, or an adequate covering of compost mulch until work resumes on that portion of the site. (Schedule A.7.f.ii)
36. Do not remove temporary sediment control practices until permanent vegetation or other cover of exposed areas is established. Once construction is complete and the site is stabilized, all temporary erosion controls and retained soils must be removed and disposed of properly, unless doing so conflicts with local requirements. (Schedule A.8.c.iii(1) and D.3.c.ii and iii)

BMP MATRIX FOR CONSTRUCTION PHASES

WORK WINDOW	1												2												3												4											
WATER WORK WINDOW	Wtr Wk Win									Water Work Window												Water Work Window												Water Work Window												Wtr Wk Win		
YEAR																																																
MONTH	JA	FE	MR	AP	MY	JE	JL	AU	SE	OC	NO	DE	JA	FE	MR	AP	MY	JE	JL	AU	SE	OC	NO	DE	JA	FE	MR	AP	MY	JE	JL	AU	SE	OC	NO	DE	JA	FE	MR	AP	MY	JE	JL	AU	SE	OC	NO	DE
EROSION PREVENTATION																																															
Orange Construction Fence	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Matting	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dust Control	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Temporary/Permanent Seedings	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Buffer Zone	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SEDIMENT CONTROL																																															
Sediment Fence (Perimeter)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sediment Fence (Interior)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Filter Berm (Mulch)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sediment Trap	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RUNOFF CONTROL																																															
Construction Entrance	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Rock Lined Rip Rap Swale/Pipe Slope Drain/Outlet Protection	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POLLUTION PREVENTION																																															
Proper Signage	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Spill Kit On Site	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

RATIONALE STATEMENT

A comprehensive list of available best management practices (BMP) options based on DEQ's guidance manual has been reviewed to complete this erosion and sediment control plan. Some of the above listed BMP's were not chosen because they were determined to not effectively manage Erosion Prevention and Sediment Control for this project based on specific site conditions, including soil conditions topographic constraints, accessibility to the site, and other related conditions, as the project progresses and there is a need to revise the ESC Plan, an action plan will be submitted.

RD
Initial

CONTROL NOTES:

1. The contractor shall be responsible for proper installation and maintenance of all Erosion and Sediment Control measures, in accordance with local, state, and federal regulations.
2. Prior to any land disturbing activities, the boundaries of the clearing limits, vegetated buffers, and any sensitive areas shown on this plan shall be clearly delineated in the field. During the construction period, no disturbance is permitted beyond the clearing limits. the contractor must maintain the delineation for the duration of the project. NOTE: Vegetated corridors to be delineated with orange construction fence or approved equal.
3. Prior to any land disturbing activities, the BMP's that must be installed are a gravel construction entrance, perimeter sediment control, and inlet protection. these BMP's must be maintained for the duration of the project.
4. The type and percentages of seed in the mix must be identified on the plans. Seeding must take place no later than September 1 based on the vegetative seed mixes specified on the plans.
5. All pumping of sediment laded water shall be discharged over an undisturbed, preferably vegetated area, and through a sediment control BMP i.e. (Filter Bag).
6. The ESC Plan must be kept on site. All measures shown on the plan must be installed properly to ensure that sediment or sediment laden water does not enter a surface water system, roadway, or other properties.
7. The ESC measures shown on this plan are minimum requirements for anticipated site conditions. During the construction period, these measures shall be upgraded as needed to comply with all applicable Local, State, and Federal erosion control regulations. Changes to the approved ESC plan must be submitted in the form of an action plan to DEQ per the 1200 C Permit.
8. In areas subject to wind erosion, appropriate BMP's must be used which may include the application of fine water spraying, plastic sheeting, mulching, or other approved measures.
9. All exposed soils must be covered during the wet weather period.

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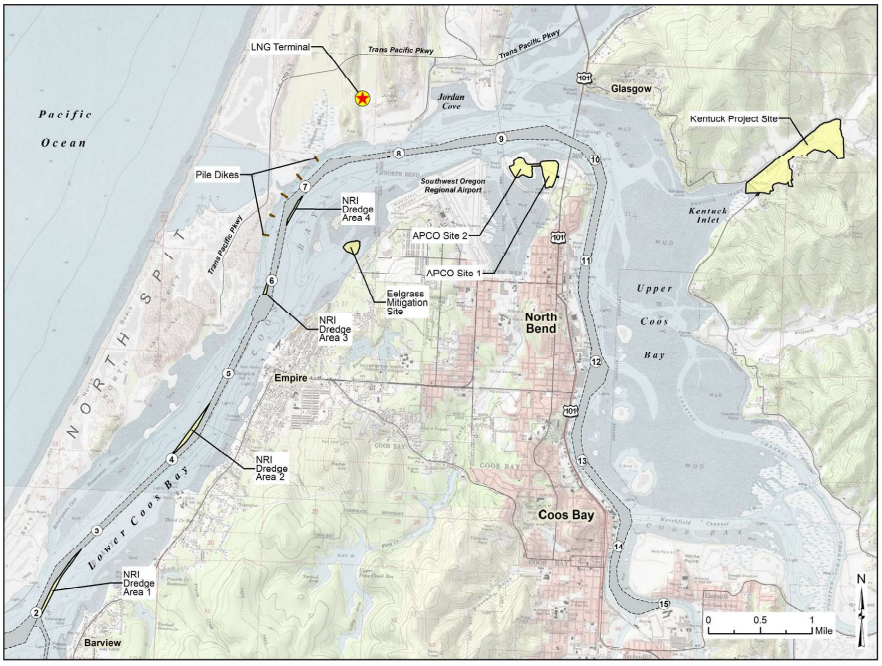
JORDAN COVE ENERGY PROJECT
APCO 2 SITE
EROSION AND SEDIMENT CONTROL PLAN

COOS COUNTY

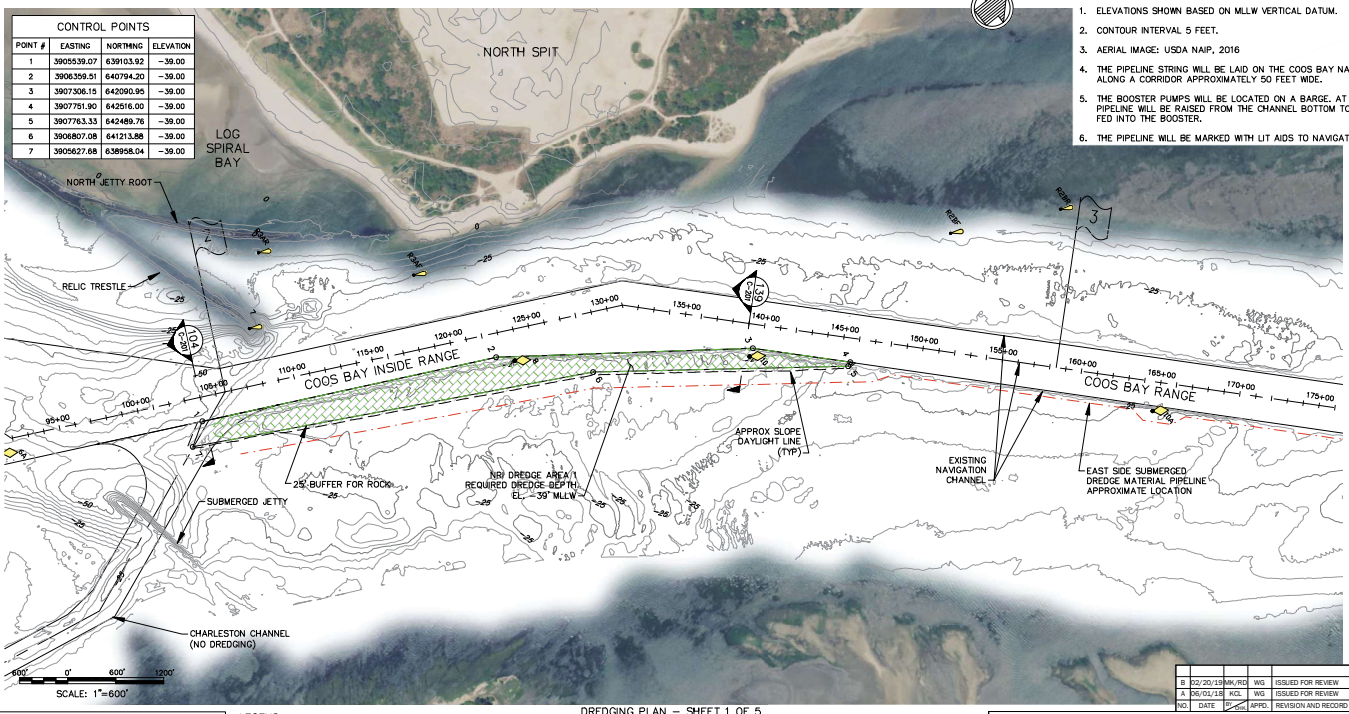
Designer: R DEVLIN | Review: M KC
Drafter: D CORCORRAN | Checker: W GERKIN

GENERAL NOTES | SHEET NO. G-002

APPENDIX B: PROJECT AREA


LNG Terminal
Trans Pacific Pkwy
Trans Pacific Pkwy
Glasgow
Pacific Ocean
Jordan Cove
Kentuck Project Site
Pile Dikes
Southwest Oregon Regional Airport
NRI Dredge Area 4
Kentuck Inlet
APCO Site 2
APCO Site 1
Trans Pacific Pkwy
Eelgrass Mitigation Site
North Bend
NRI Dredge Area 3
Upper Coos Bay
Empire
NRI Dredge Area 2
Lower Coos Bay
Coos Bay
NRI Dredge Area 1
Barview
N
0 0.5 1 Mile

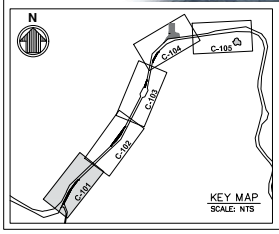
APPENDIX C: TEMPORARY DREDGE LINE LOCATION



CONTROL POINTS			
POINT #	EASTING	NORTHING	ELEVATION
1	3905539.07	639103.92	-39.00
2	3906359.51	640794.20	-39.00
3	3907506.15	642090.95	-39.00
4	3907751.90	642516.00	-39.00
5	3907763.33	642489.76	-39.00
6	3906807.08	641213.88	-39.00
7	3905627.68	638958.04	-39.00

NOTES:

1. ELEVATIONS SHOWN BASED ON MLLW VERTICAL DATUM.
2. CONTOUR INTERVAL 5 FEET.
3. AERIAL IMAGE: USDA NAIP, 2016
4. THE PIPELINE STRING WILL BE LAID ON THE COOS BAY NAVIGATION CHANNEL BOTTOM ALONG A CORRIDOR APPROXIMATELY 50 FEET WIDE.
5. THE BOOSTER PUMPS WILL BE LOCATED ON A BARGE. AT THESE LOCATIONS THE PIPELINE WILL BE RAISED FROM THE CHANNEL BOTTOM TO THE SURFACE BEFORE BEING FED INTO THE BOOSTER.
6. THE PIPELINE WILL BE MARKED WITH LIT AIDS TO NAVIGATION, AS APPROVED BY USCG.



LEGEND

- RIVER MILE MARKER
- EXISTING BATHYMETRY MAJOR CONTOURS
- EXISTING BATHYMETRY MINOR CONTOURS
- EXISTING NAVIGATION CHANNEL
- EXISTING CHANNEL CENTERLINE
- NEW SLOPE DAYLIGHT LINE
- NEW NRI AREA DREDGE TOE
- DREDGE MATERIAL PIPELINE
- ROCK DREDGE AREA
- SEDIMENT DREDGE AREA
- CONTROL POINTS
- EXISTING BUOY
- EXISTING FIXED RANGE MARKER OR FIXED LIGHT

DREDGING PLAN – SHEET 1 OF 5
SCALE: 1"=600'

NO.	DATE	BY	CHK'D	APPD.	REVISION AND RECORD OF ISSUE
B	02/20/19	MK/RD	WG		ISSUED FOR REVIEW
A	06/01/18	KCL	WG		ISSUED FOR REVIEW

DOC. CONTROL NO.: J1-760-MAR-PLN-DEA-00001-01 Rev B: ISSUED FOR REVIEW

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Jordan Cove LNG

JORDAN COVE ENERGY PROJECT
NAVIGATION RELIABILITY IMPROVEMENTS

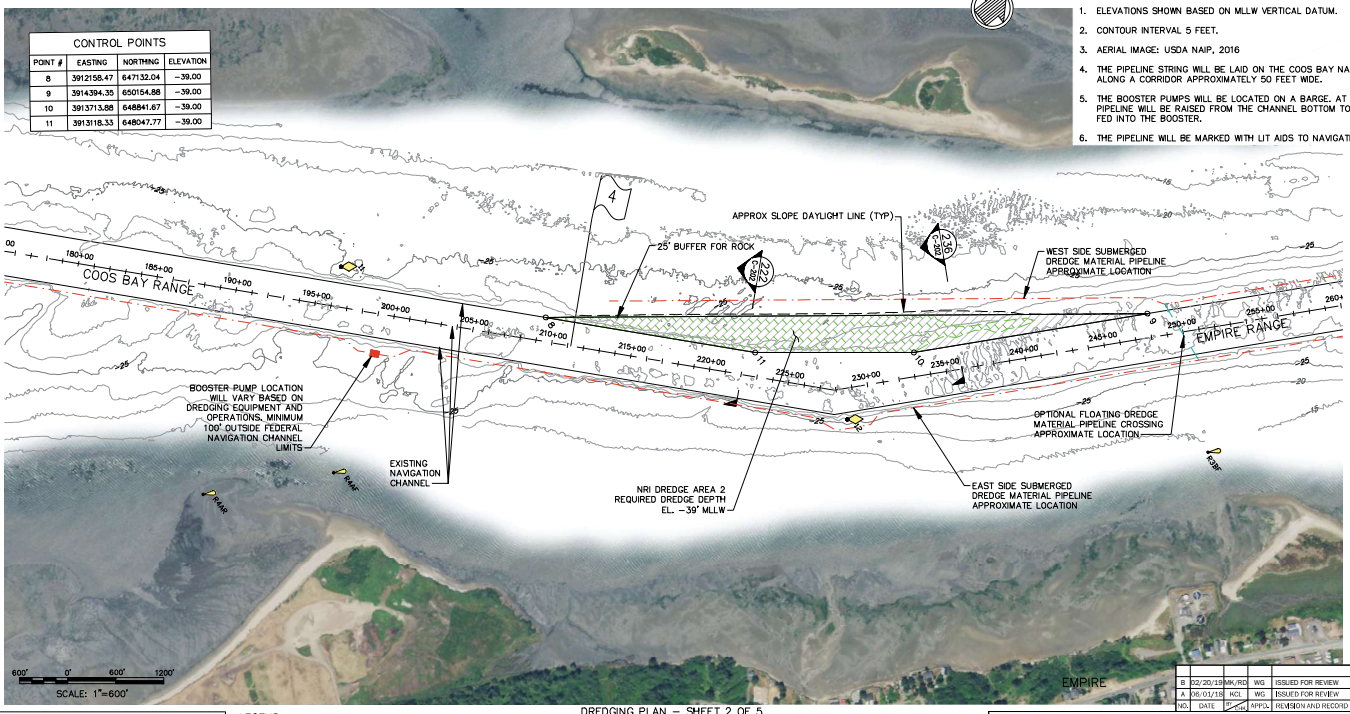
COOS COUNTY

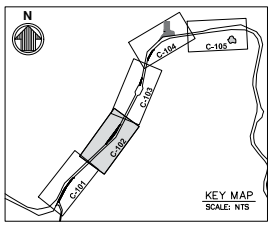
Designer: W GERKIN Review: –
Drafter: K LANDON Checker: –

DREDGING PLAN - SHEET 1 OF 5

SHEET NO. C-101

Q:\SEA\9929\9929-02 Hydrodynamic Studies (Rev A)\CADD_Active_SheetSet\9929_C101 Thru C107 2/20/2019 10:39 AM Corcoran, Darwin





LEGEND

- RIVER MILE MARKER
- EXISTING BATHYMETRY MAJOR CONTOURS
- EXISTING BATHYMETRY MINOR CONTOURS
- EXISTING NAVIGATION CHANNEL
- EXISTING CHANNEL CENTERLINE
- NEW SLOPE DAYLIGHT LINE
- NEW NRI AREA DREDGE TOE
- DREDGE MATERIAL PIPELINE

DREDGING PLAN – SHEET 2 OF 5
SCALE: 1"=600'

- ROCK DREDGE AREA
- SEDIMENT DREDGE AREA
- CONTROL POINTS
- EXISTING BUOY
- EXISTING FIXED RANGE MARKER OR FIXED LIGHT

NO.	DATE	BY	CHK'D	APP'D	REVISION AND RECORD OF ISSUE
B	02/20/19	MK/RD	WG		ISSUED FOR REVIEW
A	06/01/18	KCL	WG		ISSUED FOR REVIEW

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JORDAN COVE ENERGY PROJECT
NAVIGATION RELIABILITY IMPROVEMENTS

COOS COUNTY

Designer: W GERKIN | Review: –
Drafter: K LANDON | Checker: –

DREDGING PLAN - SHEET 2 OF 5

SHEET NO.: C-102

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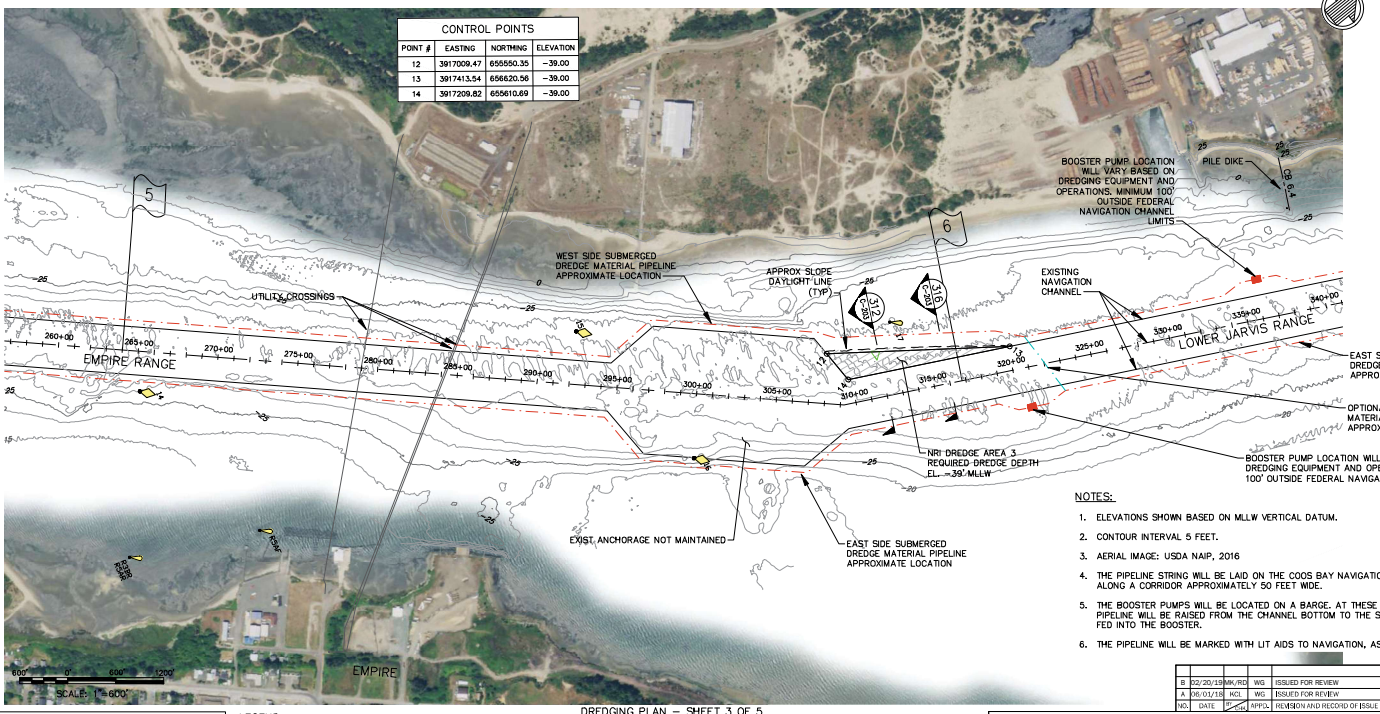
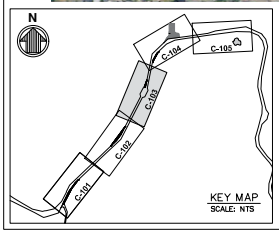


NOTES:

1. ELEVATIONS SHOWN BASED ON MLLW VERTICAL DATUM.
2. CONTOUR INTERVAL 5 FEET.
3. AERIAL IMAGE: USDA NAIP, 2016
4. THE PIPELINE STRING WILL BE LAID ON THE COOS BAY NAVIGATION CHANNEL BOTTOM ALONG A CORRIDOR APPROXIMATELY 50 FEET WIDE.
5. THE BOOSTER PUMPS WILL BE LOCATED ON A BARGE. AT THESE LOCATIONS THE PIPELINE WILL BE RAISED FROM THE CHANNEL BOTTOM TO THE SURFACE BEFORE BEING FED INTO THE BOOSTER.
6. THE PIPELINE WILL BE MARKED WITH LIT AIDS TO NAVIGATION, AS APPROVED BY USCG.

NO.	DATE	BY	CHK'D	APP'D	REVISION AND RECORD OF ISSUE
B	02/20/19	MK/RD	WG		ISSUED FOR REVIEW
A	06/01/18	KCL	WG		ISSUED FOR REVIEW



LEGEND

- RIVER MILE MARKER
- EXISTING BATHYMETRY MAJOR CONTOURS
- EXISTING BATHYMETRY MINOR CONTOURS
- EXISTING NAVIGATION CHANNEL
- EXISTING CHANNEL CENTERLINE
- NEW SLOPE DAYLIGHT LINE
- NEW NRI AREA DREDGE TOE
- DREDGE MATERIAL PIPELINE
- ROCK DREDGE AREA
- SEDIMENT DREDGE AREA
- CONTROL POINTS
- EXISTING BUOY
- EXISTING FIXED RANGE MARKER OR FIXED LIGHT

DREDGING PLAN – SHEET 3 OF 5
SCALE: 1"=600'

DOC. CONTROL NO.: J1-760-MAR-PLN-DEA-00001-03 Rev B: ISSUED FOR REVIEW

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Jordan Cove LNG

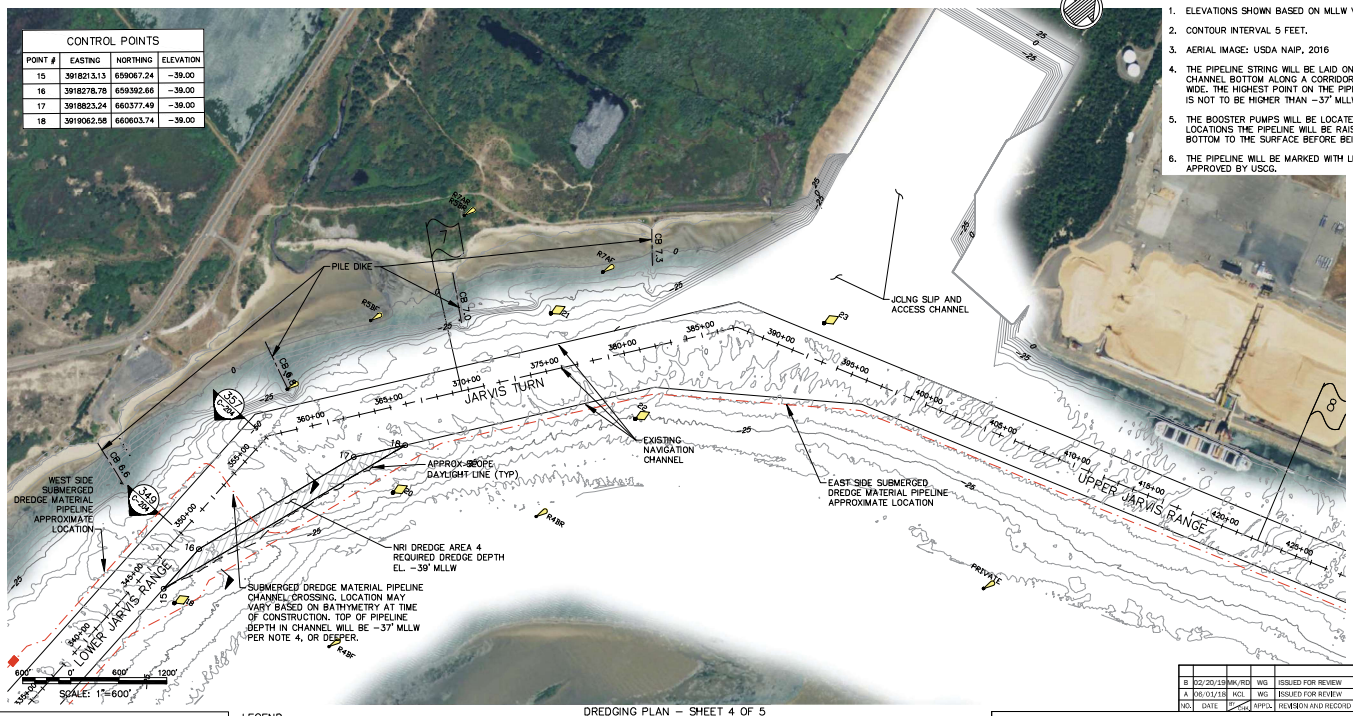
JORDAN COVE ENERGY PROJECT
NAVIGATION RELIABILITY IMPROVEMENTS

COOS COUNTY

Designer: W GERKIN | Review: –
Drafter: K LANDON | Checker: –

DREDGING PLAN - SHEET 3 OF 5 | SHEET NO. C-103

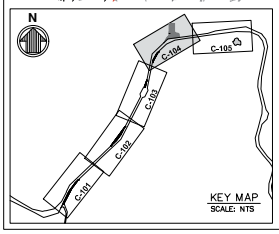
Q:\SEA\9929\9929-02 Hydrodynamic Studies (Rev A)\CADD_Active_SheetSet\9929_C101 Thru C107 2/20/2019 10:39 AM Corcorran, Darwin



NOTES:

1. ELEVATIONS SHOWN BASED ON MLLW VERTICAL DATUM.
2. CONTOUR INTERVAL 5 FEET.
3. AERIAL IMAGE: USDA NAIP, 2016
4. THE PIPELINE STRING WILL BE LAID ON THE COOS BAY NAVIGATION CHANNEL BOTTOM ALONG A CORRIDOR APPROXIMATELY 50 FEET WIDE. THE HIGHEST POINT ON THE PIPELINE OR BALL CONNECTION IS NOT TO BE HIGHER THAN −37' MLLW.
5. THE BOOSTER PUMPS WILL BE LOCATED ON A BARGE. AT THESE LOCATIONS THE PIPELINE WILL BE RAISED FROM THE CHANNEL BOTTOM TO THE SURFACE BEFORE BEING FED INTO THE BOOSTER.
6. THE PIPELINE WILL BE MARKED WITH LIT AIDS TO NAVIGATION, AS APPROVED BY USCG.

NO.	DATE	BY	CHK'D	APPD.	REVISION AND RECORD OF ISSUE
B	02/20/19	MK/RD	WG		ISSUED FOR REVIEW
A	06/01/18	KCL	WG		ISSUED FOR REVIEW



LEGEND

- RIVER MILE MARKER
- EXISTING BATHYMETRY MAJOR CONTOURS
- EXISTING BATHYMETRY MINOR CONTOURS
- EXISTING NAVIGATION CHANNEL
- EXISTING CHANNEL CENTERLINE
- NEW SLOPE DAYLIGHT LINE
- NEW NRI AREA DREDGE TOE
- DREDGING MATERIAL PIPELINE
- SEDIMENT DREDGE AREA
- CONTROL POINTS
- EXISTING BUOY
- EXISTING FIXED RANGE MARKER OR FIXED LIGHT

DREDGING PLAN – SHEET 4 OF 5
SCALE: 1"=600'

DOC. CONTROL NO.: J1-760-MAR-PLN-DEA-00001-04 Rev B: ISSUED FOR REVIEW

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Jordan Cove LNG

JORDAN COVE ENERGY PROJECT
NAVIGATION RELIABILITY IMPROVEMENTS

COOS COUNTY

Designer: W GERKIN | Review: —
Drafter: K LANDON | Checker: —

DREDGING PLAN - SHEET 4 OF 5

SHEET NO. C-104

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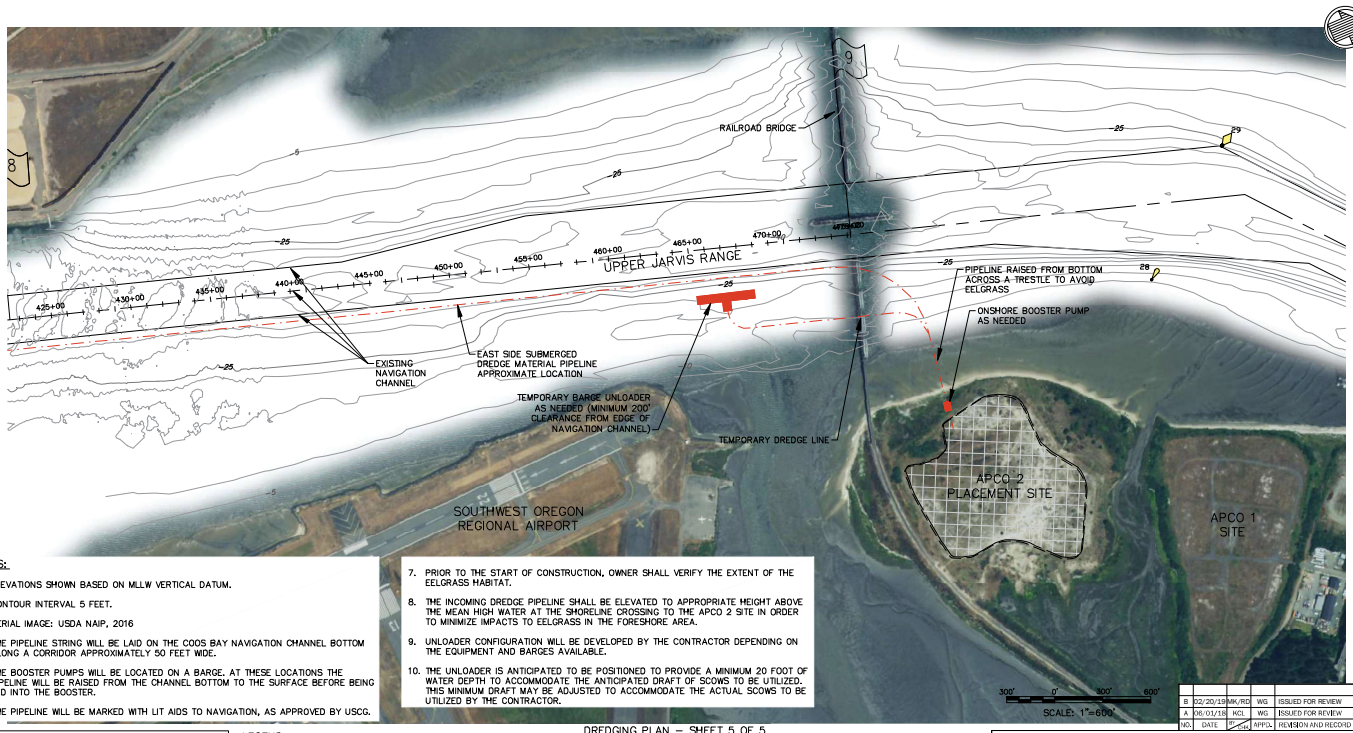
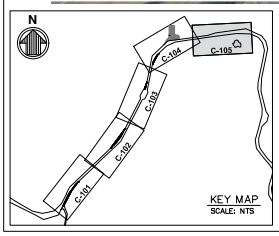


NOTES:

1. ELEVATIONS SHOWN BASED ON MLLW VERTICAL DATUM.
2. CONTOUR INTERVAL 5 FEET.
3. AERIAL IMAGE: USDA NAIP, 2016
4. THE PIPELINE STRING WILL BE LAID ON THE COOS BAY NAVIGATION CHANNEL BOTTOM ALONG A CORRIDOR APPROXIMATELY 50 FEET WIDE.
5. THE BOOSTER PUMPS WILL BE LOCATED ON A BARGE. AT THESE LOCATIONS THE PIPELINE WILL BE RAISED FROM THE CHANNEL BOTTOM TO THE SURFACE BEFORE BEING FED INTO THE BOOSTER.
6. THE PIPELINE WILL BE MARKED WITH LIT AIDS TO NAVIGATION, AS APPROVED BY USCG.
7. PRIOR TO THE START OF CONSTRUCTION, OWNER SHALL VERIFY THE EXTENT OF THE EELGRASS HABITAT.
8. THE INCOMING DREDGE PIPELINE SHALL BE ELEVATED TO APPROPRIATE HEIGHT ABOVE THE MEAN HIGH WATER AT THE SHORELINE CROSSING TO THE APCO 2 SITE IN ORDER TO MINIMIZE IMPACTS TO EELGRASS IN THE FORESHORE AREA.
9. UNLOADER CONFIGURATION WILL BE DEVELOPED BY THE CONTRACTOR DEPENDING ON THE EQUIPMENT AND BARGES AVAILABLE.
10. THE UNLOADER IS ANTICIPATED TO BE POSITIONED TO PROVIDE A MINIMUM 20 FOOT OF WATER DEPTH TO ACCOMMODATE THE ANTICIPATED DRAFT OF SCOWS TO BE UTILIZED. THIS MINIMUM DRAFT MAY BE ADJUSTED TO ACCOMMODATE THE ACTUAL SCOWS TO BE UTILIZED BY THE CONTRACTOR.

DREDGING PLAN – SHEET 5 OF 5
SCALE: 1"=600'



LEGEND

- RIVER MILE MARKER
- EXISTING BATHYMETRY MAJOR CONTOURS
- EXISTING BATHYMETRY MINOR CONTOURS
- EXISTING NAVIGATION CHANNEL
- EXISTING CHANNEL CENTERLINE
- DREDGE MATERIAL PIPELINE
- PLACEMENT SITE
- CONTROL POINTS
- EXISTING BUOY
- EXISTING FIXED RANGE MARKER OR FIXED LIGHT

NO.	DATE	BY	CHK'D	APP'D	REVISION AND RECORD OF ISSUE
B	02/20/19	MK/RD	WG		ISSUED FOR REVIEW
A	06/01/18	KCL	WG		ISSUED FOR REVIEW

DOC. CONTROL NO.: J1-760-MAR-PLN-DEA-00001-05 Rev B: ISSUED FOR REVIEW

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Jordan Cove LNG

JORDAN COVE ENERGY PROJECT
NAVIGATION RELIABILITY IMPROVEMENTS

COOS COUNTY

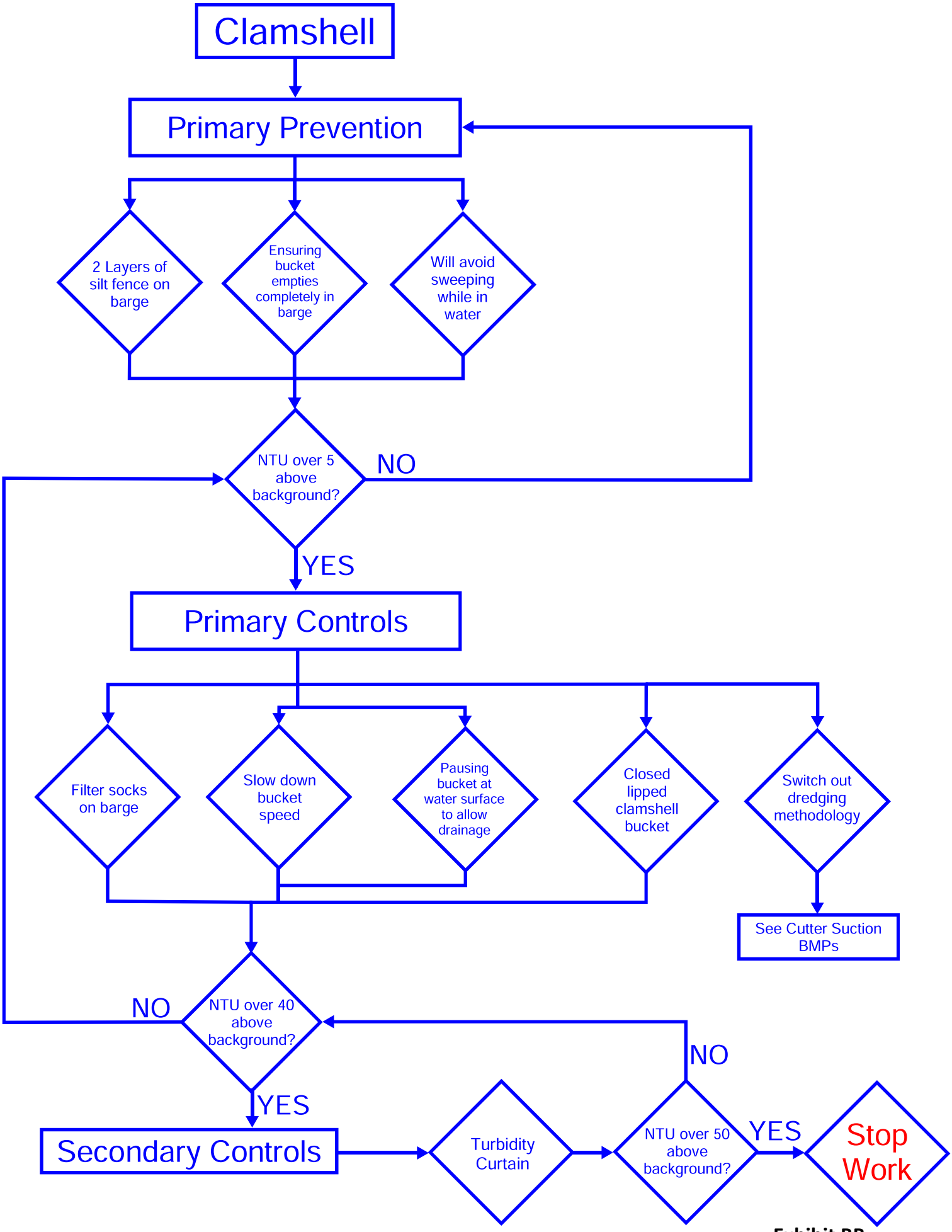
Designer: W GERKIN Review: –
Drafter: K LANDON Checker: –

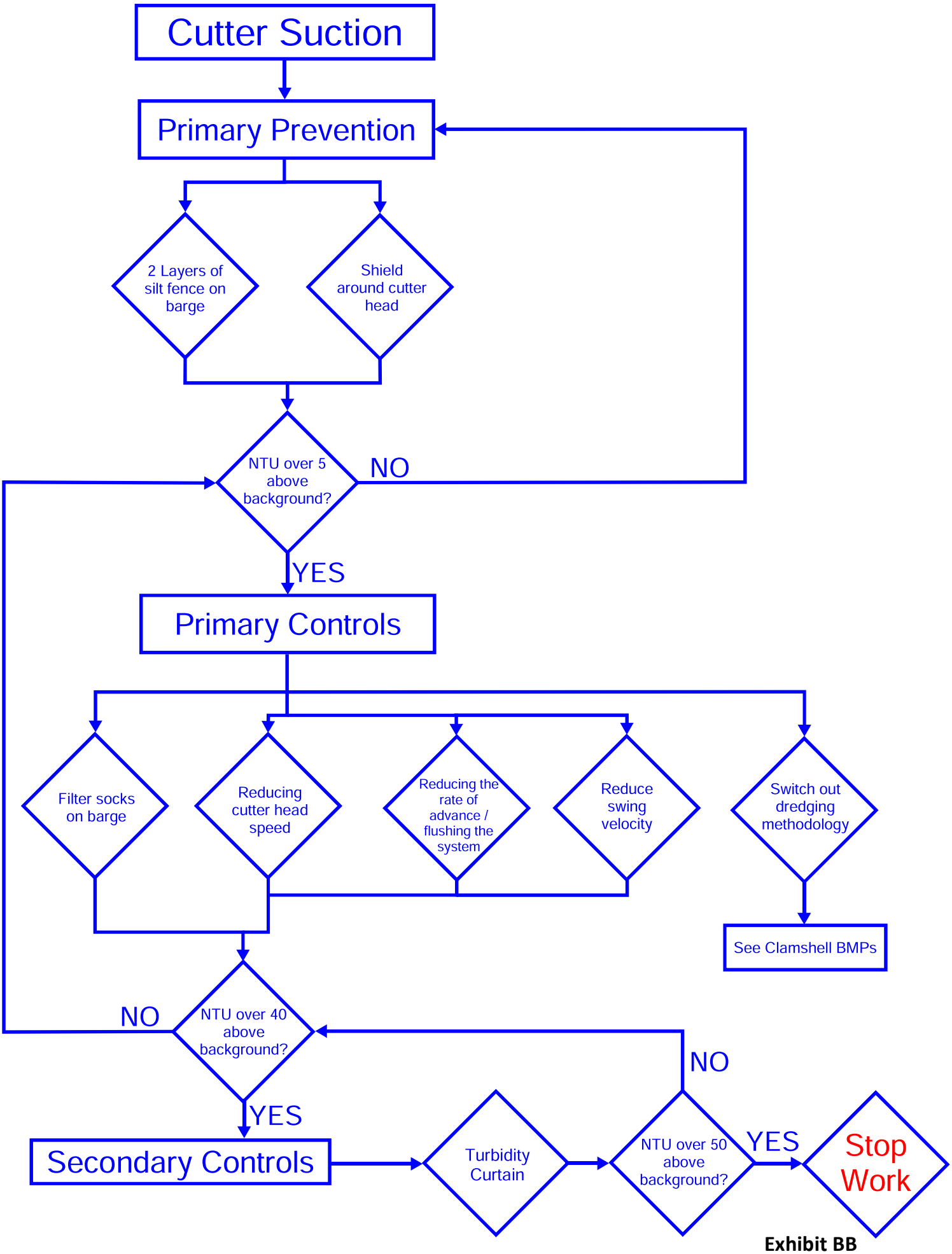
DREDGING PLAN - SHEET 5 OF 5

SHEET NO. C-105

Q:\SEA\9929\9929-02 Hydrodynamic Studies (Rev A)\CADD_Active_SheetSet\9929_C101 Thru C107 2/20/2019 10:39 AM Corcorran, Darwin

APPENDIX D: BMP FLOW CHART


Clamshell
Primary Prevention
2 Layers of silt fence on barge
Ensuring bucket empties completely in barge
Will avoid sweeping while in water
NTU over 5 above background?
NO
YES
Primary Controls
Filter socks on barge
Slow down bucket speed
Pausing bucket at water surface to allow drainage
Closed lipped clamshell bucket
Switch out dredging methodology
See Cutter Suction BMPs
NTU over 40 above background?
NO
YES
Secondary Controls
Turbidity Curtain
NTU over 50 above background?
NO
YES
Stop Work


Cutter Suction
Primary Prevention
2 Layers of silt fence on barge
Shield around cutter head
NTU over 5 above background?
NO
YES
Primary Controls
Filter socks on barge
Reducing cutter head speed
Reducing the rate of advance / flushing the system
Reduce swing velocity
Switch out dredging methodology
See Clamshell BMPs
NO
NTU over 40 above background?
YES
NO
Secondary Controls
Turbidity Curtain
NTU over 50 above background?
YES
Stop Work

APPENDIX E: WATER POLLUTION CONTROL AND SPILL RESPONSE FORMS

SPILL EMERGENCY INITIAL REPORT FORM

1. **Reporting Name**_____ **Responsible Party**_____

2. **Location of Spill (County, Nearest Town, Township, River Mile)**

   _____

   _____

3. **Spill Description (Date & Time of Spill, material involved, estimated quantity)**

   _____

   _____

4. **Environmental Impacts (Air, Water, Groundwater, Fish or Wildlife)**

   _____

   _____

5. **Reporting** **Tracking No.** **Date/Time** **Point of Contact**

   National Response Center_____

   Oregon Emergency Response System_____

6. **Incident Action Plan Strategic Goals (what to do) and Tactical Objectives (who and how)**

Strategic Goals	**Tactical Objectives**
Perform Hazard Assessment	_____
Establish Site Security	_____
Establish Incident Command	_____
Evacuate Injured or Exposed	_____
Contain the Spill	_____
Initiate Cleanup	_____

Jordan Cove LNG Water Quality Monitoring Log

Project Name:_____ Dredge Type:_____

Dredge Location:_____ Calibration Date:_____

Clock Validation:_____ Reported By:_____

Contract Number:_____ Date:_____

Captain:_____ Sunrise/Sunset:_____

Water Quality Monitoring Log																	
Test No.	Load No.	Weather	Time	Wind	Channel Type	Dredge Condition	Placement Area	Placement Type	Coordinates	NTU Display	NTU Adjusted	Depth	NTU Limit	In or Out of Plume	Stop Time	Resume Time	Exceedance Actions Taken

instabilities and are intended to restore the site in a manner that allows for long-term stream stability and protection of the Pipeline from potential exposure.

13. The Applicants have accounted for water quality impacts from erosion and sedimentation, storm water runoff, and roads

A commenter expresses concern about stormwater impacts. To minimize the impacts of erosion and sedimentation on surface waters, land-disturbing and construction activities will be conducted in compliance with the National Pollutant Discharge Elimination System (NPDES) Permit Number 1200-C for stormwater discharges during construction activities. Stormwater runoff from the disturbed portions of the LNG Terminal will be managed in accordance with a site-specific Erosion and Sediment Control Plan (ESCP) included in the NPDES permit, which incorporates stormwater pollution prevention. JCEP will install all necessary erosion and sedimentation control measures in compliance with its ESCP, as well as the provisions of FERC's Upland Erosion Control, Revegetation, and Maintenance Plan and FERC's Wetland and Waterbody Construction and Mitigation Procedures. This issue is regulated by ODEQ in the 401-certification process.

Some commenters claim that the shoreline alterations at the LNG Terminal site will themselves affect inundation of Coos Bay communities aside from impacts at the LNG Terminal site proper. Section V.1 above discusses modeling and analysis of changes in Coos Bay hydrodynamics as a result of the LNG Terminal which demonstrated a lack of significant changes or impacts to mean tidal range, tidal currents, sedimentation patterns, impacts to flood risk or existing flood control, or impacts to existing infrastructure.

14. The Applicants have sufficiently planned for impacts to water quality and habitat quality in wetlands and waterways

One commenter is concerned that Pipeline construction will involve blasting that will shift the flow of the Coquille River (Middle Fork) river and prevent that commenter from accessing the river from its property. Blasting, if necessary, would occur along the trench line and will not affect the flow of the river.

ODFW states that the Applicants should only submit in-water blasting permit applications after obtaining access to site locations and collecting necessary site-specific information to complete applications. No in-water blasting will occur within the coastal zone. Not all waterbodies outside of the coastal zone that may require blasting have been reviewed on-site, and access may not be obtained until nearer the time of construction. More importantly, road access to conduct geotechnical investigations is not available at most of the stream crossings; therefore, it is physically and environmentally impractical to recommend geotechnical investigations to determine if blasting is the only practical method to cross streams. Therefore, PCGP will provide a programmatic approach in the In-Water Blasting Plan that will detail the BMPs that will be implemented to minimize potential effects to aquatic species in the event blasting is necessary during dry open cut stream crossings due to mechanical excavation methods being unable to achieve required pipeline design depths. To the extent in-water blasting will be required outside of the coastal zone, PCGP will coordinate with ODFW during development of the In-Water Blasting Plan in the fourth quarter of 2019.

Many commenters note the Pipeline's crossing of wellhead protection areas, ditches, canals, and other waterbodies on or near their properties, and they express concern about the potential for the Pipeline to alter drainage patterns or impact drinking water supplies, including groundwater wells. PCGP works with individual landowners to ensure that water supply wells and irrigation facilities are protected during and following construction, and in some cases, the Pipeline is rerouted to avoid impacts. The Groundwater Monitoring and Mitigation Plan (see JPA Appendix F.2 to Attachment C) further describes the measures that will be implemented before and after construction to protect groundwater wells. In addition, following Pipeline installation, contours will be restored as closely as possible to their pre-construction condition, and

Regarding the Pipeline, the JPA Part 2 Attachment C details the potential Pipeline construction and operation effects to waterbodies and wetlands, as well as the BMPs and restoration and mitigation measures to avoid or minimize the potential effects. Any effects to recreation would be temporary, occurring during the construction of the Pipeline. Following construction, the Pipeline route on federal lands would be open to the public for fishing and hunting, as controlled by the federal land managing agency, similar to adjacent lands. PCGP will restrict off-road vehicle (ORV) traffic on the right-of-way to promote restoration, minimize erosion, and prevent environmental damage. PCGP easements on private lands do not allow for public access/trespass.

Although outside the scope of ODSL's review, some commenters suggested public recreational and hunting access should be granted to the Kentuck site along with additional facilities such as parking. JCEP will be developing a long-term management plan for the Kentuck site which will include details on recreational access and uses consistent with performance standards for the site. Options for inclusion of additional facilities, such as parking, will be evaluated as the Project proceeds into the detailed design phase, and will include consultation with ODFW and other local stakeholders.

4. General

Commenters indicate the need for public communications planning regarding how recreational users of fish and wildlife resources in Coos Bay and along the Pipeline route will obtain information concerning the Project, and the need for a representative of the Project to serve as a public communications specialist to the Project area constituents. JCEP will be developing a public communications plan prior to construction, and already has representatives in Coos Bay, Douglas, Medford, and Klamath who serve to provide responses to local constituents on topics including land access and the Kentuck site. The Applicants have offices in Coos Bay and Klamath Falls, where interested stakeholders can speak with these representatives to address any questions or concerns. Additionally, there is a dedicated email address and hotline for Project area constituents to use should they have any questions. As the Project progresses closer to construction, the communications team will be expanded to include more dedicated public communications staff for different areas of the Project.

V. THE PUBLIC NEED FOR THE PROPOSED FILL OR REMOVAL AND THE SOCIAL, ECONOMIC OR OTHER PUBLIC BENEFITS LIKELY TO RESULT FROM THE PROPOSED FILL OR REMOVAL [ORS 196.825(3)(A)]

As outlined supra, though both the statutory and regulatory public need provisions require that ODSL consider only the "public need for the proposed fill or removal and the social, economic or other public benefits likely to result from the proposed fill or removal," ORS 196.825(3)(a) (emphasis added), the Oregon Court of Appeals nevertheless has construed the "public need criterion" of ORS 196.825(3)(a) as requiring ODSL to consider whether a proposed "project" serves the public need before the agency can issue a removal/fill permit. *Wal-Mart*, 295 Or App at 321. The public need for the Project is therefore discussed below.

One commenter states that there is no evidence of an actual need for the Project, or that the Project will actually enter operation—and an idle pipeline and terminal do not provide meaningful economic benefits. The purpose and need for the Project is clearly articulated above and supported by the information on the LNG market set out below. The economic benefits of the Project are discussed in Section V. As stated in the JPA Section 3, Project Purpose and Need, "PCGP held an open season for transportation service on the Pipeline in July of 2017. PCGP has executed precedent agreements totaling 96% of the Pipeline's capacity."

Several commenters argue that the Applicants have failed to provide examples of any buyers for the LNG they intend to export. On March 22, 2016, JCEP announced that it had executed a preliminary agreement

with JERA Co., Inc., the largest LNG buyer in the world, for the acquisition of at least 1.5 mtpa of LNG capacity from the Project. Following the announcement of the JERA agreement, JCEP announced the execution of a preliminary agreement with ITOCHU Corporation, a significant Japanese investment and trading firm, for the procurement of 1.5 mtpa of LNG capacity from the Project. Negotiations continue with other LNG buyers for the balance of the marketed plant capacity.

Market demand for LNG is expected to grow 4% to 5% per year between 2015 and 2030, and LNG demand growth has exceeded expectations recently. While many expected the LNG market to be oversupplied in 2016, demand in Asia and the Middle East absorbed the increase in supply from Australia and the U.S. Chinese imports of LNG increased 33% in 2016 over the prior year, and India saw an increase of 25% over the same period. There were also six new importing countries in 2016 (Colombia, Egypt, Jamaica, Jordan, Pakistan, and Poland), bringing the total number of LNG importing countries to 35. Shortages in domestic gas supplies in Egypt, Jordan, and Pakistan led those countries to be among the fastest growing importers, importing a total of 13.9 million tons of LNG in 2016 during their first year of imports.

Despite the resurgent LNG demand, global LNG prices fell dramatically over the last two years following the slump in oil prices. This drop in prices has led to new LNG supply projects being deferred or cancelled, and it will undoubtedly lead to a tightening of the global market after 2020. With few new supply projects and strong demand growth driven by India, China, and Southeast Asia, the LNG market is expected to recover by 2023, and LNG demand is expected to almost double by 2030, requiring an incremental 150 mtpa of new supply by the end of the next decade.

U.S. LNG exports are one of the lowest cost supply sources in the world and are expected to maintain their competitive advantage going forward due to the size and quality of the upstream natural gas resources in North America and the availability of infrastructure. Projects such as JCEP and PCGP on the west coast of the U.S. offer a particular strategic advantage in that they are able to supply the strong Asian market demand with shorter shipping distances relative to other U.S. export projects. The distance from the Port of Coos Bay to Tokyo Bay requires 9 days shipping compared to 22 days from the Gulf of Mexico utilizing the Panama Canal.

Demand in Japan is not dependent upon demand growth but is driven by the rebalancing of the supply portfolios held by Japanese companies. Twenty-five percent of Japan's long-term contracts expire between 2020 and 2025. U.S. LNG exports to Japan are positive from a number of standpoints. Japan is the most important U.S. ally in Asia, and increased U.S. imports will strengthen this alliance and improve the balance of trade between these two countries.

Figure 1 below shows the current and predicted Japanese contracted LNG supply and demonstrates the increasing demand from U.S. export supplies.

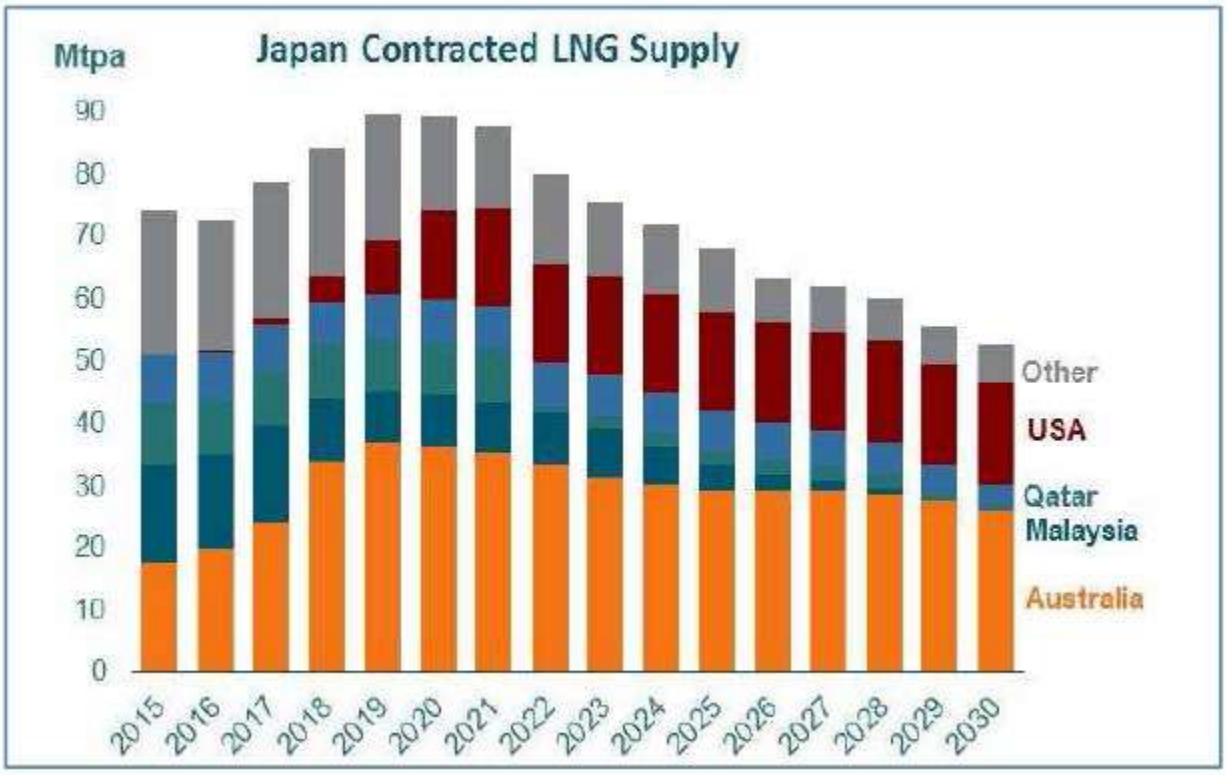


Figure 1. Current and Predicted Japanese LNG Contracts

Several commenters question the public benefits of the LNG Terminal. Other commenters claim that the Applicants rely on direct spending and local employment associated with construction and operation to derive benefits while ignoring negative effects such as displacement and other economic damages. Additionally, a commenter alleges that Department of Energy studies show that increased LNG exports will raise energy prices and redistribute wealth to shareholders of gas production companies rather than benefit the general public. The Macroeconomic Impacts of LNG Exports from the U.S. report (NERA Economic Consulting, December 3, 2012) concluded that LNG exports do benefit the public. The report projects that the U.S. is expected to gain net economic benefits from allowing LNG exports in every scenario, and that, in spite of projected higher domestic natural gas prices, the benefits that come from export expansion more than outweigh the losses from reduced capital and wage income to U.S. consumers.

The LNG Terminal will generate an estimated 110 to 120 new international deep-draft vessel calls to the port each year. That is nearly a 300% increase over current annual ship traffic. Each vessel call alone to the International Port of Coos Bay delivers an estimated $1.3 million in direct and indirect economic value — public benefit—to Oregon, as documented by the Port and the U.S. Army Corps of Engineers (USACE)[2] who are responsible for calculating the cost/benefit ratio for federal channel maintenance funding. This benefit includes $143 million annually for products, services, and spending of all types in the community and region.

As demonstrated by the letters of support from the International Port of Coos Bay, Roseburg Forest Products, and the Coos Bay Pilots Associate (the JPA, Part 1, Attachment M), the proposed NRIs will

[2] Sorenson, Paul. 2013. Economic Impact Study of Coos Bay Navigation Channel, North Bend/Coos Bay.

benefit maritime commerce in Coos Bay by increasing the operational window for safe vessel transit by approximately 20%.

In addition to the economic activity, the value of the cargo by tonnage will significantly improve the cost/benefit ratio that is critical for federal channel maintenance funding through the USACE. This channel maintenance benefits *all* shipping terminals in the Coos Bay harbor, Oregon's second largest state port.

One commenter states that significant changes in the Project design have occurred since the time that the Department approved the removal-fill permit for the excavation of the marine slip in Coos Bay. Specifically, the original proposal reviewed and approved by the Department included the LNG import facility as a component of a multi-use marine slip proposed by the Port. *See SOPIP, Inc. v. Coos County, 57* Or LUBA 301, 302 (2008) (explaining that, "[t]he proposed slip would be excavated and designed to be large enough to accommodate two berths, one of which would be dedicated to large ocean-going LNG tankers."). The Port's use of the terminal (as additional to and separate from the LNG Terminal) was found to provide "considerable benefits" to the public that outweighed negative impacts to public trust resources. Id. at 314 n.6. The current project no longer anticipates a multi-use function, but instead will be totally dedicated to the LNG Terminal. Rec. 10393. Although the scope of the benefits may be different, there will still be benefits to the public.

Several commenters question the public need for the Project consistent with *Wal-Mart*. Additionally, several commenters expressed concern that the Project does not adequately demonstrate public benefits of the Project for the citizens of Oregon. Unlike the administrative record in *Wal-Mart*, where the Department explicitly stated that it could not conclusively determine whether a public benefit had been demonstrated due to the lack of such information provided by the applicant, Applicants have provided more than sufficient information to support such a finding by ODSL for this Project based on the information in the JPA, responses provided her and a report specifically addressing this criterion in detail, clearly demonstrating the socioeconomic benefits of the Project (Attachment E).

According to ECONorthwest's June 2017 report (*Jordan Cove Energy Project and Pacific Connector Gas Pipeline: Analysis of Potential Impacts on Housing and Schools)*, in 2016, unemployment in Coos County was 6.5%, unemployment in Jackson County was 6.4%, unemployment in Douglas County was 5.8%, and unemployment in Klamath County was 6.9%. These four counties had higher unemployment rates in 2016 than the average unemployment rates in both the U.S. (4.7%) and in the State of Oregon (4.9%). This Project will provide 6,000 jobs during peak construction, and 215 permanent family-wage jobs during operations, according to economic impact analyses of the Project from ECONorthwest. These are in addition to the more than 8,500 spinoff jobs that will be created annually during construction and 1,500 spinoff jobs annually during operation in other industries, including health, restaurants, retail, etc. The Project will address the public need for family-wage jobs in Southern Oregon.

The Project is a $10 billion private investment in the State of Oregon, making it the largest private economic development investment in Southern Oregon's history. It will generate approximately $60 million per year in average property tax revenue to Coos, Douglas, Jackson, and Klamath Counties according to ECONorthwest. Those local government tax revenues benefit the public in supporting schools, public safety, public health and health care, children and family assistance, transportation and road maintenance, parks and other public facilities, and more. The ability for local governments to serve their citizens is a public benefit. At the state level, the Project will contribute an average of $50 million annually to Oregon in new state taxes to support critical public services, including public education, libraries, roads, and public safety, including fire protection services, according to ECONorthwest's analyses.

The Project will also provide a sustained economic boost to local businesses of all types, including $95.7 million in direct local spending by employees during each year of construction and $14.2 million per year

when operating, as summarized in ECONorthwest's March 2019 report, *Jordan Cove Project Worker Spending Impacts on Coos, Douglas, Jackson, and Klamath Counties* (Attachment E, Appendix F). In addition, the Project will provide more than $500 million to local Community Enhancement Plan partners by directing eligible Enterprise Zone tax savings to local governments, benefitting Coos Bay, North Bend, Coos County, and Port residents.

This financial infusion represents substantial public benefit. The Project also is providing benefit to the public in compensation to landowners for voluntary easement agreements and long-term navigation and commerce improvement in a public harbor.

One commenter suggests that the Department should not consider the operational economic benefits of the Project if it is going to exclude operational impacts from consideration. Such an approach, however, not only is inconsistent with the Department's customary methodology for evaluating the public need criteria, but also runs afoul of the Oregon Court of Appeals recent decision in *Wal-Mart* (described above). The employment benefits provided by the Project are not likely to create issues with job displacement. Coos County unemployment data, prepared by the Oregon Employment Department and the U.S. Bureau of Labor Statistics, released December 27, 2018, indicates that Coos County's unemployment rate increased to 5.3% from 5.1% in October 2018. Oregon's unemployment rate is 3.9%, higher than the nation's rate of 3.7 percent. Coos County did add 160 jobs from November 2017 to November 2018, but three-quarters of those were in leisure and hospitality, which is the lowest paying industry, with a median wage of $13.05 as of the first quarter of 2018. Sixty percent of vacant jobs in southwest Oregon pay less than $15 per hour. The ECONorthwest report calculates that in 2017 dollars, JCEP would generate more than $51,400 for every full-time employee job linked to the Project's operations, which is almost double the leisure and hospitality median wage. With an unemployment rate almost one-third higher than the state and the nation, an unemployment rate that is rising, and most jobs being added in the lowest paying industry, it is unlikely that the JCEP jobs would displace workers from other, higher paying jobs.

VI. THE ECONOMIC COST TO THE PUBLIC IF THE PROPOSED FILL OR REMOVAL IS NOT ACCOMPLISHED [ORS 196.825(3)(B)]

In issuing a removal-fill permit, ODSL considers the public economic costs if the removal-fill activity is not "accomplished," OAR 141-085-0565(4)(b), that is, if the removal-fill activity is not "allowed." See ODSL's Guide to the Removal-Fill Permit Process, at 6-12. Examples of such economic costs that may be considered include potential impact to public infrastructure investments, and loss of new jobs and tax revenues. Guide to the Removal-Fill Permit Process, at 6-12.

The economic and public benefits of the Project are described in Section V. If the Project is not accomplished because it is not approved, the economic cost to the public would include the loss of the economic and public benefits described in Section V. Additional information about the substantial economic cost to the public is identified in the economic studies prepared by ECONorthwest (Attachment E). Without this Project investment, Coos, Jackson, Klamath, and Douglas Counties will lose a total of $60 million in new tax revenue each year and the State of Oregon will lose $50 million in new tax revenue each year.